The Age of the Ship of the Line
The British and French Navies, 1650-1815
Jonathan R. Dull
University of Nebraska Press

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1. The Ship of the Line Begins Its Reign

I

Between the 1650s and the 1850s, naval warfare was ruled by the ship of the line and the line of battle after which it was named. These huge three-masted wooden ships were some 120 to 210 feet long with a beam (width) of 30 to 60 feet. They carried between 40 and 130 cannon mounted along two, three, or, in the case of the Spanish ship of the line *Santísima Trinidad*, four decks.[1] The ship of the line was the most expensive, technologically advanced, and visually impressive weapon of its day. It also was the measure of national naval power, like the dreadnought of World War I or the aircraft carrier of World War II. The line of battle—a string of warships following each other bow to stern—was the best way to bring its power to bear, as each ship thus could give support to neighboring ships. Only in shallow or poorly charted waters, like the eastern Baltic, was the ship of the line not dominant; there the galley, a shallow-draft oar-powered warship, continued to play a major role throughout the eighteenth century.

The era of the ship of the line began when its two components, the ship of the line and the line of battle, were combined. That time was long in coming. The line of battle is so logical an arrangement that the earliest groups of European ships carrying cannon

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sometimes made use of it. A Portuguese fleet commanded by Vasco da Gama seems to have employed a line of battle off the coast of India in 1502.[2] Its use was intermittent, however, because its main advantage was mutual support in an artillery duel. Some naval battles consisted of such duels; the English, for example, foiled the Spanish Armada of 1588 by the use of cannon. Until the middle of the seventeenth century, however, naval warfare often involved either boarding (ships grappling an opponent and then dispatching a boarding party) or the use of fire ships (setting ships on fire in order to ram them into enemy vessels). The Dutch, who by the 1640s had become the greatest naval power in Europe, were masters of a variety of tactics. In 1639, they used both a line of battle and fire ships against a huge Spanish fleet off the English coast.[3]

The use of great ships of 50 or more cannon also was long established by 1650. Most major naval powers had one or more of these ships, such as the English *Prince Royal* of 55 cannon, launched in 1610, and the *Sovereign of the Seas*, 90 cannon, launched in 1637, or the French *Couronne*, 68, launched in 1638. These ships, however, were clumsy to sail and expensive to build, man, and maintain. As an admiral's flagship they could be useful in a battle, but without other ships of similar size they could not alter the disorganized melee of a naval battle based on boarding or the use of fire ships. Fleets during the first half of the seventeenth century were very heterogeneous, moreover, frequently consisting mostly of converted merchant ships.

A turning point came in 1649 when the Parliament of England decided to build a group of very large and heavily armed frigates (fast, medium-sized warships usually carrying 20 or more cannon) that was the predecessor of groups (or "classes") of ships of the line of a standard size. The thirteen ships of the *Speaker* class, launched

between 1650 and 1654, were of roughly similar size (about 750 tons) and carried 48 to 56 cannon; in tonnage and armament they were similar to a very large galleon, the chief warship of the late sixteenth and early seventeenth centuries and still the mainstay of the Spanish navy, but they were longer, lower, and faster than galleons. No other navy had a group of ships to match them; the Dutch navy, hitherto Europe's best, continued to rely chiefly on taking merchant ships into naval service.[4]

The line of battle first was used, however, before most of the *Speaker* class were launched. Both England and the United Provinces of the Netherlands were republics, Charles I of England having been executed in 1649. Both were Protestant, too, although different enough in persuasion to create tension. It could be argued that they were natural allies against Catholic monarchies such as Spain and France; at any rate, geography did not automatically make them enemies. They were bitter trade rivals, however. Outside of Europe, trade rivalry, particularly for spices in Asia or slaves in Africa, frequently involved the use of force. As there were no effective international means of mediating disputes, the Netherlands and England were unable to resolve their trading disputes, and each feared domination by the other. As the crisis worsened, each tried to intimidate the other, leading in 1652 to a war that could have been avoided.[5]

