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Navigation and Pilotage of Her Majesty's Ships

Lord Brassey K.C.B.

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Friday, March 6, 1891.

ADMIRAL SIR W. HOUSTON STEWART, G.C.B., Member of
Council, in the Chair.

NAVIGATION AND PILOTAGE OF HER MAJESTY'S
SHIPS.¹

By LORD BRASSEY, K.C.B.

The CHAIRMAN: Ladies and gentlemen, it is unnecessary for me to go through the form of introducing Lord Brassey to this Institution, but it enhances our interest in a subject of such great importance as the art of navigation, to know that we shall hear it spoken of by one who has had such long and varied experience in the successful application of it in practice, as Lord Brassey has. Under the good providence of that Almighty Power, which has compassed the waters with bounds until day and night come to an end, Lord Brassey has navigated his famous cruiser, the "Sunbeam," round the world in every variety of weather, wind, and sea. From my own personal knowledge and observation, I believe there is not a better practical fore and aft sailor, a more skilful navigator and pilot, on the roll of this maritime country, than the noble lord who is now kind enough to address us on this subject.

LORD BRASSEY: I have on several previous occasions been invited by the Council of the Royal United Service Institution to contribute to the discussions which take place within its walls. Hitherto subjects have been assigned to me with which it has been comparatively easy to deal; to-day I feel some difficulty in addressing you. Indeed, as an amateur, I might reasonably shrink from undertaking to submit suggestions on the subject of navigation and pilotage to the consideration of the members of this Institution, if I were not most deeply impressed with the conviction that it is a duty on the part of those whom the Council consider capable of rendering service, to do all that may lie in their power to promote the success of these conferences and discussions. The Royal United Service Institution fills an important place in connection with our naval and military administrations. Officers serving abroad or actively engaged at home, are as a rule completely occupied in the discharge of their daily duties; but to those untrammelled by the responsibilities of office, and having the necessary time at their disposal, this Institution affords valuable opportunities for the full and free discussion of professional subjects. It is impossible to have served, as I have served, at the Admiralty, and not to be im-

¹ The publication of this lecture has been unavoidably delayed.—ED.

pressed with the sense of responsibility which has led me, in response to the invitation of your Council, to attempt a task presenting no ordinary difficulties. I may add that this is the time of the year when the compiler of the "Naval Annual" is busily at work, a fact which has created a further obstacle to my offering anything to your consideration to-day. With these remarks I will proceed to read the paper.

I AM here to-day at the request of the Council of the Royal United Service Institution to read a paper on "The Navigation and Pilotage of Her Majesty's Ships." The subject may have been suggested by the loss of the "Serpent," but that melancholy incident has been adequately dealt with in the finding of the Court-Martial.

It is hardly necessary to say that I have not been invited to lecture as an amateur to the officers of the Royal Navy on the science and practice of navigation. I shall deal with the subject strictly from an administrative point of view. It will be my task to consider whether the system of training in navigation and pilotage, as pursued in the Navy, is in any respect faulty, and whether there has been unwise parsimony in providing adequately for practical instruction. If it can be shown that something is left to be desired, it will be my duty to propose a remedy.

I may open by saying that the testimony is unanimous, both in the Service and out of it, and it is not less strong abroad than at home, that, with rare exceptions, the navigation of Her Majesty's ships is performed with distinguished ability and success. I need not go further back than the manœuvres of recent years for proof of the high standard of efficiency attained. It would be invidious to single out particular instances, but I think I shall give no offence by reminding this audience of the felicitous combination of daring and caution displayed in the conduct of the fleet under the command of Sir Geoffrey Hornby during the instructional cruise of 1885. The long and deep armoured ships of which that fleet consisted were navigated without accident through a prolonged series of difficult operations on the west coasts of Ireland and Scotland. Such feats as the departure of the fleet from their anchorage in Blacksod Bay in a dark and boisterous night, and the passage through the narrow and tortuous Sound of Islay and the western shores of Cantyre at night, deserve to be remembered. Similar performances have been often repeated, even in the peace annals of the British Navy. The escape of the "Calliope" from destruction is a recent illustration of seamanlike skill. The younger officers of the Navy may justly take credit for the able manner in which the torpedo boats commissioned for the manœuvres have been handled and navigated.

While giving this meed of well-merited praise, it is my duty to call to mind certain exceptional instances in which disasters have occurred, which can only be accounted for upon the assumption that the officers responsible were without the practical knowledge and experience which it is the duty of the Administration to secure in every individual appointed to fill a position of responsibility for the navigation of Her Majesty's ships. The loss of a gunboat on Tory Island—a small rock marked by a powerful light, and surrounded on all sides

by deep water, was a most deplorable, because easily to be avoided disaster. I may mention another case, that of the stranding of the "Starling" in the Red Sea, on the Dædalus reef. Fortunately this error of judgment was not attended with loss of life. I am not anxious to lengthen the catalogue of disasters, or I might refer to the stranding of an Indian troopship on the Isthmus of Tarifa, the loss of the "Lily" in the Straits of Belleisle, and to other instances of error, presumably due to inexperience.

