

EXPECTATION, ADAPTATION, AND RESIGNATION

British Battle Fleet Tactical Planning, August 1914–April 1916

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In mid-July 1914, a trial mobilization of the active and reserve warships of the Royal Navy, which had been planned the previous fall, put virtually all of Britain's effective naval forces on a war footing. This event coincided with the increasingly rancorous great-power dispute precipitated by the Balkans crisis. The deteriorating European political situation prompted the Admiralty to delay the dispersal of the bulk of the fleet after the conclusion of the exercise. On 28 July, with hostilities against Germany a strong possibility, Britain's manned and ready naval forces were ordered to their war stations. On 4 August, war between Britain and Germany began. Fortuitous preparedness foreclosed the possibility of naval debacle from surprise attack. With Britain's first-line naval strength poised to fight, the stage was set for a full-scale encounter with the German battle fleet. Many on both sides expected a major battle to take place within days, but the German navy did not sortie. Subsequent German operational reticence would

keep its main body beyond the reach of British guns for nearly two years.

For much of this time, the Royal Navy entertained hopes of fighting and winning a decisive battle. By the spring of 1916, however, the vision of achieving an industrial Trafalgar had been given up, replaced by the view that such a victory was not worth the risks that would have to be taken to impose action on an unwilling opponent. In May 1916, however, chance and circumstance resulted in a major encounter between the main naval forces of Britain and Germany off the

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coast of Denmark. The outcome of the battle of Jutland, however, was inconclusive. In spite of large superiorities in numbers and firepower, moreover, the British battle fleet not only failed to destroy its adversary, but suffered heavier losses. Historians have attributed the causes of this unsatisfactory result to several factors, including weaknesses in British operational command and Admiralty organization, and defective materiel.¹ In addition, much has been made of what can be called British tactical sterility—that is to say, British battle fleet tactics of the period are portrayed as simple, unimaginative, and, above all, unchanging.

The present article will challenge the conventional portrayal of early British wartime naval tactical planning by considering the interlocking technical, strategic, operational, and intelligence factors that shaped tactical intent. The examination of the interior mind of Britain's naval leadership is based on the author's recently published findings on prewar British naval tactical planning, and mainly primary sources covering the war. The inquiry will address the following three questions: What form did the leadership of the Royal Navy expect a major fleet action to take, and why? When reality did not correspond to expectations, how did the leadership of the Royal Navy respond? And finally, what circumstances conditioned the responses? The story to be told is not one of action but of the changing attitudes that informed potential action.²

Arthur J. Marder, the author of the standard account of early-twentieth-century naval policy, depicted a Royal Navy that on the outbreak of war was commanded by admirals who were tactically unprogressive, self-satisfied, and thoughtless.³ Marder's assessment was based upon the memoirs of prominent naval officers and politicians.⁴ Such apparently authoritative testimony was, however, corrupted by a combination of partisanship, ignorance, and perhaps fading memory. A considerable body of documentary evidence supports a very different view of the state of tactical thinking in the Royal Navy in 1914. By this time, more than a decade of rapid technical development and comprehensive tactical experiment had provided the basis for two different tactical outlooks. The first school of thought, which will be called the "agnostic opportunists," believed that a future major sea battle with the German navy could take any number of different forms and that the British fleet thus needed to be prepared to operate effectively under a broad range of tactical conditions. The second school of thought, which will be called the "clandestine preempters," believed that the Germans would seek to fight the one kind of naval battle in which they could expect to achieve major success in spite of their inferiorities in numbers and firepower and that the British battle fleet should thus develop specific countermeasures in secret in order to surprise and thereby defeat its opponent under these particular circumstances.

The agnostic opportunists were centered in the First Fleet of the Home Fleet. Their titular and spiritual leader was Admiral Sir George A. Callaghan, its commander in chief. Callaghan had taken this position in November 1911 and served until July 1914. The timing and span of Callaghan's tenure in command of the Home Fleet is significant. At the beginning of his tour, much fewer than half of his first-line capital units consisted of all-big-gun battleships; in 1913, two out of his four battleship squadrons were still made up of the older predreadnought-type battleships; and in July 1914, the third dreadnought battleship squadron was still at half strength. Dreadnought battleships were much more heavily armed and faster than their predreadnought stablemates, but the combination of the two types in a single formation meant that full advantage could not be taken of the dreadnought's superior qualities. Callaghan also had to contend with the fact that gunnery efficiency changed considerably over his term of office. In 1911, shortcomings in gunnery equipment and technique had raised serious questions about big-gun effectiveness. While these difficulties were largely rectified by prototypes of improved materiel and the development of new methods of firing, as late as July 1914 only half the available dreadnought battleships were equipped and trained to achieve what was believed to be state-of-the-art gunnery. The wide disparity in gunnery capability even among the dreadnought battleships thus further complicated tactical preparation. Finally, beginning in 1912, the introduction of torpedoes whose range at high speed was much greater than that of their predecessors greatly increased the vulnerability of the battle line to serious losses from underwater ordnance fired from either enemy battleships or destroyers.⁵

Callaghan was responsible for Britain's main battle fleet in the event of war, which could come at any time. His problem insofar as tactical planning was concerned, therefore, was immediate—how to fight with the forces in hand. Given the combination of difficult circumstances facing him in the moment, Callaghan appears to have focused his energies on maximizing technical efficiency—that is, getting each of the differing elements of his command to realize its highest attainable level of combat capability—rather than on formulating a tightly integrated tactical scheme.⁶ This loose functional arrangement allowed new ships and improved equipment and technique to be introduced with minimal disruption of readiness to fight. Tactical coherence, to the degree that it existed, was a matter of shared attitude in three general areas. In the first place, Callaghan believed that a fleet action would involve considerable sparring at a distance as well as the possibility of a hammer-and-tongs slugfest at medium and short ranges, which caused him to order a substantial increase in the amount of ammunition issued to all dreadnoughts.⁷ In the second place, Callaghan was by no means confident that even the latest methods of gunnery were applicable under all the

various conditions of range and visibility that were likely to occur in a real naval battle, and he thus insisted that his gunners keep up practice in a variety of methods of gunlaying (that is, pointing) and fire control.⁸ In the third place, Callaghan was convinced that under favorable circumstances destroyers could sink battleships with torpedoes; as a consequence, he planned to attach substantial flotilla forces to the battle line and use them offensively.⁹ A measure of tactical success, if not decisive victory, was to be achieved by a combination of propitious circumstances and general competence in gunnery and fleet maneuver.

The clandestine preempters were based at the Admiralty. Their de facto chief was Vice Admiral Sir John Jellicoe, most of whose career as a flag officer had been spent at the Admiralty as director of naval ordnance from 1905 to 1907, Third Sea Lord and controller (that is, overseer of navy materiel procurement) from 1908 to 1910, and Second Sea Lord (that is, in effect, director of naval per-

By late 1915 Jellicoe had decided to fight a long-range engagement to disrupt German intentions but also under the right conditions to resort to a medium-range fight to achieve a decisive victory.

sonnel) from 1912 to July 1914, with only short breaks in between with the fleet. While in charge of the Admiralty's technical departments as DNO and controller, Jellicoe had directed the course of improvement in gunnery materiel and technique.

