The Newport Papers

Ninth in the Series

A DOCTRINE READER

The Navies of United States, Great Britain, France, Italy, and Spain

James J. Tritten
and
Vice Admiral Luigi Donolo, Italian Navy (Retired)

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A Doctrine Reader

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Introduction

In March 1993, the United States Navy and Marine Corps established the Naval Doctrine Command as the primary authority for the development of naval concepts and integrated naval doctrine. It has several specific roles—serving as the coordinating authority for the development and evaluation of Navy service-unique doctrine, providing a coordinated Navy-Marine Corps voice in joint and combined doctrine development, and ensuring that naval and joint doctrine are addressed in training and education curricula and in operations, exercises, and war games.

Although this was the first time the sea services had established a formal command to prepare and publish multi-service naval doctrine, it was not the first time that either service, or navies in general, had formal written doctrine. In the minds of most serving officers, however, doctrine was something new for the fleet. Newport Paper Number Nine is the first of two publications in this series which will present the story of naval doctrine's history and theory for use in war colleges, command and staff colleges, professional schools, and other centers of excellence. The major message of these pages is that naval and navy doctrine is not new and there is value today in reviewing the lessons of past doctrinal development experiences.

Under the leadership of the Naval Doctrine Command's first commander, Rear Admiral Frederick Lewis, U.S. Navy, the Command set out to examine history to learn the lessons of naval doctrine development from the past. This effort was not an attempt to publish history, as such. Instead, it was directed primarily as a study of history from the perspective of doctrine—a term generally not found in the index pages of naval historical studies. Our own navy and four European navies were selected for in-depth analysis, primarily because the history of these navies is well-documented and it was relatively easy to find the evidence of past doctrinal development once researchers became familiar with the concept.

Newport Paper Number Nine contains the results of research conducted on the navies of the United States, Great Britain, France, Italy, and Spain. Each has a unique story to tell, and each story has value for us today. This paper concludes with an interpretive essay on the relationship of doctrine to technology, particularly revolutions in military affairs (RMAs). It questions the ground forces-oriented RMA paradigm and makes a strong case for the uniqueness of naval warfare.

A forthcoming Newport Paper, which continues with two additional interpretive essays on the theory of military and naval doctrine and two essays that express the need for doctrine, takes the lessons learned from all these studies and provides the U.S. Navy and Marine Corps with the issues that must be addressed in naval doctrine publications of today.

We at the Naval War College are pleased to assist the Naval Doctrine Command through original research, doctrinal development, instruction on doctrine and its history, and publication of materials such as these which can be used as readings to support teaching. The formation and use of doctrine must be a dynamic and interactive process involving active debate and discussion of issues on the pages of our professional journals. We in Newport are committed to supporting that professional dialogue and await your contributions.

J. R. Stark
Rear Admiral, U.S. Navy
President, Naval War College

Doctrine and Fleet Tactics in the Royal Navy

James J. Tritten

THE U.S. NAVY was characterized in a recent RAND Corporation study as "the supra-national institution that has inherited the British navy's throne to naval supremacy."[1] Given the legacy of traditions that have passed from the Royal Navy to the U.S. Navy, one cannot consider naval doctrine in the U.S. Navy without first conducting an analysis of how naval doctrine evolved in Great Britain.[2] This paper reviews and analyzes doctrine in the British navy. It concludes with an assessment of the doctrinal process in the Royal Navy and with potential lessons for the U.S. Navy today.

First Stirrings: The Navy Royal and Private Enterprise

The Royal Navy's entrée into the world of written doctrine commenced with King Henry VIII, who took a great interest in the development and enhancement of a fighting "Navy Royal" in addition to a merchant fleet.[3] Henry was aware of the Spaniard Alonso de Chaves' first written substantive naval doctrinal work, *Quatri partitu en cosmografía práctica*, also known as *Espejo de navegantes* [Seaman's Glass], published in 1538.[4] Henry issued a set of written fighting instructions to develop the combat performance of his fleet. Based upon the Spanish model, they improved upon use of the artillery concept and the taking of the weather gauge (or upwind side) during battle.[5] This doctrinal principle endured until the end of the age of sail. Henry's instructions were reissued in 1544 and provided for the integration of sailing ships and rowed galleasses in a combined arms battle fleet.

