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Friday, February 21, 1890.

ADMIRAL SIR R. VESEY HAMILTON, K.C.B., Lord of the Admiralty, in the Chair.

ON LESSONS TO BE LEARNT FROM NAVAL MANŒUVRES.

By Rear-Admiral RICHARD C. MAYNE, C.B., M.P.

"Our Country looks to its Sea Defences; let it not be disappointed."—NELSON.

WHEN I was asked by your Council to give this lecture my first impulse was to decline, on the ground of my incapacity to treat such an immensely important subject before a professional audience, with such a knowledge of detail and comprehension of facts as would result either in benefit to the Service or credit to myself; and also from a regard to that proverb of Solomon which I have always held in great esteem, "Even a fool when he holdeth his peace is accounted wise." But all ventilation of ideas however crude, and all discussions on the Navy, do good; and on second thoughts I decided that it would do me no harm, and might be to the benefit of the Service, if I submitted myself as an anvil upon which my brother Officers and others much more competent to treat such a subject, could hammer out more worthy conceptions and more useful conclusions.

Though I hope that at least some of my opinions may find acceptance, it is far more with a view to discussion of the points raised, and eliciting the opinions of others, that I have undertaken the task. There is no pretence of originality, and I look forward with no displeasure whatever to anyone's laying claim to each or all of the ideas set forth. I have freely robbed anybody whom I thought worth robbing, and quoted wherever I thought it desirable from the writings and speeches of those competent to speak on naval affairs. I hope I have abstained from cavilling at or criticizing minor defects where there is a desire to reform abuses. I consider that in this respect great credit is due to the present Admiralty; but, as the Financial Secretary to the Admiralty said quite recently, "Though much has been done, much more remains to do;" and I presume I am addressing those who have no faith in the suggestion made by one of our modern statesmen, "that we should dispense with costly defences

and rely on a substitute of unparalleled cheapness—our undying historic memories;” but who believe that if we are to maintain our position among the nations of the earth we must not relax our efforts, but push forward till we attain the highest possible standard in the construction of ships, guns, and engines, as well as in the training and discipline of Officers and men; that no sum of money which any Government is likely to propose to the House of Commons to grant can be too great to attain these aims, always assuming that such money is spent to the best advantage; and that to be in a state of thorough preparation to defend our rights and Empire is the best way to prevent war, one year of which would in all probability cost more than the whole value of the British Navy—ships, guns, and men put together; in short, that you believe the key to the whole position, the reason for the existence of the Navy at all, the basis of all naval policy upon the correct realization of which depend the number and class of ships, and the number of men and reserves, is that a great Empire must be strong or perish.

The more immediate lessons from the actual Naval Manœuvres, such as have been carried out during the last three years, are in one sense the smallest of those to be learnt, important though they be as part of the whole system. I mean that the part of it comprised in the “mobilization of our Fleet,” and the subsequent handling of our ships together for a certain time at sea, is only a test of what you have got to hand—a test of efficiency of the matériel and proficiency of the personnel of that part of our Fleet which is in home waters—and the result of which has been principally to bring into the strongest possible relief the contrast between our personnel and matériel, showing the great proficiency of the former, especially, I think I may with justice say, as regards all junior Officers and what may be called the “working” part of the Fleet; and, on the other hand, the sad deficiency of most of our ships in those qualities which would be required in actual war—the result of want of continuity at Headquarters in planning and building; of the apparent absence of fixed ideas of what is wanted; of the adoption of the views of foreigners without due consideration; of the endeavour to make one ship answer the purpose of several, and of an unwise parsimony, spoiling a really good vessel by limiting her cost to a certain sum, when a few more thousands—nothing in comparison to the whole amount—would have made her thoroughly efficient, of which the “Admiral” class is a glaring example.¹

The manœuvres, further, lead all concerned to look more closely into the questions of naval warfare. They have brought prominently forward, so far as regards our own coasts, the immense importance of the coaling question; of the efficiency of communication not only between H.M. ships and steamers of the mercantile marine, but also between cruisers and signal stations on shore, both by night and by day; subjects which still require great development. They have also practically proved our deficiency in

¹ I believe I might add the cruisers to this category also.—R. C. M.

Officers of Lieutenant's rank, and in Stokers. They have further demonstrated the inefficiency—I might say the uselessness—of ordinary torpedo-boats as an adjunct to a seagoing fleet, however useful they may be for an attack on a blockading fleet and for harbour defence. They have given Officers more experience of a certain nature in a few weeks than can be obtained by three years on distant foreign stations, and they have tended to bring about, I hope and believe, much closer relations between the Royal and the Mercantile marine, which must be of the greatest value in any future war. These and many other points are brought prominently to the front, among which by no means the least important is that of drawing the attention of the public to the fact of our having a Navy at all! enabling them, to a certain extent at least, to see what it is for which the taxpayer gives his money; and creating a general interest in naval affairs, which is of the utmost importance, both to the Navy and the country generally.

But while these are the lessons taught to Officers in general and to the public, I must presume that they demonstrate no novelties to those who have the responsibility of providing for the naval defence of the kingdom. For, despite the late denial of a very high official of the existence of any such thing as a "Plan of Campaign" at the Admiralty, I must decline to believe that our rulers sit at Whitehall with no idea as to what they would do on the outbreak of war, and with the intention of trusting entirely to the moves of the enemy for their policy and their strategy. If really no such thing exists, and if we are to believe that all our ships, with their precious burdens, are to go into war on the haphazard of the moment, and that no scheme for the protection of our food supply has been authoritatively approved and placed in the hands of the various Commanders-in-Chief, then should our rulers join with the utmost fervour in the prayer for peace, for there must be a heavy day of reckoning for them whenever war breaks out.

In the following remarks, then, I assume the position of "Commander-in-Chief of the Navy." I do not wish to shock anyone's susceptibilities by the title "Commander-in-Chief," for the title is a matter of comparative indifference provided that the principal naval Officer at Headquarters holds the position which is perhaps better expressed by that title than any other; and that being divested of the petty routine work which now occupies almost entirely the time of the "First Sea Lord," he would be able to look into the really important matters concerning the Service. I assume that he has lately come into office, but with a full knowledge of all naval requirements such as an Officer selected for that position should have; and that he sets to work to consider 1st, what he has got in men and material; 2ndly, what is lacking to enable him to defend the shores and maritime interests of the British Empire against any probable combination of other Powers; and 3rdly, whether the administration by which he is surrounded is in all its branches calculated to make the most of the resources of the Empire in this respect. In this task he must have before him various "plans of campaign," based on the

various alliances of other European Powers with and against us; and, as he has the means of knowing precisely the size, speed, and armament of all foreign ships, this is a comparatively simple task as far as the line-of-battle and its accompaniments is concerned, although all naval operations are sufficiently problematical to necessitate the provision of large reserves to meet miscalculations as to the combinations and movements of the enemy, and the amount of loss occasioned to the Fleet by the first general action.

Important as cruisers and trade protection, to which I shall refer presently, are, the Fleet with which we have to attack and overwhelm the enemy's fleet in line of battle, or its modern equivalent, is undoubtedly of the first importance, as I think it will be admitted that the effect of the loss by this country of one great naval action is almost beyond our conception. The adoption of a standard of naval strength based on a numerical comparison of ships between this and other naval Powers, apart from its general inaccuracy, is misleading, and indicative of ignorance of the strategical requirements of modern warfare. It is upon the "work to be done" that the strength of the Fleet must depend, although of course the forces and dispositions of the probable enemies and allies will be a factor in the calculation. Perhaps one of the first ideas to be dismissed, and one which late discussions in this Institute have tended materially to put on a sounder footing, is that fixed defences are to be accounted as of any real assistance to the Navy, beyond that of protecting dockyards and ports from raiders. For if the Fleet is not sufficiently strong to keep the enemy from our shores, no amount of fortifications will do so. Raleigh said: "His master after God will employ his good ships on the sea and not trust to any entrenchment on land." Nelson writes: "We must keep our enemy from our coast if possible and be able to attack him directly he comes out of port." And all history points in the same direction, that the invasion or attack of our ports by anything more than a small flying squadron is impossible while we have the command of the sea, and the power to retain it. It is now over 100 years (1788) since a Committee reported in favour of a large outlay on fortifications, which was supported in the House of Commons by no less a person than Mr. Pitt. The recommendation was based on the supposition that the Fleet might be absent from our shores for four months; and it was defeated in the House on the motion of Sheridan, on the ground that the Fleet never could, would, or should leave our shores unprotected for any such period. Without going into the enormous outlay of money on fixed fortifications since that date, and which I wish I could think was going to be no longer tolerated, the naval "Commander-in-Chief" will at least leave them out of his calculations, on the strength not of naval opinion only, but on such competent authority as General Sir Andrew Clarke, one of the most able Royal Engineers of the day, who has held the post of Inspector-General of Fortifications, and other military men. We must be able to maintain our fleets in such a position and in such predominant numbers that no hostile fleet can count upon the time requisite for any serious enterprise, without

a strong probability of having to deal with a superior force. As the Secretary to the Admiralty said not long ago: "We must possess a Fleet more than sufficient to watch and destroy every war-vessel of a possible enemy," always bearing in mind that the destruction of a Continental fleet would not entail the same consequences upon them as the destruction of our Fleet would upon us. We could not attack them upon land, and they are not, like us, dependent upon the sea for their supplies, the stoppage of which, even for a short time, would cause such misery as very probably to produce a state of anarchy in the country. What this Fleet should be is the question; but it is certain, as Admiral Hornby writes, that "the country which is to keep the sea must have a large superiority over that which can lie in harbour and put to sea whenever it sees a chance." Is the Navy yet up to this standard? There is a strong professional feeling that it is not. The attached "plan" (Table I) which is submitted, *faute de mieux*, as at any rate a plan, though open probably to considerable difference of opinion, points to a lamentable deficiency in cruisers and videttes, two of which it is generally admitted should be attached to every battle-ship. Each squadron should have a torpedo-depôt ship attached to it. At present there are only two in the whole Navy!

There are twenty-four fast merchant vessels on the Admiralty list which it is assumed could be equipped in eight days, and in preparation for which a subvention of 50,000*l.* a year is paid. In addition to this there are 150 vessels of over fifteen knots' speed available for transports, &c. It is very doubtful, however, how many of these could be withdrawn from their own important work of bringing food-stuffs to our shores and carrying mails. Our policy I consider should be to arm all these vessels at the joint expense of the owner and the taxpayer, and let them defend themselves. I am aware that I might be here reminded of that obstructive document, the Declaration of Paris. But no document must stand in the way of our sea-defence and the steady supply of food and raw material which is essential to the very existence of the people of these islands.

The defence of the commercial depôts of the Empire has not been considered in this paper, and it must be relegated to local efforts, assisted by the Government as regards the supply of guns, mines, ammunition, a staff of instruction, &c. Our arsenals and coaling-stations must also be secured against possible attack, and the mode of effecting this is not by indiscriminate and costly fortifications, but by mines, movable batteries, and torpedo-craft, and one of the first points which would become evident to our "Commander-in-Chief" is the absolute necessity of the whole of the defence of each district being under the direction of one supreme head.

As I have no intention of criticizing the operations carried out by the various squadrons in the Manœuvres of the last three years, I shall only refer to them in detail in the tabulated form appended (Table II), which gives the number of vessels employed and general idea, together with a note of the result in each year; but the practical lessons which each taught (and which a *table* cannot record!) are—

TABLE I.—Proposed "Plan of Naval Campaign." Based upon the following assumptions:—

- (a.) War with two great maritime Powers, A and B, the strength of whose fleets are respectively—
A. Battleships and coast defence, 56. Cruisers, 73. Torpedo-vessels (sea-going), 36. 1st class torpedo-boats, 76.
B. " " " 33. " " 42. " " 26. " " 28.
(b.) This country is without an ally.
(c.) The enemy's war fleets are to be *blockaded* in their ports.
(d.) That main trade routes have been laid down by Order in Council.
(e.) That the Mediterranean trade route will be abandoned.
(f.) That the principal merchant ships are armed and capable of self-defence.
(g.) That the "coaling stations" and "commercial depôts" are *locally* protected:—
(1.) By submarine mines. (2.) Earthenworks, armed with quick-firing and 6-inch guns, to cover them. (3.) Torpedo-boats, steam launches, and tugs (two of each). (4.) Steam yachts to cruise outside depôts in pairs, and at the most important places. (5.) A coast-defence vessel.
(h.) That "envisors" have a "coal endurance" of 5,000 miles at 10 knots.
(i.) That all "Commanders-in-Chief" are conversant with the "plan," and put so much of it as they consider practicable into practice annually.

Nature of "the work."	Chief "Naval Command" responsible for "the work."			Force "required to do the work."						
	Extent of "command."		Designation.	Headquarters.	Battleships.	Satellites.	Cruisers.	Torpedo de- pot ships.	Coal and other ships.	Personnel.
	From	To								
Blockade of ports and protection of channel.....	Yarmouth— Texel line.	Portland— C. la Hogue line. }	The "S.E.".....	Portsmouth.....	10	20	15	1	5	10,670
Ditto	Portland— C. la Hogue line.	Selly— C. Finisterre line. }	The "S.W.".....	Plymouth	15	30	15	2	5	14,950
Blockade of war-ships at entrance to Baltic, and protection of North Sea.....	Yarmouth— Texel line.	Shetland— Bergen line. }	The "N.E.".....	Leith.....	6	12	10	1	5	7,980
Protection of west coasts and ap- proaches	Selly—10° W line	60° N.—10° W line.	The "N.W.".....	Belfast	10	...	3	2,750
Blockade of Mediterranean and pro- tecting flank of main trade route ...	C. Finisterre— Gibraltar line.	Madeira— Gibraltar line. }	The "Mediterranean".....	Gibraltar	10	20	10	1	5	10,620
(1.) Reserve squadron	Independent, Ditto.		The "I. Reserve"	The Downs.....	6	12	6	1	3	6,050
(2.) Ditto			The "W. Reserve"	Millford.....	6	12	6	1	3	6,050

[illegible]

TABLE II.—*Summary of Naval Manœuvres.*

GENERAL IDEA.

1897.

Composition of the Squadrons.	<p>(1.) The British Cruisers had lost touch of an enemy's fleet which had put to sea with a view of damaging English ports in the Channel, Thames, Medway, and West Coast of England and East Coast of Ireland.</p> <p>(2.) Special squadron (C) for protection of commerce.</p> <p>(3.) Night attack by torpedo-boats on ships at anchor.</p>					
Squadron	A ¹	A ²	B ¹	B ²	C	Total.
Base of operations.....	—	—	—	—	—	—
Battle-ships	5	5	5	5	—	20
{ 1st class.....	—	—	—	—	—	—
{ 2nd class.....	1	—	1	1	6	9
{ 3rd class.....	1	2	1	1	—	5
{ Monitors.....	2	—	4	—	—	6
Coast defence. { Gunboats.....	16	—	13	—	—	29
{ Torpedo-boats..	10	—	26	—	—	36
Special service boats.....	—	—	—	—	—	—
Total number of pennants..	35	7	50	7	6	105
Total number of men	—	—	—	—	—	—
General result	<p>Deficiency of scouts. Consequent partial success of enemy. Coast defence flotillas, as constituted, offered no real impediment to a properly constituted hostile attack.</p>					

1898.

Composition of the Squadrons.	<p>To blockade two hostile squadrons in two ports before their preparations are completed; the blockading squadrons to prevent the escape of the enemy's squadrons, or, should they fail in doing this, to follow and capture them.</p>				
Squadron	Blockading. A ¹ A ²		Blockaded. B ¹ B		Total.
Base of operations.....	British ports		Lough Swilly and Berehaven.		—
Battle-ships	6	5	5	4	20
{ 1st class.....	1	1	—	—	2
{ 2nd class.....	4	3	3	1	11
{ 3rd class.....	3	3	2	4	12
{ Monitors.....	—	—	—	—	—
Coast defence. { Gunboats.....	—	—	—	—	—
{ Torpedo-boats..	8	4	6	6	24
Special service boats.....	—	—	—	1	1
Total number of pennants..	22	16	16	16	70
Total number of men	5,134	4,527	3,292	2,998	15,951
General result	<p>That the blockading squadrons were insufficiently and inadequately constituted, scouts being far too few. Insufficiency of connected coast signal stations.</p>				

1889.

Composition of the Squadrons.		(1.) Masking the enemy's fleet from a suitable strategical base, watching his movement by means of scouts, and being prepared to follow and destroy him if he puts to sea. (2.) Protecting the English coast.						
Squadron	A	B	C	D	E	F	G	Total.
Base of operations	Milford and Falmouth.	Queens-town & Berehaven.	Lamlash and Falmouth.	Plymouth.	The Nore.	Hull.	Leith.	
Battle-ships . . .	9	9	2	—	—	—	—	20
{ 1st class . . .	7	2	—	—	—	—	—	9
{ 2nd class . .	6	4	—	1	1	—	2	14
{ 3rd class . .	5	5	—	1	—	2	—	13
Coast Cruisers . . .	—	—	3	1	2	—	—	6
{ Monitors . . .	—	—	1	—	3	2	4	10
{ Gunboats . . .	—	—	—	—	—	—	—	—
{ Torpedo-boats .	10	8	4	6	6	2	2	38
Special service boats	—	1	1	—	—	—	—	2
Total number of pennants	37	20	11	9	12	6	8	112
Total number of men	9,891	7,518	1,317	1,053	975	557	813	22,123
General result .		"Masking" could only be successful with a very large force of cruisers and scouts. The coast defence flotilla, as in 1897, offered no impediment to enemy.						

(1) That the official speeds of ships are unreliable data; (2) That commercial depôts and their approaches cannot be adequately protected by passive defence alone; (3) That speed is a most necessary factor in a war-vessel; and (4) Next to it large coal endurance; (5) That the maintenance of a squadron with coal, stores, &c., requires special and careful organization; (6) The mystery attached to the movements of ships and their object should be abolished, so that everyone concerned should be induced to take an interest in them; and (7) It was most evident that the squadrons were deficient in cruisers and scouts.

I here make a numerical comparison of our naval strength with that of the rest of Europe as estimated for 1894, when our programme will be completed. This comparison may very likely prove erroneous soon after 1894, by some of the other Powers increasing their programme, but it is the nearest at which we can arrive at the present moment. Tables IV and V still further elucidate our position.

Table III.¹

	English.	French.	Russian.	German.	Italian.
Sea-going battle-ships.....	55	34	11	13	13
Coast defence.....	16	22	22	15	4
Cruisers.....	123	73	42	32	24
Torpedo-vessels.....	178	204	117	109	142

¹ This table is compiled from Lord Brassey's Annual for 1888-89, with our new programme and the published new French programme added. "Gunboats" are omitted.—R. C. M.

TABLE IV.—*Summary of Sea-Keeping Fleet (Built and Building).*
I, II, 90.

Relative Speeds.

* Speeds on Measured Mile.	Battle-ships.	Cruisers.	Torpedo-gun-vessels (Satellites).	Merchant Vessels of 1,000 tons and upwards.	—
20 knots and upwards.....	—	13	33		Coast Defence Iron-clads, 13.
18 " "	—	56	—		
16 " "	20	22	—		
14 " "	18	8	—		
12 " "	17	27	—		
Under 12 knots.....	—	—	—		
Grand totals.....	55	126	33	2,643	

* *Note.*—These speeds serve as a rough standard for comparison, but must all be reduced by at least 2 knots an hour to give sea-going speed.

Such comparisons, however, can of course only be *numerical*, as it would be quite impossible in this paper to enter into a discussion of the fighting values of the different ships of different nations; my ideal Commander-in-Chief working out his "standards of strength" by the work the Navy has to do, and not by the money which it may fit in with some Chancellor of the Exchequer's views to grant in a certain year (and not for one moment admitting the position taken up a year ago by the Secretary to the Admiralty that the money expended in fortifications is in any way to be regarded as a set-off against a deficiency for the Service), will of course have to go into many details for which I have no time here.

TABLE V.—*Summary of Sea-Keeping Fleet (Built and Building).*

Relative "Endurance."

• Radius of Action (at 10 knots).	Battle- ships.	Cruisers.	Torpedo-gun- vessels (Satellites).	Merchant Vessels of 1,000 tons and upwards.	—
15,000 knots and upwards..	—	2	—		Coast Defence Ironclads, 13.
10,000 " " ..	—	13	—		
8,000 " " ..	—	45	—		
7,000 " " ..	8	6	—		
6,000 " " ..	3	10	—		
5,000 " " ..	15	13	—		
4,000 " " ..	4	8	—		
3,000 " " ..	1	13	—		
2,000 " " ..	4	14	33		
Under 2,000 knots.....	20	2	—		
Grand totals.....	55	126	33	2,643	

• *Note.*—This table is based on official information, but is probably quite one-third in excess of actual coal endurance. To justify this statement I may say that the "Colossus" is put down as being able to steam 7,000 knots at 10 knots speed, while in reality 3,900 knots is her limit under most favourable circumstances.