From late 1911 through mid-1912 he had commanded a battleship squadron that spent much of its time testing new gunnery equipment and methods. Where Callaghan's main concerns about tactical practice were immediate, Jellicoe's were prospective. For most of the decade that preceded the outbreak of war, his attention day to day had been devoted to the advancement of gunnery capability beyond a state of critical imperfection. For years Jellicoe had struggled with recalcitrant technical problems in gunlaying, fire control, ordnance, and warship design. Overcoming these difficulties, he believed, was vital in order to deal with two major threats to Britain's battle fleet. The first, which has already been mentioned, was the danger posed by long-range torpedoes. The second, which requires explanation, was what was believed to be the German intention to fight a medium-range action with a combination of big guns, quick-firing guns, and torpedoes.

Admiral Alfred von Tirpitz, the state secretary of the Imperial Naval Office and the driving force behind German naval expansion, was an outspoken proponent of aggressive tactics. Tirpitz, who was responsible for naval administration and shipbuilding, had no control over operations. His views on how the battle fleet should be used nevertheless shaped British assessments of German operational intentions. British naval intelligence reported that the Germans

believed that their fleet would be able to win a decisive battle at medium ranges (roughly seven to eight thousand yards). The Germans were apparently convinced that their ships would be able to close to medium ranges without suffering significant damage because British gunnery would be thrown off by the quick change of range during the approach. After closing, the Germans would turn onto a course parallel to the British line, which would keep the range constant and thus maximize the accuracy of fire. At this point, the German fleet—with its faster-firing though lighter-caliber big guns, a large superiority in medium-caliber guns, and battleship torpedo batteries that were twice the size of their British counterparts—would be capable in theory of inflicting much greater damage than it would suffer in return in spite of its numerical inferiority.¹⁰ To counter this threat the British fleet either had to develop the capacity to hit when ranges were long and changing, and thus stop or cripple the German fleet before it could bring its weapons into action, or devise means to fight and win a medium-range action without suffering heavy losses from German gunnery and torpedoes. The third possibility, retreat in the face of a German advance, was rejected as morally unacceptable.¹¹

For several years, Jellicoe favored efforts to accomplish the first of the two alternatives, namely, to hit effectively at long ranges that were changing.¹² But in 1912 he concluded that recently adopted and forthcoming new gunnery equipment and methods would not only enable a British battle line to overpower a German opponent at medium ranges but would do so in a way that neutralized the torpedo threat. Improved gunlaying and sight-setting equipment promised a dramatic increase in the Royal Navy's practical rate of accurate big-gun fire at short and medium ranges. The introduction of heavier-caliber big guns and better armor-piercing projectiles would make the more accurate and rapid fire even more deadly. Also, defensive deployment of all available cruisers and destroyers was to provide the means of stopping at a distance German flotilla attacks on the battle line, whose shooting would thus be undisturbed by maneuvering to avoid torpedoes. The prospective net gain in firepower was enormous: with the proper gunnery equipment and well-drilled crews, the British dreadnoughts coming into service from 1912 onward could, when steaming on a straight course, place more than ten times the weight of projectile on target than earlier dreadnoughts. This would be enough to shatter the German battle line in no more than six minutes, which was less time than it took for a high-speed torpedo to traverse the distance between the opposed forces at medium range. On the assumptions that German gunnery technique was no better than that of the Royal Navy before 1912, that tight British security had concealed the improvement in British gunnery, and that accordingly the Germans would seek a medium-range engagement on parallel courses, the British battle fleet

would be able to deliver an overwhelming hail of fire, after which all ships could turn simultaneously in response to a single signal to avoid oncoming torpedoes. Following this turn, the line could be reformed by a second signal, which would be made in the absence of firing and thus under conditions that favored accurate transmission and receipt of the order.¹³

Jellicoe's scheme must have been attractive for several reasons. The agnostic opportunists envisioned a battle of complex offensive maneuver by battleships, cruisers, and destroyers. Coordinating such an action required a very high degree of tactical skill throughout the fleet, as well as complicated signaling. Tactical errors by subordinate commanders or breakdowns in communications would produce at the very least some confusion, at worst complete disorganization, which would open the possibility of defeat in detail. Even if order was maintained, British gun crews that had been trained to fire at long as well as medium ranges might lack the practiced skill required to outshoot or even match opponents who had concentrated all their energy on maximizing speed and accuracy at medium range. If the British battle line stayed on the same course for much longer than six minutes at medium range, it was likely to suffer heavily from torpedoes as well as gunfire. The program of the clandestine preempters, in contrast, called for offensive action by battleships that did not maneuver, with cruisers and destroyers providing a defensive screen; that approach posed relatively simpler command and control problems, called for gunnery methods that would give the British battle line firepower superiority under the very tactical conditions that would be sought by their German opponents, and offered a remedy to the torpedo threat.

A consensus within the Admiralty in favor of Jellicoe's tactical scheme appears to have been formed in late 1912. Because German cognizance of the Royal Navy's plan and the capabilities upon which it was based would compromise its effectiveness, knowledge of its existence was restricted to a select few. Keeping the plan secret was made easier by the fact that the British fleet was ill prepared to execute it. By mid-1913, only one battleship squadron out of the four in the First Fleet of the Home Fleet was made up of ships suitable to fight the kind of medium-range battle envisioned by Jellicoe. But ships under construction that would come into service in the next two years could be formed into a second squadron, while the older, less heavily armed dreadnought battleships could be given the new sight-setting equipment, which would enhance significantly their ability to shoot accurately and rapidly at medium ranges. In the spring of 1914, Jellicoe was informed that he would succeed Callaghan as commander in chief of the Home Fleet at the end of the year. By this time, the Home Fleet would be only a few months away from having a second full squadron of battleships fitted with state-of-the-art gunlaying and sight-setting equipment and armed for the

most part with big guns that were much larger than those in the German fleet. The remaining dreadnoughts would, had the war not begun in August, most likely have been fitted with the new sight-setting equipment;¹⁴ only one squadron would have been made up of predreadnoughts. With all that brought to fruition and three-quarters of the battle fleet thus more or less appropriately equipped, Jellicoe would have commanded a force with a credible capacity to execute his vision of decisive battle at medium range.

By the spring of 1914, the British view of a medium-range engagement had been broadened to include the possibility of an engagement between two lines of battleships on parallel courses but moving in opposite directions. Little attention had been given to this contingency until Captain William Wordsworth Fisher, commander of the dreadnought battleship *St. Vincent*, submitted a memorandum on the subject to Callaghan in April 1914. Callaghan observed that “action on opposite courses at medium range will afford excellent opportunities for long range torpedo fire.” This was because the opposed fleets would be advancing rapidly toward torpedoes launched by their opponent, which meant that the distance the torpedo had traveled by the point of impact would be much less than the range to the target had been at the point of firing. The threat of torpedoes under the circumstances described could not “be eliminated short of leading the van out of torpedo range,” which “might be impossible without exposing the rear to the fire of a larger number of enemy ships.” That being said, Callaghan believed that superior British gunfire would be capable of rendering the enemy battleships incapable of either effective gunfire or torpedo attack, although he did not mention the greater difficulty of aiming guns when the change-of-range rate was high, as would be the case when fleets were steaming on opposed courses. He was convinced, moreover, that such an action would give the British forces an opportunity to smash the leading ships of the German battle line and thus disrupt the entire enemy formation. Callaghan concluded that battle on opposite courses was possible either in the form of a meeting engagement in bad weather or in good weather through deliberate action (for unspecified reasons). What Callaghan may have had in mind was the transformation of a pursuit action into a battle on opposite courses by a simultaneous turn by a retreating German fleet, whose motive was to maximize the effectiveness of its superior torpedo armament.¹⁵