During the reign of Henry VIII, the embryonic navy developed the concept of the "capital ship" with smaller supporting ships and auxiliaries and a shipbuilding base. During the reign of subsequent monarchs, the navy acquired slowly many of the characteristics of a modern composite fleet—one designed to perform a variety of tasks and command local waters. This fleet was the tool that allowed England to enter the international conflicts of the sixteenth century.

The development of the "Navy Royal" was enhanced by the experiences of English privateers and semi-pirates, who experimented with the use of artillery at sea to engage larger ships and convoy escorts. In subsequent engagements

the naval broadside was perfected. There were signs that an informal line ahead was developing into doctrine as early as the Armada battle (1588), but in general, coherent naval doctrine had to await the formation of a truly modern fleet during the Commonwealth. Ordinarily, commanders of this era did not act as components of an integrated fleet but rather as individual entrepreneurs whose primary motivation was the pursuit of prize money.

Anglo-Dutch Wars

The army-dominated English Commonwealth government followed the Dutch lead in mandating escorts for merchant ships. The Convoy Act of 1650 established a requirement for naval protection of shipping, which eventually resulted in confrontation with French and Moslem privateers and Holland. Many of the naval engagements during the subsequent Anglo-Dutch Wars (1652–1674) were fought against Dutch convoys.

Three of Oliver Cromwell's best army colonels were asked to serve as seagoing generals to lead the navy. Cromwell distrusted the monarchist tendencies of naval officers and, of course, he himself was of the army. The massing of so many cannons at sea allowed for new tactical opportunities, and they were recognized in revisions to the tactical procedures of the day.[6] Early cannon were notoriously inaccurate, hence the earliest doctrine was to amass offensive firepower close together in line ahead so that a devastating broadside could be delivered. If artillery became the "king of battle" ashore, the broadside became the *sine qua non* of battle afloat; and just as firepower bred linear tactics ashore, it led to similar developments at sea.

In addition to tactical improvement, the seagoing generals recognized also the need to improve battle management. They provided some degree of order to the general chaos of early privateering sailing ship tactics, which was brought about by, essentially, "mimicking the leader," whereby captains watched and conformed to the maneuvers of the leader (e.g., if he closed to engage, they all did). The English seagoing generals developed well-structured plans for managing as many as a hundred ships in battle, many of them privateers, and they saw the need to experiment with tactics and the overall battle plan before engaging in combat. The context for most battles was defense of and attack on convoys.

This period also marked the introduction of a new professional officer corps in England and a centralized organization for the administration of the fleet. Cromwell's reform efforts, which were supported by England's gentlemen, would result in an emphasis upon maritime forces rather than the already

powerful army.[7] Local seagoing commanders began in 1636 to issue written instructions for their subordinates.[8] Parliament issued comprehensive articles of war in 1652, and in 1653 the first comprehensive written doctrine was promulgated by a fleet commander. This written doctrine combined both sailing instructions and fighting instructions, in separate but companion volumes. The doctrine on fighting instructions was much shorter than the sailing doctrine.

Fighting instructions cannot be studied without considering sailing instructions. The fighting instructions attempted to mass firepower. The commander now had a different command and control problem than previously, since his captains would no longer simply mimic his behavior—they were required to place their ships in precise positions, which required a system of communications. However, the signal book was incomplete by itself, since, if the captain merely acted upon receipt of orders, he might fail to take advantage of a tactical opportunity in the absence of a signal or when signals could not be sent or seen. Doctrinal fighting instructions thus informed the commander how to make decisions in the absence of other more tactical directives.

The new standing orders were immediately put to the test during three Anglo-Dutch Wars in which:

- Strategically, England essentially replaced the Dutch at sea throughout the world.
- Operationally, England executed a series of campaigns including several devastating convoy battles, blockades, and bombardments of the Dutch shoreline.
- The seagoing generals more then held their own against the Dutch fleet, led by the greatest admirals of the world.

The English success was generally due to the massing of superior firepower and refusing to let the Dutch close for boarding. The defeated Dutch, on the other hand, continued to rely on the *mêlée* and had not yet accepted the primacy of artillery.