And now let us ask ourselves whether incidents such as I have referred to are attributable in any sense to defects in our method of training. I venture to assert that they may be traced to a faulty system. We have not secured, as it was our duty to secure, for every officer in the Navy, sufficient practice at sea in navigation and pilotage. Until within a recent period no midshipmen were appointed to mastless ships. This restriction is now no longer observed, and the change is, from many points of view, to be regretted. Partly owing to the substitution of mastless for masted ships, and partly owing to the considerable periods spent on shore in the Gunnery and Training Schools, and the College at Greenwich, the actual service at sea in the early stages of a young officer's career has been unduly shortened. On the other hand, the standard of attainments in mathematics is being raised; our younger officers are becoming more scientific in gunnery and better acquainted with Physics, Chemistry, and Electricity, while their opportunities of gaining experience in an essential branch of the profession, in which proficiency depends upon practice, are being lost. The advantage to the Service of having a certain number of officers of the highest scientific attainments cannot be overrated; but in providing the means of higher education for the few we must take care that we do not turn the attention of the Navy unduly to scientific as distinguished from practical qualifications.

The latest Committee on Naval Education assumed in their Report that young naval officers on joining the Royal Naval College, at 19 or 20, would have attained a fairly sound practical knowledge of navigation. There is reason to apprehend that the cases are numerous in which such an assumption could not be sustained. It is generally admitted that the Flying Squadron offers all that could be desired for the training of young officers on first going to sea. Unfortunately only a certain proportion of our midshipmen have served in this excellent school. It should be arranged that every cadet should begin his service in ships of the Flying Squadron. A midshipman who has served throughout the early stages of his career in ships not suitable for training purposes, will not find the means under existing arrangements of making good his deficiency at a later stage. He spends six months in the Naval College at Greenwich; his college course is followed by a month on the "Vernon," and three months in a gunnery ship. It concludes with a two months' course of instruction in pilotage. On passing an examination in pilotage the sub-lieutenant is confirmed in his rank. It is evident that a scheme of instruction such as that which has been sketched out is more favourable to scientific training than to the practice of navigation.

The suggestions of the Committee on Education would provide no effective remedy. Limiting their proposals to the officers borne for navigating duties, they recommend a six months' course at the Royal Naval College with only such practical instruction and exercise as can be obtained in a pinnace attached to that establishment. I would urge that a six months' course of instruction in pilotage is indispensable for all officers who may be placed at any period in their career in command of ships. The instruction should not be merely theoretical, but should embrace a thorough practical training at sea. For this purpose a small flotilla of suitable vessels, such as cutters, withdrawn from the Coastguard service, and gun vessels, should be maintained. In these vessels officers should be constantly at sea, and especially at night, in waters crowded with shipping and difficult of navigation. The Downs and the channels extending from the North Foreland to the Nore, and the North Channel to the Thames as far as Yarmouth Roads, should be frequently visited. The instructional cruises should extend in the summer months to the West Coast of Ireland and the Baltic; in the winter to the Mediterranean. At Malta a yacht, or other suitable vessel of moderate size, should be provided, and should be constantly at sea during the winter, visiting the ports of Sicily and the Ionian Islands. Harbours should be frequently entered at night.

We have been behind other nations in the completeness of our system of instruction for young officers in the important branch with which we have to deal to-day. In the American Navy six years are spent by young officers at the Naval Academy, and the cadets cruise for three months every year in sea-going vessels. In the Austrian Navy officers spend four years at the Academy, and they are at sea two or three months every year. In the Danish Navy the school course extends over four years, eight months of every year being spent on shore, three months in a corvette, and a month in a gunboat. In the Dutch Navy four years are spent at school, and the midshipmen cruise in summer in a corvette. In the French Navy two years are spent on board the "Borda," to which vessel two sea-going corvettes are attached for practice in cruising during two or three months in the summer. On leaving the "Borda," a year is spent in the sea-going training ship "Iphigénie." In the German Navy the course of instruction extends over a period of five years. The pupils in the Naval School at Kiel cruise at sea during the summer months in the Baltic and in the English Channel. On leaving school they spend two years in a training ship at sea. In the Russian Navy the school course is six years. Every summer the whole training establishment is removed for four months to a Training Squadron, consisting of three or four corvettes. In the Swedish Navy the course is for six years, eight months of every year being spent on shore and four at sea.

The impossibility of making a good navigator and pilot by merely theoretical instruction is well illustrated in the passage which I shall read from a paper prepared by Captain Kiddle on the education of Naval Executive Officers. "The education of a Naval Officer," he

says, "may be roughly divided into two parts; seamanship, and, to use a common but expressive phrase, learning. Good seamanship means something more than handling a beautiful ship in fine weather; it means that those who are proficient in its mysteries never allow the slightest signs to pass unheeded; it means that whether an officer is watching the reefing of a top-sail in a gale, or setting a royal in the trade winds, or running his ship on a dead lee shore in thick weather, or rounding-to to pick up a shipmate who has fallen from aloft, a knowledge of its principles enables him to do exactly the right thing at the right time. It means that each cloud, as it rises above the horizon, should be carefully watched and its probable effects as carefully weighed; it means that the slightest discoloration of the water, the presence of a patch of seaweed, or the appearance of a land bird, should at once command attention, to know why they are there, and what they may possibly indicate, and this with a vigilance which is untiring and sleepless. . . . You can no more produce a Nelson by sending a boy to the 'Britannia,' than a Vandyke by articling him to an artist; the feeling is innate. It was seamanship that enabled Nelson at the Nile to discern with unfailing correctness that where there was room for an enemy's ship to swing there was room for one of his to anchor; it was seamanship that enabled him at Trafalgar to perceive that by breaking and doubling on the French and Spanish lines he could attack them in detail; and it was seamanship that enabled Hawke, on the ironbound coast of Brittany, to say to the master who called his attention to the dangers of a lee shore, 'You have done your duty, leave the rest to me.' At present this branch of the profession is apparently subordinated to the torpedo and long-ranged gun. The modern navigating-lieutenant is drifting into the position of the officer he displaced; and if reports are true the majority wish to avoid the duty."