The orderly transition from one tactical regime to another that was planned for late 1914 was disrupted by the decision of the Admiralty in the last week of July to replace Callaghan with Jellicoe immediately in the likely event of war with Germany. Jellicoe objected strenuously to this ruling, and with cause. He could not fight the kind of battle that he wanted with the fleet that existed. If a major engagement against the German navy was to be fought in the near term, it would have to be executed along the lines worked on by Callaghan, in which case

the incumbent admiral, with two years' experience in office and the confidence of his subordinates, was the better choice. Winston Churchill, the First Lord, rejected Jellicoe's demurrals, however, and Jellicoe reluctantly accepted the appointment, which became effective on 4 August, the day war was declared.¹⁶ On this date he took command of the first-line fighting ships of the Home Fleet, a force that was designated the Grand Fleet. The Admiralty's reasoning is still mysterious. It may well be that Britain's naval leadership believed that the Germans would keep their navy in port during the early months of the war and that Jellicoe, as the leader of the clandestine preempters, was the best man to use the time to prepare the just-mobilized battle fleet to achieve a decisive victory along the lines formulated in 1912. In any case, German operational reticence, compounded by British operational caution, practically eliminated the possibility of a major fleet action in the fall of 1914.

Although Tirpitz called for the immediate offensive deployment of the battle fleet, he was unable to persuade the operational leadership of the German navy to risk a major clash prior to the reduction of the Grand Fleet's numerical advantage by the action of German destroyers, submarines, and mines.¹⁷ Conversely, Jellicoe feared that British losses to those threats would set the stage for a German sortie to fight a battle at medium range, the outcome of which might well be unfavorable, given yet-to-be rectified materiel shortcomings.¹⁸ He thus instructed his command in August and September that he would exercise caution when threatened by torpedo attack or mines, even to the point of giving up what appeared to be opportunities for decisive action. In contrast to Callaghan, Jellicoe made it clear that the primary function of destroyers was to prevent or disrupt enemy destroyer attacks on the battle line. Jellicoe stated a general intention to fight at what could be called "very high medium range"—that is, nine to twelve thousand yards. But he also warned that "it may be necessary to close the range or otherwise maneuver the fleet to avoid indecisive action." Nevertheless, Jellicoe called for deliberate shooting at ranges that were well above ten thousand yards, in the hopes of throwing the German fleet "into partial confusion before its attack can be developed, with consequent loss of initiative and interference with their prearranged plan [i.e., closing to medium range]."¹⁹

In October, Jellicoe expressed these same views to the Admiralty, after which he declared his intention to "pursue what is, in my considered opinion, the proper course to defeat and annihilate the enemy's battle fleet, without regard to uninstructed opinion or criticism."²⁰ The short-term prospects of achieving this objective, however, were not good. In October, the Grand Fleet lost one of its dreadnought battleships to a mine, three more were crippled by engine defects, and a fifth was in dock refitting. All five vessels, moreover, were of the latest type, which thus cut the battleship force capable of using the new methods of gunnery

to full effect by half. In November, yet another first-class dreadnought battleship was disabled by engine trouble, and in December two others (including one of the units that had suffered engine problems in October) were damaged by collision. These losses were mitigated by the addition of four new battleships, which required, however, some months to work up to the same standards of efficiency as older units.²¹ Thus the Grand Fleet's ability—measured in battleships of the appropriate kind and level of effectiveness—to fight a medium-range engagement effectively was even less during the last three months of 1914 than it had been at the beginning of the war. In late December, indeed, the Second Battle Squadron—the only unit that was fully equipped and trained to execute Jellicoe's tactical ideas—was at half strength (see table). These circumstances were exacerbated by a severe shortage of destroyers. In early December, Jellicoe reported that in view of

COMPOSITION OF BRITISH BATTLE SQUADRONS IN TERMS OF GUNNERY EFFECTIVENESS AT MEDIUM RANGE, AUGUST 1914–JANUARY 1916

Units	Actual Early August 1914	Actual Late November 1914	Actual Late December 1914	Actual Late January 1915	Nominal January 1915	Nominal January 1916
1st Battle Squadron	1 A 2 B 5 C	1 A 2 B 4 C	1 A 2 B 5 C	1 A 2 B 4 C	1 A 2 B 5 C	1 A 2 B 5 C+
2nd Battle Squadron	8 A	7 A	4 A	6 A	8 A	8 A
3rd Battle Squadron	8 D	7 D	7 D	6 D	8 D	7 D
4th Battle Squadron	1 A 1 B- 3 C	1 A/1 A- 1 B 3 C	2 A/2 A- 1 B 3 C	3 A 1 B 3 C	4 A 1 B 3 C	4 A 1 B 3 C+
5th Battle Squadron	*	*	*	*	*	3 A
Total by Category	10 A 2 B 1 B- 8 C 8 D	9 A/1 A- 3 B 7 C 7 D	7 A/2 A- 3 B 8 C 7 D	10 A 3 B 7 C 6 D	13 A 3 B 8 C 8 D	16 A 3 B 8 C+ 7 D
Total Effective Units [A, B, C+] at Medium Range	12	12	10	13	16	27

LEGEND

Maximum effectiveness [proper guns, mountings, fire control] = A
 Maximum effectiveness but not worked up = A-
 High effectiveness [proper mountings, fire control] = B
 High effectiveness but not worked up = B-
 Good effectiveness [proper fire control] = C+
 Poor effectiveness [lack of proper guns, mountings, fire control] = C
 Very poor effectiveness [predreadnought] = D

Note: C units were probably being upgraded to C+ as they refitted from the fall of 1914 through 1915. Actual figures take into account ships under repair or refit. Nominal figures do not.

Sources: F. J. Dittmar and J. J. Colledge, *British Warships 1914–1919* (London: Ian Allan, 1972), pp. 15–19; Jellicoe, *Grand Fleet*, pp. 168, 185, 199.

the more than two-to-one superiority in destroyer numbers enjoyed by the Germans, he would have no choice but to “adopt the objectionable and difficult one of turning the battle fleet away when the attack takes place.” This, he observed, would upset gunfire and possibly forfeit “a position of tactical advantage.”²²

During the first five months of the war, the German navy’s decision to confine its operations to battle-cruiser raids and forays with submarines and light surface craft while keeping the battle fleet back meant that the Grand Fleet’s weaknesses with respect to a medium-range battle did not matter. The Admiralty, however, did not believe that German operational diffidence would last. By as early as October 1914, according to the official history of the Royal Navy, Britain’s naval leadership had concluded that the Germans would

husband their fleet for some sudden blow when the long winter nights would give them the best chance of evasion and surprise. Now that their failures in France had forced them to recognize that the war would not be the short and brilliant affair they had expected, they were already having to give anxious attention to the question of food supply, and however prudently inclined the High Command of the navy might be, its hand might at any time be forced into some desperate attempt to diminish the stringency of the blockade, or to deter us from sending further troops to France.²³