The Cromwell-era fighting instructions and other reforms were not repudiated with the dissolution of the Commonwealth. Indeed, the return of the monarchy under Charles II had a beneficial effect upon the politically untainted fleet, which was now commissioned the Royal Navy and was provided with a new benefactor, at the direct expense of the Army. The Royal Navy of this era may have had its origins in the need to protect convoys, but with the combat-proven potential of artillery and massing, doctrine began to shift to the offensive form of warfare. Simply put, the fleet could be used for other than defensive tasks.

Doctrinal sailing and fighting instructions were issued in various forms by several different fleet commanders. The instructions were flexible, issued as guidance that was unlikely to be followed scrupulously in the heat of battle. Revisions to the fighting instructions and new instructions reflecting combat lessons were issued repeatedly during the wars (in 1654, 1655, 1666, 1672), and for the first time as an integrated whole in 1672–1673.[9] These revised fighting instructions allowed for tactical flexibility on the part of the local commander—to include *mêlée* tactics and the breaking of the line. Frequently overlooked, but important, was the function of both fighting and sailing instructions for ensuring that commanders acted more as components of an integrated fleet having political aims rather than as entrepreneurs whose motivation was the pursuit of prize money.

Commanders in Chief Sailing and Fighting Instructions

Following the Anglo-Dutch Wars, newly revised fighting instructions were issued in 1678, 1688, 1690, 1691, 1695, 1702, and 1703. Many of these revisions allowed for additional initiative on the part of the local commander. The first fleet-wide sailing and fighting instructions were issued during the reign of William and Mary (1689–1702). Although the actual date of their publication is not known precisely, the instructions followed generally those previously issued in 1672–1673.

During the War of the League of Augsburg (1688–1697), the French managed to unite their Toulon and Brest fleets into one fighting unit. The numerically inferior English elected initially to maintain a "fleet-in-being" until detached units could return to bolster their defense. The concept of a fleet-in-being called for a numerically inferior force to remain in port from which it would threaten to sortie. Since it did not seek engagement, the effectiveness of the concept would depend upon the enemy's perception of its combat capability—it served more as a deterrent than a true fighting force. If the fleet-in-being could deter the French from invading England, then it would be a successful use of assets. The Crown, however, disagreed with the concept, and a combined English and Dutch fleet sortied under Admiral Lord Herbert Torrington, who was promptly defeated at the Battle off Beachy Head (Bévéziers) in 1690 by Admiral Anne-Hilarion de Costentin, Comte de Tourville. Fortunately for the English, the French were unable to capitalize upon their tactical victory.

Following successes of a combined Anglo-Dutch fleet at the 1704 Battle of Malaga, using the line-ahead formation, the English attitude toward doctrine

may have split into two camps.[10] The first camp emphasized the ability of the line ahead to bring the maximum number of guns to bear on the enemy. Malaga had demonstrated that victory was possible with a well-disciplined battle line, and it naturally followed that defeat would result when this doctrine was not followed. This first group is referred to by some historians as doctrinal "formalists." The second group placed more emphasis on independent maneuver and is referred to as the "*mêléeists*." The maneuver-oriented *mêlée* doctrine attracted some of the more dashing English commanders, who did not want to be as bound by rules and had the skills to master the freedom of maneuver warfare.

The first version of what eventually came to be known as the *Permanent Sailing and Fighting Instructions* was issued during the reign of Queen Anne (1702-1714), probably about the time that the Act of Union created Great Britain. The various instructions issued by the fleet commanders in chief, and after 1799 by the Admiralty, gradually became known as *Sailing and Fighting Instructions for Her Majesty's Fleet*. These instructions were authoritative but *not* binding on the admirals in the fleet. Although most of the fighting instructions were printed by the Admiralty for use by the fleet commander in chief, they became regulatory only when signed by the fleet admiral and issued to subordinates. Copies of the instructions were made available to all admirals when they hoisted their flags. Tactical orders based upon the instructions were mandatory for the individual ship captains who were in receipt of signals drawn from the instructions.

In 1714, a private publisher produced an unofficial book that enhanced the presentation, and presumably the comprehensibility, of the signals portion of the formal fighting instructions. Jonathan Greenwood's *The Sailing and Fighting Instructions, or Signals as They Are Observed in the Royal Navy of Great Britain* even added signals not currently in use by the fleet. This unofficial publication was adopted by at least one Mediterranean fleet commander.