This "standard" should be looked upon as the national capital, and being established and annually revised would be the basis of our ship-building policy, the making good of its deficiencies and wastage—when the Fleet has once been brought up to its proper strength—being the elements of the annual expenditure. I may point out that these latter have not been dealt with in the recent Defence Bill, and consequently the business-like proposition of the First Lord in 1887, in which he annunciated the actual value of the Fleet, the rate of its depreciation, and the annual expenditure necessary for replacement, viz., 4 per cent. on armed and protected vessels, 6 per cent. on corvettes and sloops, &c., 9 per cent. on torpedo-boats and launches, and 5 per cent. on harbour craft, is held in abeyance. But it is only by reverting to some such business-like basis that the Navy will ever be steadily kept up to its proper strength. In this reference I may mention a grievous defect in our maintenance of the Fleet. As soon as the number of units of strength required is decided upon, that number should be permanently and constantly maintained in efficient condition. So long as any ship remains upon the effective strength of the Fleet, so long should she be able to take part in any operations; and on a ship being paid off on return from a foreign station or otherwise, she should either be wiped off our effective naval strength, or at once repaired and put in order for commission. In short, no ship should be taken credit for on the strength of the Fleet unless she is ready to go to sea and fight. Under our existing system—

or absence of it—this is not done, and ships remain in the Reserve going from bad to worse for want of this “stitch in time,” and of a sufficient number of people to keep them in proper order while they are in Reserve, with the result that when brought forward again for commission, thousands have to be expended where hundreds should suffice, the vessel having steadily retrograded since she was paid off. This under a proper system would be a matter to be dealt with entirely by the Admiral in command of the district, who should have men and money for the proper care of the portion of the Fleet under his orders, for all which he should be held fully responsible.

My Commander-in-Chief at the earliest opportunity procures the mobilization of all the home forces, in order to apply the best practicable test possible in peace-time to the whole war machinery as he finds it, and he would of course be afloat and watching the performance of the various units at sea with which he had got to work out the problem; the position he would be placed in giving him time for this really important work. If his conclusions were in any way similar to mine—after having had four cruises with the home squadrons—he would wonder how such a collection had ever been got together, and he would in vain seek for any guiding principle in their construction. This would, however, be no great surprise if he had followed the speeches and letters of the principal constructors of modern times; when he found, for instance, that one of the most prominent, Sir Edward Reed, who was for several years Chief Constructor to the Navy, made it his great point to give our ships “greater breadth in proportion to their length,” and so late as 1880 publicly stated that if you wish to build ironclads carrying a heavy armament, coupled with great speed, you must build them circular: when he found the same gentleman, quite recently, advocating the placing of heavy-armour belting completely round the ship, though before Lord Dufferin’s Committee he stated that the plan he recommended “rendered unnecessary all vertical armour except for the citadel:” when he found also that Sir N. Barnaby, who has lately argued that our battle-ships are too large; said so lately as 1888, that “the larger the ship, the greater its offensive power, if it is skilfully designed; and the greater at the same time, and by reason of its bulk, its defensive qualities.”

Even a superficial study of such contradictory views expressed by the leaders of public opinion in this matter will account to him for the motley team he has to drive; and dropping the past, he will consider what should be the features at which to aim in the future. He will see the cruisers, nominally of great speed, unable to maintain more than some 14 or 15 knots, by reason of their shortness and the enormous weights that we have put into them. He will see battle-ships belted to the utmost extent that they are able to carry, and only not completely belted on account of the impossibility of putting any further weights into them without giving them a displacement as yet unheard of. He will see them, by reason of their low freeboard forward and their enormous guns, pitching bows under and straining everything, so as to make their between decks uninhabitable: this from mere straining,

and without inquiry into the effect which would be produced in this respect if they were chasing in earnest, and had to fire their heavy guns many times in the line of the keel, especially from a turret. What would then happen is still left to the imagination! These and many other points will be evident to him, and will be to him a practical "lesson from manœuvres," because, notwithstanding all his nautical experience, he will probably never have had before a chance of witnessing the performance, under so many and varied circumstances, of so many different types of vessels driven at full speed without fear of reprimand as to the coal bill. Freed from the enervating atmosphere of Whitehall, and with the plain evidence of his senses before him, he will say: "These vessels must be longer in order to maintain at sea that speed which in these days is absolutely essential. That being so, however much my friends and advisers, or even I myself, may desire the water-line belt, it must be discarded on account of its enormous weight. Already the greatest differences of opinion exist with regard to its proper length and its proper position. Let us cut this Gordian knot by abandoning it altogether. All protection to the engines and below water should be by a curved steel deck, which is admitted to have three times the defensive power of vertical armour.¹ Let us use vertical armour only for the protection of the guns of both the primary and secondary armaments. The armaments themselves must also be materially simplified. We must have no more ships carrying a dozen different kinds of guns; and, if we are to have torpedo-tubes at all, two or three must be the limit number, instead of seven or eight, as at present. More room must be given to the engines and boilers to enable them to fulfil all their functions properly, the necessity for sudden stopping, turning, and changing speed in the modern man-of-war rendering it essential that every part of her machinery should be much stronger and heavier in proportion than that of a merchantman, instead of lighter and weaker, as at present. More room also should be provided for the stowage of coal." As to forced draught, he will decide on its abolition as far as possible, that is to say entirely for big ships. He will acknowledge that it must be retained for small craft such as torpedo-boats, where, owing to the small size and light scantling of the boilers, all parts are soon and *equally* heated and cooled, while to the boilers of large vessels, where this is impracticable, "forced draught" is simply a "blow-pipe" on the tube-ends and plates, and being connected as they are with rigid masses of stays, plates, &c., something must give way.

He will also see that masts and yards are things of the past, and will wonder why they have been retained in the ships in which new engines or boilers, or both, have been placed. He will know that all

¹ A friend having questioned this proportion, I may say I took it from Lord (then Sir Thomas) Brassey's speech in the House of Commons, when asking for the additional grant for shipbuilding in December, 1884. He said in the presence of, and uncontradicted by, Sir E. J. Reed, that the 2-inch steel deck of the "*Mersey*" made her equal to the latest Russian battle-ships which had 6 inches of vertical armour.—R. C. M.

yard and sail drill has entirely lost interest among both Officers and men, and is looked upon solely as a bore, taking up time which should be employed in more useful and practical exercises. Much as he may regret that he is never again to come on deck at 7.45 with lower yards and topmasts down, and give the order "one pipe cross royal yards," it will be the same kind of regret that he felt when he first realized that he was never to have the glory of commanding a wooden three-decker with three stern-walks! and he will feel as a practical man that nothing justifies the retention of what is absolutely dangerous in action, and when steaming head to wind impedes the ship's progress by something like a knot an hour! Their disappearance also would greatly increase the space in our now overcrowded vessels, and materially help towards the stowage of more coal.

He will also remember that our annual manœuvres are only a test—and that only partial—of our preparedness *at home*. Though the whole of the available force of ships in the arsenals of this country has been "mobilized," local communication partly organized, and a small attempt made at protecting our commerce, nothing has been done abroad or with reference to our Colonies. The efficiency of our reserve of ships or men at home has not been tested. The local defences of our commercial ports and their approaches were not tested at all, partly owing to the military being considered out of the game, and their operations, possible and actual, entirely disregarded; and he will undoubtedly come to the conclusion, strengthened by each succeeding year of the manœuvres, that our heterogeneous Fleet is not only susceptible of great improvement in its component parts, but in the aggregate is not sufficient or nearly sufficient, especially in cruisers and scouts, for the work it would be called upon to do. No amount of apparent success gained or claimed on either side in the game must blind our eyes to or induce us to ignore this. He will note that, as before said, we have only two torpedo-depôt-ships, the "Hecla" and the "Vulcan," for the whole Service; and that such vessels, with machinery capable of doing extensive repairs, not only to the engines of torpedo-boats, but to the main and auxiliary engines of ships, are essential to each squadron; and as they cannot be readily extemporized we should be prepared to supply one to every squadron detached from our arsenals. More vessels carrying guns for high-angle fire would be required in war to dislodge ships assembled in large numbers in the enemy's ports. Taking the "Handy" as a fair type for this purpose—more, say half-a-dozen of them, should be built, and they could be utilized in peace for gunnery and mining practice.

As to Torpedo-boats, he will, I hope, relegate them to their proper position as harbour and river defences, and no longer subject both Officers and crews to the useless misery of spending their time on what may be compared to "a half-tide rock" at sea. Having done this, and blocked up their bow ports, which could never be used without almost certain destruction to all on board, and fitted them with pivot-fire only, he will find some use can be made of what has cost so much.

Such will, I consider, be his general views on the matériel provided. But before leaving this all-important subject, sufficient in itself, if one went into detail, for a whole paper, let me point out that there are many other reasons than mere weight for the reduction of our enormous guns before referred to to something much smaller. You do not want a gun to pierce armour heavier than is carried by any nation afloat. Taking the penetrating power as approximately twice the calibre, the 9·2 gun would penetrate everything afloat, with one or two exceptions. No gun should be put on board ship which cannot be man-handled in case of need. Without entering into the question of the exact endurance of the big guns, or our power to construct them, it is evident that smaller ones could be much more easily constructed and given greater endurance, in addition to the immense advantage of much more rapid fire. One or two types also should be selected for the secondary armament, which should not be, as is now the case, composed of several kinds of guns, some of which, at least, have never been submitted to thorough practical trials. Our gunnery depôts should thresh out the details of all guns, and none should be put on board our sea-going vessels until every detail has been practically perfected.

Though more strictly comprised under "administration," I cannot leave this subject without saying that I do not believe we shall ever be right in this most important matter so long as we have to go to the War Office for our guns. The only solution, I believe, is the resuscitation of a separate Ordnance Department, with a civilian head—selected for his knowledge of the subject—and with a naval and military Officer under him to express and look after the requirements of their respective Services. Such department should issue its own orders, and the charge should appear on its own "votes."

In regard to coal-endurance, which is a most important feature, especially in our cruisers, the greater length proposed for the ships, and the abolition of masts and yards, would admit of greater stowage. In view of the absolute impossibility of coaling at sea, the possibility of using liquid or fluid fuel should be carefully considered, as, of course, apart from other advantages, its adoption would solve this problem. We know that Mr. Nobel uses it entirely in his vessels on the Caspian. I am aware that it is usually said that if this were adopted, we should be dependent on foreign supplies. This is believed to be a mistake. Two able, scientific and practical men have written to me lately, strongly advocating its use. One of them says, "if there were really to be a steady demand, I have little doubt that the coking process, now most wastefully carried on, might be made to produce liquid fuel instead of poisoning the air; indeed, I cannot think why this important question of liquid fuel has not received more attention than it has."

I have said that in this paper I lay claim to nothing original. As to the advocacy of higher speed, I may remind you that I am merely going back to the Report of a Committee of 1831, where 19 knots was fixed upon.

Personnel.

Turning next to the personnel :—Although the ships and guns have been entirely reconstructed in recent years, the successful manipulation of the elaborate and complicated engine of war of the present day depends upon the skill of the same men physically as existed in the bow-and-arrow age. But happily, though physically the same, their mental capacity has wonderfully improved while the ships have been undergoing their transformation, owing to advanced civilization, education, and improved treatment in every way. The skill and the bravery of both Officers and men have been, and are continually being, tested in war with the elements, and in overcoming every kind of difficulty when not required for actual warfare; and the behaviour of all during the Naval Manœuvres of the last three years gave every reason for believing that we get the best possible article out of which to construct the trained British seaman. Entering both Officers and men as boys, the whole of their development depends upon our system. Do we employ the best? So far from it, our system of training both Officers and men is much too elaborate and wide of the mark. Too much time is spent at school and college and in training ships. We do not require our people to design or build ships, guns, or torpedoes, but to manipulate them and develop their utmost power, and to have and maintain such physical training as shall, under the misnomer of "nerve," qualify them to handle the biggest ships under the most trying circumstances, never forgetting that a single wrong order at a critical moment may cause the loss of a ship, and perhaps of a fleet. These conditions are to be attained, not by an extensive course of mathematics, physics, or chemistry—all very interesting and valuable subjects—but by actual and constant practice of their real work under all circumstances and conditions. This is what we require for our naval Officers and men. Are we using the best means to attain it? I say "Certainly not." The "Britannia" and the college at Keyham should both be abolished, and Officers entered direct into the Service from public or other schools, and this by open competition, not in special subjects, but in all the varied subjects taught at such places; the first test being only in such subjects, and to such an extent as any properly educated lad of the age adopted, should know; in fact an "Intelligence" examination in which the best are selected. I fear that many of my brother Officers are not yet ready for open competition. But it must come, as it has already in the Royal Engineers and Artillery; and in view of the altered circumstances of the present day, and those to whom nominations are now given, I see no great reason against it. The State should no longer be called upon to bear so much of the charge of the special education of these boys; but, being entered at the age of sixteen or seventeen, when the groundwork of their education will have been laid, they should at once commence at sea the course of instruction and training in what they will have to practise during all their lives in the Navy. The collegiate part of the young Officer's education should be given at the same age as it is to those who go to

our universities, and after a service of two or three years afloat. Every duty on board Her Majesty's ships should be in the hands of Officers so entered and so educated.

If education should not be begun as it now is, still less should it be ended on the present system, by which it is not necessary for a young Officer ever to open a book after he is about twenty. Examinations should not cease until the rank of Captain is attained; and without going into details, some such system as that of the Staff College for the Army should be adopted, by which, while no absolute veto would be placed upon those who do not pass, a decided preference, *ceteris paribus*, should be given to those who did pass it, and still more if they passed well. When looking into this question, my Commander-in-Chief would see one paper containing the following opinion of the Germans upon our system: "The Officer entrusted with this duty (of the Central Abtheilung), who is considered about their greatest authority on the subject, told me that the English system of education for naval Officers was considered so utterly unsuited to modern requirements that there was scarcely any part of it which they were enabled to adopt." The opinion of our own Committee, appointed to inquire into this subject in 1835, is expressed as follows: "But we are equally convinced that any system is a faulty one which forces boys to study such advanced subjects at so early an age, and then to a great extent throws away the labour thus expended, by placing the young Officers in such a position that the further earnest pursuit is difficult and antagonistic to the necessary mastery of the duties of an Officer; which demands also that the general education of an English gentleman should be cut short at thirteen, whilst yet failing to secure a thoroughly efficient professional training." In short, they utterly condemn the present system from beginning to end. The present system at Greenwich is as faulty as the site. Whether it be possible to make any other use of that magnificent pile would have to be considered. I am not only aware of, but feel strongly, all the naval sentiment attached to the place; but, apart from the existing defects of discipline and instruction, which are remediable, it is too near London, too full of temptations. The young Officer during his course is entirely cut off from all connection with ships, and knows absolutely nothing of what is going on in the Service, instead of being in close contact with all that is newest and best in ships, guns, and experiments of all kinds, which latter, by the bye, instead of being kept secret among a few select officials, should be witnessed by as many Officers as possible. The "moral" argument, which I believe did much to condemn Portsmouth, may be used with tenfold force against Greenwich.

As regards the Engineers, as a separate class they should disappear. We do not require high scientific knowledge of an elaborate order to work and look after a ship's engines. It is a matter of experience and common sense. We have never had a more valuable and more highly respected Officer in the Service than the old Chief Engineer, who never arrogated to himself any special scientific

attainments, but knew his work and did it well. He was essentially practical, and that is what we require. We require specialists more than ever to look after engines, guns, and torpedoes. But there is no reason whatever to suppose that if an executive Officer devotes as much time to learn engineer's work as he does to learning torpedo work, he would not be perfectly competent to supervise the engine-room artificers, by whom the principal part of the engineer work is now performed; and the "Engine-room Lieutenant" would bring to the discharge of his supervising duties, the habits, constitutional and acquired, of supervision and command which are known to be the characteristic of the class which he joined on first entering the Service; and his occupation would certainly be as useful as the "Torpedo Lieutenant's," the "Navigating Lieutenant's," or that of any other special branch. The engine-room staff would thus comprise a "military branch" Officer, in charge, with one, or perhaps two, assistants of the same branch, and we should in this way be able to enter more Officers available for many purely naval duties. Below these there would be the "engine-room artificers," and a rating of petty officers—"seamen stokers"—in several grades. These petty officers would be as permanently assigned to engine-room duties as the gunnery instructors, torpedo instructors, captains of turrets, &c., now are to their special duties. The remainder of the engine-room complement would become a "part of the ship," through which the whole seamen part of the crew might be put in the course of commission. Every stoker would thus be trained to arms. I have said that the Manœuvres showed, *inter alia*, our deficiency in stokers. It may not be generally known, but I mention it in proof of my assertion, that we actually had to fill up our Fleet with stokers who were, and are now, in receipt of Greenwich Hospital aid for serious physical defects! No wonder complaint was made of the physical inefficiency of the mobilized stoker!¹ The present distinction between "combatant" and "non-combatant" should disappear. Every person in the ship should be a combatant, able to take an effective part in offensive and defensive work. Why should the Engineer be a non-combatant? Why should the Paymaster or the Schoolmaster? both of whom, however, should disappear in these days. The Admiralty should insist upon everyone knowing the principles of offence and defence. Naval instructors would of course disappear, and the young Officers would be instructed in practical navigation and languages by an additional Lieutenant; and, indeed, the far greater part of the education of Officers, as well as of men, should be carried out by those actually serving as combatant Officers on board Her Majesty's ships at sea.

I am not for one moment supposing that such changes can be made by a stroke of the pen, or by anything but gradual entry at one end

¹ It having been stated by the Chairman in the discussion that no complaints were made by the Captains of the ships employed in the manœuvres as to paucity or inefficiency of the stokers, but that, on the contrary, a large number remained in port, I wish, in addition to the statement as to how the numbers were made up, to call attention to Table A, p. 440 of Brassey's Annual, 1888-89.—R. C. M.

and extinction at the other; and in bringing such views prominently forward I would rather be considered in the position of one pointing out what he believes to be the inevitable and proper thing to all concerned, whether as those who make the changes or as those who are affected by them, viz., to prepare for them, and to smooth the way.

The Paymaster, a non-combatant Officer, should be allowed to die out, and his place and duties should be taken by a Lieutenant, assisted by petty officers—executive—as “writers,” which latter should become extinct. I have the evidence of several of the oldest Paymasters and secretaries, that there is nothing in their duties which could not be thoroughly well performed in this way; and indeed experience, where this has had to be done, has shown it to work admirably. An Admiral's secretary of considerable experience assured me that two of the best writers he had ever had were two injured seamen, sent to him as an experiment by the Commander-in-Chief of the station.

The volunteer “seaman-gunner,” so-called, should be abolished. Every person should have a certain knowledge of gunnery, torpedoes, and signals, but to specialists only should the higher knowledge be imparted. Captains of guns and torpedo-tubes, instructors in gunnery, torpedoes, and signals should be selected from the best men, and be well paid. The rest should be trained to work the guns of the ships to which they are attached. But everyone in every ship should have a knowledge of the rifle, pistol, cutlass, and small quick-firing guns, as well as of ordinary “signals.” One of the greatest evils of the present system with the seamen, creating perhaps one of the greatest difficulties of the day, springs from the unhappy mania for over-training Officers and men under a system which necessitates long continuance in harbour, or even on shore. It was well said to me by a very able Officer but a short time ago, that no one ever proposes anything that will add to the time spent *at sea*. It is believed that the seaman-gunner of to-day does not spend more than seven out of his twenty years in an actual sea-going ship. Yet, while all this “fancy work” is going on in our naval ports, the Steam Reserve has not men enough to keep the ships in its charge even in moderately good order; I believe I do not exaggerate when I say not even enough to keep their double bottoms clean, this being a matter requiring no small amount of labour. This paucity of men for ordinary work is one of the causes, referred to before, of the waste of money upon ships when brought forward from the Steam Reserve for commission.