By early 1915, the Grand Fleet’s ability to fight a medium-range engagement had improved significantly, for several reasons. First, the four new battleships had completed their workups and could be considered fully effective. Second, by late 1914, British naval signals intelligence was able to give warning of German warship movements, which enabled Jellicoe to reduce the time spent at sea in anticipation of enemy activity, with the result that the crippling loss rate of the previous fall from engine wear decreased substantially.²⁴ Third, the ability of perhaps at least a few of the older dreadnoughts to fight at medium ranges had been much improved by new-model fire control equipment, the fitting of which had been given a high priority after the outbreak of war;²⁵ as a consequence, the Grand Fleet from January 1915 onward almost certainly had available a significantly greater number of all-big-gun battleships that were more or less equipped to hit hard and rapidly at medium ranges than it had had in late 1914 (see table). Fourth, destroyer reinforcements to the Grand Fleet substantially reduced the German advantage in this category of warship.²⁶

On 12 January 1915, Admiral Sir John Fisher, the First Sea Lord, informed Jellicoe that there was “some ‘movement’ going on in the German High Seas Fleet—nothing at all definite, but nevertheless enough to arouse suspicion.”²⁷ The Admiralty also had good reason to believe that when the Germans acted, they would seek a medium-range engagement. Notice to the Grand Fleet was given in the form of a complete translation of a recent redaction of the *German*

Tactical Orders, which was taken seriously by Jellicoe.²⁸ This pamphlet, which was printed for distribution in January 1915, stated that German battleships would close to fight at ranges of 8,800 to 6,600 yards, that torpedoes would be fired at this range, and that decisive victory at any cost was the objective.²⁹ Jellicoe may also have been influenced by intelligence reports indicating that the German battle fleet had devoted considerable time to practicing rapid course reversals through simultaneous turns;³⁰ that could have indicated a German intention to transform a retreat into a medium-range battle on opposite courses.³¹ The Second Battle Squadron was best equipped to deal with the high and varying change-of-range rates that would characterize such conditions; for this and other reasons it may have been designated to lead the fleet into battle, as was to be the case at Jutland.³²

Jellicoe seems to have responded with an instruction to the Grand Fleet prescribing methods of gunnery that were suitable for a medium-range battle and conversely discouraging the use of director firing, a centralized system of aiming all the guns of the main battery of a capital ship, which was essential for accurate shooting at long range.³³ Moreover, Jellicoe stressed not only the general importance of fast firing but its specific importance with respect to those battleships that were best equipped to carry it out. This instruction, dated 18 January 1915, stated that

experience has shown that under really favourable conditions firing by direct gunlaying is superior to director firing both as regards rapidity and accuracy of fire, markedly so in the matter of rapidity in ships fitted with quick elevating valves and presses [to train, elevate, and depress the gun barrels], as are the latest ships, if there is an awkward yaw [lateral motion of the ship's bow] and roll. . . . The fact is that in a turret ship the director is in some respects more difficult to handle well than is a gun, and therefore an awkward motion, yaw, turns, particularly with a second-rate director layer, often results in inaccurate or a reduced rate of fire. . . . It cannot be too strongly emphasized that volume of accurate fire is the object to be aimed at—the ship which *first* succeeds in hitting hard gets halfway to victory. We know the Germans shoot well, no one doubts that the advantage of early hits is thoroughly appreciated by them, and that they will do their utmost to develop initial superiority of fire by rapidity, which as our guns are more powerful, is their *only* chance of succeeding. . . . It follows, therefore, that our system must be that which, under the condition existing at the time, will enable the highest rate of accurate fire to be developed.³⁴

In February 1915, following the tactical victory of the British battle cruisers under the command of Vice Admiral Sir David Beatty over their German counterparts at Dogger Bank, Admiral Friedrich von Ingenohl, the commander of the German battle fleet, was replaced by Admiral Hugo von Pohl. During the first two weeks of March, the combination of signals intelligence and this change in

leadership prompted the Admiralty to warn Jellicoe of a possible German battle fleet sortie.³⁵ In the meanwhile, the Grand Fleet conducted gunnery exercises replicating the conditions of a medium-range fight.³⁶ An exercise of 9 March envisioned an action in which a fleet that “desires to engage at long range” was opposed by one that “desires to close to 11,000 yards or less.” The exercise of 12 March involved a battle in which visibility was assumed to be only ten thousand yards.³⁷ Following these experiments, Jellicoe added a gunnery addendum to the Grand Fleet Battle Orders on 20 March 1915. “At all ranges,” he declared, “the early development of accurate rapid fire is the object to be kept in view.” Jellicoe made clear that he expected gunners to resort to rapid independent fire, a method of shooting that was most effective at medium ranges, as well as rapid

Tabletop war games in the battleship Benbow explored an engagement between the British and German battle fleets at eighteen thousand yards.

salvos. Also, given the likelihood that the poor visibility conditions typical of the North Sea might restrict shooting to medium ranges, he insisted that “ships must be prepared to open rapid fire from

the outset in order to make sure of establishing initial superiority.”³⁸ Jellicoe’s misgivings about director gunnery were also still in evidence in the late spring. On 20 April, Jellicoe discouraged the use of directors improvised because of delays in the supply of factory models “except under conditions when the ordinary method of firing [that is, direct laying, in which each turret’s crew aimed its own guns] cannot be employed.”³⁹ It is, he observed on 27 May, “more difficult to handle a director well than it is to lay a gun.”⁴⁰

British expectations that the Germans would seek a decisive fleet action peaked in April. “In my view,” Fisher wrote to Churchill, the First Lord, on 31 March, “there are many indications—of which the recent cruise of the German Fleet is an example—that under their new Commander-in-Chief we may anticipate a more forward and aggressive policy in the North Sea, and therefore we must be prepared for all eventualities.”⁴¹ In mid-April, the crisis seemed to have arrived. On 15 April, Fisher warned Jellicoe that “VON POHL HAS SOMETHING ON! That is quite certain!”⁴² The next day, Fisher wrote, “Von Pohl is assuredly up to something.”⁴³ The Germans, however, aborted their deployment. “We really thought,” Fisher confided to Jellicoe on 17 April, “the battle would be joined to-day! Everything pointed to it. . . . They had arranged not to return till dawn of [the] 19th or night of [the] 19th, and suddenly a very urgent and immediate order [was] given for the whole Fleet to return home.”⁴⁴ A second scare followed a week later, but again the German fleet withdrew to its base after staying well beyond the reach of Jellicoe’s forces.⁴⁵ These events convinced Fisher that a battle fleet showdown with the Germans was unlikely. There would, he declared to

Jellicoe on 23 April, “NEVER be a battle with the German High Seas Fleet unless von Pohl goes north specially to fight you, *and that he never will!* That’s the situation and you can’t alter it!”⁴⁶