The last observation of Captain Kiddle receives support from the Report of the Committee on Education. "Before proceeding," they say, "to indicate the lines on which a special course might be arranged, we would direct attention to the widespread feeling of disappointment which prevails among navigating officers. Of all avenues to promotion, the performance of navigating duties has come to be regarded as the longest and most tedious. While the lieutenant who takes up the gunnery, torpedo, or first-lieutenant line is tolerably sure of advancement, the lieutenant for navigating duties, whatever his ability, and however expert he may be, has the mortification of finding his juniors constantly promoted over his head. Accordingly the navigating branch, though possessing some advantages, is avoided by the more enterprising members of the profession. It is obvious that this state of things, if prolonged, will lead to serious mischief. The tendency will be to drive every officer of ability from navigating duties; and yet everyone recognizes how important it is that those duties should be well performed." The remarks which I have quoted point to an error in the distribution of rewards which it is urgently necessary to rectify.

Having dealt with training in the early stages we pass on to

the practice of navigation in sea-going ships. Admiral de Horsey, in some able letters, has urged that more attention should be paid to navigation than has been customary with many officers. The Admiralty have given their endorsement to the recommendations of the gallant officer by a recent circular. Of the wisdom of Admiral de Horsey's advice it is not possible to entertain a doubt. All the responsibilities of the command of Her Majesty's ships are properly centred in the captain. It is obviously his duty to keep himself efficient, not only to superintend the work of his subordinates, but to take charge, personally, in a critical moment. The varied duties which devolve upon the captain of a ship of war do not admit of the same devotion to navigation which might be expected from a captain of the Mercantile Marine: but navigation has been too much neglected by the executive line in the Navy.

The subject of this paper brings up for consideration the change which has been made in recent years by the abolition of the navigating line. I see no reason to regret the part I took in the debates on this subject in the House of Commons. The testimony is general that the navigating duties are well performed by the lieutenants of the executive line, who volunteer for this service. The old masters, in the early stages of their career, had few opportunities of acquiring practical skill; they gained their knowledge after their promotion to the rank of master. There were social objections of a grave character to the existence of two classes on board a ship, to one of which all the rewards of the Service were open, while to the other they were denied. It was a yet greater evil, incidental to the system, that it tended to discourage lieutenants and captains from giving their attention to navigating duties. The success of warlike operations may not rarely turn on ability in navigation and pilotage. Lord Nelson in his autobiography makes special reference to the valuable experience which he had gained as a midshipman when in charge of the long-boat attached to the flag-ship at the Nore, in which he was constantly afloat in the estuary of the Thames.

We cannot revive the old conditions of service at sea. The seaman's life is no longer surrounded by the circumstances of romance and adventure which furnished a grateful theme to Lord Byron and Captain Marryat. We have to adapt the training of our officers to the service as it exists to-day. In proposing that the School of Pilotage shall be expanded from a short theoretical course at Portsmouth into a practical training of six months at sea, in vessels suitable for the purpose, and under the supervision of an adequate staff, I am proposing an addition to the training of the Navy which it should be possible to carry through at a comparatively moderate expense. I am confident that it would result in more uniform efficiency in the essential branch of navigation and pilotage.

Mr. F. W. BULLER: I should like to make one or two remarks on the most interesting paper to which we have just listened. The paper, indeed the whole subject, is so interesting to many of us, that we would wish, I feel sure, to agree, as it were, with every word of it; but I cannot help thinking that Lord Brassey has to some extent pursued an argument in the paper, which I for one should be sorry

to let pass before hearing the opinions of many Officers of great professional experience, to which we look forward with much interest. Lord Brassey says that he is only an amateur, by that he means that he is a yachtsman, and he knows that I am one of the same body. There is no reason why a yachtsman should not have as practical a knowledge of navigation as a professional Officer, and I am sure that Officers present would not object to a man, although he is an amateur, rising to express his opinions on a subject of this kind, provided that those opinions are sound. The point I wish to make is this: that from what I have heard of the paper, I should put it in this form, the lecturer has said there have been losses of Her Majesty's ships; those losses show degeneration in navigational skill.* Then he says the reason of this decrease in navigational skill is the excessive scientific element in training or education. This, therefore, is the conclusion to which he comes, that we must reduce the scientific element, and we must provide in its place additional practice. That is the point to which I wish to call attention.

LORD BRASSEY: I have no wish whatever to reduce the length of previous instruction of a scientific character; I simply wish to extend the two months of practical instruction into six months at sea.