It is well known that most of the ships when they are paid off are in better order than they have ever been before, and that if the necessary repairs were taken in hand at once, and the ship kept up to the mark at which she should be while in the Steam Reserve, thousands of pounds would, as has been before said, be saved on every ship when re-commissioned. This will bring my Commander-in-Chief to a consideration of the number of men now voted for actual service with the Fleet and the Reserve, upon which he can lay his hand in the event of war. I pass by the additions necessary to

meet the increased Fleet of 1894, the entry and training of which I presume we shall all agree should be commenced at once. Seventy new ships are to be produced by 1894, and 1,000 to 1,500 men should be added to the Fleet in the forthcoming Estimates. But apart from this, the whole system of employment of our men is faulty; and the Reserve, at any rate, is deceptive as to our available strength, and we should find to our cost, in the event of war, a very small portion of the Second Class Reserve available. It is a literal fact that when the last war-scare took place, the men in training on the North-east Coast disappeared, and on the Officer in command of the district asking the Inspector the meaning of this sudden diminution of the number of men at drill, he was plainly told that they had gone on account of this scare and the possibility of their being called upon to fight, which they had never had the slightest intention of doing! The fact is that by far the greater number join for the 2*l.* 10*s.*¹ bounty, the suit of clothes, and the six weeks' keep. They would vanish into thin air when wanted for service. This system should be swept away, and the First Reserve increased. Space does not here permit of going into further details than to say that this force should be so reorganized as to make it, at least for the greater part, constantly interchangeable with the sea service, and the fishery and several other duties now performed by the "regulars" should form part of the reserve work. The increase should be to the extent of giving enough men for keeping all the vessels in the Reserve that I have spoken of, in proper order. These vessels should have (say) half their proper ships' companies always on board, and being under the command of a combatant Officer—probably the "Engine-room Lieutenant"—the men could be regularly assembled for drill, both on board and on shore, as often as is considered desirable. This system of seamen and sea Officers living on the sea is, I submit, far better as well as far more economical than the naval barracks so strongly advocated by some Officers. Not only would the ships all be kept in order, but when mobilized or commissioned they would have half the crew conversant with all the intricacies of ship, guns, and engines, instead of an entirely raw set. One, at least, of our most highly esteemed Officers is strongly in favour of the Russian system of permanent crews. They have a full complement of both Officers and men for every man-of-war from the day she is launched till the day she is finally condemned as being unfit for service. The men live in barracks, and the Officers on shore in lodgings, &c. I understand, however, that they have lately seen occasion to introduce a change. There are many difficulties in such a scheme, and with us the number of men necessary to be maintained at all times for full crews would probably be a practical bar. But apart from this, it must seriously detract from that flexibility which is of such importance in naval mobilization; some men might belong to the same ship all their time, and she might be a "Glatton," or some coast defender,

¹ Originally stated in error to be 6*l.*, that being the amount paid to First Class Reserve men.

while others might be all their time in the training squadron, or some vessel employed for five or six years on a foreign station. With great deference, I confess I do not see how this system would work advantageously with us, though something would be gained if we get the proper number of men into the Reserve by their interchangeability every two or three years with men serving in sea-going ships. As you are probably aware, the present Royal Naval Reserve, as established by the Royal Commission presided over by Lord Cardwell in 1858, has never been brought up to anything like its authorized strength, viz. :—

Authorized strength ¹ ..	920 Officers,	30,000 men
Actually enrolled	264 ,,	18,000 ,,

As it is well to know what qualified lookers-on think of our system, I quote the following views from the very able report of Lieutenant Colwell, U.S.N. : "The material of which it is composed is admirable, but the system is open to the objections that these men, if drafted on board a modern man-of-war, would be nearly as useless as any other untrained men their training would be found to be of little value, for they have no permanent organization, no permanent Officers whom they know and to whom they are accustomed, no uniform system of instruction has been given them, and the weapons with which they have been in the habit of going through their annual drill are obsolete, and no longer find a place on war-ships. The short periods of training with strange comrades, strange Officers, varied weapons, and unfamiliar surroundings, owing to their constantly changing the place at which they take their drill, cannot possibly give them the discipline and systematic way of performing their duties so necessary to the fighting efficiency of that complicated machine—the war-ship of the present day." And he goes on to give it as his opinion that it would be a "liberal estimate" that one-third could present themselves at the rendezvous in a fortnight—*very* liberal, I think—and "those might find themselves drafted to a class of vessel with which they were totally unfamiliar, and stationed at a type of gun they had never seen."

The Royal Naval Artillery Volunteers might be made into a very useful corps if turned into the artillery more in keeping with their name instead of the hybrid they are at present, and increased to, say, 5,000 strong. They would then form part of the force under the naval Officers who should command all our coast defences. They would be most useful, also, to release the large number of coastguardsmen whom it would now be necessary to retain for our coast signal stations.

The training, pay, and position of signalmen is still much below what it ought to be, though it has been improved of late. The importance of this body in war-time cannot be overrated.

¹ It was stated in the discussion that the numbers actually enrolled—especially of Officers—are considerably in excess of those put down. I am very glad to know it, but cannot at this moment lay my hand upon any data from which to correct the above.—R. C. M.

Though perhaps it may be considered almost a detail, Admiralty messmen are a requisite of the new order of things. They are an absolute necessity of the manœuvres for the hurriedly mobilized Fleet, and ought to be supplied to all Her Majesty's ships.

All the various duties of *actual service* along the coast,—the principal among which in time of war, and now that smuggling is almost entirely a thing of the past, viz., the working of various coast signal-stations all over the kingdom, would be performed by the Reserve men. I feel sure that it would be now found that in addition to the failure of the Second Class Reserve to produce anything like its supposed quota, at least a third of the present Coastguardsmen would be unavailable afloat in war-time, having to be left on shore for signal purposes; as I can hardly suppose it is the intention to leave the signal-stations round our coasts entirely unprovided with efficient signal-men just when they are most wanted. At least, such would not be the view of my ideal Commander-in-Chief! The whole importance of these signal-stations was demonstrated in all the Naval Manœuvres, but perhaps more particularly in those of 1889, which showed that although an enemy might run up the Channel, and threaten various ports, he could not remain long without being brought to action, provided we kept up an efficient home fleet and well-organized and connected signal-stations. The difference in this respect between 1887 and 1889 was very marked. The connection of these stations is also a matter of immense importance. To conclude my remarks on this head—the whole forces and the whole defences of each section of the coast should be actually under the single and sole command and responsibility of the Admiral in command of the district, holding a position somewhat analogous to that of the *Préfet Maritime* in France, the separate Admiral in command of the Reserves being suppressed; and thus alone can our Fleet and coast defence be properly conducted. Such a position and such a responsibility also can alone in these days justify the existence of a Commander-in-Chief at a home port, who will inevitably be economized off the face of the earth, unless he can show some better reason than I fear he could of late years, to justify his existence. In short, he must be something more than what a Commander-in-Chief at Portsmouth once told me he considered himself, “a big Midshipman!”

Promotion, Retirement, and Pensions.

Though it will be upon financial grounds that this question will be forced upon us, and it concerns principally the First Lord and Financial Secretary, it is one which cannot be ignored, and the sooner it is realized that the days of a “Non-effective Vote” of over three millions sterling annually for the Navy and Army are numbered, the better, so as to avoid hasty and ill-considered action. The present system of promotions, retirements, and pensions is most unsatisfactory, and entails immense expense upon the taxpayer. It is—especially since the Childers scheme—demoralizing to the young

Officer, as it debars him from looking upon the Navy as the work of his life; and it tends to blunt the energies, chill the ardour, and repress the zeal of both Officers and men. It is deplorable that many Officers are now retired nearly in the prime of life, costing the country an enormous sum for which no value is received, when they might and should be most usefully employed in the Reserve. This should cease; and as it is essential that provision of some kind should be made for the country's worn-out servants,—to prevent the otherwise possible spectacle of an improvident Officer sweeping a crossing in an Admiral's uniform!—every public servant should provide for his own pension by a compulsory deduction from his pay. Commutation of the *whole* amount should never be allowed; it has brought a fearful amount of misery on many Officers. All pensions for good service, wounds, &c., should cease, and grants be given instead.

Maintenance of Squadrons and Dépôts.

Turning to the immensely important point of the maintenance of squadrons and dépôts at home and abroad with fuel, ammunition, and stores, as also arrangements for their refit during war, ample employment for organizing powers will still be found. Although there are abundant means all over the Empire for transporting coal and stores, little has been done towards perfecting the arrangements for supplying squadrons, or ships of war actively employed, with rapidity and certainty. The importance of this is second to no part of the naval programme, as without such facilities the very best ships and the best men are powerless. Some slight notion of what we require, in one branch alone, may be gathered from the fact that during the late manœuvres a fleet of twenty-seven vessels was employed to convey coal to the squadrons engaged, several vessels making more than one trip. Coaling at sea being, as I have before said, out of the question, and only to be solved, if solved at all, by the use of fluid fuel, blockading and other squadrons must seize and occupy any convenient places in their neighbourhood for coaling; and the question of furnishing colliers with more rapid means of discharging coal, and our ships with more rapid and convenient means of receiving it and stowing it away, and whether it would be more economical to supply coal from a store kept at the pit's mouth and ship it only as required, instead of being shipped and re-shipped several times as it now is, form matter for serious consideration. Our deficiency in coaling-station armament has been so seriously taken up of late that one does not like to criticize the long delay. I will only submit that, as far as possible, here as well as at home, colliers should be the stores instead of landing coal and having to re-embark it to its manifest and great detriment. Special ammunition-vessels fitted to stow each kind of ammunition so that it can readily be got at, will be another necessity. Docks also, capable of taking in our heavy ships, are of the utmost importance, especially in such places as Bombay and Gibraltar, which latter is of far more importance to the British Navy than any

other position out of England, Malta included. A dock at Gibraltar, which private enterprise is fully prepared to construct, is of the utmost importance, as well as a considerable increase in the length of the new mole; and I trust that this session will not pass by without something definite being done with reference to this question. Time precludes my more than glancing at the fact before mentioned that the Naval Manœuvres are at the best but very partial, and that they throw no light on the more extensive questions of colonial and commercial defence. The new colonial ships are a good omen of the worthy part which our colonial offspring is prepared to take for the general weal of the entire kingdom, and I expect to see the colonial forces, both on land and at sea, gradually increased year by year until they become as formidable as their countries are important. I consider that we should enter, both as Officers and seamen, a proportion of lads from the colonies annually, to be paid for by them, who will when trained, become the Commanders, Officers, and the instructors, if not the whole ships' companies, of the colonial war-ships. These ships should be annually mobilized with our Australian squadron, and, if possible, the Training Squadron, and any other ships that can be collected from a reasonable distance, should manœuvre together, and make the same tests as are being made by the manœuvres at home.

The number of cruisers required for commerce-protection is subject to the greatest difference of opinion; but some attempt has been made to formulate views as to the number required, in the table before referred to (Table I). Our commercial routes in war-time should be authoritatively laid down by Orders in Council, in some such way as in Table I, and any ship captured off them, should forfeit all claim to compensation. I see no reason why such prescribed routes should not be patrolled by light fast cruisers in open seas, and by heavier vessels at their convergence towards the depôts, at the entrance to the English Channel, and other points which lend themselves most to an enemy's attack in force, especially if, as before laid down, every merchant ship with a speed of over 15 knots, were armed for its own defence.

Time again prevents my dealing with the question of attacking open coast towns, about which a good deal has been said of late. But I feel sure that anyone who has read the articles written by foreign Officers, as well as by civilians and international lawyers, on this subject, will be convinced that we should be trusting to a very rotten stick indeed, if we considered that our open towns will be free from threats used for the purpose of extracting a ransom such as is admitted to be perfectly justified in the case of a General with an army before an unfortified city. There is no reason for supposing that a different measure would be meted out by a Continental navy from that which is invariably meted out by their armies. I may, however, quote a few words from one of the last articles by Captain Stenzel of the German Navy on our Naval Manœuvres of 1889, in which he says there are other means of arriving at a victory over us than annihilating our Fleet: "Great Britain is open to attacks on all

sides. The population is dependent for its food and raw material on the constant and uninterrupted supply from foreign ports
and to these the panic caused by the bombardment of a few coast towns."
 And he adds that the strategy will be "to appear everywhere, like the 'Anson' before Aberdeen, and at no point where an attack might be expected!"

Administration.

Lastly, but by no means least, my Commander-in-Chief, having returned to Whitehall, turns his regard inwards upon the establishment with which he is working, and which is working sometimes with, and, alas! not unfrequently against, him; and asks himself if this system is best adapted to call forth, train, and make the most of the resources in money, men, and material placed at its disposal.

But the path of the reformer is beset with many difficulties. An instance of this is the feeling about the Board on the part of those who, having been used from childhood to that time-honoured institution, hug themselves with the idea that no efficient change is possible, because, say they, "at any rate our system works better than the War Office;" and some consider that a more distinct definition of responsibilities would weaken the position of the "Naval Lord" in the eyes of the Service, an idea begotten and fostered by a false impression of the regard in which an individual "Naval Lord" is held by the Service. Of course a certain amount of deference is paid to him because he is generally an Officer of high rank, and it is also known that he has the ear of others who with him make a power. But the fact that it requires two men and a secretary to do anything is perfectly patent to everyone in the Service, and is a ridiculous position which has been freely commented on in the evidence given by Naval Lords themselves before the various Commissions and Committees which have been held since the Crimean War. This evidence, which shows throughout the diametrically opposite views taken by various civilian First Lords and Naval Lords concerning their own and each other's positions and responsibilities, would be quite enough to condemn the existence of the system, even without quoting such emphatic words as those of that distinguished Officer, Admiral Sir Thomas Cochrane, who, before the Committee in 1861, when asked—"I gather from your evidence that you believe that nothing can be worse than the present system of the Board of Admiralty?" answered, "I think so. It is as bad as it possibly can be." This answer, I would remind you, was given in the days of the old system, years previous to Mr. Childers' Orders in Council, which some would try to persuade us are the root of all the evil. The actual fact, which is beyond denial, is that the existing system has never worked well during the whole period of its existence. It is an institution honoured by time, and by nothing else, which tends to hamper an energetic administrator, and to shield from due responsibility a weak or inefficient one; and whatever good has been done—and in this respect, as before said, I would give great credit to the administration of the past few years—

has been done in spite of the system, and not by its aid. The Board, according to its own internal evidence shown in various Blue Books, never was a reality, and during the last twenty years it has been a positive fiction. There is not either, and cannot be, any continuity of policy among a set of men, no matter how able they may be, who are here to-day and gone to-morrow.

The Board is a misleading fiction also to the House of Commons and the country, because, although the First Lord may say he is absolutely responsible for everything done at the Admiralty or laid before the House in connection with it, the House and the country generally are under the impression that his utterances are made after consultation and agreement with his naval advisers. The late discussions, and the evidence before the Navy Estimates Committee, have only begun to give them a glimmering perception that the First Lord *may* be speaking of what "we" have decided upon, when it is really his own decision, and against the opinion of some, or even possibly of the whole of the naval element. There is no way at present for the public to ascertain what is the opinion of the Naval Lords upon any subject. The problem is, how to administer the affairs of a great Navy, under a system of strong Parliamentary Government. I am aware, and as a naval Officer I sympathize with it, that there is a strong feeling among my brother Officers, of impatience at what they consider the interference of Parliament. However unpopular it may be with such to say it, it cannot be too strongly pointed out that the sooner this feeling is eradicated, the better. Parliamentary interference with everything, is part of the price we pay for our liberties, and as Parliament becomes more democratic in its tendencies, it will become all-pervading. But I would remind you that its sole object is resistance of officialdom and the evil liking for secrecy among those in office, and, as I have suggested, everything would appear open and above-board, if official answers to questions were given straightforwardly, instead of being, as they too often are, purposely to conceal what has happened, and Parliament would be found working in support of the nation's executive instead of against it. It was with pained surprise that I heard a "Sea Lord" speak before a House of Commons' Committee of its being "no use to speak" of having ships for which the House of Commons would not vote the money. The Service should be reminded that the House of Commons has never refused, and, I believe, never would refuse, to grant money for the Navy when it is asked for in a straightforward manner by a responsible Government. What the House does want to know, and what it will insist upon knowing, is how the money voted is spent. The very *raison d'être* of naval administration is to prepare and organize an adequate defence for the Empire, and to protect its commerce crowded on every sea, from the destruction which would possibly, if not probably, involve our national extinction. It may be taken as admitted that until quite lately, our naval administration had endangered our maritime supremacy; and yet it would be unjust to fix the responsibility on any particular Board, still more under our present system upon any individual member of any Board.

I presume no one will dispute that the head of our administration must be a Cabinet Minister, as otherwise the Navy would be without any voice at all in the great council of the country. Its voice is not strong enough as it is, and Heaven forbid that we should weaken it! If this be admitted, it follows that as a rule the First Lord must be a civilian, for it is very seldom that a naval Officer, from the nature of things, can attain to Cabinet rank. It may be questioned whether he would be the best man for First Lord under any circumstances. My reforming Commander-in-Chief, being free from any prejudice, would at once see this necessity, and that whether he be called First Lord, Naval Minister, or by any other title, he must be supreme. But this affords no reason why he should not have the most able naval Officer that can be selected at his right hand constantly to advise and consult with him, who would, under ordinary circumstances, be the exponent of the views of the naval element, and whose opinion, when it differed from that of the First Lord, should in some way be made known to the House of Commons and the public. In short, I see no reasons for, and many against, any secrecy whatsoever as to what goes on at the Admiralty, whether it be as to experiments or simple business, beyond the exact orders sent to the various Commanders-in-Chief, as to the steps they would take in the event of the outbreak of war, or strained relations with any given country, so far as this can be laid down beforehand. In this respect I would remind you that it is from us alone that any such matters are kept. For, as was well said a few years ago by the present respected Leader of the House of Commons, who has served his country both as War Minister and First Lord of the Admiralty: "It is imbecility to suggest that foreign Powers do not know the condition of our forces of every kind at least as well as every Minister of our own Government, with the exception perhaps of the Secretary of State for War and the First Lord of the Admiralty."

I do not propose to give a scheme of administration, though I have one prepared, because the details of arrangement must be fully gone into by a Committee; but I chiefly insist, as before said, on the First Sea Lord—by whatever title called—being relieved of that amount of petty detail which now occupies the greater part of his time, and prevents the possibility of his giving that attention which should be given to the formation and administration of the Fleet in all its branches. As the First Lord's acknowledged prompter, as the adviser of the other Lords, as well as of all Commanders-in-Chief and others who sought his opinion, and as head of the Intelligence Department, he would find ample occupation for his time, energies, and abilities, and he could have the opinion of the other Sea Lords whenever he chose to ask for it, as they could have his. But without here deciding the precise number of such Sea Lords, it should be stipulated that, except when specially called upon by the First Lord or First Sea Lord for opinions on general questions, they should attend to their own special departments as laid down. Each of these Lords would be the better for a naval assistant, and I cannot see why the naval work of the Admiralty should not be performed by those

who understand what they are writing and talking about. I emphatically disclaim any attack upon the civilian clerks at the Admiralty; for there are unquestionably many duties which they are admirably qualified to perform and do perform with undoubted zeal and ability, but I claim that the distinctly naval and military branches should be handed over to Naval Officers.

All the Lords and other Naval Officers should be appointed for a fixed period of three, four, or five years; and care should be taken as far as possible that they do not leave at the same time. How can continuity be expected when we remember that for instance in the thirty-two years after the last Lord High Admiral (1827 to 1859) there were seventeen First Lords, or on an average one year and ten months to each; and 103 members of the Board and Secretaries, giving an average tenure of office of four months each. Almost any period would show the same. Take from 1880 to 1888. We have had three First Lords, sixteen other Lords, and seven Financial Secretaries, giving an average of two years and eight months for the First Lords, six months for the Sea Lords, and one year for the Secretaries, so that the British Navy is governed by a First Lord, who, though he calls himself absolute, cannot sign or speak in the first person, no matter how much he may differ from the others; who has no power to issue a single order without the signature of a Lord and a Secretary, and yet who practically overrules them all; who has an average experience of little over two years and a half, while he probably entered office in utter ignorance of everything connected with the Service, and—and here is the worst feature of all, and one for which no political excuse exists—he is advised by naval Officers who have held office for an average of six months! and by a Financial Secretary who usually commences with the same utter ignorance of the subject as himself, and whose average experience is one year.