Although the new English battle fleet temporarily disrupted Dutch shipping and fought several battles, the first campaign of the war was indecisive. On 29 March 1653 the three officers jointly commanding the English navy issued instructions that guaranteed its fleets henceforth would fight in a battle line. Two months later the English won a smashing victory off the Gabbard shoal in the North Sea, largely due to their use of the line of battle.[6] This marriage of

ship and tactics endured for two centuries. The sailing ship line of battle dominated naval warfare through the Battle of Sinope in 1853, in which a line of Russian ships of the line destroyed a group of Turkish frigates. During the ensuing Crimean War of 1854–56, ships of the line, including some equipped with auxiliary steam power, were the chief naval weapon, although by now they were vulnerable to explosive shells. The death blow to the ship of the line, however, was the launching of the first iron warships in the early 1860s.[7] The line of battle persisted through the age of iron and steel battleships, though, until the last great fleet action, the 1944 Battle of Leyte Gulf.

II

What accounts for so enduring a marriage between this weapon and these tactics? In part, both were the product of the same technological advances, the creation of large cannon firing extremely heavy cannonballs and the development of gun ports, openings cut in the sides of ships through which cannon could fire. It took a very large ship to carry banks of cannon weighing several tons apiece. Equally important the ship needed great strength to withstand the impact of cannon balls sometimes weighing as much as 42 pounds; in the late eighteenth century, the British even developed cannon firing a 68-pound ball. Ships needed as many cannon as they could carry, using equal numbers on both sides, starboard and port. Moreover, ships needed large crews to work their sails and fire their cannon; a French cannon firing a 36-pound ball, for example, weighed more than four tons and needed fourteen men to fire it.[8] Although crew members slept and ate among the guns, ships needed space for water, food and drink, munitions, and various spare parts and supplies.

The ship of the line was like a floating fortress, but it had points of weakness that a fortress did not. Its bow and stern could not be

as strong and straight as its sides if it were to maneuver through the water, and it had room for only a few cannon facing directly ahead or astern. This made it vulnerable to a volley of cannon balls fired from directly in front or behind it. Not only could these penetrate more easily, but also once inside an enemy ship they would find little resistance, since the ship of the line was not divided into compartments like a modern steel ship. Such an attack, called "raking," usually inflicted heavy casualties and damage. A lone ship had only its speed and maneuverability to protect it from raking; on its own a ship of the line was vulnerable even to frigates, which were smaller but more nimble except in a heavy wind. The best protection for a ship of the line was having other ships of the line just ahead of and just behind it. This mutual support against raking depended on the ships sailing together in as close and straight a line as possible. This line of battle also had offensive advantages. If fleets were passing in opposite directions, each ship could pound the hulls or fire into the masts of several opponents in succession.

The line of battle also was effective, particularly as a defensive tactic, because of other limitations of wooden sailing warships. There were two major ways of overcoming a line of battle. The first was "doubling" one of the ends of the line, that is, placing warships on both sides of the enemy ships at either the front or back end of the line. The second was to break the line by a concentration of force somewhere in its middle. Both tactics were very difficult unless the attacker had a considerable advantage in numbers or skill, because it was much easier for sailing ships to keep formation and maintain mutual support while on the defensive. Difficulties in communicating between ships and in maneuvering in unison made coordinating an attack so challenging that decisions in battle usually had to be left to individual ship captains.

Throughout most of the late seventeenth and eighteenth centuries it was rare for a fleet of superior size to suffer a decisive defeat. Sir Cloudesley Shovell, one of the leading admirals at the beginning of the eighteenth century, claimed that without a miracle, numbers would gain the victory.[9] Although generally British warships were sturdier and their crews better trained that were the French, the differences in quality between them usually were not enough to produce a major victory unless there was a substantial difference in numbers. Most battles ended with few ships being lost, and generally casualties were fewer than those in land battles involving similar numbers of men. Captured French ships served alongside British ones and vice versa. Decisive battles, such as the 1759 Battle of Quiberon, usually came after the quality of French crews had drastically declined. After the onset of the French Revolution, however, the French navy underwent a rapid decline, largely due to shortages of funds, sailors, and supplies. Admiral Horatio Nelson's defeat of a larger Franco-Spanish fleet at Trafalgar was due less to his genius than to the poor quality of the fleet opposing him. Such a battle was unusual. In most cases the key factor in a battle was numerical superiority.