MR. E. W. BULLER: At any rate, I have had the satisfaction of getting an explanation which has cleared my mind, and for which I am very grateful. The proposition means that additional time is to be given to the actual practice of navigation. There has been hitherto a sort of division or separation between the science and the practice of the art, which you do not find in any other modern practical science. I believe a reaction is taking place in that matter, and I observe in some of the works on navigation it is distinctly laid down that science and practice should be more closely combined than they have been previously. Certainly it has not been in previous years, and in support of what I say, I may quote one or two observations made by men who have achieved great distinction in the past. Admiral Shadwell in his writings continually mentions that the element of science in navigation has been reduced to a minimum, in consequence of which he says navigation has been made unintelligible, complicated, and obscure. He adds, "Do not teach navigation in this way; make it more scientific; let them know the reasons for what they are doing; let them know the why and the wherefore as well as the absolute rules they are to apply." I do not know whether it refers to the same Officer or not, but I see in a recent book by Harbord, a statement to the same effect, also under the name of Shadwell, pleading for more mathematics, for more science, so that an Officer shall not be obliged to go and look for a rule, but shall know enough of the scientific principles bearing on the subject to find his own rule. That, I think, is a very important point, and that all means the addition of more science to the practice of navigation. I know myself one expression used by Admiral Shadwell was "the fair science of navigation;" and he complains that it is overloaded with a lot of stuff which will only diminish the interest taken in it. It is complained that Officers go away and think more of long-range guns, and torpedo work, and electricity, and so forth. On this point I am not an amateur, for thirty years ago, when I was a cadet at Woolwich, the great change in the artillery of the country was being brought about. We had plenty of novelty then in the artillery world. Since those days I have watched the continued rush of young men into these modern sciences, just as in the Navy they are really leaving navigation, the essentials of the profession, and going away to these novel sciences. They do it, in pure commercial phrase, because it is better rewarded, because there is more chance of originality and independence of thought, and these are the things which pay. I would strongly suggest to Officers of experience, to whom his lordship's remarks were addressed, that they should also give some consideration to this view of a man who takes the scientific side. Why should not navigation be restored to its true position, and made much more a science than it is now? Why should there not be a demand made for improvements in the science? I think if that were done, the greater part of this question would be settled.

Captain WHARTON, Hydrographer to the Navy: Lord Brassey in his paper has opened up a very important, very wide, and very difficult subject, and one upon which a discussion will be of very great service; but I am a little afraid that despite Lord

Brassey's words all through his paper it will be rather thought by the public that the navigation in the Navy has deteriorated. Now, I do not think that is so; I do not say it is perfect, but at any rate I maintain that it is up to the mark. I have certain means of judging. I have been now some time at the Admiralty, and so far as one can judge from the accounts of the different disasters, small and great, that come to the Admiralty, there are very few of them, indeed, that can be put down to what you can really call inexperience. In all cases they are want of judgment, and that we shall never get rid of as long as human nature is human nature. You will find just the same want of judgment in Officers of long standing as you do with younger Officers. Dealing specially with what Lord Brassey has said as to the younger Officers, I do not think he has quite made good his point there. The young Officers do not come to grief more than the old Officers. Whether it is that feeling themselves inexperienced they are more cautious I cannot say; but I can state as a fact that young Officers who are, so to speak, pitchforked into ships, and have to assume the navigation of ships with extremely little experience, do not come to grief as a rule. That does not affect the argument that we should endeavour to improve, and there I heartily agree with Lord Brassey. The thing, however, that is pressing upon us more than anything else at the present moment is the want of Officers. To persuade those in authority to extend the period of practical training just at this moment is, I think, simply impossible, or at any rate it will require a great deal more proof of its necessity than we have. I am very happy to say they are reducing the time that the Sub-Lieutenant will be in passing his examination. It is all taken off the college course at Greenwich, and I think it is a most wise and practical step to take not to endeavour to make all Officers pass through the same mathematical mill. Whether they will consent to extend the period of training in pilotage is another matter. I rather doubt the value of training Officers in batches. What you want is to train them in practical pilotage, and in order to do that you want responsibility. That is the way to make a man learn. Put a man in a ship: give him sufficient knowledge to know what he ought to do, and the responsibility which will press upon him almost day and night at sea will, if there is anything in him, teach him more in a month than he would learn certainly in six months in a training ship. Lord Brassey has referred to the longer training that Officers in foreign navies go through. Without wishing to make any comparison, for we might make comparisons that we should not care to, I say, without hesitation, our Officers are better navigators than the naval Officers of foreign navies. It has been the policy of the Admiralty for many years to endeavour to force Officers to take upon themselves responsibility in pilotage by refusing to allow them to have pilots, and by saying, "If you take a pilot you must pay for him yourself." That practice has had the very best results, and the Captains never dream of taking pilots on our ships of war. I think the argument as to the training of youngsters in vessels is not very strong. Where, however, a great improvement can be made is in getting the young Officers on board our ships to take an interest in navigation, for that is where the weak point comes in. The Captains in many cases do not take quite the interest in pilotage that they should, and they do not impress upon their Officers that it is necessary that they should attend to navigation, and show them that it would do more for them than anything else. If all Officers in command took the interest that Sir Houston Stewart did when he was Captain of a ship, I am sure we should have a higher average of good navigating Officers. The question of rewards for navigating Officers is also a very difficult one, and I do not know that I should touch upon it at all. I may say this, I think the case up to the present is a little bit exaggerated. I was at one time also under the impression that, as Lord Brassey says, the navigating Officers were having the mortification of finding juniors constantly promoted over their heads. I went into the question not very long ago, and it was shown that up to the present time, although Officers have been picked out for distinguished proficiency in other branches, and have been promoted early, navigating Officers have not been, generally speaking, passed over, or, at any rate, many of them have not been passed over; but I think that one Officer should be picked out occasionally to encourage the others. I quite agree with Lord Brassey that the practice which one had under sail was of the greatest value, and it would apparently seem as if in these days of steam that we ought to have a very much