To sum up, the defects of the Board are:—(1.) Want of spontaneity; (2.) Want of unity; (3.) Indirectness of purpose; (4.) Tardiness in action; (5.) Wastefulness in expenditure; and (6.) Lack of individual responsibility. To which I may add a general disposition to meddle in the affairs of every Commander-in-Chief whether at home or abroad, and to consider that all naval knowledge and all administrative ability is concentrated in themselves. What is required for an efficient administration is *personal* responsibility and supervision. Decentralization, as far as our Parliamentary system of Government will admit, is much needed; and increased power and responsibility should be given, as I have before said, to Commanders-in-Chief, especially at home ports. Ships, guns, and men are of no use, and the money voted by Parliament is only squandered, unless there exists a proper administration for designs, training, equipment, and maintenance. The Naval Estimates have been much improved in their form, but, to repeat the Secretary's own expression, "though much has been done, much more remains to do." Dockyard administration, though greatly improved of late, is by no means yet what it should be. It is a self-evident proposition that if the Royal Dockyards are worked on a proper basis, ships should be built there more cheaply

than they can be in contractors' yards, by the amount which the contractor must make in order to live. But so long as the ships building in our yards are saddled with incidental charges for schools, chapels, libraries, clothing, &c., so long as men are liable to be knocked off building for the purpose of repairs, &c., so long will no fair comparison be possible between Royal and contract yards. All dockyards should in the first instance be considered as a "National" charge, because they are maintained for many purposes besides shipbuilding, and most of them would have to be kept on equally if every ship were built by contractors.

Again, the whole system of estimates for repairs, &c., is most wasteful. The dockyards, as well as everything else within his district, should be under the direct control and responsibility of the Commander-in-Chief of the port. The Superintendents of all the dockyards should be appointed for not less than five years, irrespective of their rank. Under the present system they frequently remain only 1½ to 2 years—there have been four at Pembroke since 1885—and they leave just as they are beginning to know the work and place. Efficient superintendence under such circumstances is impossible. The Port Admiral should be provided with funds from time to time for the repairs and other work which have to be carried out. He should have entire responsibility for each "unit of strength" being put in order as rapidly as possible on being paid off at his port, for being kept in proper order when she is in the Steam Reserve, and until she passes out of his hands on his final inspection of her when she has been recommissioned, and is about to leave his port.

To this I would again urge that the present system of placing the passive defences of the Empire in the hands of a military Officer—independent of his colleague—and the active movable forces in the hands of a naval Officer, will inevitably lead to confusion and disaster. One man should be held responsible for the defences of his district; for the state and efficiency of mines and floating batteries, the working of signal stations, and the communications not only between them and ships at sea, but also between them and headquarters, as well as for the efficient mobilization of the reserves of his district. In short, everything should be in one hand and under one head, who would of course be supplied with sufficient subordinates to carry out all details of work. Lieutenant Colwell, U.S.N., may well be again quoted as a perfectly independent and able exponent of the necessity on which I have insisted of placing *all* our coast defences under the one naval head. He points out that the Germans have now transferred all theirs, including the fortifications at Kiel, Wilhelmshaven, and the mouths of the Elbe and Weser, from the Army to the Navy, and much the same system obtains in France; and, after giving several detailed reasons in favour of it, says: "Complete unity of control is thus established. . . . The coast defence of Great Britain is notably the most inefficient of any of the great European Powers. Owing to divided control, lack of co-operation, absence of digested schemes for mutual support, and the mixing of naval and military duties, the defence is unwieldy in its administration, unprepared for

sudden work, and labours under the disadvantage of placing military men in situations outside their legitimate sphere of action." That this dual system is a gross waste of money is undeniable.

Although I have avoided, as far as possible, going into minute details, I feel that I have already carried this paper beyond the ordinary and defensible limits. My excuse must be the vastness and importance of the subject. I felt this at first, and felt it still more as I proceeded; for what are not the lessons which may fairly be said to be learned by, through, or in connection with "Naval Manœuvres"?

If some of the ideas broached are considered infeasible or bad, I only want a fair consideration of them before they are utterly rejected; and if the smallest benefit accrues to the Service from this paper or its discussion, I shall no longer regret my temerity in venturing to give a lecture on such a subject in this hall, nor object to any criticisms which may be made upon it.

Captain BRIDGE: Before the discussion of the views which have been so ably and clearly put before us by Admiral Mayne begins—as I think it would be improper for an Officer holding an official position, as I do, to enter into any discussion of those views, or to express any opinion either in favour or opposed to them—I venture to ask permission to briefly call your attention to one statement of fact, a statement the truth of which I do not for a moment call in question. But I would ask those of my brother Officers who are here present to allow me to call to their recollection another statement of fact—another series of facts—which I think they should place side by side with the statement which we have just heard from Admiral Mayne. His statement is this: "It is a literal fact that when the last war scare took place, the men in training on the north-east coast disappeared, and on the Officer in command of the district asking the Inspector the meaning of this sudden diminution of the number of men at drill, he was plainly told that they had gone on account of this scare and the possibility of their being called upon to fight, which they had never had the slightest intention of doing." Now there are a great many Officers, perhaps a good many of us here present, who remember what was called the "Trent" affair, and I appeal to the recollection of every Officer who can carry back his knowledge to what then took place to say what the position of the Naval Reserve men of that day was. Is it not a fact that they came forward in all parts of the country, without even being called upon, to offer, if need be, to fight for their country? I think it would be a very unfortunate thing if the statement which has been made in the lecture—the truth of which, as I have already said, I do not doubt for one moment—were to go forth from this Institution without the corresponding statement accompanying it.

Captain CLEVELAND: Although I may say I am in accord with much that the lecturer has said, embracing, as it does, a very vast range of subjects, including almost the whole of the administration of the Navy, pointing out to us of what vital importance mobilization and subsequent manœuvres are to our Fleet, yet I will just make a few comments for the purpose of stimulating discussion and eliciting the opinions of my brother Officers. I do not agree with the lecturer upon the question of abolishing sails in cruisers, though I may say I do as regards battle-ships, especially those with double screws. I am well aware of the reasons for abolishing sails—the liability of the rigging to foul the screw, the amount of space required for spare sails and rope, and also, I may add, their additional weight, both of which might be allotted to increased coal stowage; still, when we consider that our cruisers have to *keep the sea*, not merely to make a passage, they have to husband their coal, and should for that purpose be able to travel under sail; I think ignoring the great natural motive force of the wind is a very great mistake. Our ships should have very powerful fore and aft sails—I am speaking entirely of cruisers—as well as square sails. I see no difficulty, in these days of mechanical contrivances, in both rapidly and snugly disposing of the upper masts and yards. I think we

could let them down with the greatest possible ease, and there would be no fear of their fouling the screw. I should like to elicit the opinion of my brother Officers most particularly upon this point, whether sails should be entirely abolished in our seagoing cruisers. With respect to the lecturer's remarks about our guns, I certainly am very strongly in accord with him. He speaks first of all of heavy guns, and says that no gun should be put on board a ship which cannot be man-handled in case of need. I think that is a most important point, otherwise with the delicate machinery for working them, which is very liable to give way, you would lose a very large fractional part of the power of your ship in a very short time.

Admiral Sir GEORGE WILLES: Can you man-handle a gun of 50 tons?

Captain CLEVELAND: My opinion is you can man-handle the mechanism of a 12-inch 45-ton gun. I throw that out as a suggestion. I am sorry to see we have adopted the large heavy 67-ton guns (which cannot be worked by hand) in our new battle-ships. To my mind it is a very serious matter. I think myself, seeing that a 38-ton muzzle-loading gun has been worked by hand, there is no reason why a 12-inch 45-ton gun should not be worked by manual labour as well as by machinery. Then comes the question of the number of guns on board ship. Having a large number of guns means a large number of magazines, and variety of stores, and possible confusion in the supply of ammunition. In some ships we have as many as ten or twelve kinds of guns on board, and the number that there are in the Service I could not enumerate. I should like to see a strong stand made to simplify the working of our guns, their ammunition and stores, and 95 per cent. of them pitched into the "scrap heap," for the enormous variety of guns must lead to great confusion in war. The lecturer points out most distinctly that one of two types should be selected for the secondary armament, perhaps the 4.7-inch and 6-inch quick-firers when they are thoroughly thrashed out; but let us have no gun that is not thoroughly thrashed out in all its details placed on board any of our seagoing ships. Turning our seagoing ships into experimental vessels is undoubtedly a mistake. I quite agree with the lecturer's doubt as to the expediency of our merchant ships taking the place of cruisers in the event of war. In my opinion it would be a very grave mistake if we attempted to withdraw ships from industrial pursuits in war-time. How is the food supply and the raw material that is required in this country to be brought to it except by means of these powerful and fast ships? I entirely agree that what we should do is to arm these vessels (every arrangement being perfected in peace-time) and let them look pretty well after themselves. I attach immense importance to the "Plan of Campaign," which I congratulate Admiral Mayne on having produced. It is the only business-like method of ascertaining the number and the nature of ships we should require in war-time for the "work" we have to do. Having got that clearly in our heads, the next thing is to see what is the "force" required to do it, both in matériel and in men, and upon this basis our ship-building policy, as well as the entry of men, should rest. As regards torpedoes, I go further than the lecturer. I am one of those who are entirely against having torpedo tubes *abore water* in battle-ships. I think they should be relegated to special vessels, but I should like to hear the opinion of the meeting upon that point. I see the lecturer speaks of special vessels for carrying guns for "high angle" fire. I attach great importance to "high angle" fire; I think it is a thing we shall find extremely useful for dislodging a large number of vessels assembled in an enemy's port with these heavy guns in the smallest possible ships you can put them into. I am perfectly in accord with the lecturer about the system of training Officers and men; I think we over-educate them, having lost touch with what we absolutely require them to do, that is, to develop to the utmost extent the resources of the ships in which they will have to serve, and that can only be learnt and done on board with the latest—not obsolete—matériel. The State should only give such education as cannot be obtained elsewhere. With regard to the question of ships in the Reserve, again I entirely agree with the lecturer, that after a ship has been completed by the dockyard, men shall be put on board of her, and shall learn their "drill" on board that particular ship in which they are to serve. The present distinction between combatants and non-combatants should disappear. With that I most strongly agree. Every person on board ship should be a combatant (there is no

reason why he should not be so, it is only a sentiment), and should understand the use of the rifle, cutlass, pistol, quick-firing gun, and also elementary signalling. There is no doubt it only wants to be said and then it will be done! I am perfectly certain of that. Admiral Mayne says that the Volunteer "seaman gunner" should be abolished. I am very strongly of that opinion, and include the S.G.T. In order to obtain a smattering of knowledge (the time allotted to torpedo work will not admit of more), the "Volunteer seaman gunner" is kept in harbour on an average about a year. I am perfectly satisfied that every seaman should be a seaman gunner. We require captains of guns, highly trained men, also captains of torpedo tubes, and instructors in both subjects; but, when you think of it, it is ridiculous keeping men in a dépôt ship for a year on purpose to learn (with necessarily obsolete matériel) what they will possibly never be called upon to practise. With regard to the administration, that is a matter I will not touch upon. I do not profess to know very much about it, but I am satisfied we should have one head to supervise the passive as well as active defence of our coasts, arsenals, and ports, and not the division of authority which exists at present.

Admiral BOWDEN-SMITH: The interesting paper which we have just heard from Admiral Mayne goes over such a wide field and brings so many subjects to our notice, that I hardly know where to begin; and I have been still more confused by the remarks which we have just heard from Captain Cleveland, for he appears to agree with the lecturer that we have too much education, and yet that the naval Officer should know everything. You only have to say the word, and everybody on board ship will be able to do everything: navigate the ship, manage the engines, work the guns and torpedoes, know the signals, and everything else. I will, however, confine myself to the title of the paper: "Lessons to be learnt from Naval Manœuvres," and, as far as possible, I will restrict my remarks to the two questions that occur in the first paragraph. The lecturer mentions the "sad deficiency of most of our ships in those qualities which would be required in actual war." I conclude he alludes to speed and coal endurance. I think these naval manœuvres teach us the supreme importance of speed and coal endurance; and it would be only waste of time to speak of it, because all naval Officers are thoroughly alive to the fact. I do not think the public, however, are yet sufficiently instructed in the matter; I do not think the public in this country are sufficiently aware how very obsolete some of our ships are, and how unsuited they are for modern war purposes. To quote one or two—I won't mention ships like the "Glatton;" but in 1883 Admiral Rowley was put to blockade Lough Swilly, and had, amongst other ships, the "Neptune," which, though a powerful vessel in some respects, consumes so much coal, and stows so little, that she hampers any Admiral who is unfortunate enough to have her under his command. Admiral Sir George Tryon, in his report of 1889, writing of this ship, says: "She is a weak ship in her engines and consumes a coal-mine daily;" and of the "Hotspur" he says: "She carries very little coal;" and of the "Belleisle" he says: "This ship stops altogether if steaming against a head sea, and was never intended for fleet work at sea." Those ships and others like them are only fit for the protection of ports and for mooring torpedo-boats stationed at those ports. They can hardly be called efficient coast defence ships, for such ships to be efficient should be able to assemble rapidly on any part of the coast where they are required, and when they get to that station they should be able to keep the sea for at least a few days; they should be able to chase a ship off the coast; but these ships could not chase an enemy's ship off the coast, because if they did so, they could not get back again; they would have no coal left. I have noticed during the past twelve months that some of our public men, in talking to their constituents and others, have been rather inclined to disparage the wise efforts now being made to bring our Fleet up to a proper state of efficiency; and they have gone further and said that this great increase we are making to our Navy is a menace to other Powers, and that we shall have them doing the same. I think these manœuvres should teach such men that we are not making a very great increase to our Navy as regards fighting ships. We are only building a few new ships to take the place of those which are obsolete and entirely unfit for modern warfare. We are merely doing what every mail ship company

worthy of its name does, building new ships to take the place of the old ones, for if they did not do so they would carry no mails and get no passengers. Admiral Mayne alluded to the question of signalling, a matter of the utmost importance. In a country like this we must have ships, and we must have guns, and we must have men; but we shall not make the best use of those ships and guns and men unless we have also an efficient system of signalling and communication. It is of the most supreme importance that men-of-war should be able to signal to each other rapidly and correctly, and also to communicate with mercantile steamers and signal stations on shore, and that by night as well as by day. I am afraid that not very much progress has been made in that respect; but with regard to our Fleet, I think we may congratulate ourselves that there is a great improvement. Last year the supply of signalmen was very much better than it was in 1853; but still, as the lecturer says, much remains to be done. We are still short of men, and there was one 4,000-ton cruiser last year taking part in the manœuvres which had only one signalman on board. The Captain of that ship valued that man very much; it was said that he got a special waterproof suit for him, and that he gave him hot coffee in the morning and Borril during the day, and so kept him on deck and efficient during the entire cruise. It seems that our brethren in the Army are paying more attention to signalling than we are. They have a Superintendent, or Inspector, of Signalling, and an Assistant Superintendent. We have nothing of that kind; and I submit it would be a very good thing if we had some Officer of the rank of Captain or Commander especially to watch over the signalling question, and the communication with the mercantile marine and land forces. He would then be able to see that signalling was properly taught, and that a uniform speed was adopted, that men did not make their signals too quickly or too slowly. When a number of ships get together, as at the manœuvres, you perhaps get a ship that has been three years in commission, everybody knowing their work, brought in contact with a ship that is just commissioned. The one ship has a smart signalman; and when he sees that the signalmen in the other ship are rather dull, he won't signal slower, but will do it all the faster in order to show his own superiority over the other men. In that way confusion arises; but if there were proper supervision, these things might be arranged, besides an Officer in that position would be able to see that the best sort of lamps were used. I thought last year that the lamps used in signalling might be improved, where the electric light was not used. Then, again, we should see that we are working with the Army, so that we could communicate readily in war-time. To show that looking after these things is necessary, I may mention that at the present moment the United States Army is not using the same system of signalling as the Navy; the Navy are using the same Morse alphabet that we are and that the Post Office is using; but the American Army are using another alphabet, and they are demanding that the Navy should use the same system as they do. I do not think they will, because the Navy think theirs is very much the best, and will stick to it. The Army say they are using the true American Morse; whereas the Navy are using the English Morse. I do not know how that may be—I see my friend Admiral Colomb is present who introduced the flashing system into the Navy—perhaps he can tell us. I was under the impression when we gave up his alphabet some years ago, although we are still using his numerals, that we adopted the true American Morse. I think one of the principal things that these manœuvres teach, or one of their great advantages, is that they bring a number of Officers together who otherwise would never know each other, and they are enabled to see ships manœuvred in fleets and squadrons, and also to observe the new ships and to watch their behaviour under similar circumstances of wind and weather. Last year we had nearly the whole of the "Orlando" and "Magicienne" class out. It gives us the opportunity of seeing more and learning more in five weeks, as the gallant lecturer truly observes, than we should do in three years on a foreign station. I wish to say one word with regard to the defence of my old ship, the "Britannia," because I entirely disagree with what the gallant lecturer has said about that ship. I would ask him whether he has visited the "Britannia," because I have found that some of those who have been most against the "Britannia," after staying a day or two on board, have changed their minds. He quotes the opinion of the last Committee that the system is faulty.

because the general education of an English gentleman is now cut short at thirteen. Now, the Admiralty, very wisely I think, have raised the age of entry to fourteen, and the boy remains two years, and, with the exception of classics, gets a very general education. They are not taken from school at thirteen now. Whether the age is quite sufficiently advanced, I cannot say; but I am very much against Officers coming into the Navy as young men. Life in the Navy is an unnatural life, and in order to accustom people to sea life you must begin tolerably early; I do not say you should begin at thirteen, that was too early. They were not boys, but children, and many of them had not got over their infantile complaints; the result was that when there was anything near the place, measles, whooping-cough, mumps, or anything else, we always had it on board the "Britannia." It only remains for me to say how much I have enjoyed this lecture, and I hope that the discussion that will follow will be of benefit to the Service.

Admiral Sir MICHAEL SEYMOUR, Bart.: As to what Captain Cleveland has said respecting sails, I would say that when I was in the Pacific, which is a station always quoted as one where sails are necessary, we hardly ever set them except for exercise, and had much rather have been without them, and this not only on the coast, but the Commanders of ships going round the islands came to the same conclusion. No one is fonder of sailing than I am, but the time has come when sails are no longer required, and I am afraid we must accept it. There are one or two points I should like to say a word on. One is as to the cruisers, and another as to the administration, which speakers do not seem to like to touch upon at all. I suppose we should not have heard anything about it if it was not to be touched on. It certainly is a very delicate subject, and I do not propose to go into it. I will only say with regard to responsibility in the Admiralty that I think you cannot have too much responsibility put on the Naval Lords. Everybody will remember the scare about the Navy when it was generally allowed and accepted in the correspondence which appeared in the "Pall Mall Gazette" and other papers that 1869 was the date at which the Navy began to go down hill. You have also this fact, that in 1869 we had the Order in Council of the 16th January, by which responsibility was taken away from the naval men, that is to say, responsibility to the country and to the Queen. Only the First Lord, a civilian, is now responsible, and the naval men are responsible to him. I do not say that one is the consequence of the other—that going down of the Navy—but I think it is a very curious coincidence that those two things should have happened at exactly the same date, and I think it is deserving of more attention than it has received from the public and from naval Officers. Then as to the cruisers. The lecturer, I think, said that he was entirely for lengthening the cruisers, and that the shortness of those ships was a very great reason why they could not steam against a head sea. It is, I think I may say, the sole reason. We have these large liners going across the Atlantic, going over in six days, and the reason they go over in so short a time is simply because they are long. I do not say you can build a man-of-war like the "City of Paris" or the "Umbria," because the conditions under which we build our vessels are totally different as to weight, &c., but you can go on the same principle and make them longer. You cannot go against a head sea with speed unless you make them long. Of course there are all sorts of objections, and one of the principal objections put forward is the question of manœuvring. I do not think anything of that at all; I think really there is very little difference between a ship 300 feet long and one 400 feet long, and as a matter of fact I am told the "Anson" takes as large a space to turn in as the "Minotaur." The real question is not one of manœuvring; it is entirely a question of money. I had a casual conversation with my friend Mr. White. I said to him, "With regard to the 'Orlando' class, you seem to me to have entirely spoilt them by making them too short; they stop dead in a head sea." I said, "They ought to be brought out 25 or 30 feet at each end." He said, "Yes, but then you make a larger ship; you must have more displacement, and that costs more money." That is just it. I do not consider that Mr. White is to blame. Mr. White, I take it, is the servant of the Board, and he has to design ships according to order; but it seems to me that instead of starting by saying that you are only going to pay a certain sum, and then getting as many guns as you can into the ship, you should start and say what guns she is to carry,

and then make her as big as is requisite. The only other point I would touch on is that of entrance into the Navy. I am entirely with Admiral Bowden-Smith in hoping the "Britannia" will not be done away with. I think the lecturer said that he was entirely for open competition. I do not know whether that was for the benefit of his constituents or for naval Officers; but I am dead against open competition, in fact I am dead against competition at all. Have a test, and make it as high as you like, but do not go to open competition. At all events we have now nomination, and that is a great security. It seems to me we should keep up the old traditions of the Service, and to do that, it is essential that you should have nomination, by which means you secure having Officers who are gentlemen born and bred.