Private publications of a doctrinal nature had appeared earlier in Britain. For example, *The Seaman's Vade-Mecum and Defensive War at Sea* (1700) developed recommendations for the defense of merchant shipping, including convoys. Convoy defense doctrine in this era was quite sophisticated; it was understood that the role of the escort was to sacrifice itself, if necessary, to allow the merchants to escape. Parliament passed the Cruisers and Convoys Act in 1708, resulting in instructions for the proper interaction of merchants and commanders of warships.

During the first part of the eighteenth century, the commanders in chief's fighting instructions were not routinely revised, presumably because none of

the maritime campaigns lasted long enough to warrant such reconsideration. Hence, there were no major technological breakthroughs. On the other hand, additional instructions, also doctrinal in nature, were issued by the fleet commanders, first in 1678 and regularly after 1710. These additional instructions were as important as the main fighting instructions but were issued by local commanders who were then held accountable for their use. If validated by combat success, additional instructions could lead to additional deviations. Unfortunately, when the additional instructions were not validated in combat, and the fighting instructions provided an alternative course of action, they might also provide justification for punishment by court-martial.

Developments during the Wars against the French Monarchy

Courts-martial for combat failure while not adhering to the existing fighting instructions were an ever-present threat to the commander in the Royal Navy during the long years of war with the French. There was an infamous case of doctrinaire adherence to "keeping the line" above all costs at the disastrous February 1744 battle off Toulon. Admiral Thomas Mathews, maneuvering in what was virtually a line abreast, had expected his subordinate, Vice Admiral Richard Lestock, to use common sense and engage the enemy when Mathews signaled an attack. Lestock, "confused" by Mathews' continued flying of the signal for line ahead, maintained his station in line ahead and failed to join the engagement quickly. Mathews had him arrested.

Complicating the problem was Admiral Mathews' failure to get his fleet into proper station on the previous night. Mathews had in fact issued the proper orders, but his subordinates had failed to execute them, and the fleet became further dispersed. The next day, Vice Admiral Lestock ignored some of Mathews' instructions to increase sail and get into line-ahead position more quickly; indeed he actually shortened sail on two occasions. Mathews and Lestock were not on the best of terms before the battle, hence the failures at Toulon are a bit more complex than whether or not officers adhered blindly to doctrine in lieu of common sense.

At the court-martial, Lestock was exonerated because he had followed his commander's primary signal (line ahead) during an extremely confusing engagement of changing and conflicting signals and maneuvers. Mathews was cashiered instead—due primarily to the escape of the Franco-Spanish fleet under Admiral La Bruyère de Court. Four captains who had exercised initiative

under conflicting signals and maneuvers, therein deviating from the standard and additional instructions, were also cashiered.

The scandal of Toulon provoked reform, and new instructions for the Mediterranean fleet were prepared to alleviate future confusion. Mutual support was to take precedence over maintenance of the battle line. Abandonment of the line ahead in favor of the general chase was sanctioned when the enemy fleet was markedly inferior, disabled, or "on the run." Of course, if the admiral gave signal for the general chase and failed, he would still be subject to close after-action scrutiny by a court-martial.

During the First Battle off Cape Finisterre in 1747, Admiral Baron George Anson took advantage of existing loopholes in the fighting instructions regarding maintenance of the line ahead. Even though he used the general chase, he avoided court-martial because he defeated the French and captured numerous convoy merchants. Admiral Sir Edward Hawke ordered a general chase in the successful Second Battle off Cape Finisterre (1747). New additional instructions followed, further refining and clarifying the doctrine contained in the fighting instructions.

As a result of Parliament intervention, joint doctrine developed extensively during the Seven Years' War (1756–1763). William Pitt, Secretary of State and leader of the House of Commons, ordered his generals and admirals to cooperate, which they did with remarkable success. Elaborate written doctrine was prepared for the transport, protection, disembarkment, and support for ground troops, and it was used successfully in the captures of Louisbourg (1758), Quebec (1759), and Belle Isle (1761). This followed the disastrous performance in Admiral Edward Vernon's and General Wentworth's abortive amphibious operations against Cartagena (1740–1741).