smaller percentage of accidents than there are. It is only in human nature that having steam we should place reliance upon it, and so, perhaps, run rather closer and probably nearer to danger than was done in the old days, when the ships had their sail power only. In the case of a lee-shore in former days a much greater allowance was made. It is a thing yet scarcely realized that a vessel under steam makes leeway with a beam wind and sea, and sufficient allowance for this, over and above currents, is often not made. These are small points which I thought I should like to mention; but, in concluding, I would say that I wish heartily to thank Lord Brassey for introducing this very interesting subject to our notice.

Admiral MAYNE, M.P. : I should like to say, as I took upon myself also to write to the "Times" on this subject, at the time that Admiral de Horsey did, that I entirely agree with Captain Wharton that the science of navigation in the Navy has not gone backward in the least. It is no disparagement to the old masters to say so, because we all know and fully recognize their immense value, but the manœuvres of the last four years are alone perfectly plain evidences that the handling of our ships going in and out of harbours, and the English and Irish Channels, and the "pilotage" part of navigation, at any rate, is as good as ever it was. I think when Mr. Buller spoke of Admiral Shadwell wishing that the teaching should be more "scientific," that he rather used a wrong word, a more "intelligent" rather than a more "scientific" teaching was meant. I think the idea was not higher science, but that a man should know the meaning of what he did; what he really means when he talks of time, declination, equation of time, and the other elements that he is using. I have always thought that it is a great pity that Captains do so little as a rule to familiarize young Officers with navigation and astronomical observations; that instead of treating it as the simple matter it is, there is so much fuss made about it, and one of the greatest follies is working to seconds at sea. I have continually asked a man, "Why do you work to seconds?" It is quite impossible to observe to seconds at sea. If you can get an altitude within one or two minutes under ordinary circumstances you may be quite content. If you strike out the seconds in the working of the chronometer and the meridian altitude, the whole reckoning would not take above ten minutes to work out. Any time in the forenoon the man gets ready he merely gets the altitude, adds up three or four lines of figures, and the thing is done. The real trouble is that the whole of the navigation of a ship is, and has invariably been in the ships that I have been in, with the exception of surveying ships, underrated, not given anything like its proper importance in daily routine; there is not that weight attached to it that there ought to be. I agree with Captain Wharton that teaching in batches would do little good; as evidence of the small effect of it, one might remind any old college Officers who were supposed to learn steam going in and out of Portsmouth Harbour in the "Bee" how little was really learnt, without disparagement to any of them; one may refer to the Officers who are supposed to have learnt surveying, whether at Portsmouth or Greenwich, by going about in batches with an Officer, himself, no doubt thoroughly qualified; but I have never heard of any real surveyor having been turned out by this system at either of these places. I am convinced that the principal reason of the fact on which the Hydrographer (Captain Wharton) has commented, that the younger Officers navigate in proportion to their years and experience, certainly better than the older ones, arises from the simple fact that when the Lieutenant has passed he drops his book for ever. No more study is necessary during the remainder of his career. The Captain of the ship is not supposed to know the details of gunnery, and it does not much matter if he does not, he sends for the Torpedo Lieutenant, or the Gunnery Lieutenant. But as he has forgotten the gunnery and torpedo work, so he has forgotten the navigation, and when after four or five years on shore, following several years as First Lieutenant, during which he was excused, never having studied it very closely, he takes command of a ship to navigate her, he is practically unfit for a time to navigate her. I have suggested here—I am afraid it is not likely to meet with the sympathy of my brother Officers—that we should have something of the description of the Military Staff College, and that Officers should have to pass at least in navigation and pilotage as Commanders and Captains before they are given command. I regret that I cannot share the apparent approval which

Lord Brassey gave to the circular upon the navigation of H.M. ships, which has been issued of late by the Admiralty. I know as a matter of fact that there are many valuable Officers afloat at this moment who look upon it as an insult. I have received letters myself saying that they utterly deny the insinuation, that the ships of the present day are not as well navigated as they ever were, and consider that they pay the utmost attention to the navigation of their ships. I regret that, the orders on the subject being so distinct as they are in the Queen's Regulations, it was thought necessary to issue a general circular upon the loss of a small gun-vessel; I feel convinced that no Officer who would neglect such a duty as the safety of his ship and crew without a circular is more likely to attend to it on the receipt of one.