There remained the possibility that luck or good intelligence would enable Jellicoe to intercept the German battle fleet, which might then be engaged at a distance as it attempted to withdraw. As early as 2 April, the Grand Fleet carried out a gunnery exercise in which battleships fired at sixteen thousand yards.⁴⁷ It should be noted, however, that Jellicoe restricted ships whose gun crews had not been fully worked up to methods of firing best suited to a medium-range fight, a decision implying that mastery of these techniques had priority over those needed for effective gunnery at long range.⁴⁸ Gunnery exercises on 6 June were carried out at no more than twelve thousand yards, and perhaps less, with apparently good results.⁴⁹ Jellicoe thus informed Admiral Sir Henry Jackson, the First Sea Lord, on 16 June, “If only we could get our chance to finish off the High Seas Fleet now, I feel we are in the pink of condition. But we must exercise patience.”⁵⁰ In late June, tabletop war games in the battleship *Benbow* explored the nature of an engagement between the British and German battle fleets at eighteen thousand yards, with the former in pursuit of the latter.⁵¹ There are no records of the proceedings, but on 23 June 1915 Jellicoe informed Beatty that the participants had “certainly learned lessons.”⁵² In early August, the Grand Fleet carried out gunnery exercises that involved shooting at seventeen thousand yards for newer dreadnoughts and twelve thousand for the older units, whose main-battery guns were smaller.⁵³ This was followed in early September by an exercise at sea that dealt with the case of a retiring German fleet.⁵⁴

Firing at extended ranges, where the percentage of hits to rounds fired would be low and thus quick decisions would be improbable, meant that pursuit, even if successful, would be protracted. This would give the Germans ample opportunity to launch attacks with their destroyers and possibly even to maneuver in ways that would draw the Grand Fleet into a minefield or submarine ambush.⁵⁵ Arthur James Balfour, Churchill’s successor as First Lord, advised Jellicoe that he was convinced that the problem posed by a German retreat covered by mines and submarines was insoluble. Jellicoe, in his reply of 10 July, did not answer his chief’s concerns directly but did make it clear that he would never advance without a full destroyer screen.⁵⁶

Given his record of caution and recent declaration of prudent conduct in the face of threats from underwater ordnance, Jellicoe must have been surprised and offended by a suggestion from Beatty in early August that the Grand Fleet had focused on the use of heavy guns to the point of denying the powers of the mine and torpedo their due. This provoked a strong response from Jellicoe on 7 August. He insisted that he had been “most fully alive, ever since the war began, to

the extremely important part which mines and submarines are likely to play in the fleet action, if fought where the Germans want it.”⁵⁷ At the same time, Jellicoe categorically rejected the charge that the Grand Fleet was “obsessed with the idea . . . that we place reliance in our guns alone,” insisting that indeed some members of his command placed “too little reliance on the gun.”⁵⁸ Given the German numerical superiority in destroyers, Jellicoe believed he had no choice but to deploy his own flotilla defensively, which meant that decisive victory, if it was to be had at all, would have to be produced by the action of heavy gunnery. Beatty, in his reply to what he regarded as a rebuke for perceived defeatism, conceded on 12 August that the Grand Fleet’s gunnery advantage was “at present . . . our only asset” and endorsed the proposition that “decisive victory is the only thing to aim at.”⁵⁹

Looking to effective gunnery as the main source of decisive victory, however, raised difficult issues. In September 1915, Frederic Dreyer, the captain of a battleship in the Second Battle Squadron and Jellicoe’s chief gunnery adviser, observed that the “experience of the War must have shown the Germans that they have little or no hope in clear weather of getting their Battle Line to so close a range as 8,800 to 6,000 yards from the Grand Fleet.” Dreyer argued that British rangefinders and associated fire control equipment could in clear weather produce “excellent results” at up to fifteen thousand yards and “good results” from fifteen to seventeen thousand yards.⁶⁰ But poor weather conditions in the North Sea limited visibility more often than not, and in any case the rate of hitting from above ten thousand yards was far less, even under ideal conditions, than it was at seven to nine thousand. This meant that British ships would require a much longer time to inflict heavy damage while steaming on a straight course than in a medium-range engagement, which would expose them to torpedoes fired by German battleships or destroyers. German torpedoes at their high-speed setting had a maximum range of roughly ten thousand yards. Dreyer thus argued that the British battle line should maintain a distance of 13,500 yards from German battleships and accompanying destroyers, which was far enough to avoid torpedoes from the former and allow defensive action by British cruisers and destroyers against the latter. Should the British screening units fail to intercept the attacking German flotilla, Dreyer insisted that the Grand Fleet “*must* turn away . . . even if this means losing the High Sea [*sic*] Fleet (better than losing the Grand Fleet).” Dreyer concluded, “If we deployed at 18,000 yards in very clear weather we should, with our superior Fleet speed, be able to close in to 13,500 yards with all guns bearing . . . —before Fire is ordered to be opened at about 15,000 yards—unless the Germans open fire before we arrive at that range.”⁶¹

Dreyer’s counsel, which by his own admission represented a compromise between countering the torpedo threat and meeting the requirements of gunnery,

offered little hope of decisive results. Commander Roger Backhouse, a member of Jellicoe's staff, believed, on one hand, that 13,500 yards was too low to ensure security against German destroyers, while on the other hand, he was convinced that assuming the German flotilla threat could be neutralized the fighting range should be from ten to twelve thousand yards. This, he argued, would allow decisive results to be obtained in good time.⁶² Jellicoe, for his part, had no alternative but to accept action that would most likely have to take place at ranges considerably greater than those at which his main batteries could hit consistently. Although the documentary record is sparse for the fall of 1915, it appears that gunnery exercises in October and later were for the most part carried out at ranges above fifteen thousand yards.⁶³ By this time, long-range hitting capability had been greatly improved by the fitting of directors in the majority of the dreadnought battleships.⁶⁴ That being said, continued belief in the possibility of a medium-range engagement seems to have prompted a test of the Grand Fleet's capacity to shoot accurately with methods of fire control that facilitated high rates of shooting. This exercise, which took place in late December, was apparently reassuring.⁶⁵

The general revised edition of the Grand Fleet Battle Orders of December 1915 established rules of engagement that balanced the views of both Dreyer and Backhouse. "In weather of good visibility," Jellicoe maintained, "the range should be between 15,000 and 10,000 yards; the later being reached as the enemy's fire is overcome; in the *early* stages of action I do not desire to close the range much inside 14,000 yards."⁶⁶ The torpedo threat was to be avoided by keeping the range long. "The torpedo menace," Jellicoe warned,

must always be borne in mind. . . . Until the enemy is beaten by gunfire it is not my intention to risk attack from his torpedoes, although [it] is always possible that if we were inferior in strength on meeting it might become necessary to close sufficiently to attack by torpedoes. Such a movement would, however, be ordered by me, and generally speaking it is to be understood that my intention is to keep outside torpedo range of the enemy's battle line.⁶⁷

Jellicoe made it clear, as he had in his instructions of August 1914, that effective long-range shooting was important in order to disrupt German deployment for a medium-range engagement.⁶⁸ Nonetheless, Jellicoe added to the orders a section declaring that circumstances could arise in which the leading squadron would be "gradually closing with a view to obtaining decisive results with gunfire and for the purpose of firing their torpedoes, but not being followed to that closer range by our center or rear."⁶⁹ Here again Jellicoe may have been thinking specifically of the Second Battle Squadron, at this date still the only squadron of the Grand Fleet made up completely of ships with heavier main batteries

and, with one exception, the latest fire control equipment (see table and note 32), and which would, as noted, be deployed in the lead at the battle of Jutland in 1916.