There was also additional doctrine developed for blockading and observation squadrons as well as for the interdiction of ships undertaking to leave a port. Much of this doctrinal development was published in the form of private signal books for which there was no official commander in chief or Admiralty sanction. The successful telegraph signals system that later supported Admiral Lord Horatio Nelson at Trafalgar had its birth in the privately published doctrinal and signal development that took place during this era.

In a celebrated Seven Years' War episode of failure that was tied to the fighting instructions, the British in 1756 failed to engage fully a French fleet off Minorca that was supporting the landing of a ground force, and which resulted in the eventual loss of the garrison. The British admiral, Sir John Byng, was eventually shot for his performance during this episode, but *not* for failing to follow the existing fighting instructions, although that certainly was a major

element of the prosecution's case.[11] Byng had in fact deviated from the fighting instructions in his plan of attack at Minorca. However, he was shot simply because he failed to gain a victory when one was needed—a British force in America, under the command of General Edward Braddock, had just suffered a major loss to the French and Indians. The second major defeat, at Minorca, threatened the British government, which at the time also was sensitive to charges that it had not provided Byng with enough ships.

Simply put, a scapegoat was needed. Braddock had been killed in Pennsylvania, and Byng was available. The court-martial found Byng guilty of failing to "do his utmost" either to defeat the French fleet or relieve the garrison on Minorca; a law of 1749 mandated the death penalty for admirals who failed to try hard enough. A review of the tactical situation, however, can lead one to the conclusion that neither defeat of the enemy fleet nor relief of the Minorca garrison was possible and that even had Byng fully engaged the French, and had his plan been properly executed by his captains, victory was by no means certain. In fact, compounding the difficulties he had in signaling intentions from the rear of the formation were signal books that did not contain provisions for exactly what he intended. Byng further complicated the matter, like Mathews at Toulon, by continuing to fly the line-ahead flag while simultaneously signaling to engage and maneuvering for a nearly line-abreast attack against a well-formed enemy line.

The shooting of Byng had major repercussions throughout the Royal Navy. It did not, however, make the fighting instructions dogmatic; it had the opposite effect. Admiral Hawke's victory at Quiberon Bay (1759) was due in part to his courageous decision to initiate a chase before properly forming into a battle line. This victory had strategic implications; the loss of their escort force ended French plans to transport ground forces from Quebec to Europe for an invasion of England. Concurrent with the French loss in 1759 at the Battle of Lagos (again due to a general chase rather than line ahead) and the loss of Quebec in that same year, the result of Quiberon was a shift in the war's focus from contesting control of the seas to applying real power from the sea to the shore.

Common sense was introduced into subsequent courts-martial that concerned failure to follow doctrine. Admiral Augustus Keppel was exonerated for failing to follow the fighting instructions: he did not "waste" time to form a battle line (directly engaging Admiral Louis Guillouet, Comte d'Orvilliers) and failed to "do his utmost" (the fleets passed each other on opposite tracks at the Battle of Ushant in 1778 where Keppel was defeated).

Another private doctrinal book, *Naval Evolutions: Or a System of Sea Discipline* (1762), was published by Lieutenant Charles O'Bryen, Royal Navy.

This book was based largely on Père Paul Hoste's *L'Art des armées navales ou traité des évolutions navales* (1697). Although the translation of the French extracts was poor, and the experiences of the recent Seven Years' War tended to discount much of the doctrine, it signaled a growing desire by fleet officers to have a tactical manual in book format.

The publication of then-Captain Sébastien François de Bigot, Vicomte de Morogues' *Tactique navale ou traité des évolutions et des signaux* in 1763 was noticed not only in Paris but also in London. Within four years, it had been privately translated into English—probably by Charles or Christopher O'Bryen. Like O'Bryen's earlier work, only sections were translated, and the quality of the translation was poor. The translation of Morogues' work included an additional section on fighting at sea, probably written by one of the seagoing O'Bryen family.

A movement commenced to capitalize on these privately published doctrinal books by officially revising the fighting instructions. However, no one on active duty was willing to take on the commanders in chief; hence the standing fighting instructions were allowed to languish "as is," and local commanders continued to issue and revise additional instructions. These additional instructions indicated a growth in doctrine that capitalized upon the lessons of the Seven Years' War. Finally, the Admiralty itself issued a supplement to the standing fighting instructions codifying local practice, thus avoiding a debate over existing articles versus established procedures in the fleet. Left unsettled was the proliferation of tactical doctrine and sailing and fighting instructions by both the commanders in chief and private individuals—all in use by commanders at sea.