The CHAIRMAN: As the question of sails has been discussed, I may say they are to be abolished; the fiat has gone forth.

Captain LONG: Looking at the ground covered by this paper, I cannot but congratulate the gallant member, whose constituent I happen to be, on having so carefully gone over the whole subject. I do not propose to attempt for one moment to follow him over all this area which he has touched upon, but I should like to remark on one thing which appears to me to be the main lesson of the manœuvres, namely, the importance of speed and coal endurance. I would particularly do so, because it has happened that in two of our very important text-books a statement has crept in, which I do not for one moment ascribe to the authors of those text-books, but as being supposed to be the expression of naval opinion at the time, based necessarily on peace experience only, and that is to the effect that a man-of-war is only required to go at full speed for a short time and at long intervals. Now I think we naval Officers must be most grateful to the Government of the country which has brought about these naval manœuvres. Those who recollect what was going on ten years ago will recollect most distinctly that we did not know the capabilities of the new ships, or what they could do or would have to do. One thing that these naval manœuvres have done is that they have utterly exploded the idea that a man-of-war only needs to go at full speed for a short time and at long intervals. They have brought out most clearly the importance to us of having ships that can keep up full speed. You might just as well say that a hawk does not want any wings when you see him shut up, because he is then fed with meat, as that a man-of-war only wants to go for a short time at full speed. Naval Officers on a ship kept shut up in harbour do not know what they want; but when war comes they will have to do what the merchant ship has to do now, that is to say, to fulfil the object of their existence, and that will involve going at full speed for a long time and constantly.

Admiral SELWYN: I am delighted to hear so much confirmation of views which were advanced by me some fifteen years ago at the Naval Architects. Naval Officers were then called upon by the late Mr. Scott Russell to lay down the requirements of their ships, and a great many did it. I do not know exactly their views, but I put down speed, and what is now called "endurance," which I called like as in a racehorse "bottom," "lasting power." I then set myself to work to discover the fuel by which this might be done. I knew very well that speed could not be kept up until we had the right fuel, and those who know me know how many years I have laboured to show that not only can new ships be provided with speed and with great endurance more than they could reasonably require in going at high speed from one place to another, where a fresh supply could be had, but that all the old obsolete ships can very easily be brought up to modern requirements where they are not of such effete construction as sea-going or sea-keeping vessels that they had better be broken up for old iron. There is an error which many people make in calling the thing which I have always advocated "liquid fuel." Liquid fuel was talked of a long while ago by Mr. Malet, a very eminent engineer; but I have found and exhibited new principles by which gases are burnt with and alongside of fuel. I therefore call it "fluid fuel," because all gases are fluid, though all fluids are not gases. The supply of oil by distillation from coal is a very good idea if we do not happen to have any other; but in the shale field extending under the island of Portland first of all we have enough for the Navy for the next 100 years,

capable of giving by convict labour 60 to 120 gallons of oil per ton; and then we have a bed extending 670 feet thick and 10 miles wide across all England right to the coast of Norfolk. There is more available fuel in that bed than ever there has been in all the coal fields. With regard to the manœuvres, all naval Officers will join with me in saying that speed is one of the chief factors of all manœuvres. If we do not have the speed and bottom, of which we have been speaking, or speed and endurance, it is folly to classify a fleet by the size of the ships, the number of guns that they carry, or their importance in any other way. If we have in a squadron or fleet one bad ship that cannot go more than 8 knots, or keep up her fuel supply sufficiently long, the speed of a whole fleet is reduced to the speed of the lame duck. The manœuvres too are very nearly dependent on whether all the fleet are possessed of twin screws or single screws.

Admiral Sir GEORGE WILLES: All the ships have twin screws; we call them double screws.

Admiral SELWYN: That was the old name given to them by the inventor, Richard Roberts, and advocated by the late Captain Symonds and myself at the Naval Architects. Captain Symonds and I took the question up many years ago, and I hope it is now settled. The classification of ships I maintain ought to be by speed and endurance. If an Admiral is wanted to do certain work, he must be given a fleet fit to perform that work; he cannot perform it if he has all classes of vessels mixed up in his fleet or his squadron. Naval volunteers, as sailors, are getting further from us every day. Every day, more and more, the Navy is becoming a special profession. The knowledge must be so varied and so accurate on certain subjects that no mere knowledge of the sea or of seamanship is sufficient to enable persons to take part in it; and we shall have in all probability to divide that knowledge up into classes more than we have yet done. I think that of all the papers I have had the pleasure of hearing read at this Institute, I have never heard one more calculated not only to open up a large field of enquiry, but to indicate, though only indicate, true methods of dealing with it. When we talk about stokers as combatants, it is very difficult to do away with the fact that you can only get the stokers off watch; that you must have the others down below, and perhaps sometimes almost all of them hard at work at their fires, so that they cannot possibly be otherwise employed on deck. The beauty of the fuel which I proposed is that you need no stokers whatever, or coal trimmers, or anybody else connected with the fires; the engineer can control it all and decide how much to burn. The question of the water-line belt connected with the defence of the ship can be solved in only one way. No one can ignore the fact that the water-line is a fearful danger if pierced by modern projectiles. If the belt is to be done away with, some efficient remedy for that danger must be found, and that efficient remedy is to be found in combination with a more perfect efficiency in the use of hydraulic propulsion. The instant that is used, we may have any number of engines we please and do away with the need for sails which have been hitherto talked of as the sole resources in the case of ships breaking down, because it is not probable that six pairs of engines would all break down together. The engines can be much smaller, and we have a knowledge of the power of the revolutions of these engines lately, according to Mr. Parsons, which makes it utterly undeniable that the steam turbine is the coming engine. When you get up to 12,000 revolutions a minute, which is constantly going on now, you have the true means of propelling and pumping at once and the same time. You can also meet to a certain extent the question of water-line by cellular construction; but everyone who knows what a ship is, will know perfectly well that cellular construction may also be carried too far; you may make it impossible to get from one part of the ship to another. With regard to the forced draught, I was very much pleased to hear what the lecturer said. It is the greatest economical mistake that has ever been made, and it is accompanied with very great danger, as we have seen lately in the case of the "Barraqueta." There is a well-known fact that if we mix air with combustible gases in the proportion of between nine and thirteen parts of atmospheric air with one of combustible gas, we shall make an explosive mixture, and we may get a flame or an explosive which will destroy a ship, simply by not being able quite to control the exact quantity of air that ought to go in. Absence of masts and yards can be very well excused if you

have a number of independent propellers; but I should not like to do it without them, because everybody will see, as we are at present, we have twin screws and two sets of engines; but it may be, it is at least possible, that both these should break down together. It is still more possible that the boilers may give way under higher pressure. Does any one propose to send a vessel, or a fleet of vessels, to sea with no power of locomotion after such an occurrence? Some means we must have. I do not prefer sails; but I do prefer that we should consider the question closely and provide for it in the best possible and the most advanced way. In the case of education and training, I would like the meeting to remark that every specialist has the greatest faith in his own particular training, and that if you were to hand over to a schoolmaster boys from the age of 8 to the ages 17, 20, or even 25, he would not say it was at all too long. But it is on board ship alone that a sailor can get familiarity with his work. It is all very well to teach him up to the age of 14 or 15; I should prefer 13 rather than 14 on shore or in harbour. There he ought to be principally kept to learning those parts of his duty which relate to the workshops, very little indeed of the higher work of the gunnery, &c., which he would be called upon to practise later, but a great deal of hammer and chisel work, a great deal of knowledge of the use of tools which he won't afterwards have to use, and a great deal of hard work to keep him out of dissipation. If you allow any specialist, I do not care how good he may be, to lay hold of you with the idea that he will want all the attention of every boy from childhood to twenty-five, I do not think that can be done usefully for the Navy—where discipline is a paramount consideration. I think the workshop is the place, and I am quite sure having got the boy to choose a line which he prefers and shows aptitude for, you may in great measure separate them into men designed by Providence to do certain things. You cannot make an engineer by putting a brass plate on the door. God makes the engineer; God makes the telegraphist; God makes the electrician. The God-made man will be an expert in the special art; the others will do nothing at it. Choose them out early, put them to do their proper work, and then insist on their knowing it thoroughly and forming schools under them of similar boys.

The discussion was then adjourned on the motion of Admiral Sir GEORGE WILLES, to Tuesday, 25th instant.

ADJOURNED DISCUSSION.

Tuesday, February 25.

ADMIRAL SIR R. VESEY HAMILTON, K.C.B., in the Chair.

Admiral Sir GEO. WILLES: It is impossible that anybody can do justice to all the questions contained in the paper. I have therefore selected a few, and I commence by referring to rather a delicate subject by suggesting that that part of the paper which relates to the administration of the Navy should not appear in the Journal. In my opinion the discussion of the administration of the public services is beyond our province altogether. But I must say that I do not agree with our gullant lecturer, for, in my opinion, the administration of the Admiralty under the Patent is the very best system we could possibly have. If the Naval Lords of the Admiralty are independent men and true to each other, their power is very great; and it is well known that Lord Hartington's Commission has approved of the Admiralty administration and suggested it for the Army. Now about the manœuvres. There cannot be the slightest doubt that they have proved a success; but I do hope that in the future the system of raiding towns and capturing merchant ships will be forbidden. It turns the whole thing into ridicule; there is, however, a dark side to the picture. As I understand, during these manœuvres all gun drill, all exercises, all steam tactics, are at an end, and there is nothing for the men to do but to coal the ships. The Officers, on the other hand, are gaining

a great deal of experience. There is still another great objection, as I believe it will be found impossible with our present strength of the dockyards to keep the ships in proper repair. We had a very able State paper drawn up by three Admirals two years ago, and I am proud of the authors of that paper. It is well known that one of them is now in the chair. In that paper they have pointed out that no ship should be taken credit for until she is in all respects ready to go to sea and fight. What is the present position of affairs? There is scarcely one ship in that position. At any rate, the ships that have been repaired and are ready to proceed to sea may be counted on the fingers of one hand. Henceforth the most important consideration will be the care of all these large ships which are to be built and kept ready in the state described by those gallant Admirals. This is a very serious business. The only way to maintain our ships in the First Reserve is that after the manœuvres they should be immediately repaired and turned over to the Commander-in-Chief, who must be responsible that they are kept efficient. I have heard some lecturers, and I have also heard Officers outside, say that they should have their crews on board. Now, I went carefully into that question. There are a great many difficulties to be considered relative to discipline, fire, short days in winter, and climate. At Toulon the climate is much more suitable, and there can be no objection to the men and Officers being kept on board. I suggested that dépôt crews should be selected, with a certain number of Officers to take charge of the men, to be marched on board in the morning to look after the guns, machinery, and so on, and then to return to barracks in the evening. Our gallant Chairman the other day rather astonished me by announcing that the fiat has gone forth that ships are no longer to have masts and sails. The general introduction of twin screws made this inevitable, for there can be no real reason for keeping masts and sails in twin screw ships, except as a gymnasium; but I do protest against removing them from our "boys' training ships," our training squadrons, and from ships which may still exist with only one screw.

The CHAIRMAN: It is not intended to apply to those ships—simply to the ships of the future.

Admiral WILLES: Then I leave on record what I have said, because that meets my views. If masts and yards are abolished, can there be any reason for not abolishing the "volunteer seaman gunner"? quoting Admiral Mayne's words. I concur with what he has said on this subject, and the Board of Admiralty in 1879, of which the gallant Officer behind me, Earl of Clanwilliam, was an honoured member, decided the change should be made but vested interests and passive resistance were brought into play, and the evil still exists. I have given my opinions upon the question in this theatre on other occasions, and will not enter upon them again. I was glad to hear Captain Cleveland's opinion on this subject, for he is an expert, and has just left the "Cambridge." It is an open secret that about 90 per cent. of the Officers consulted by Admiral Bosanquet's Committee were in favour of this change, which must come about in spite of all opposition, and the sooner the better. I now come to the question of torpedo-boats and torpedoes. I quite agree with the lecturer, and I do not believe that the torpedo will ever form an important part in *offensive* warfare. We cannot, however, withdraw torpedoes from our ships altogether as long as they are maintained by other nations; but I certainly think that they should only be used when they can be fired submerged. The idea of firing them otherwise under the frightful fire which would be produced by the quick-firing guns is to me absurd. The great question in this theatre used to be the gun, the ram, and the torpedo. Where is the ram? Gone. Our lecturer said the other day that you cannot get speed without length, and so those small ships, "Wasps," which Sir George Sartorius used to advocate, are out of date. Well, the torpedo has lost ground, and our good friend the gun is more powerful than ever. Admiral Mayne couples a deficiency of Officers of Lieutenant rank with a deficiency of stokers. No doubt the training of the stoker is a very easy matter. Our gallant Chairman can remedy that difficulty. I stated my views on this subject last May. You can get stokers in course of time, but they must be trained. We have no training system. The Italians have a good one; and I have no doubt the French also. It ought not to be a question of expense (and we know that money is not tight just now). As to the increase in

the number of Lieutenants, it is a very serious subject, and I do hope that by introducing more Officers of the Naval Reserve, and increasing the number of Warrant Officers, under instruction for navigation and pilotage, we may avoid the necessity of increasing Lieutenants' lists. Warrant Officers could be employed in our torpedo-boats and gunboats in time of war, so that our Lieutenants may go to sea. If you increase the number of Lieutenants, how are they to be promoted? It is sad enough now, and it is no use looking forward to any increase of the higher ranks; at least I think so. Therefore I do hope that the ranks of the Lieutenants will not be sensibly augmented; for by and by a cold fit will come on as usual, the number of ships will be reduced, and then we shall have a number of these most valuable Officers on half-pay. The lecturer has alluded to the conduct of the Naval Reserve. I do not attach much importance to the "Trent" affair; it is quite a matter of ancient history; but we must not forget that directly war is declared, the Naval Reserve men come under the Discipline Act: they must come forward. I do believe that the villages and towns in which they live will make it too hot for the defaulters. Under the head of the "personnel," I cannot concur in all that has been said by Admiral Mayne. I have on two occasions given my opinions in this theatre. No doubt there is much that is faulty in the education of our Officers—I only allude to the Executive. To take a young Sub-Lieutenant away from his ship at the age of 19, to pass 18 to 20 months in Portsmouth and Greenwich, cannot be for the good of the Service. In fact I know it is not, and I hope the system will be modified. Now as to open competition. Well, I am afraid it will come sooner or later, and I hope later, for it will be an evil, for reasons which cannot well be expressed in public. Admiral Mayne proposed to do away with—I won't call it the "Britannia," but with our Royal Naval College. I am sorry the word "Britannia" has not been dropped. It is a floating naval college. In the Army the young men who are successful in the competitive examinations are sent to Sandhurst and Woolwich for a course of study and discipline before they join their different corps. Why then should our admirable Naval College be abolished, and young men at the age of 17, 18, or 19 be embarked direct? I pity the poor Captains, and I pity the Navy. No doubt there is one evil in the Naval College, namely, the expense, but this might easily be reduced. In the Naval College, with which I am proud to have been connected, the civilians had to pay what was then considered a large figure, 120*l.* per annum, for their sons, whilst naval and military Officers paid according to their rank; but in the "Britannia," I believe—Admiral Bowden-Smith will correct me if I am wrong—they all pay alike, about 80*l.* a year, so that gentlemen well off send their sons there for the same figure as naval and military Officers. I believe that this will lead to great abuse. Many men will say, "Oh, it is a capital thing, it is the best public school in England,"—and so it is without exception,—"I will send my boy there, and pay 80*l.* a year for him. I cannot get him educated anywhere else under 150*l.* or 200*l.*: then when he has been there for five or six years the Navy won't agree with him, or he won't agree with the Navy, and he will come on shore."

Admiral BOWDEN-SMITH: A limited number are taken on at 40*l.* I cannot sit down without alluding to our Chairman, whose appointment as Senior Naval Lord has met, I believe, with the general approbation of the Service. He is not only able, but he has advanced and liberal views, and I am quite certain that he will do his best to carry out the possible changes advocated by Admiral Mayne. It will be a laborious task, but I am sure he will have the moral support of the Officers of the active Navy, and the good wishes of the retired Officers.

Captain W. SR. JOHN S. HORNBY: I rise with great diffidence after the distinguished Officer who has just spoken. My words, at any rate, will be very brief, and I hope they will be to the point, for they will be confined to this lecture. The first point is this about Open Competition. This is the first time, I believe, it has been broached here, but I had the pleasure twenty-two years ago, or more, when I was a young Commander, of mooted this same subject at the Naval College, and it was scouted, as it will be to a certain extent now. I think that open competition, properly brought forward, will be one of the best things for the Navy and for the nation. I believe, if open competition in that way were given to all the big schools, Eton, Harrow, and so on, it would be a grand thing for the Navy, and I think you

might extend it to all the grammar schools; and then, if the Admiralty would give facilities in the way of scholarships, you would get classes formed at the schools and colleges; but unless such facilities were given, the head masters would not take the trouble. By open competition I think you would get the bone, sinew, and brain of the nation. But even if that does come about, I should not by any means do away with the "Britannia." I think the "Britannia" is one of the best institutions that ever has been invented and carried out, but I would give the open competition so as to prevent it becoming more and more the custom that all the nominations and appointments should be in the hands of politicians. The First Lord, for instance—I speak with deference, of course—has a great many appointments, and the politicians are getting the whole thing into their own hands, whereas, by open competition, you would get just as good fellows as you do now in another way. An Officer spoke at the last discussion on this lecture about the naval families, and so on. Well, some of these naval families have had a very good "innings;" but I think that all monopolies should be done away with. I will not touch further upon that subject, but will refer to the question of every one in a ship being a "combatant." It is very pretty on paper—but take the case of the stokers; how is it possible for any one to make a stoker a combatant? I am here reminded by Sir William H. Stewart that in the ship I served in, under his command, all the stokers were trained, but those were pre-steaming days; there was not the steam power in ships in those days that there is now. I should like to know from Officers who have been employed during these late Naval Manœuvres, whether they had any chance of sending the stokers on deck? Is it not rather the case that, if you are blockading or chasing the enemy, or engaged in operations of that kind, you have to send your deck hands down below, in order to keep the fires going, so that the training, on board a man-of-war, of the stoker, is simply a waste of time, and employing your Gunnery Lieutenants and instructors absolutely to no purpose? It takes half the naval lifetime to make a man a perfect swordsman. It is absurd to waste your strength in that way. If your stokers were entered young and trained up as stokers, and you had them in barracks all ready to put on board ship, I grant that something might be done in that direction. Another thing in connection with the stoker is, that he believes that he ships for a certain purpose, *i.e.*, for stoking, and stoking only, and he does not understand when he is shipped that he is to be bound by the Naval Discipline Act or Mutiny Act, is therefore obliged to do everything that he is told, and be away from home three years. That is one of the reasons why stokers hesitate to embark in the Navy, and makes the shipping of stokers for the Royal Navy difficult. Another point with regard to all persons in the Fleet being combatants is this—take the Paymaster branch. It is comparatively easy, of course, for one who studies hard to master the principles of book-keeping, but it is more difficult to put them in practice. I should be very sorry, if I was a Captain of a man-of-war, to be answerable for all the accounts unless they were kept by a person who had gone through a regular training. Book-keeping is an art, and a person must be always at it to understand it and do it thoroughly. Would commercial men, in large firms, doing a large business, leave their books in charge of a man who is always going to balls, parties, and all manner of things? Of course they would not. But that is done in the Navy, and I venture to say that in the occasional scandals which have cropped up of late, you will find that the men who ought to have looked after the book-keeping were always slipping ashore to tennis parties and all manner of things.

The CHAIRMAN: This hardly bears upon the point of the manœuvres.

Captain HORNBY: I think, Sir, that I am in order. What I want to say is this, that men who have the particular education ought to stick to their own peculiar work. In order to carry on book-keeping a certain training of mind and temperament is requisite, and it should be in the hands of those who have made it their business to study and practise it.

The CHAIRMAN: I do not think that is quite relevant to the subject, "Lessons to be learnt from Naval Manœuvres."

Captain HORNBY: I think it is one of the points. Reference was made on Friday to "every one being a combatant;" Lieutenants giving instruction in navigation; a Lieutenant in the stoke-hole, and so on—

The CHAIRMAN : No ; I think not.

Captain HORNBY : There are some very excellent naval instructors, but they are not all able to impart to young Officers the knowledge they themselves possess. They are not all the same as Professor Laughton, and I think, considering that the naval Lieutenants of the present day have such a high standard of education, they might very well take that part of the duty, and thus we should have an additional combatant Officer in the sea-going ships. With regard to the administration of the Navy I will not say a word ; it is not in my line. I have my opinions the same as most of us ; but with regard to the ships I think I might say a word. I think if the commission of the ship were shortened it would be more to the contentment of the Service. Everybody knows that the happiest part of a ship's commission is the first two years —

The CHAIRMAN : We are not learning that from the naval manœuvres. We want to discuss lessons to be derived from naval manœuvres, and certainly that is not one of them.