It would thus appear that by late 1915 Jellicoe had decided to fight a long-range engagement to disrupt German intentions of fighting at medium range with both their battleships and flotillas, but also under the right conditions to resort to a medium-range fight with his best squadron to achieve a decisive victory. The fact that a medium-range battle was still considered a serious possibility would explain why the revised edition of the Royal Navy's *Manual of Gunnery*, which was released in January 1916, covered fire control methods and gunlaying practices that were appropriate to a medium-range as well as

The British dreadnoughts coming into service from 1912 onward could place more than ten times the weight of projectile on target than earlier dreadnoughts.

long-range battle.⁷⁰ Also, Jellicoe at this point probably had reasons to believe that the German battle fleet might seek action in the near future. The Germans' abandonment of their unrestricted subma-

rine campaign against merchant shipping in September 1915, after the objection of neutral powers, most likely prompted some expectation of compensatory aggressive action by the surface fleet. The onset of the second winter of the war may also, as in the year before, have given rise to the belief that the Germans would exploit bad weather and poor visibility to conduct battle fleet operations. Finally, British intelligence may have learned of the bitter dissent in Germany between proponents of action and advocates of caution in the government and fleet.⁷¹

By the spring of 1916, the inactivity of the German battle fleet through the very season that in theory most favored the success of an inferior force had at last convinced the leaders of the Grand Fleet that decisive battle was unobtainable. Queried by Jellicoe on the issue, Beatty replied on 14 April 1916, "I think the German Fleet will come out *only* on its own initiative when the right time comes," by which he meant a sortie to engage an inferior British force. "I am firmly convinced," Beatty added, "that under no circumstances could we ever by taking the initiative induce them to commit themselves to an action which in any way could be considered decisive."⁷² Two days before, Jellicoe had informed Admiral Sir Henry Jackson, the First Sea Lord, that all the important strategic benefits of destroying the German battle fleet were being achieved by its confinement to harbor. For this reason, Jellicoe argued, "it is not, in my opinion, wise to risk unduly the heavy ships of the Grand Fleet in an attempt to hasten the end of the High Seas Fleet, particularly if the risks come, not from the High Seas Fleet itself, but from such attributes as mines and submarines."⁷³ The balance of his letter was devoted to examining the chances of attacking the German battle fleet in its

harbors or home waters with aircraft and mines. The prospects for achieving major success with such operations, Jellicoe concluded, were not good.⁷⁴

The belief that the Germans would sooner or later seek a decisive engagement at medium range largely determined the character of British tactical thinking about a battle fleet action in the North Sea during the first twenty months of the war. British tactical preparation during this period went through four stages. From August to December 1914, the Grand Fleet lacked the material means for the decisive victory at medium range envisioned by the clandestine preempters prior to hostilities. Admiral Sir John Jellicoe, commander in chief of the Grand Fleet and the leader of the clandestine preempters, was thus compelled to adopt a cautious battle plan based upon fighting at long range, which made a decisive action in the near term unlikely. From January to May 1915 the Grand Fleet's ability to fight the medium-range action called for by the clandestine preempters before the war was improved significantly by the commissioning of new battleships, reduced losses from mechanical defects, modernization of older units, and destroyer reinforcements. During this time, Jellicoe welcomed the prospect of a head-to-head encounter with the German battle fleet, and he was probably prepared to commit his command to a medium-range battle in order to achieve a decisive victory. German refusal to challenge British control of the North Sea with their battle fleet, however, forced Jellicoe to modify his tactical planning. From June through October 1915 the Grand Fleet conducted a series of gunnery and tactical experiments to explore the possibilities of fighting a long-range action against a German opponent who was unwilling to fight at medium range, while simultaneously maintaining the capacity to fight a medium-range battle in the event of a German change of heart or a meeting engagement in poor visibility. From November 1915 to April 1916, the Grand Fleet was more or less prepared to fight either a medium-range or a long-range engagement depending on circumstances, adopting what was to a degree the approach of the agnostic opportunists.

Six assessments can be made on the basis of the foregoing analytical summary. First, British tactical preparations before and during the war were driven by the need to address the threat posed by a specific enemy whose tactical intentions were highly dangerous. Second, during the war, British tactical practice altered when the German navy did not behave as expected, which is to say that in spite of the lack of a major battle, British tactical thought was dynamic, not static. Third, the development and maintenance of the capability to outfight the German battle fleet at medium range was the primary objective of British tactical preparation up to the end of 1915, and probably through the spring of 1916; meeting the requirements of a long-range action took second place, which may

explain the defects in British gunnery at long range eventually exposed by the battle of Jutland. Fourth, the response of the clandestine preempters to the threat posed by a German fleet determined to fight a medium-range engagement was well advised, because the German navy's operational leadership might have decided to heed Tirpitz's call for a naval offensive, in which case a British battle fleet unprepared to fight at medium range could have been roughly handled, if not defeated. Fifth, the fact that the British battle fleet was ill prepared to fight a medium-range action in the first five months of the war suggests that Tirpitz's argument for the aggressive deployment of the German battle fleet had more in its favor than has previously been supposed. Sixth and finally, given the effort invested in developing and maintaining the ability to fight effectively at medium range, it seems likely that had the opportunity presented itself at the battle of Jutland, Jellicoe would have reached for decisive victory through a medium-range fight.

The story of Britain's naval "agnostic opportunists" and "clandestine preempters" in the early twentieth century illustrates what might be described as the fundamental dilemma of operational planning. On the one hand, belief that future hostilities will pose a range of different circumstances can promote preparation of the armed forces for a diverse set of actions, with the drawback that the consequent division of effort with respect to both equipment and training will preclude the achievement of levels of tactical proficiency needed to achieve decisive victory. On the other, the conviction that the future is predictable can lead to the preparation of the armed forces to fight one kind of engagement, but at the risk that such a course will produce serious or even critical weaknesses should events transpire differently than had been anticipated. Choice of operational approach, in other words, is a matter of having to consider the advantages and drawbacks of two problematical alternatives. This policy quandary might be expressed in terms of the opposition of two well-known maxims, Jomini's insistence upon concentration of force as the basis of all military success, and Voltaire's observation that "the best is the enemy of the good."

NOTES

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1. For guidance to the enormous literature on Jutland, see Eugene L. Rasor, *The Battle of Jutland: A Bibliography* (New York: Greenwood, 1992). For the most recent comprehensive consideration of Jutland, see Andrew Gordon, *The Rules of the Game: Jutland and British Naval Command* (Annapolis, Md.: Naval Institute Press, 1996).