During the opening days of the American War of Independence, Admiral Lord Richard Howe, commander of the British fleet in North America, published his own quite sophisticated signals book. Unlike the standing fighting instructions provided by the Admiralty, Howe's *Instructions for the Conduct of the Ships of War, Explanatory of, and Relative to the Signals contained in the Signal-Book Herewith Delivered* (1776) consisted of standing orders, explanations of tactical ideas, and standardized signaling evolutions. Howe adopted some innovative maneuvers for the execution of the battle line. He issued additional instructions the next year with further emphasis on the role of the individual commanding officer.

Taken as a whole, the system of fighting instructions by that time in force off North America was so complex that an extensive period of instruction and exercises would have been required before the fleet could respond to the directions of its commander. There is evidence that Howe held regular meetings

of his admirals and captains so that he could explain his doctrine, and also that he exercised them regularly as well. Howe issued additional instructions in 1778 that formed the basis of a reconnaissance system later adopted by Nelson before Trafalgar. By the end of his service in North America in 1778, Howe had created the system of instructions and signals that he would subsequently use while in command of the Channel Fleet.

A Set of Signals for a Fleet on a Plan Entirely New (1777), by Lieutenant Sir Charles Henry Knowles, another privately published book, used the best parts of Morogues' *Tactique navale ou traité des évolutions et des signaux* and provided for actions by fleets or separate divisions. In his subsequent *Fighting and Sailing Instructions*, published in 1798, although written in 1780, Knowles expanded upon individual ship engagements to a degree that foreshadowed Nelson.

Rear Admiral Richard Kempenfelt, chief of staff of the Channel Fleet, embarked singlehandedly in 1779 on the most ambitious tactical reforms ever undertaken by any one officer in history. During a twenty-seven-month period, he issued more signal books and fighting instructions than anyone before or after him. Many of the instructions were influenced by Howe; one was an exact copy of a signal book used by the French. It was, however, not their centralized version but rather a separate system adopted by Rear Admiral François Joseph Paul, Comte de Grasse-Tilly (an officer to whom the Untied States owes a great debt). Kempenfelt blended the best of Howe and the French into a system of instructions and signals that allowed for greater control over a larger fleet in fighting a well-disciplined opponent.

Innovations were generally confined to the Channel Fleet. Despite Howe's earlier efforts in North America, officers subsequently assigned to those waters and to the West and East Indies generally reverted to the combat-proven fighting instructions and supplemental instructions that were issued. Natural conservatism as well as primitive communications hampered transmission of new ideas from Europe to the far-flung reaches of the empire. Also, the commanders in those distant stations had their own ideas about how to defeat the French, and the Channel Fleet had yet to prove the value of its innovations in major combat.

Admiral Lord George Brydges Rodney was a commander who was willing to test the waters with new doctrine. Departing European waters with a considerable portion of the Channel Fleet, Rodney seized the opportunity to attack a Spanish convoy and then a Spanish squadron at the Battle of Cape St. Vincent, also known as the "Moonlight Battle" and the Battle of Santa María (1780). Rodney used the new freedom to his advantage—he signaled a general chase instead of maintaining the battle line. After his arrival in Caribbean

waters, Rodney met a French squadron at Martinique (1780), but he failed to bring on a successful engagement. Rodney censured his captains for failing to break tradition and execute a *mêlée*, and he subsequently drilled them in his doctrine.

A series of doctrinal issues being debated at the time included:

- Should the admiral ride in the van, at the center, or outside the line?
- Should he sail in a heavily armed ship of the line or in a fast frigate?

Shifting the flag to a frigate had been tried by Lord Howe off Rhode Island in 1778, and Admiral Sir George Rodney did the same off Martinique in 1780. Following de Grasse's capture at the Saints (1782), French doctrine changed to require that commanders in chief fight from frigates. Generally, the British ended their experimentation by allocating a place for the admiral to occupy in a heavily armed ship at the center.