In spite of Nelson's victories there was relatively little evolution in naval tactics between 1660 and 1815. Similarly the evolution of the ship of the line was gradual and unspectacular until the nineteenth century. The maximum size of a ship of the line increased slowly over the seventeenth and eighteenth centuries; the 120-gun *Nelson* of 1805 was only 70 percent larger than the *Sovereign of the Seas* of 1637.[10] Vital components such as sternposts and mainmasts were best constructed from a single tree, whose maximum size was limited by nature. The British navy tried to compensate by packing more guns on the decks of its vessels, but this did not work very well;

an 80-gun French ship was almost as large and as powerful as a 100-gun British ship. The first "revolution" in the design of the ship of the line did not occur until near the end of its existence with the invention of the screw propeller and the use of steam. Admittedly the ship of the line did benefit from continual improvements such as the development in the late eighteenth century of copper plating for hulls, which retarded the growth of marine organisms.

Such improvements, even if gradual, had some effect on naval warfare. A major difference between seventeenth- and eighteenth-century navies was their endurance. The former was generally held in port during winter weather while the latter could fight year-round; the newer ships were less top-heavy and more maneuverable thanks to larger and better designed hulls and improvements in rigging and sails.[11] A second difference was a large increase in the number of seamen per ship; for example, in 1690 a French 80-gun ship carried a crew of 600, a 74-gun ship a crew of 500, and a 64-gun ship a crew of 400. By 1759 an 80-gun ship required 860 men, a 74-gun ship required 695, and a 64-gun ship required 500. Slightly more than half of the crews were petty officers and trained sailors. The remainder were ship's boys, marines, and various landsmen. The same development occurred in the British navy.[12]

The requirements for a ship to serve in the line of battle also increased. In the middle of the seventeenth century, a ship with 40 cannon qualified as a ship of the line, but by the beginning of the eighteenth century at least 48 or 50 were needed. At the Battle of Beachy Head in 1690, for example, half of the French line of battle of seventy ships were ships mounting 50 to 58 cannon, although only one had fewer than 50. By the middle of the eighteenth century, 64 cannon generally were needed, and in the 1780s, the French navy began phasing out ships carrying fewer than 74. The cumulative

effect was navies of bigger ships and more crewmen, which cost much more money. Louis XIV's navy of 1692 had ninety-five ships of the line plus half a dozen warships of 44 or 46 cannon, but only forty-nine ships carried 64 or more cannon; in 1782 the French navy had seventy-two ships of the line, of which sixty-seven carried 64 or more.[13]

III

Although the English had a head start over the Dutch in the development of both the ship of the line and the line of battle, the first war between the two states (1652–54) was not decisive. During the war, power in the Commonwealth passed from Parliament to Oliver Cromwell. Faced with other threats, he did not choose to exploit the naval supremacy gained by the English navy. He signed a compromise peace with the States General, the ruling body of the Netherlands. After Cromwell's death in late 1658, public support for the republic collapsed, in large part because of an expensive war against Spain begun in 1655. In 1660 the Stuart monarchy was restored. Naval construction slowed temporarily, largely because Parliament did not trust the new king, Charles II, but it did not completely stop.[14] Charles II was a strong supporter of the navy, and his brother James served as lord high admiral between 1660 and 1673. The navy continued to have a strong influence on British politics and diplomacy. For James and Charles, the Dutch were still the enemy, and the efforts to crush them had the potential side benefit of strengthening the monarchy against Parliament. As we shall discuss in the next chapter, England fought two more wars against the Netherlands (1665–67 and 1672–74), but they were less successful than the first had been. The Dutch learned from their shortcomings in the first war. They built larger ships and eventually adopted the line of battle.[15] They also benefited from excellent

political leadership and superb admirals. During the last of these wars, however, the Dutch were fighting for survival against another rival, one that had a far larger population than England as well as a huge army and a large navy. The English, too, soon realized that the Dutch were no longer their chief rival. A new competitor for both their navies had arisen: the navy of France.