Commander HULL: As an old Master, I should like to give my approval to the very practical paper which has been read, a paper useful to the Navy, and therefore to England. What particularly struck me was Lord Brassey's calling attention to the necessity of practice. It has been my good fortune to be employed lately on the revision of a work that the Chairman and all sailors know well, viz., Raper's "Practice of Navigation." Published in 1840, the book is still the best treatise on navigation that I know of. The portions relating to the compass had to be rewritten through the introduction of iron in shipbuilding, but any attempt to add to other parts of the book would have rather spoiled than improved it. The argument of the work is "practice." I will, with your permission, read a short paragraph which bears very much upon what Lord Brassey said. It is taken from the advertisement to the nineteenth edition of this book. "The simplicity of its mathematical theory makes navigation appear an easy matter to men teaching or using it on shore, but pilotage, common and proper, is a very different business when practised by sailors in a gale of wind, at night, or in hazy weather, on board a ship at sea. Proficiency in the science can never compensate for a lack of experience in the handicraft of navigation. This experience can be obtained only by incessant practice at sea; by a capacity for taking trouble, unceasing caution, and a desire to do well." I have been somewhat comforted by the remarks of my friend Captain Wharton, who, although I am not serving at the Admiralty, I still consider to be my chief. His remarks have helped us much. At the same time I would keep in view Lord Brassey's excellent advice to keep up practical instruction. When I had the good fortune to be an examiner at Greenwich, under the late Sir Astley Cooper Key, who we all know was quite equal to any question of navigation, the Oxford and Cambridge part of the management wished me to set a paper on the sextant. I did not see my way to find out what an Officer might know upon the principle and use of this all-important instrument by a paper. My idea was that an examination as to the sextant must be conducted with the instrument in hand. I wanted to see how an Officer took the sextant out of the box, to see what screws he touched; in reply to my questions as to the adjustments how he looked at the sun with it, in fine to see his mode of handling the weapon. I question whether a man could scrape through such an examination who was not thoroughly acquainted with his instrument, whereas on paper, a man might explain what his fingers could not do. The suggestion as to the six months' course of instruction in pilotage is a very good one, although I quite follow Captain Wharton that it is no use to try to train men in batches, still by making Officers in turn responsible for a season for the safety of the ship at sea, letting them understand that errors or ignorance tending to place the ship in danger would mean danger to themselves, might cause them to begin to feel the earnest nature of responsibility at sea. Gunners men often lament that there is no war to try their powers. The navigating men are better off. We have got the wind and the sea, which will always oblige us with a war if you only choose to sally out and battle them. The pilotage training ships should be sent out into the Channel or down to the Straits of Gibraltar, purposely in bad weather, because that is the test to try the powers of the Master. From all I hear I am disposed to agree with Lord Brassey as to the neglect said to be suffered by navigating Officers. The duties that have to be performed on board a ship of war appear to me to be after the fashion of a three-stranded rope: there is the First Lieutenant's duty to maintain discipline, the gunner's duty to use the weapons of war, and the pilot's duty to handle the ship. A man should

be as certain of getting his promotion from pilotage as he should from torpedo practice or from doing his duty as the First Lieutenant. As things are I can quite fancy a man of the world saying to his son, "Now, my lad, just as little of navigation as you can manage, you won't get much out of that; you go in for torpedo or gunnery work." I hope that I am wrong in that conclusion. Lord Brassey says that the success of warlike operations may turn on ability in navigation or pilotage. Many here will remember an incident in the war between Chili and Peru, and the loss of the large Peruvian ironclad "Independencia" on the coast of South America. As far as I remember, that great ship was lured on to the rocks by the artful pilotage of a small corvette, the "Coradonga." That is a case which, I think, proves all that Lord Brassey has said. Never mind how perfect a ship may be in her artillery, let her gunnery Officer possess the combined talent of all the "Excellents." Let her discipline be of the highest order, still unless that ship also possesses a pilot competent to handle her in safety and efficiency on the high seas and in narrow waters, and place the platform carrying men and guns in the required position, the abilities of Gunner and First Lieutenant are wasted, and the huge mass is little better than old iron. Lord Brassey naturally refers to Nelson—a name that comes into most good naval papers. Nelson's success at the Nile, Copenhagen, and in the famous pursuit of the combined fleets of France and Spain across to the West Indies was due to the fact that Nelson was not only an Admiral, he was also a pilot.

Captain FAWKES, R.N.: Having just come home from the command of a ship, it may be useful if I say one or two words. One of the great points in Lord Brassey's lecture is the necessity of experience. That experience cannot be taught, and I believe the practice to which he alludes of the present Navigating Lieutenants dropping into the old lines must continue, because it is necessary. It has been said that navigation is easy to acquire: so it is at sea, but in war time we may have to go in to engage forts, or try to cut ships out. It seems to me that the man who can take a ship at great speed into harbour or into narrow waters must have had experience in picking up land-points which he has never seen before, and that can only be got by practice. I think myself that Navigating Lieutenants should be encouraged by promotion. A good Sub-Lieutenant when promoted to Lieutenant naturally goes to the Captain, and says, "What had I better go in for?" That means, "What will get my promotion quickest?" if he is worth anything. The navigators ought to have just as good a chance of promotion as the others. My experience has been that it is not necessary for the Navigating Lieutenants to navigate only, and in the ship that I have commanded the Navigating Lieutenant was also First Lieutenant. No doubt in many of the ships that cannot be done, but he can do something, and if he wants promotion he must be allowed to take a share in other parts of the work of the ships, and I think if they see a chance of getting promotion through it, they will be quite ready to do so. I do not think that any one who has not been afloat lately can realize how energetic Lieutenants are until they have lost all hope of promotion. They take an enormous amount of interest in everything; and I may say, without having given any such orders as that excellent one of the Chairman, I have been quite surprised in the morning to see what interest is taken, the numbers of sights taken, and the energy with which the young men work. On two occasions I had Lieutenants navigating the ship with very marked success. I think if Lieutenants have only a fair hope of promotion they will try and fit themselves, not only for torpedo and gunnery, but also for navigation work.