2. For the most recent serious consideration of naval action in the North Sea during the first six months of the war, see James Goldrick, *The King's Ships Were at Sea: The War in the North Sea August 1914–February 1915* (Annapolis, Md.: Naval Institute Press, 1984).
3. Arthur J. Marder, *From the Dreadnought to Scapa Flow: The Royal Navy in the Fisher Era, 1904–1919*, 5 vols. (London: Oxford Univ. Press, 1961–70), vol. 1, pp. 395–404.
4. K. G. B. Dewar, *The Navy from Within* (London: Victor Gollancz, 1939), pp. 122–23, 133–34, 153; Lord Chatfield, *The Navy and Defence: The Autobiography of Admiral of the Fleet Lord Chatfield* (London: William Heinemann, 1942), p. 114; and Winston S. Churchill, *The World Crisis*, 6 vols. (New York: Scribner's, 1923–31), vol. 3, p. 131.
5. See Jon Tetsuro Sumida, "The Quest for Reach: The Development of Long-Range Naval Gunnery in the Royal Navy, 1901–1912," in *Tooling for War: Military Transformation in the Industrial Age: Proceedings of the Sixteenth Military History Symposium of the United States Air Force*, ed. Stephen Chiabotti (Chicago: Imprint, 1996), pp. 49–96, and "A Matter of Timing: The Royal Navy and the Tactics of Decisive Battle, 1912–1916," *Journal of Military History* 67 (January 2003), pp. 85–136.
6. Memorandum HF 0235, "Remarks on the Conduct of a Fleet in Action, Based on the Experience Gained in the Maneuvers and Exercises of the Home Fleets during the Year 1913," 5 December 1913; and Memorandum HF 03, "Conduct of a Fleet in Action. Commander-in-Chiefs Instructions," 14 March 1914; both T25346-T25410, Backhouse Papers, Naval Library, Ministry of Defence.
7. Nicholas A. Lambert, "'Our Bloody Ships' or 'Our Bloody System'? Jutland and the Loss of the Battle Cruisers, 1916," *Journal of Military History* 62 (January 1998), pp. 32–33.
8. G. A. Callaghan, "Remarks on Rangefinder Control," *Home Fleets General Orders No. 14*, 5 November 1913, DRAX 1/9, Drax Papers, Churchill College, Cambridge, U.K.
9. Nicholas A. Lambert, *Sir John Fisher's Naval Revolution* (Columbia: Univ. of South Carolina Press, 1999), pp. 287–88.
10. See Sumida, "Matter of Timing," p. 100, note 42; Patrick J. Kelly, "Strategy, Tactics, and Turf Wars: Tirpitz and the Oberkommando der Marine, 1892–1895," *Journal of Military History* 66 (October 2002), p. 1048.
11. Arthur Hungerford Pollen, "Of War and the Rate of Change," December 1910–January 1911, in *The Pollen Papers: The Privately Circulated Printed Works of Arthur Hungerford Pollen, 1901–1916*, ed. Jon Tetsuro Sumida (London: Navy Records Society, 1984), pp. 281–82, 286–87.
12. See, for example, J. R. Jellicoe, "Type of Gun to Be Adopted for the Armoured Vessels of the 1907–08 Programme. Whether a 13.5" Gun or a 12" Triple Gun Turret," 21 June 1906, Ship's Cover vol. 223 (HMS *Bellerophon*), National Maritime Museum, Woolwich.
13. See Sumida, "Matter of Timing."
14. "Rangefinder Mountings," CP 19513/14, 30 July 1914; and "Table Shewing Number of Rangefinder Operators Who Will Be Required for the Fleet in the Near Future," 8 November 1913; both in *Important Questions Dealt with by D.N.O.; Copies, Precise, &c.; Vol. III: 1914*, Naval Library, Ministry of Defence.
15. W. W. Fisher, "Two Fleets in Single Line Ahead Engaged on Opposite Course," n.d.; [Probably Cdr. Roger Backhouse], "Action on Opposite Courses," n.d.; G. A. Callaghan, "Memorandum: Tactics of Two Fleets Engaged on Opposite Courses," 20 April 1914; all Backhouse Papers.
16. A. Temple Patterson, ed., *The Jellicoe Papers: Selections from the Private and Official Correspondence of Admiral of the Fleet Earl Jellicoe of Scapa*, 2 vols. (London: Navy Records Society, 1966–69), vol. 1, pp. 41–42.
17. Paul G. Halpern, *A Naval History of World War I* (Annapolis, Md.: Naval Institute Press, 1995), p. 39.
18. Adm. Sir John Fisher, Jellicoe's patron, warned him not to expose his fleet to German flotilla attacks, for which see Fisher to Jellicoe, 29 August 1914, in *Fear God and Dread Nought: The Correspondence of Admiral of the Fleet Lord Fisher of Kilverstone*, ed. Arthur J. Marder, 3 vols. (London: Jonathan Cape, 1952–59), vol. 3, p. 56.
19. "Addendum No. 5" [n.d. but September 1914], *Jellicoe Papers*, ed. Patterson, vol. 1, p. 63.

20. Jellicoe to the Secretary of the Admiralty, 30 October 1914, *ibid.*, p. 76.
21. Halpern, *Naval History of World War I*, p. 38. For the up-to-date character of the gun mountings of at least one of the foreign battle-ships taken over by the Royal Navy in 1914, see Vickers Limited, Sir W. G. Armstrong, Whitworth and Co., Ltd., *Specification of Armament for a First-Class Battleship for the Imperial Ottoman Government*, n.d., p. 34, Naval Library, Ministry of Defence, JA 353.
22. Jellicoe to the Secretary of the Admiralty, 4 December 1914, *Jellicoe Papers*, ed. Patterson, vol. 1, p. 102.
23. Sir Julian S. Corbett and Sir Henry S. Newbolt, *Naval Operations*, 5 vols. (London: His Majesty's Stationery Office, 1920–31), vol. 2, p. 4. See also Fisher to Jellicoe, 17 November 1914; Jellicoe to Fisher, 2 December 1914; Fisher to Vice Adm. Sir David Beatty, 7 December 1914; Fisher to Jellicoe, 21 January 1915; Fisher to Jellicoe, 8 March 1915; all *Fear God and Dread Nought*, ed. Marder, vol. 3, pp. 74, 85–86, 89–90, 142, 163, respectively.
24. Admiral Viscount Jellicoe, *The Grand Fleet 1914–16: Its Creation, Development and Work* (London: Cassell, 1919), p. 188.
25. See Sumida, “Matter of Timing,” p. 116.
26. Fisher to Winston Churchill, 20 January 1915, *Fear God and Dread Nought*, ed. Marder, vol. 3, pp. 137–38; and Jellicoe, *Grand Fleet*, p. 396.
27. Marder, ed., *Fear God and Dread Nought*, vol. 3, p. 129.
28. Jellicoe, *Grand Fleet*, p. 393; and see Dreyer remarks in September 1915 below.
29. Great Britain, Admiralty, Intelligence Department, *German Tactical Orders*, January 1915, pp. 5–8, ADM 137/17, Public Record Office, Kew.
30. Marder, *From the Dreadnought to Scapa Flow*, vol. 3, rev. ed., p. 119 note 33.
31. See note 15.
32. Of the eight ships in the Second Battle Squadron, four were equipped with the Argo Clock Mark IV. This machine was more effective under conditions of high and changing change-of-range rates than the computing devices in the Dreyer tables that were standard in most of the battle fleet. Three of the four remaining ships were fitted with the better of the two main forms of computing mechanisms to be found in Dreyer tables. For the two systems compared, see Sumida, “Quest for Reach,” pp. 69–72.
33. For director firing and other gunnery issues, see Sumida, “Matter of Timing,” pp. 134–46.
34. “Remarks on the Use of Director Firing from the Main Armament,” 18 January 1915, ADM 137/199S, Public Record Office, Kew. I am indebted to Dr. Nicholas Lambert for this reference.
35. Fisher to Jellicoe, 8 March 1915; Fisher to Jellicoe, 16 March 1915; Fisher to Jellicoe, 17 March 1915; all *Fear God and Dread Nought*, ed. Marder, vol. 3, pp. 163, 166.
36. Documentary information on gunnery exercises prior to the battle of Jutland is sparse, for which see Great Britain, Admiralty, Naval Staff, Gunnery Division, *Extract of Gunnery Practices in Grand Fleet, 1914 to 1918: Battleships and Battle Cruisers*, March 1922, p. 2, ADM 137/4822, Public Record Office, Kew. That being said, probably a great deal of gunnery practice, if not the majority, was devoted to medium-range firing—that is, shooting at ten thousand yards or less. Practice at longer ranges in 1914 appears to have been opportunistic and, in two out of the three recorded cases, at stationary targets, for which see Jellicoe, *Grand Fleet*, pp. 147–48, 156, 158, and 182, and Admiral Sir Frederic C. Dreyer, *The Sea Heritage: A Study of Maritime Warfare* (London: Museum, 1955), pp. 89, 90, and 91. According to Jellicoe, practice at ranges above ten thousand yards did not begin in earnest until the late summer of 1915, for which see Jellicoe, *Grand Fleet*, p. 65.
37. Memorandum HF 0037/1, 6 March 1915, and HF 0037/2 Memorandum “Exercise C,” 12 March 1915, both Backhouse Papers.
38. Gunnery Addendum, 20 March 1915, in Naval Staff, T. and S.D. Division, *Grand Fleet Battle Orders*, vol. 1, *August 1914 to May 31st 1916*, p. 96, Naval Library, Admiralty, London.
39. “Section ‘B.’ Grand Fleet Orders. 1915,” April–September 1915, p. 33, ADM 137/4051, Public Record Office, Kew.
40. “Section ‘B.’ Grand Fleet Orders,” p. 47.
41. Marder, ed., *Fear God and Dread Nought*, vol. 3, p. 179.