Captain HORNBY : As regards the ships, the fat has gone forth that masts and sails are to be done away with. I venture to say if ships were built more for special purposes, that is to say for particular stations, it might be better for the Service. Each station requires a particular type of ship, in accordance with the naval base of operations and coaling stations, and it appears to me that if masts and sails were at once done away with at foreign stations, it would not be altogether an advantage —

The CHAIRMAN : Before we go on with the discussion, may I make one remark ? We have a very comprehensive lecture to consider, and the title of that lecture, as I have said, is "Lessons to be learnt from Naval Manœuvres." One of those lessons can hardly be the point as to whether ships should be two years in commission or not. I hope that we shall not wander away from the real subject before us.

Admiral BORS : I will premise by saying that our lecturer has given us an extremely good paper, but I think he has mistaken the title. The title is, "On Lessons to be learnt from Naval Manœuvres." Now, when I came here I expected to hear something about manœuvres, a description of what happened, or the strategic movements of the fleets : but I have failed to discover anything on those subjects. The paper deals with the general organization of the Navy. Many points are touched upon which are very valuable. Before referring to some of them I may say I feel I ought to apologize for rising to speak at all, because I consider it is far better in this Institution, as a rule, that the speakers should be those who are in the position to command our ships and command our fleets. Their opinions must be more valuable than those of the majority of us who are sitting on this front bench as retired old Officers ; and although occasionally we may do some good in giving our experience to those who come after us, still I really think that it is desirable to give the greatest scope to such men as most of those who have already spoken. Admiral Mayne has touched upon the seaman gunner. I know the question of seamen gunners to some people in our Service is like holding a red rag to a bull : if you mention a seaman gunner they will start up to decry him with a view to his being abolished. Now what is a seaman gunner ? A seaman gunner in my days was, and is now, a man trained and drilled beyond other people, and he receives extra pay for extra qualifications. He has to know everything connected with his drills, and besides that he is to be an instructor. One of his special duties is to instruct other people. It is said that everybody should be a seaman gunner ; undoubtedly he should ; but that is a practical impossibility ; every seaman cannot reach the standard required. What is proposed is that you are to have men to be captains of guns, of turrets, quick firers, to give instruction in gunnery, rifle, and cutlass, and everything else, and these men are all to be trained for the purpose, but they are not to be called seamen gunners ; in fact you are to have twelve pence instead of one shilling. It seems to me to be an anomaly. My connection with seamen gunners commenced just forty years ago ; and I must say, from my experience, it would be very detrimental to the Service if the seamen gunners, as a class, were done away with. We must have a body of men of that description. What happens now ? I appeal to any Captain or any Admiral, who are the men

that he looks to—especially on first commissioning—as the nucleus of his ship's company to fight the ship, but to the seamen gunners? If an Admiral inspects a ship, in all probability he can pick out every seaman gunner by his appearance, by his general bearing, and, as a rule, by his superior intelligence. Sir George Willes says the seamen gunners are kept in harbour longer than other people; this I much doubt. I think it would be a sad mistake to employ such men as is intimated in the paper, in cleaning ships' double bottoms, &c. I think they are far better engaged as they are now, whether on the "Excellent" or the "Cambridge," or on shore in barrack perfecting themselves in their drills, and making themselves competent to teach others, because gunnery Officers and seamen gunners learn more of such duties, while in "the manual" after they have passed through the instructional course. Seamen gunners must be good seamen before they go through their qualifying instruction at all; if they are not, it is the fault of the Captains who give them their certificates. No man could qualify as a seaman gunner in my day until he had a certificate to say that he was a good seaman; therefore I should be very sorry indeed, and I am certain it would not be for the good of the Service, if ever the rating of seaman gunner were to be abolished. You may call him what you like, seaman gunner, or instructor, or anything else—but men of that class you must have. In peace-time we probably may have more of these men than are necessary, but we must remember that we have to legislate not for peace but for war. What will happen immediately on the declaration, or probable declaration of war? The gunnery ships will all be shut up: the seamen gunners will be distributed over the whole sea-going fleet, and when you have distributed them to every ship in commission and about to be commissioned, you will have none too many, and they will be extremely valuable wherever they may be. In merchant-ship cruizers especially a few seamen gunners would act as captains of guns, would assemble the crews round them, instruct and drill them at the guns that they may have to deal with. I have a very strong feeling on this question. My friend Captain Cleveland I know is a man for putting his foot down, and, when he does put his foot down, those who are under it feel the weight of it; but that does not imply that he may not make a mistake sometimes—and I believe him to be wrong in this case. Merely giving the order will not make men efficient in acquirements for which they have not the capacity. There is another point which I should like to touch upon—the entry and education of our young Officers. To a great extent I agree with our lecturer. I maintain it is not necessary that young gentlemen of the present day should be educated generally at the expense of the State in an expensive establishment afloat. What does the education consist of? I myself have had a boy in the "Britannia," and a nephew in the "Britannia," and another at the same time in a public school. The course of instruction and the curriculum were very nearly the same; even the school bills corresponded. Why should the Government undertake the education of these young gentlemen? I do not see why they should at all. And then as to entering at so young an age. I quite agree that in former days when they went to sea, especially in small craft such as brigs and schooners, at twelve or thirteen, they had many hardships to endure, it was necessary that they should enter early in order to be broken to the life. But there are no hardships now-a-days. There might have been a little hardship accidentally a week or two ago when more youngsters were sent to take passage in a ship than there was accommodation for; that was exceptional, and they were none the worse. In my opinion no boy should join the Navy till he is sixteen. No doubt my friend Admiral Bowden-Smith is quite correct when he believes that the "Britannia" in his day was everything that the "Britannia" ought to be. At the same time I maintain she is a mistake. She is nothing but a public school, and no school, as a rule, can be a success when the head master is changed every three years, as is the Captain of the "Britannia." Then, again, the boys being under naval instructors for education, and combatant Officers for discipline, is inconsistent. They cannot be Officers and schoolboys at the same time. The Chairman reminds me my time is up, so I must stop.¹

¹ I intended to add, that I do not believe in entry into the Navy by competition, and competition at the age of twelve or thirteen is no criterion of what a lad may

Admiral Sir HOUSTON STEWART, G.C.B.: I should be glad to say that I have listened to and read with great pleasure the very able, clever, and instructive lecture delivered by my gallant friend Admiral Mayne. I have never heard here or anywhere else a more clear and able address. I cannot attempt to range over such an extensive field for discussion as he has presented, comprising as it does the whole constitution and policy of the Navy. I will only attempt, in compliment to my gallant friend, and to show him that I have read his paper with care, to glance over a few of the many points that he has raised. I quite agree with him in not believing that our brother Officers sit in Whitehall in ignorance of what they would do in case of war, although they are obliged to maintain a careful reticence, involving as it does the consideration and approval of the Prime Minister and the Cabinet. I am glad to see in this paper that fortifications are recognized as being of real use for the protection of our dockyards and our ports. I have never been quite able to understand the drift of some interesting papers and discussions that have taken place in this Institution on that subject, but I must say my own opinion is that no Power can be considered as a first-class Power whose dockyards and arsenals are not protected by sufficient fortifications, and the approaches to whose commercial towns from the sea are not rendered reasonably secure from the acts of raiders, nor can any Power be justly entitled to maintain the title of a first-class Power whose naval and military forces are not capable of ready expansion and organization in time of war. I think my gallant friend's proposal about a Commander-in-Chief having a "standard" is an admirable one. It has been proposed and discussed before at the Admiralty, but during the time I was there it was never possible to meet with a general agreement on the part of the Admiralty and the House of Commons as to what the "standard" should be. I quite agree that it is of the utmost importance to maintain our battle-ships at their full efficiency, and that the standard of battle-ships should never be permitted to fall below what would enable us to have reasonable security in the event of war with two maritime Powers. But to my mind the paramount consideration is that we should maintain, not only in war but in peace-time, on every sea where our commerce is found, efficient cruisers. When I speak of efficient cruisers in time of war, I take as a type, as near as they can be approached in the design of a war-ship, our first class ocean steamers, that they should be able to go anywhere, in spite of wind and weather. All others I relegate to the duty of defending harbours, estuaries, and acting as scouts. When our great pitched battles in the past were fought, if the world of the sea had not been covered by our cruisers, the cruisers of the enemy might have worked their wicked will on our commerce. Where then would have been that financial credit which alone enabled our great Minister of that particular day to provide the sinews of war, without which those great and prolonged struggles could not have been continued? With reference to the seven lessons from the naval manœuvres, which our gallant friend has drawn, the first is, "that the official speeds of ships are unreliable data." That is perfectly true. The second, "that commercial depôts and their approaches cannot be adequately protected by passive defence alone." I do not quite understand what that means. Third, "that speed is a most necessary factor in a war vessel." That is undoubtedly so, and to me it has always been the first consideration ever since I could form an idea on the subject. To maintain speed at sea, you must have length of ship. "Next to it large coal endurance." In that I entirely concur. When Controller I always endeavoured to increase the coal endurance of our ships. "That the maintenance of a squadron with coal stores, &c., requires special and careful organization." Undoubtedly it does. "The mystery attached to the movement of ships and their object should be abolished, so that everyone concerned should be induced to take an interest in them." I do not quite understand this. If it means that the movements of the ships and the

be even three or four years later; it is incongruous, and only one remove better than putting the names of the candidates in a hat and pulling out the lucky ones. The proposal I advocate is to give nominations at the age of thirteen or fourteen, and inform parents there will be a test examination at sixteen or seventeen, when they would be sent direct to their ships. This system would have many advantages.

affairs of the Navy are to be known to the public, I think they are quite known enough already. And lastly, "it was most evident that the squadron were deficient in cruisers and scouts." There are no two opinions about that. Those are the seven lessons that the lecturer gathers from the manœuvres. I venture to express my opinion that the time taken by the Torpedo Lieutenant is far too short for him to learn the trade of an engineer, and he cannot direct others unless he is master of the subject himself, which requires both theoretical and practical knowledge. I quite agree with regard to the non-combatants, that the firemen or stokers should be trained to the use of guns and arms. I have been in three paddle steamers, and one three-deck screw ship, where all the firemen and stokers were trained for battle. In the "Firebrand," which had four 10-inch broadside guns, partly manned by the firemen, when the ship took part in the bombardment of Sebastopol, and on other occasions, this proportion of firemen stationed at those guns worked them during the action. The time is much too short to enter into the subject of the Second Class Reserve for the preservation of ships, but I do not think it would be advisable to allow half the crew to be embarked under a Lieutenant. It seems to me that this would be too large a number of men practically in harbour ships, and with not a sufficient staff of Officers, they will deteriorate, and discipline will suffer. With respect to the question of no organization for coast defence, which is remarked upon by Lieutenant Colwell, it is well that we should see ourselves as others see us. It undoubtedly is the case, and I cannot understand how our coast defence can be ever perfected under the purely voluntary system. Until it becomes the enforced duty of every man who makes the sea his profession, or carries on his trade around the sea coasts, whenever called upon to be obliged to take part in the defence of his country, I do not see how that organization can ever be what it should be. With reference to the administration of the Navy, one of the great difficulties of Admiralty administration is the conflict of naval opinions. I do not know any greater, and I think we have a specimen of that here with reference to what has been said as to whether the "Britannia" should be done away with or not. And here I will venture to remind the able lecturer of what appears to be a contradiction. He speaks, no doubt most properly and deservedly, of the proficiency of the younger officers, as shown during the manœuvres, in contradistinction to the non-proficiency of the material or ships. That would rather argue that the young men do come from the "Britannia" well prepared for the work they have to perform. Another of the differences of opinion is a very important one. Admiral Mayne has quite decided to do away with the side armour of ships. We know that other Naval Officers, whose opinions are very valuable, are strong on the contrary for its retention. As to the question of guns, I have no doubt my gallant friend is as well acquainted as I am with the difficulties other countries have had in the manufacture of these novel and large guns; they have had as many failures as we have. I know also that they have had accidents as serious, so far as the efficiency of the gun is concerned, and much more serious in the loss of life caused. I rather fail to see how the civilian head of this revised Ordnance Department, with a sailor and soldier to help him, will put us in a better position than we are now with such an establishment as Elswick, as well as Woolwich, and the possibility of having whatever naval or military Officers may be selected, to assist in gun designing and manufacture. The lecturer has remarked on the extravagance of the system of repairs, which he thinks will be rectified if it were put into the hands of the Commander-in-Chief of the port. I have had a good deal to do, in the dockyards and out of them, with the question of repairs to ships, and I could dilate for a long time on the subject, if time and your patience permitted. I am not going to do so, but only to say I fail to see why, supposing a ship is repaired at Portsmouth, the repair should be more economically carried out under Sir John Commerell, the Port Admiral, than it is now carried out under Admiral Gordon, whose special attention, as Superintendent of the Dockyard, is directed to the repairs and nothing else. I have no time to say more; it may be the outcome of an old-fashioned sentiment, but I do feel,—able, instructive, and clever as this paper is, and there are many points in which I agree—some misgiving as to whether some of the subjects of this lecture, so clearly expressed, are suitable for discussion in this Institution.

Lieutenant BADEN-POWELL, R.N.R.: In attempting to make a remark or two on such a question as this, and with such high flag Officers present, of course it will be my duty to keep as clear as I can of criticizing the technical subjects of the ironclads engaged in the naval manœuvres. But, in reading the lecture, one thing struck me very forcibly, and that was in regard to the action in the naval manœuvres in which the ships chased the merchant steamers and captured them of untold wealth, something like Ali Baba did the cave in the "Forty Thieves" story. Sir George Willes said that this was perfectly nonsensical, or words to that effect, and I quite agree with him; from the sailor's point of view there is nothing more nonsensical than has transpired in the naval manœuvres than putting down on paper that certain fast merchant steamers were captured as prizes. I should like to have seen where those cruisers would have been after chasing for twenty-four or forty-eight hours: they would have been a long way astern. But there is another way of looking at that, and I think the Government, perhaps, is right in allowing this chasing to take place, more especially in allowing the printing thereof to take place, and that is, it gets the money out of the House of Commons. That is the way I look at it, and if you can have a little by-play, which keeps the House of Commons and the British public amused, and gets the money into the naval locker, then I say it is justifiable. The subject of the Declaration of Paris has been just glanced upon in this paper, and though I have once or twice in this theatre spoken upon the Declaration of Paris, and hold strong opinions upon it, I think it is a long time since the country has had a large naval funeral, and I think the sooner a small naval funeral is organized, in peace-time, to quietly bury the Declaration of Paris in the middle of the Channel, with naval honours, the better it will be for this country in time of war. You could then arm your merchant steamers, your volunteer yachts, and so forth, and make the whole nation a naval nation, but you cannot do it while the Declaration of Paris exists as good paper. Then there is the question of masts and yards. It has been said that there used to be a fine old "pipe" when the lower yards lay across the bulwarks; one pipe to "Cross royal yard," and it was done. I venture to submit to naval Officers present whether it is not possible, even in these days, with the sailors and Officers that man our ships, to have yards and sails and keep your stations, and so save your coal, and to give another pipe when you want to chase or to take an important announcement to the Admiral or the shore, and that is, "All yards on deck," and would not they be down quite quick enough for the cruiser to steam head to wind, just as well as an Atlantic liner can? If you mix up the cruiser and the fighting ship, I think you are doing wrong. I think you must have the cruiser purely as a scout to look out, to bring in intelligence, but capable of fighting a ship of its own size, and therefore I do not think the yards and masts, if they save the coal, will be found in the way in war-time, and coal will be precious in war-time, for colliers will not be able to roam about the sea as they do now; they will be snapped up as prizes, for coal is contraband of war. There is some allusion in the paper with respect to the seamen and Officers, as to their education. It seems to me, without going into particulars thereupon, that the tendency of the Navy, to a very great extent in some quarters, is drifting towards soldiering, and it appears to me, if it is not checked by those men who have the sea at heart, we shall soon, figuratively speaking, have the blue-jackets pipe-claying their white collar bands and the Officers wearing down-peaked caps, like the Guards. I cannot say that I like that tendency. I certainly think we must acknowledge that, seeing that engines and guns have come to be worked by electricity, or other motive power, scientific training is necessary, but I do not think the time has yet come for doing away with the British blue-jacket or seaman-gunner, nor the Officer who has the heart of a seaman within his body. Admiral Willes said that the cry was at a certain time past, "the ram, the gun, and the torpedo," and he asks, "Where is the ram? Where is the torpedo?" But I think the cry has been very much of late, "Where is the gun?" I think the only answer to that is that it is in the manufacturer's hands, and the sooner that reasonable details of business between the Admiralty, the War Office, and the producer are worked out thoroughly, so that the guns are up to time with the ships, the better it will be for the Service. Then as to education; now, for the last few years many have looked with horror upon the amount of education that an Officer of Lieutenant's

rank has to go through; and I think we shall have to stop giving any increased education till we have bred a new kind of man, with a larger displacement to his head. I think that the paper is quite correct in saying that the attention of the Officer ought to be turned rather more to the handling of his boat and ship, for it is more important that he should become a good boatman and a good handler of his ship than that he should be seen poring over a lot of logarithms and chemical analyses, because he will soon pick up anything he requires in that line when he gets put into a special department to work it. To know his ship is the first order of the day, and the man who cannot work his ship will lose his action. I now go to the question of the Naval Reserve, and I will not touch much upon that, because I see a Naval Reserve Officer on my right (Mr. Caborne). I leave the Naval Reserve confidently in his hands. But I should like to say one thing, and that is, I think the country has not awakened to the fact that the Naval Reserve might be vastly improved, vastly augmented in time of peace, and then it will not be in chaos in time of war; but if you leave it till time of war, and then have to start a kind of *quasi* press-gang to hunt up seamen, it will be too late. You will not have time to train either Officers or men; you will have a good article, but without training. The country might get off cheap enough now if they would only throw out a bait tempting enough, by increasing the ranks in the Naval Reserve, by making it possible that the Naval Reserve Officer should hold the rank of Commander. It is absurd to me to see an Officer of a fine ship, such as the "Teutonic" or "City of Paris," a man of perhaps forty-five years of age and thirty years' sea service, ranking only as Lieutenant. I think that these men ought to rank as Commanders, and when they are called out to active service there are plenty of small ships of which they could be put in command, without treading on the toes of any naval Officer on the active list. Increased rank would be a very great bait to catch the best fish. The men might also be improved in position, and if they were more brought in contact with the Navy, so as to learn the routine duties of a man-of-war, and also what are the comforts and the prospects of a man-of-war's man, I think they would then come to the Service, and we should have none of that vanishing away into thin air that is mentioned in the lecturer's paper.