Admiral Sir FRASER OMMANNEY, F.R.S.: I believe that something could be done by Commanders-in-chief of stations and Captains, by providing the means for young Officers to become acquainted with the hydrography and pilotage of the localities where ships are stationed. Looking back to the old regulations of the Admiralty, it very much depends upon the way in which Captains discharge their duties in all that relates to navigation, and what they require from the young Officers in working out the reckoning of the ship, and taking astronomical observations in order to make them good practical navigators, because where a Captain manifests a personal interest about the navigation it inculcates a desire to follow a good example. Unquestionably it is a very great advantage to gain experience from early responsibility; it was my good fortune in early life to enjoy it, for when I served in the Royal

Yacht as a mate, in the reign of William the Fourth, instead of idling in Portsmouth Harbour, the Lieutenant, four mates and a crew, were placed in a 10-gun brig for packet service, and employed in carrying the mails continuously between Falmouth and Lisbon; no navigating Officer was appointed, therefore by necessity the navigating duties were carried out by the mates; from this circumstance I acquired a thorough knowledge of practical navigation. Following on this service, I served under Captain James Ross as a Lieutenant, on a forlorn expedition in the depth of winter to Baffin's Bay in a hired whaler; in this vessel there was no special navigating Officer, so that I had again the advantage in acquiring further experience in practical navigation, which proved of great value to me, and inspired me with confidence in the various commands which I have held in the Service, likewise affording a pleasing interest in the superintendence of the navigating duties. I was pleased to hear the observations which fell from Captain Wharton, as I feared that after hearing the paper the audience might carry away an idea that the Navy was deteriorating in navigation matters. It is a long time since I was afloat, but I hope that the Captain will always be held responsible for the safe navigation of his own ship.

Captain C. JOHNSTONE, R.N.: I think the importance of the study of the profession cannot be at all underrated, but the time at the disposal of an Officer in the part of his career before he comes into a responsible position is limited, and it is quite possible to overdo the courses of instruction through which he has to go. The whole of the education of a man is now crowded into a few years at the outset of his service. It has been said that there should be an examination later on; I do not think an Officer should be examined when he gets to high rank, or after he passes a certain age, but it is a great pity that the whole of the examinations should come to an end at the age of about twenty. I think it is quite possible to spend a great deal too much time on these courses of instruction. That is the only objection I see to the lecturer's proposal as to having a course of six months' actual instruction at sea, viz., that it takes up so very much time. As Captain Wharton has said, people do not pay so much attention to these things as they ought, unless there is responsibility attached to them; the moment they have to do them with an object, they study them in a way they never thought of doing before. It has been said that a seaman must be born, that he cannot be made. Now I think it would be very unfortunate if that idea should go abroad. There are plenty of people who go to sea, who certainly were not born to go to sea, but they make uncommonly good Officers. Good seamanship can be attained by hard study, and it is not at all necessary that a man, if he is to make a great mark in his profession, must be born for it, at least I do not think that is a proper conclusion to come to. Captain Wharton refers to errors of judgment. I think experience *does*, to some extent, overcome errors of judgment, and that want of judgment is very often due to want of experience. Therefore we ought to expect that with more experience people will not make so many mistakes. I think in the letters written by Admiral de Horsey and Admiral Mayne (I am sorry Admiral Mayne has gone), which appeared in the "Times," with regard to the navigation of Her Majesty's ships, it was rather too much assumed that Captains did not pay enough attention to navigation. Navigation is a specialty, and although Admiral Mayne talked about working chronometers in five minutes, I should be very sorry to attach much importance to a chronometer that was worked in five minutes. I have paid a good deal of attention to it, and after making a custom of working up the ship's reckoning myself, I found when I went into a squadron that I could not do it; there was no time for it. The Captain's time is taken up in watching the Admiral or different matters, and he has not time to pay very great attention to the working of navigation himself. Of course he should oversee it, but he has not time to go through all the details, because it is no use doing it in a half-and-half sort of way. I think it is very much better that it should be an understood thing that the Captain should oversee the navigation of the ship, and make himself responsible for it, and not at all that he should work it out himself. With regard to the study of navigation, I think the Admiralty has taken a backward step to some extent. About three years ago, or to go back a little further, when I commanded a ship in the training squadron, I first came again in contact with Midshipmen, not having been with

them for many years, and to my surprise I found that the Midshipman's work-book was almost entirely given up. Midshipmen were formerly ordered to enter their reckonings daily, and to produce them at all examinations, but I found this had been given up, and that Midshipmen in many cases could not produce their books, they had not been kept up continuously. The Naval Instructor, when spoken to about Midshipmen working sights and so on, said, "If the Midshipmen take up all their time in working sights and navigation, how shall we get sufficient time for mathematics?" So that certainly, in his idea, the navigation of a ship must be subordinated entirely to the Midshipmen working up mathematics. The regulation in the Admiralty instructions was that a Midshipman was to work his reckoning daily and to enter it in his book, to produce it at all examinations; but about three years ago the regulations as to Midshipmen were modified considerably, and for some reason or other, as I say, this was withdrawn, so that now I do not think there is any rule that will compel a Midshipman to produce his reckoning regularly. I do not suppose that was the intention, but at the same time it has that effect, and it certainly has opened the way for those people who wish to put navigation on one side, and think it of more importance to study pure mathematics. I think that is a point that deserves attention.