42. *Ibid.*, p. 196 [uppercase in the original].
43. *Ibid.*, p. 197.
44. *Ibid.*, p. 198.
45. Fisher to Jellicoe, 21 and 23 April 1915, *Fear God and Dread Nought*, ed. Marder, vol. 3, pp. 199, 200, respectively.
46. Marder, ed., *Fear God and Dread Nought*, vol. 3, p. 200 [uppercase and italics in the original].
47. Memorandum HF 0034/1, "Grand Fleet Firings—5th April 1915," 2 April 1915, Backhouse Papers.
48. Jellicoe specifically prohibited certain ships from using director fire, prescribing instead the "gunlayers system"—that is, direct laying, which allowed faster shooting.
49. Memorandum HF 0037/7, "Enclosure No. 1," in "Orders for Full Calibre Day Firing," 6 June 1915, Backhouse Papers.
50. Jellicoe to Adm. Sir Henry Jackson, 16 June 1915, *Jellicoe Papers*, ed. Patterson, vol. 1, p. 167.
51. Memorandum HF 0037/19, 10 July 1915, "War Game Carried Out on *Benbow* on 22 and 23 June 1915," ADM 137/2020, Public Record Office, Kew.
52. Jellicoe to Beatty, 23 June 1915, *Jellicoe Papers*, ed. Patterson, vol. 1, p. 168.
53. Memorandum HF 44/59, "Orders for Target Practice from Cromarty, Monday, 2nd August," 30 July 1915, Backhouse Papers; and Jellicoe, *Grand Fleet*, pp. 236–37.
54. Memorandum HF 0011/17, 31 August 1915, Backhouse Papers; and Jellicoe, *Grand Fleet*, p. 245.
55. For the British fear that Zeppelin reconnaissance would enable the Germans to set up such attacks, see Beatty to Jellicoe, 12 August 1915, in *The Beatty Papers: Selections from the Private and Official Correspondence of Admiral of the Fleet Earl Beatty*, ed. B. McL. Ranft, 2 vols. (Aldershot, U.K.: Scolar Press for the Navy Records Society, 1989–93), vol. 1, pp. 279–80.
56. Jellicoe to Balfour, 10 July 1915, *Jellicoe Papers*, ed. Patterson, vol. 1, p. 172.
57. Jellicoe to Beatty, 7 August 1915, *ibid.*, p. 175.
58. *Ibid.*, p. 176.
59. Beatty to Jellicoe, 12 August 1915, *Beatty Papers*, ed. Ranft, vol. 1, p. 281.
60. Dreyer was being more than optimistic, for which see Lt. J. W. Rivett-Carnac (one of Dreyer's subordinates in the battleship *Orion*), "Notes on Rangefinders and Their Operators in H.M. Ships of the Grand Fleet," 29 March 1915, ADM 137/199S [I am indebted to Dr. Nicholas Lambert for this reference], and "Report of Proceedings by Commander Richard T. Down, R.N. during visit to Washington—6th May to 27th June," 27 June 1917, pp. 5–6, ADM 137/1621, Public Record Office, Kew.
61. Capt. Frederic Dreyer, "A Few Notes on the Determination of the Most Advantageous Range at Which the Grand Fleet Should Engage the High Seas Fleet" [n.d. but September 1915, for which see Roger Backhouse response dated 15 September 1915], Jellicoe Papers, Additional Manuscripts 49012, British Museum, London [italics in the original].
62. Roger Backhouse minute, 14 September 1915, Jellicoe Papers, Additional Manuscripts 49012, British Museum, London.
63. Memorandum HF 44/88, "Orders for Full Calibre Target Practice from Cromarty, Tuesday, 5th October, 1915," 29 September 1915, Backhouse Papers; and Jellicoe, *Grand Fleet*, pp. 65, 252–63.
64. In August 1914, eight dreadnought battleships had been fitted with directors, as opposed to nineteen in December 1915, for which see Great Britain, Admiralty, Technical History Section, *Fire Control in H.M. Ships*, December 1919, pp. 10–11, Naval Library, Ministry of Defence.
65. Memorandum HF 44/134, "Full Calibre Target Practice in the Moray Firth, Monday, 20th December, 1915," 14 December 1915, ADM 137/2020, Public Record Office, Kew; Jellicoe to Beatty, 22 December 1915, *Jellicoe Papers*, ed. Patterson, vol. 1, pp. 190–91; Jellicoe, *Grand Fleet*, pp. 262–63; and *Extract of Gunnery Practices in Grand Fleet*, p. 2. Jellicoe's remarks in his memoirs are probably misleading, and they should be compared with the referenced documents and correspondence.
66. Great Britain, Admiralty, Naval Staff, T. and S.D. Division, *Grand Fleet Battle Orders*, vol.

- 1, *August 1914–May 31st 1916*, p. 294, ADM 116/341, Public Record Office, Kew [emphasis original].
67. Ibid.
68. Ibid.
69. Ibid. Jellicoe might even have ordered a deployment that brought the center and rear of the Grand Fleet within torpedo range, for which see Jellicoe, *Grand Fleet*, p. 407.
70. Great Britain, Admiralty, Gunnery Branch, *Manual of Gunnery (Volume III) for His Majesty's Fleet, 1915*, January 1916, Naval Library, Ministry of Defence.
71. Halpern, *Naval History of World War I*, pp. 302–303.
72. Ranft, ed., *Beatty Papers*, vol. 1., p. 303 [italics in the original]; also Patterson, ed., *Jellicoe Papers*, vol. 1, pp. 235–56.
73. Jellicoe to Jackson, 12 April 1916, *Jellicoe Papers*, ed. Patterson, vol. 1, p. 232.
74. Jellicoe to Jackson, 12 April 1916, *ibid.*, pp. 232–34.