Admiral Sir GEORGE TRYON, K.C.B.: I should not have ventured to have spoken to-day, at least, I thought I should not, when I heard that the lecture was to be given with reference to the Manœuvres. I have not had time to do more than glance over the paper; but when I did so I found that it was not a paper so much with reference to anything that occurred during the Manœuvres as it was in relation to the organization and to the system of the administration of the Navy as exemplified and experienced in those Manœuvres. I venture to say with reference to the Manœuvres, the question with those present was not to consider how young gentlemen were educated, or whether stokers ought to be drilled, or how men ought to be obtained, or questions as to the Reserve, but it was with us who were actively employed, how to make the best use of the materials that were placed in our hands; and I venture to say, as one of the Officers in command, and in the presence of Officers who commanded ships on that occasion, that we were very satisfied with the personnel that was placed under us. Of course we should have liked everything more perfect; we always asked for more. We know the Admiralty just lately have turned their attention to giving us a more ample supply of fit stokers. You cannot get them at a moment's notice, and there are but few available in the mercantile marine. I see gentlemen before me of authority in the mercantile marine, and I can tell you that this is not a new subject with me. There are very few Companies who retain their stokers permanently in their service, and the general complaint in the mercantile marine is what an indifferent set of men are sent on board as stokers. Of course there are some that are very good, and we should be glad to have them, but the mass are not suitable. On the whole, the stokers are a difficulty, but we are getting over that; we are training them, and we are much better off than we were last year or the year before. We have heard expressions about the gun, the ram, and the torpedo, and that the ram and torpedo are gone, and the gun alone remains. I do not concur with the observation. I know that when the Officers who were serving with me were present in my cabin consulting over matters, it was felt that as we had in some of our ships

but four heavy guns, and those four guns were necessarily very exposed, it was quite possible that at any moment one, two, or perhaps more might be disabled. But it was not the intention of one of those Officers to fall out of line because a gun was disabled, but rather to concentrate his attention on the use of the ram, and it was felt that the Officer who concentrated his attention on the use of the ram was more likely to be successful with it than the one who intended to use gun, ram, or torpedo, whichever might by some chance be afforded an opportunity. With reference to torpedoes, I think they are necessary, if only for the reason that they are the best antidote I know for the ram. I therefore think the gun, the ram, and the torpedo all have their respective duties. I should not have ventured to say a word to-day if I had not known that the discussion had taken rather the form of re-editing the paper, able as it is; it touches on so many subjects, and opens such a wide field for discussion, that it is difficult to deal with it. There is only one point that touches myself and the duties I have to perform, and that is with reference to the result of calling out the Naval Reserve. It is stated as a literal fact that at the last war-scare the men in training on the north-east coast disappeared. I think that is an anecdote; we hear such stories told by almost anybody about everything. Admiral Mayne also says he thinks we ought to do away with the Second Class Reserve and take more of the First. As a matter of fact, it would be very difficult to largely add to our number of First Reserve men. The number of Second Class Reserve men could be increased if it were required. But I may mention this with regard to the want of confidence apparently entertained by Admiral Mayne in the Second Class Reserve, and that is expressed in the paper—I think that those Officers who have most studied the question or had experience of it will differ with him. I have not seen a single bad report with reference to the Second Class Reserve. On the contrary, His Royal Highness the Duke of Edinburgh spoke most confidently of them. My predecessor, Admiral Baird, spoke most confidently of them, and I think we may be confident that if this country requires their services they will come forward quite as cheerfully and readily as the Volunteers will to back the Army. Allusion has been made with reference to Officers in the Royal Naval Reserve. I am happy to say comparatively recently a modification of the Regulations has been made by their Lordships which has succeeded in bringing the Service more within their reach. No less than fifty-one young Officers joined us in the last half-year. It was a great consideration to get young Officers, and also young Officers who would go to sea, serving for a year with us, and I know not one who has not brought back with him a good report of his new life and messmates, and of the treatment he has received. There is one question I think Mr. Baden-Powell spoke of, a question of rank and baits. Now I think no baits are required. That which is offered is very substantial. We have numbers of men offering for the Second Class Reserve. If we have not so many for the First, it is because we really practically have most of the really available men in the mercantile marine. As regards Officers, we have had many applications to join the Royal Naval Reserve. There is the question of rank, to which he has referred, and a very important one it is. The great standpoint in the Navy is that of Lieutenant. Once a Lieutenant, you may jump rapidly to almost any rank, and if war arises it is impossible to foresee how rapidly Officers may rise to higher rank, as was the case in days gone by. We may take the experience of the American Navy in their great war. The highest rank they gave was that of Acting Volunteer Lieutenant Commander. At the end of the war the Volunteer Officers were scratched off the list; there was only one seagoing command of importance given to these Officers, and that was given to an Officer who commanded the "Vanderbilt." There were many Acting Volunteer Lieutenants given gun vessels and smaller vessels. Should the Naval Reserve Officers ever be called out on service, they will be welcomed by their brother Officers, and it will be to "a fair field and no favour," and the best men will go to the top of the tree.

Captain T. S. JACKSON, R.N.: It has been said this afternoon that the conflict of opinion of naval Officers is a source of difficulty to the Admiralty. If that is the case, how very easy the Admiralty must find it to carry out any reform on which we are practically unanimous. A paper like this, at all events, brings out the points

on which we differ. We are not always equally emphatic on points on which we are all absolutely agreed. That speed in ships and also coal endurance are necessary, are points on which there is no difference of opinion. I leave all those out, and will go to those points on which I differ, whether much or slightly, from Admiral Mayne. The Naval Manœuvres, he said, proved the deficiency of Officers of Lieutenants' rank. So far as my own experience went I do not know that they did. The ships were sufficiently manned; they were well manned; they were also well officered, as far as I had any opportunity of judging. Of course a larger supply of Lieutenants would be required in event of war, and provision ought to be made for them, but I quite agree that the Lieutenants' list ought not to be increased from the ranks of Sub-Lieutenants. I submit that there are other ways of increasing it. There are many Warrant Officers of high education who have passed in navigation. Sir George Willes is mistaken in thinking that we began to teach the Warrant Officers navigation only two or three years ago. In the "Cambridge" twenty years ago the whole of the Warrant Officers were instructed in navigation, and I submit that Officers can be promoted from the warrant rank. They would be of such an age that, except in war-time, they would probably have no great opportunity of rising higher than Lieutenant, or at all events higher than the rank of Commander. They would be very well satisfied with the position that they reached, and the extra retirement to which they became entitled on reaching the rank of Lieutenant. You would then have a body of Officers perfectly capable of doing the ordinary work of Lieutenants, who would not be always thinking they were ill-used if they were not promoted to the rank of Commander in the next batch. Then, as to the deficiency of stokers. Was there any deficiency of stokers? I have not the slightest idea that there was. As far as the ship I commanded was concerned the complement of stokers was complete. There was a large proportion of 2nd class stokers who were very green, but they worked well; they never fell out from their work, and they improved as matters went on. Of course there are many points connected with the Naval Manœuvres which appear absurd. Many events occurred which would be impossible in real war. Mr. Baden-Powell is quite right about the reported capture of fast merchant ships, but he must recollect that these Manœuvres were simply a game played according to certain rules, and the rules gave Officers an opportunity of effecting a capture by sticking close to a merchant ship which could have left him easily if she had chosen. In the same way must be regarded the rush made on all occasions, both last year and the year before, to get to the Thames. What on earth would a squadron like that commanded by Admiral D'Arcy Irvine do if it got to the Thames? They could do nothing whatever, except wait and blockade the place, until they were picked up by an English squadron and destroyed. The question of fortifications was utterly ignored, whereas the existing fortifications are far in excess of what is really wanted to keep off a fleet. Those fortifications were absolutely ignored by the rules. We find gunboats and torpedo-boats going up the Liffey, past Pigeon-House Fort and destroying in broad daylight the ships at Dublin. I should like to see any torpedo-boat go past Pigeon-House Fort in war-time. Certainly Admiral Mayne has pointed out one blot in the matériel with which we are provided for naval war, and that is that we have no ships at all capable of delivering high-angle fire. We have never yet got through any naval war without attacking fortifications in some way or other, and we have never been successful, except against a vastly inferior enemy, unless we had high-angle fire. We find at the end of the Russian war we had mortar-boats by the dozen. In the operations in the Mississippi, Admiral Porter's mortar-boats enabled Admiral Faragut's fleet to pass the forts below New Orleans with a very small loss, owing to their having bombarded them for several days beforehand. We have never succeeded in carrying out any naval attack of great importance without mortar-boats. Well, now we have absolutely nothing, we have not even the preparation for anything of the kind. We have not decided what the style of rifled howitzer or mortar is to be which will be mounted on the ship, and when we arrive at the piece of ordnance I do not believe we have got a mounting for it. Admiral Mayne proposed something of the "Mandy" class. If you have ever been on board the "Mandy" when the gun was fired you will know it was very difficult to stand up, and you do want for the moment of firing—for high-angle firing—an absolutely steady platform. I fancy

it would be difficult to get accuracy from any craft of that kind. But that is a more matter of detail, and I am very glad the question of high-angle firing has been alluded to, and that I can so cordially agree with Admiral Mayne on the subject. It is quite impossible to touch on all the points or half the points that the lecturer has alluded to, but there is one that struck me—perhaps it did not strike the lecturer so much in the Manœuvres as he was, I think, tied to a battle-ship—and that was the extreme value and importance of cruisers, and the infinitely greater importance of their work than that of ordinary battle-ships. We find that Officers of experience and of great reputation were put in command of the heavier vessels and really had practically little to do. The position of an Officer in command of a cruiser was one of very much harder work and much more importance. That would point to the selection of Officers for the command of cruisers being a much more important matter than that for the command of battle-ships. Another point which struck me with regard to cruisers, which I had no idea of before, was the enormous duration of the chases that we might expect in war. Four of our cruisers chased on one occasion two of the enemy's cruisers for 200 miles, until nearly all of us broke down. That is something quite beyond anything I had previously expected for a chase. That, I think, shows more than ever that we must be absolutely prepared to steam long distances and we must be prepared to keep up the speed; we must not be satisfied with short runs, and it is as important for a man-of-war cruiser to be able to keep up her speed at sea as it is for any merchant vessel; it must not be considered a matter of short runs.

Lieutenant W. F. CABORSE, R.N.R.: As an Officer of the Royal Naval Reserve, I should like to say a few words on this occasion. I may mention, however, that Admiral Sir George Tryon has rather taken the wind out of my sails by some of his remarks, not that I complain of that, because I was very pleased indeed to hear his statements. With regard to the anecdote about the Second Class Naval Reserve and the so-called war-care, it is very unkind on my part to try and spoil it, but I am assured by a naval Officer who commanded a drill-ship on the north-east coast at that time, that to the best of his recollection and to the best of his belief, there is not the slightest foundation for the statement put forward. Coming to the present strength of the Royal Naval Reserve, Admiral Mayne tells us that there are 264 Officers and 18,000 men, but, as a matter of fact, on the 31st of January, 1890, there were on the Active List (including Lieutenants, Sub-Lieutenants, Midshipmen, Engineers, and Assistant Engineers) 545 Officers—or rather more than double the number named—and enrolled in the various classes 19,369 men. I will now pass on to another paragraph of the paper. The lecturer, speaking of Lieutenant Colwell's report, says, "And he goes on to give it as his opinion that it would be a liberal estimate if one-third could present themselves at the rendezvous in a fortnight"—very liberal, I think—and "those might find themselves drafted to a class of vessel with which they were totally unfamiliar, and stationed at a type of gun they had never seen." Taken in conjunction with that which has gone before, this abridged quotation would seem to imply that not more than one-third of the men would turn up owing to their unwillingness to serve, but that was not what Lieutenant Colwell meant, as he distinctly states the reason to be that they are scattered not only all over the United Kingdom, but also in different parts of the world. Now, I think I effectually disposed of that argument last year, when I had the honour of reading a paper on "The Royal Naval Reserve" in this theatre. I then pointed out that at that time less than one-quarter of the number of men enrolled were absent from the United Kingdom, and that the majority of those so absent would be available for service on foreign stations. At the end of January, out of the 19,369 men enrolled no less than 15,767 were at home, in the coasting trade, and making short voyages to near Continental ports, all of whom would be available for service in a week or ten days. With regard to the men being drilled with obsolete weapons on board obsolete ships, no doubt that

¹ The "Aurora," "Galatea," and "Forth," afterwards joined by "Warspite," chased the "Mersey" and "Arethusa" for fourteen hours. The distance covered was about 215 miles.

is a fact. But whose fault is it? Is it the men's? I have stated before in this theatre, and I fearlessly and unhesitatingly repeat the statement, that the Royal Naval Reserve will be found ready and willing to do its duty when called upon. I need not enter into the "Trent" affair, as that subject has already been mentioned. I have yet to learn that merchant seamen are cowards, and would be unwilling to assist in the noblest and highest of all duties—the defence of their country. I venture to think that in all the great wars of the past merchant seamen bore a not undistinguished part, and I claim that the history of the Royal Navy is also, more or less, the history of the mercantile marine. I will only give two instances of the services of our merchant seamen, and then I shall have finished. Admiral Sir George Byam Martin, in his evidence given before a Select Committee of the House of Lords, in 1848, said that all who were acquainted with the state of the Navy, prior to the outbreak of the war in 1793, were aware that Lord Howe's glorious victory of the 1st of June, 1791, was won by the merchant seamen of the Kingdom. Again, in the Museum of this Institution there is a sword of honour, which was presented to the Captain of one of the Honourable East India Company's ships as a memento of a certain day in April, 1804, when a fleet of British merchant ships engaged, beat off, and chased a squadron of French men-of-war. Why should it be said that the successors of those men have degenerated? In conclusion, I would say that we do not object to criticism—in fact, we court it—but we ask, and we think we have a right to demand, that such criticism shall be at once fair, intelligent, and based upon facts.¹

Rear-Admiral BURNE: I think, Sir, in the first place, I may say how much we in this theatre are indebted for the very able lecture that Admiral Mayne has given us. It has gone over a great many points, and I may say, in my opinion, he has touched upon all of them with a great deal of light, and a great deal of justice. I rise on this occasion particularly to call attention to his views, partly his own, partly quoted, with regard to the Naval Reserve. It is a point, perhaps, upon which I am, to a certain extent, qualified to speak, because for a good many years of my professional career I was mixed up with the men, both with the First Class Reserve and the Second Class Reserve. I was at their drills and at their homes; in the drill-ships and the drill-sheds, and became very intimately acquainted with the value and the work of these men. With regard to the point which Admiral Mayne first of all discusses, which is as to whether the men will or will not be available in time of war, it is hardly worth while, I think, saying very much about that; those who know the subject know that the men are available, they know that the men will come forward, not merely by the force of public opinion in their villages, but because the men, as a body, are very trustworthy, very honest, very straightforward, and to use their own expression, I should think they would never go back from their word. They have given us their word, and they will keep to it. I now pass to a thing of much greater importance. When an Officer of cool judgment and intelligence comes to this country with distinct instructions to report to his own country upon our position as regards our Naval Reserves, and that report is put here before us, it becomes a positive duty that it should either be accepted or denied. I read it because it is a very important report. He says, and this is the statement of Lieutenant Colwell speaking of our Naval Reserve, "The material of which it is composed is admirable"—that is very satisfactory—"but the system is open to the objections that these men, if drafted on board a modern man-of-war, would be nearly as useless as any other untrained men their training would be found to be of little value, for they have no permanent organization, no permanent Officers whom they know and to whom they are accustomed, no uniform system of instruction has been given them, and the weapons with which they have been in the habit of going through their annual

¹ The lecturer is in error in stating that the Second Class Naval Reserve men get 6*l.* bounty, and are kept for six weeks. In reality, they receive an annual retainer of 2*l.* 10*s.*, and are required to drill for four weeks; their total remuneration for the year, including retainer, drill pay, clothing, and lodging allowance, amounting to about 7*l.* 12*s.*

drill are obsolete, and no longer find a place on war-ships." This statement has to be faced, and I need not say it is a very difficult subject. Nothing is more difficult than to know how to deal with these men at their drills so as to bring them up to modern requirements. Everybody who has anything to do with these men knows that much of their life is given up to occupations which in time of war will prove absolutely useless for the object for which we require them. We must look back to thirty years ago when this force was established. The chief consideration at that time was that the First and Second Class Reserve men should be sailors, men qualified to go to sea, to go on board ship and take part in what was going on, and at that time they were fitted for their work. If those men had then been told to go on board the "Victory," and fight the Battle of Trafalgar, they would have done their duty thoroughly, they would have fought that battle as they did before, and they would have won it again. But if you tell these men to go on board our latest ironclad, the "Victoria," and fight the French ironclad battle-ship "Redoutable," I think they would feel themselves placed under conditions very strange and new; they would not understand the heavy guns, they would not know anything of the quick-firing guns, they would know nothing practically of what was around them, and they would be very much handicapped when they came to fight. That is the case. What can we do? I venture to give the opinion, but it is only an opinion, that some plan will have sooner or later to be adopted, by which a very much superior system of supervision and inspection as regards the gunnery drills and of cohesion in the general training of the men will have to be brought about. An Officer will have to be appointed who will be personally responsible for the drills, and for the efficiency of these men. He must be an Officer who thoroughly understands the special work that he has to do; he must know how to bring these merchant seamen and fishermen together as a disciplined force, he must understand the character and capacity of the men, and he ought also, of course, to understand what kind of training these men require. I venture to think that this Officer must be an Officer of high rank. He will have to deal very much with the Registrar-General of Seamen with regard to the First Class Reserve, and with the Board of Trade with regard to the Second Class Reserve, and, of course, with headquarters with regard to whatever plans it is wished to carry out. I think, if that Officer is properly supported in his duties, that within a certain number of years, perhaps five—for it would take five years to bring these men into practically efficient training—we should be able to say that we have a body of men absolutely fit to take their place on board of our ships, and to fill up the waste of the seamen of the Navy in time of war. At present, there is a doubt whether they could do that, but much can be done, and I am convinced when that is done, we shall feel very much more safe as regards our permanent position as a great Naval Power. We shall be of greater strength, and we shall also feel that as war goes on we are secure when sending drafts of men from this country to the ships, especially to the cruisers, that they will really be fit for the work they are called upon to do.

Mr. REGINALD OLDKNOW, Fleet Engineer, R.N. (retired): I only think of saying a few words, because it seems to me that the lessons of the Naval Manœuvres, to which I shall strictly confine myself, have not yet been touched upon, excepting in a very perfunctory manner, from an engineering point of view. One of the very first lessons, in fact the first and most important lesson to be derived is the fact, and the warning too, that our cruisers were never able to approach within three knots of their estimated speed. That is due to various causes—to that which has already been dealt with by Admiral Mayne, that they are too short for sea-work, that any sea-way inevitably checks their speed, so that their chasing power is wasted in churning water. It is due still more to the fact that they do not really have the nominal power put into them. You might just as well chuck the money into the Thames which is expended in the horse power necessary to produce the speed on the measured mile of 19 knots, when all you can get in actual service is 15 knots, because that is what it comes to. The "Warspite" we hear a good deal about—she is supposed to have done very well, seeing that she chased for fourteen hours with an average speed of exactly 15 knots. That is nothing to brag about. But worse than that, we learn only this morning that she left Chatham for the Manœuvres 30 per cent. short of her proper

complement of stokers, and that those were supplied by needy lads, second class men who are no use; so that when she arrived at Chatham after the short campaigning, her condition was simply terrible—the pistons were grown together, the slide gear could not be moved by hand, and she was altogether to pieces, because she only had a small proportion of men actually acquainted with the working of the engines. So much for the "Warspite." Another thing made manifest was that something will have to be done to prevent the emission of smoke, as no naval action would be possible under certain circumstances on account of the smoke, although it is stated in the official "Narrative" that the very best Welsh coal was used. Not only could no action have been fought on account of the smoke, but also no ship could possibly have been sent upon any secret mission, if at a distance of 15 miles she was visible to anyone wanting to see her. As to forced draught, I think we may take it for granted that invention of the Evil One, as Admiral Mayne called it, is doomed, excepting for torpedo-boats. Nine-tenths of the breakdowns that occurred, owing to the giving out of tubes, and the destruction of fire bars, were due to an improper and excessive use of that forced draught, which I hope to learn one of these days has been entirely abolished, and done away with altogether. But the main reason why the cruisers are so utterly ineffective is the merciless cutting down of weights by the Constructor's Department at the Admiralty. If room is wanted, cut it out of the machinery. For increased coal endurance, even, engine room is sacrificed to bunker room, never mind that as long as you squeeze your machinery into a next to impossible space. The system of cutting down weights has become so terrible that contractors are literally frightened at the very smallest proposal to add the most necessary thing—a little bit of piping, for instance—because they are afraid it would add to the total weight. The manager of one of our very highest marine engineering firms told me the other day he was overwhelmed with joy because the engineer in a ship of the "Rattlesnake" type agreed to do away with a spare spanner, weighing 7 lbs.¹

Admiral COLOMB: I have to begin by disagreeing a little with my friend Admiral Boys, as to retired Officers speaking; although they are old and feeble, their tongues are a little freer to speak, and I think if they endeavour to collect the real opinions of the active Officers and put them forward in a discussion of this kind they do their duty, and a certain amount of good. The Admiralty has been touched upon in the paper, although the passage relating to it was not read; but it has been discussed, and I think one might say in a general way that the work, good or bad, of the Admiralty is not absolute but relative, and I want to know whether there is any department in the English Government which, take it all in all, does its work better than the Admiralty? If I might say so without offence to the gallant lecturer, I would remark that he has brought together in a general way the pious opinions of the Navy, with the object of getting out any further pious opinions that may lurk in the breasts of the hearers of this paper. Well, we have our pious opinions about the Admiralty, all of us, and we think, I believe without a dissentient voice, that it was a pity that the Orders in Council of 1869 were ever put forward. We think that it is a pity that the statesman whom we all admit must be at the head of the Admiralty should not be obliged to hear all that his councillors have to say. I do not think any of us ask for any more, but I do not think that we ask for very much less. I think that a civilian statesman at the head of a highly technical service like our own is in a very bad position if he is able to hear the opinions of some of his council and not of all. Reference has been made to the competition for entrance into the Navy, which seems to come next on the list. I do not think it matters whether you have the present system or whether you throw it open to public competition, but I do think the check the First Lord of the Admiralty has with regard to people who, from their outside standing and so on, would not be desirable in the Navy, should be maintained. I have every