Colonel RICHARDSON, R.A.: A complete outsider sometimes sees a good deal of the game. Most of the speakers to-day have been decrying the College in which our naval Officers study, and there has been a sneer at the university element in it. What I wish to ask shortly is:—Could not science and navigation be combined by taking the Naval College to sea? I think you would get rid of a good deal of the university element then, and possibly both practice and science would be more firmly united. Soldiers notice a growing tendency in the Navy to come on shore and imitate them. Soldiers go through a number of special courses, during which they partially forget their regular work, and I now see the Navy going through course after course, on shore; they live in barracks, on shore; and they imitate our discipline. It is very flattering to us, but soldiers look upon the Navy as their first line, and we certainly should like to see our first line out at sea, or working in these difficult channels that Lord Brassey has told us of. What I suggest, then, is that the Naval College might spend its time partly afloat acquiring knowledge practically.

Lord BRASSEY: It now only remains for me to thank those who have spoken for the indulgent terms in which they have expressed themselves. I scarcely venture to go so far as to hope that the discussion will impress the Board of Admiralty with the necessity for making any further provision for the practical instruction of our young Officers, which would involve the country in increased expense. There can be no doubt that to extend the course of instruction in pilotage from two months to six, and to provide a flotilla in which the young Officers might be instructed by frequent service at sea, would entail increased expenditure. The flotilla would cost something, and as the course of training would be extended over a further period of four months, a certain addition would have to be made to the number of Officers on the active list of the Navy. The discussion which has just taken place will not, however, be without its value, even though the principal proposal which has led to it may not be adopted. It is, for instance, of great public interest to receive from the Hydrographer of the Navy the reassuring statement that he has made with regard to the general proficiency of Officers in the duties of navigation and pilotage. I trust it will not be assumed, because I was invited to read a paper here on Navigation and Pilotage, and accepted the invitation, that it was implied that there was a falling-off from the former standard of proficiency. The disaster which befell the "Serpent," under circumstances which can never be accurately known, and on which it is not profitable to speculate, led to some discussion in the public journals; but I am quite sure that among members of the profession, and among those most competent to form an opinion, no doubts have been created as to the general proficiency of those who navigate Her Majesty's ships. I am glad to have had the opportunity of calling attention to the important paragraph in the Report of the Committee on the Higher Training and Education of Naval Officers, in which allusion is made to a widespread feeling of discouragement among those Officers who take up navigating duties. I rejoice to hear from Captain Wharton

that there seems to be no adequate reason for such a feeling. If we should now be arriving at a time when, as he says, there may be more difficulty than has hitherto been experienced in getting a fair appropriation of reward to those executive Officers who devote themselves to the subject of navigation, I feel confident that great pains will be taken at headquarters to see that justice is done. It would be a most untoward thing for the Navy if these duties should be taken up by men of less ability than is found amongst those who turn their attention to gunnery, torpedoes, and other specialties. I am glad to have been the medium of making known the valuable order which Sir Houston Stewart issued on board the ships which he commanded.¹ It seems evident from all that has fallen from various speakers that a good deal can be done by Commanding Officers generally to encourage amongst the younger Officers attention to navigation and pilotage. If the discussion of the subject should tend in any degree to promote this result, our afternoon will not have been spent in vain.

The CHAIRMAN: I have to thank Lord Brassey for so kindly giving prominence to my order. I consider that the teaching of the young Officers of the Navy practical navigation is in the hands of their Captains and Commanders. If they carry out strictly the regulation of the Admiralty, as to the practice of navigation of necessity; the Officers of a ship must become good practical navigators. I found that the result of this order, strictly carried out, was to induce all the Officers to take a very great interest in the navigation of ships. With reference to what has been said about foreign navies. I have always had the greatest interest and respect for everything that fell from Mr. Pitt, and reading his life there remains on record his advice to this country, never to lose sight of what is being done in the French Navy. He considered that the French Navy was regenerated after the Revolution was at an end, and he said, "Let us watch France more actively than in former days, because she has attained new and extraordinary energies." Let us always be alive to what is being done or developed in that Navy. I say the same of the Navy of the United States. I think the history of the American War shows us what America can, and what she will do in case of a naval war, and why should it be otherwise, because if this old country is renowned in sea-fight, why should not the oldest, and the greatest of our progeny, inherit our skill? Therefore I hope whatever is done in these navies will be closely watched by us. Lord Brassey, I am sure, must gather from what has been said at this meeting, how truly we thank him for coming here to-day, and giving us this most interesting and valuable paper. I am sure you will cordially join with me in asking him to accept our very best thanks for his presence amongst us, and what he has done for the Institution.

¹ Mentioned during some *vis à toe* remarks by the lecturer which he has not recorded.—ED.