¹ Although many of the details discussed and lessons deduced are of very great gravity and importance, they are insignificant beside the one grand lesson of all,—that our Navy is not strong enough, nor nearly strong enough, for the work it would be called upon to do in time of war.

reason to believe that there is no difficulty on the part of any parent getting a nomination for a naval cadetship for his son, if suitable, and I do not think he would be any better off if it were thrown open to public competition. We next come to the question which the lecturer dwelt upon, of everybody in the ship being a combatant. That is a pious opinion that I have never heard controverted by any naval Officer that I have met. I believe we all wish for that ideal to come when every soul on board Her Majesty's ships should be a combatant person, and when we should get rid of different classes, and have only one class of combatant persons for all purposes. Whether we are ever going to get it I do not quite know; but I believe that, speaking still of our pious opinion, we can agree with the lecturer that a great deal may be done if we keep that principle continually in mind. With regard to the stokers, I had the satisfaction on one occasion of receiving from my Commander-in-Chief a sort of reprimand from the Admiralty for a certain expenditure for ammunition that I had authorized in order to make the stokers marksmen. Well, I was very glad to take the reprimand, because the stokers fairly understood how to handle the rifle, and I was quite ready to take another reprimand of the same kind. Speaking of the Naval Reserve, I cannot help regretting that the lecturer has put forward that anecdote of the Naval Reserve on the north-east coast. But I think that really he did it with a certain purpose, and that was to bring up on the other side what was to be said. We have had from the other side over and over again, that after all, the Naval Reserve are Englishmen, and feel like all Englishmen, and when the time comes they will go to the front. As to the education of naval Officers, I have two sons in the Navy. The lecturer has stated in one part of his lecture that one thing which the Naval Manœuvres brought forward was the excellence of the personnel, and he dwelt particularly on the excellence of the junior Officers. Well, now you see we must put two things together. The pious opinion is that the present system is not a good one, that is to say, in our zeal for reform every naval Officer would like to see things better than they are: but at the same time we must bear in mind that the young Officers of the present day are infinitely better than they were in most of our younger days. We who can look back to times long past know very well what the change has been. And although I think that the movement of the Admiralty in increasing the age of entry for cadets was a good one, I think any movement you make in this direction must be exceedingly tentative and careful, that you had better not interfere too much with what is working, as far as the practice goes, as far as the eating of the pudding goes, exceedingly well. We now come to cruisers and chasing. We all are agreed, every one of us, that if you want speed you must have length, and it was pointed out by Admiral Seymour, and was referred to in the reading of the paper, that length did not so much interfere with manœuvring power as people believed. Length is but one out of about a dozen elements which make manœuvring power; and some of your largest ships are your best manœuvrers; the "Minotaur" and the "Northumberland," two of your longest ships, are also two of the very best manœuvrers you have in the Navy. Mention was made of the "Anson," as being a bad manœvrer. I cannot speak for the "Anson," but I can speak distinctly for the "Edinburgh," which had the same lines, or nearly so, as the "Anson." There is no shadow of question that the "Edinburgh," which is 75 feet shorter than the "Minotaur," takes a full ship's length more space in manœuvring than the "Minotaur" does. As to getting speed and chasing, of course if you have the speed your chase will be shorter, but I do not quite think the lesson of the manœuvres in chasing merchant ships is entirely to the point, because it is no mere chasing that you have to deal with. If you are bringing the fire of two or three 6-pounder quick-firing guns to bear on the chase, and bursting shells continually about her ears, I think most merchant captains would find that it was their duty to expose life for the mere guarantee of property, and therefore I think in actual war for that reason the chases would be somewhat shorter than they proved to be in the Naval Manœuvres, when there were no shells flying about. I am glad to see the lecturer dwelt upon a question of importance, namely, the signals of ships, and signals round the coast. It was a great element in the preservation of our commerce in the old wars, and although the signals of those days were exceedingly elementary, they did their work. In these days where the signals have improved

to a very great extent, I conceive that you cannot have anything more preservative of your commerce, and of your shores generally, than a first rate system of signal stations connected by the telegraph, with headquarters round the coast. But you must recollect that we in the Navy are only now beginning to think that the question of signals is of importance. This discussion brings back to my mind the days when I thought that they were very important, some twenty-five years ago, and when I was looked upon for quite seven years, by the Admiralty of those days, as a public enemy, because I did think so, and because I pressed the question forward. In the Army all these questions are dealt with in a totally different way, that has been mentioned. The Army do take methods when any important matter comes up; they do put it in practice; they have a larger staff, with great expense about it to carry it through and put it right. For instance, we had the range-finding the other day; the position-finding for our fortifications; we had the arranger of that system paid 25,000*l.* and 1,000*l.* a year for ten years, and we have since had appointed an Inspector of range-finding, and no doubt he will have a staff, and you will have very expensive arrangements for that. Now, I think the Army in their way go as much to the extreme as we fall short of it. I think there is a medium, but in the Navy we do not reach it; we do not go so far as we ought to go, although I should be very sorry to see us go as far as the Army does in these matters. As to the question of signals, I think it is time that some Officer should be appointed specially to look after that service. I think it never will come right, and I do not think you will get the best that can be done, until that measure is taken. Masts and sails, we were told by the gallant Chairman, were gone, and I can only say I am exceedingly glad. But I have observed in the discussion one important mistake which has been made by the supporters of masts and sails, they have always gone upon the theory that masts and sails are an economy in the way of coal. Now, I had the honour of reading a lecture here on the question, and greatly to my astonishment, on going very carefully into the figures, I found that so far from masts and sails ever being an economy when put in a man-of-war, they were always a dead loss; they always cost the coal to carry them about. [Admiral Sir HOUSTON STEWART: Oh! oh!] My gallant friend says Oh! oh! but that is so, and you cannot get over it.

Admiral Sir HOUSTON STEWART: I remember you sent that paper to me at the Admiralty, but your brother Officer, in a sister ship, entirely differed from you. The conclusions of the Captain of the "Iron Duke" were totally different from yours. They were both laid before the Admiralty.

Admiral COLOMB: I have yet to learn whether the Officer who differed from me had done what I did, and got at the figures. I never heard of anyone but myself doing it. With regard to retirement and promotion, which has also been spoken of, I think the point and the difficulty in that question is that you have been applying your retirement both in the Army and the Navy in the wrong place. You want to bring your retirement to bear where the shoe pinches. Now, the shoe pinches in the Navy amongst the senior Lieutenants, and in the Army amongst the senior Captains, because that is the place where the large numbers have to be squeezed into small numbers, and I quite think that if you would apply a large liberal retirement there, where the shoe pinches, you would find it was not nearly so necessary to apply it higher up. You would save a great deal of money, and give a great deal of contentment by doing it. With regard to gunnery instruction, although my excellent friend Admiral Boys differs from the lecturer, I understand the opinion, which is now almost universal in the Navy, is that the time has quite come when every blue-jacket ought to be a gunner, and that the higher class of instruction should be kept apart for special men, captains of guns, instructors, and so on. A question has been raised as to the time of the men being wasted over instruction in harbour. Well, now, I do not say that, because I understand the modern policy to be the preparation of numbers of men corresponding to the ships that you have in reserve, to provide men ready to man the ships that are ready for them, and it seems to me from that fact that we must accept the position of having large numbers of men in harbour. I think every man ought to be a seaman-gunner, that is to say, I think that every man should pass through the "Excellent." That is what it comes to, the real people who stay in harbour, but have no busi-

ness there, if I may say so, are, in my experience, the second class men, the bad hats; those are the people that are so difficult to send to sea.

The CHAIRMAN (Admiral Sir Vesey Hamilton): Before I call upon the lecturer to reply, as I have a few remarks to make rather against his lecture, I will make them now instead of afterwards, in order that he may have the opportunity of replying to them. When I introduced him on Friday last I observed that the rule of this Institution was that the Chairman was not responsible for the lecture in any way, and in this case I certainly was not, for I had not read it till I came here. Had I done so beforehand, my opinion is I should have advised the lecturer to have condensed it into two columns, by saying what he approves of. He has given us twelve columns of what he disapproves of; in fact, I rather look upon it as a sweeping condemnation of everything connected with the Navy except the personnel. The administration is wrong, the education in "Britannia" is wrong, and the training of Officers after leaving is wrong, the ships, the boilers, everything is wrong; in fact, the only lesson to be derived from the Manœuvres, as far as I can make out, is that everything is wrong. Under these circumstances it is my opinion that the gallant lecturer ought to get up in his place in the House of Commons and propose to abolish the Navy bag and baggage. The lecturer is strongly of opinion, in which he is supported by Admiral Colomb, that our Lieutenants should be Admirable Crichtons, able to do everybody's duty. It seems to be supposed that our Lieutenants commanding torpedo-boats and manœuvring them at 20 miles an hour, after having imbibed an enormous amount of oxygen in that way, should then be put down into the Paymaster's office in order to get rid of it. I heard it remarked, after the first day's discussion, "Would the gallant lecturer like to have his leg taken off by the Lieutenant-Surgeon or Surgeon-Lieutenant?" I do not believe in Utopias or in Admirable Crichtons. I am rather of opinion that most of us should stick to his last. The lecturer has summoned to his aid, with regard to naval education, the opinions of a German. I think the opinions of that German Officer are of as much value, with regard to what he knows nothing about, namely, about our naval wants and duties, and details of our system, as my opinions would be if I were to attempt to criticize the details of the German Army, of which I know nothing. Therefore I attach not the slightest value to any foreign opinion on this point. The proof of the pudding is in the eating. Except France, whose Navy, like our own, is a very old Navy, every nation comes to us for information on naval matters, and some ask for our Officers to train them or to let their Officers join us. The gallant lecturer does not say anything about the way in which the Manœuvres were performed, whether the seamanship was good, whether the plan of campaign was good—he does not give us any credit on that point, or any opinion. Another point I wish to remark upon is where, quoting Lieutenant Colwell, he points out that the Germans have transferred their coast defences from the Army to the Navy, and you will see by Table III that though we have almost as many ironclads as any three nations, we are far inferior in our proportion of coast-defence ships. The lecturer here, I do not think has gone deep enough into this question. The reason is obvious. Both France and Germany, in the event of war, want every available soldier on their frontier or beyond it, and their navies are of secondary importance. It is on land that the fate of Continental nations will be decided, while with us, our decisive battles must be fought on the sea. Our frontier, as Nelson pointed out, is the enemy's coast, and it is there our Navy should be; and as the great Duke of Wellington said, the influence of the British Empire would be very limited if the naval force was required to guard and defend the coast. Coast-defence, in reality, is the resource of a weaker naval Power to try and balance its inferiority by immovable forts. I will not detain you longer at this late hour, except to point out two errors in the lecture, first with regard to the 9·2 gun being sufficient for almost every purpose of penetration. The lecturer says that it will penetrate 27 inches. As a matter of fact, it will penetrate 14 inches of backed armour under the most favourable circumstances, i.e., at right angles. Another point on which he has spoken has been the insufficiency of stokers during the Manœuvres. Now, the total complement of the Fleet for the Manœuvres, of engine-room Officers, was 218, and they were none short; the total complement of artificers was 687, and they were five short; the total complement of stokers of all ratings was 3,927, and they

were fourteen short; in all, out of 4,832, there were 19 short; and at that time there were in the various home ports, 119 engineer Officers, 101 artificers, and 595 stokers, so that it was the fault of the Captains who commanded these ships if they were short, and on my asking the Captain of the Steam Reserve at Portsmouth if the ships were fully manned with stokers, he answered, "I have supplied every requisition, and I have stokers in reserve, and there has nobody come to me." A little fact like that is much more conclusive than any amount of theory.

Admiral MAYNE, in reply: I may say, in the first place, in thanking you for coming, and my brother Officers for criticizing this paper in the way that they have, I am extremely pleased and gratified at the reception that has been given to the paper, because to a certain extent it has done exactly what I wanted. I said in the paper that I wanted the opinions of those who were much better able to express them than I was myself. I only regret that the Chairman has not been able to give us his views at greater length, and that I have no time for detailed replies to the various criticisms made. As to the remarks made by Sir George Tryon and by the Chairman, with reference to the Manœuvres, I have given in a table the ships that were out, and the general results, but I suppose you did not expect me to come here and criticize the strategy of Admiral Tryon, Admiral Baird, and other Admirals, because that is the very last thing I had in my head to do. With reference to the Chairman's last remarks, as to my having stated that the penetrating power of the gun was three times its calibre, it is a misprint for "twice," and I should like to say here that the paper in your hands is an uncorrected proof, in which, no doubt, there are many errors. But, with reference to his figures, with great deference to him, I prefer my own, and mine are that the penetrating power of the 9.2 gun is 17.5 inches, wrought iron, at 1,000 yards. As to the shortness of stokers, I will only say that we have heard it, and seen it in all the newspapers complained of constantly that the stokers were short, and the stokers were inefficient. I will mention one fact—I do not know whether the Chairman knows it—that there were stokers afloat during these Manœuvres who were in receipt, and are in receipt of Greenwich Hospital pensions for being unable to perform their duties properly, who have been deserving, and are still considered as deserving, of these pensions. I wonder, if the stokers are so fit and so numerous, how it is that we are now entering them in such very large numbers. Perhaps that subject rather trenches upon the question of administration. I thought that it was an acknowledged fact that the Lieutenants and the stokers were the parts of the ships, so to speak, that were shown to be deficient in numbers, though not in ability. I have to thank everybody for the remarks which they have made, and the kind way in which they have made them, with one exception, which I think must have been through an error on the part of Mr. Caborne. I never meant in the least to attack the whole of the Reserves, or, as he made it appear, the courage of Englishmen generally, and when my friend Captain Bridge the other day spoke of the "Trent" affair, which was certainly rather ancient history, I felt very much inclined to remind him that there were no Second Class Reserves in those days; the Order in Council had only just come out, and the Second Class Reserve had not been formed. But as to one important fact, the truth of which he has called in question, I repeat that my fact is a fact, and that I asked the Officer, to whom I referred only the other day, to repeat to me the exact statement that he had made, in order that I might make no mistake.

Admiral Sir GEORGE WILLES: Was he a naval Officer?

Admiral MAYNE: The Officer in command of the District; there was no question about it. I will not give the Officer's name, but I must say I have said nothing so severe as what Mr. Caborne said only last month: "I am not very sanguine as to the success of such a plan, for I am aware that the patriotism of many men does not extend beyond what they at the moment consider to be the best interests of their individual pockets." That was a remark made in this room.

Mr. CABORNE: That was not referring to the Naval Reserve. It was taken in conjunction with shipowners employing foreign seamen in preference to their own countrymen.

Admiral MAYNE: "With reference to the presence in our mercantile marine of a large number of foreigners." I do not wish to enter too closely into it, but the men of whom I speak are supposed to be in many cases foreigners, and they are trading from our northern ports to German and other foreign ports, but it is a matter of opinion, and I adhere to mine, confirmed by Lieutenant Colwell, U.S.N., that they would not be all forthcoming when they are wanted. As to the paper generally and its title, as the Chairman has said, it is too comprehensive. The paper grew under my hands, and my only excuse is I have never read a paper here before. It is the first time I have ever appeared in public before my brother Officers, and I dictated it as quickly as I could, one thing after the other. As I say, it grew to such dimensions that I felt very much inclined to throw the whole thing into the fire; in fact it was only at the urgent request of several friends that I have appeared before you. If I have touched upon any subject that I ought not to have done here, I greatly regret it, and as to cutting out the part with reference to the administration, I am entirely in the hands of the Council. But I should like to say on that point I do not in the least agree with the remarks that the Chairman and one or two other speakers made with regard to commenting on the administration, because comment you must have, and you will have. The House of Commons, goodness knows, has enough of it, and friendly comment—comment with a view of eliciting opinion upon a system, not of condemning those who are administering it, because I should not have asked the First Sea Lord to come here to take the chair if I had meant to reflect upon his ability or administrative power, or that of his colleagues. It has nothing to do with the administrative power of the individual. The simple question, and one upon which we may gain great benefit by the discussion of naval Officers, is whether our systems, not our people, are the best. I wish I had time to make a proper reply to the questions contained in the most flattering speech of my friend Sir Houston Stewart, but I must say I think the discipline of the Navy is better now than it has been ever since I was in it. When I first went to sea under a certain celebrated man named Jack Shepherd, for three years, the discipline was of a very different character, and to say that it was any better or one tithe as good as it is now would be to make a perversion of fact. With regard to the education, I think there is a good deal of misapprehension as to the bearing of my remarks. I do not say for a moment that the "Britannia" is not a good school, in fact my complaint, as one gentleman put it, is that it is too good. All I say is, as a matter of fact, I believe the country will not go on paying for it. I say this, because in the House of Commons we hear about these things a good deal. I hear of these various things discussed, and I feel pretty certain that it is thought there is no justification—I have already been asked whether I see any justification—why one of my sons at Eton should pay so much, and the other on the "Britannia" should pay a fourth of that sum for an equally good education. Then I go further, and I say that I want to go back to the old plan which obtained when we were youngsters, and when we came in from every sort of school with every variety of ideas; and I would like people to pass what I call a competitive examination, by which I merely mean a sort of intelligence examination; take the boys straight to sea at sixteen, and then bring them back, and put them into college when they are of the same age as their fellows go to college, after two or three years at sea. By sixteen they would have got the groundwork of their education, and I take a view which may be erroneous, but which I hold very strongly, that few of us learn much worth remembering during life that we did not learn after we were grown up. I am a great believer in adult education. Ground a boy, teach him to learn, but it matters little what you put him at; the thing is when he grows up to nineteen or twenty, then he may begin, when he realizes the value of knowledge, to learn something which it is worth carrying into and through life. As to Sir Vesey Hamilton's remarks about the Admiralty, the general administration, and the whole paper being fault-finding, I confess that that was partly my intention, partly and principally, because I do not agree with nine-tenths of the present system in most of our affairs, and partly also because I was in hopes that some Officer, for instance, with regard to education, Admiral Bowden-Smith, who has commanded the "Britannia," and other who have special knowledge, would support or oppose

those parts in which they take a special interest. As to the Admiralty, I should be very sorry to abolish it without putting something else in its place. What I proposed to do is exactly what Sir George Willes urged, viz., to give actual responsibility for the Fleet to the naval Officers, and there again partly for a House of Commons reason. The House of Commons, I know—many Radicals have told me so—is now under the impression that when the First Lord comes and makes a certain statement his views are in consonance with those of his naval advisers, and they will not continue to vote money unless they do believe that the naval Officers approve of the way in which it is being spent, and of the amounts which are being asked for. I have not time, I am afraid, to go through the various questions as I should have liked to have done if you had not discussed them so kindly and so fully, but I cannot sit down without saying that I have been much pleased to find that there are so many of my brother Officers who do agree with me on one point or other, because I did not expect to find so much support to views which some may consider advanced. I find that Sir Houston Stewart, for instance, with all his experience, agrees with much that I have said. I find that while Captain Cleveland condemns open competition, Admiral Bowden-Smith is in favour of it, and even Sir George Willes admits that it must come.

Admiral Sir GEORGE WILLES: Unfortunately!

Admiral MAYNE: That may be: but what have I said? When a thing must come, the great thing is to smooth the way for it. What we are trying to do every day is to say such and such a thing must come; if we hand it over to the others, then good bye to all checks. If we face it, and say that it must come, then there is a possibility of guiding it and keeping it within moderate bounds. My view is this: I have heard that the artillery and the engineers consider themselves no worse for competitive examination; they have had it, and if so why should not we be in the same position? I think it would do us no harm at all. As to various types of ships, there are differences of opinion. There is one point on which Sir Houston Stewart touched that I may say a word about, that is the armour belt, and I should like to say upon it—what I have written about it before—my feeling is not that I want to do away with anybody's particular hobby if they like to have 6 feet or 6 inches of armour round one particular place, but that if you are to have the ships able to maintain such a high rate of speed at sea continuously, as Captain Jackson spoke of, then you must have them long, and if you have them so long as to do that, then you cannot carry the belt. Already you are obliged to say, "Shall we have it two-thirds, or shall we put it on the middle?" and one Officer says, "I do not mind how low it is; I should like it all below water-line;" and the next says, "What is the good of that? There is none above the water-line." So that at the present moment you are seeking to put weights into ships which they cannot carry, and, as experience has shown, water-line hits are comparatively very few. My view is to have a curved steel deck springing from well below the water-line, covering the engines, and then as much protection as you can carry round the guns, is the best thing. I thank you for the attention you have given me.

The CHAIRMAN: I am sure you will allow me to return your thanks to Admiral Mayne for his comprehensive and able lecture.