The new doctrine of giving precedence to local instructions was not foolproof; the defeat of Admiral Lord Thomas Graves at the Battle off the Virginia Capes (1781) can be explained in part by the lack of clarity in local doctrine. Graves had only recently taken command of the North America station and had yet to hold a meeting with his commanders to explain his views on doctrine and signals. Furthermore, ships of the West Indies and North American squadrons had been using different signal books. When Admiral Samuel Viscount Hood failed to use common sense and engage de Grasse despite confusing signals, he knew the defense of his actions rested in his strict adherence to the precise signals flown by Graves. This all sounds remarkably like Mathews and Lestock at Toulon and very unlike what would take place at Trafalgar. Graves' failure to attack Admiral de Grasse until the French had sortied from their anchorage was something else that would not be repeated by Nelson, at the Nile.

John Clerk of Elden, a retired merchant from Edinburgh, analyzed the naval tactical issues of the day and wrote an *Essay on Naval Tactics* in 1782. This essay pointed out the superiority of the French system in particular respects and recommended concentrating strength against weakness—specifically against only a portion of the enemy's line. In fact, this tactic was used by Rodney in his successful and very significant victory in the Battle of the Saints that same year, resulting in the capture and disgrace of de Grasse. Rodney failed to exploit the victory fully, indicating that even innovative commanders were still somewhat conservative. Discipline was still so great at this time that, although some of his advance ships were in a position to fire on French ships being chased at the Battle of the Saints, Hood denied permission to fire, since he had not been granted permission to do so by his own senior, Admiral Rodney.[12]

Although Clerk claimed credit for influencing Rodney's action, in point of fact Rodney did not plan to break the line, nor was such a maneuver new. Nevertheless, the victory at the Saints was the Royal Navy's major success during this phase of the long war with France, and after that, Rodney's supposed action and Clerk's book took on a life of their own. Clerk was well connected socially in higher naval circles and had access to the evidence presented at the various courts-martial resulting from important battles. His analysis and logic were sound. Independently wealthy and with no official connections to the Admiralty, Clerk was able to write his own views without fear of reprisal or financial ruin. Although Clerk's book was a direct attack on the fighting instructions, it had an influence on British naval thinking.[13] It was decidedly offensive in its orientation. One of the commanders who favored it was Admiral Lord Horatio Nelson, who reportedly had his chaplain read it to him.

The loss of the North American colonies and Howe's assignment to the Admiralty from 1783-1788 stimulated further doctrinal reform in the Royal Navy. A number of fighting and additional instructions were issued and reissued. Captain Jacques Bourdé de Villehuet's 1765 *Le manoeuvrier ou essai sur la théorie et la pratique des mouvements du navire et des évolutions navales* and Commodore Jurien, Vicomte de Grenier's 1787 *L'art de la guerre sur mer, ou tactique navale* were fully and accurately translated into English in 1787-1788. The latter is one of the most masterful books on tactics written during the age of sail, and it challenged fully the dogma of the line ahead.

Doctrine during Wars against the French Republic

The privately published *Signal Book for the Ships of War* (1790) was issued to the Channel Fleet, thus capping Howe's long process of doctrinal reform. Howe experimented with this revised doctrine and signals during the summer of 1790 Channel Fleet exercises. By the end of that year, Howe retired, and the mantle of doctrinal reform fell to the new commander, Lord Hood. Hood was more interested in fleet discipline and station-keeping than in doctrinal reform. He held exercises in 1792 to drill his captains in accordance with his version of doctrine and signals, which did not include many of the innovations permitted by his predecessor.

With the outbreak of war with France in 1793, Howe was recalled and once again took command of the Channel Fleet. By now Howe had lost some of his enthusiasm for reform and agreed that until his captains could perform basic tasks in accordance with standing doctrine, there would be no need to grant them a freer hand. Howe led a well-disciplined and recently exercised Channel

Fleet against the Brest fleet of Rear Admiral Louis Thomas, Comte de Villaret de Joyeuse, in the Battle of the First of June, 1794.[14] Villaret de Joyeuse had been a lieutenant at the time of the French Revolution (1789), as were his fellow flag officers. Most of the French captains had been very junior officers, captains or mates of merchant ships, and a few of them had been enlisted men. The performance of the Brest fleet against the well-trained British and their able commander speaks well of Villaret de Joyeuse's leadership abilities and the value of fighting spirit in combat.

The "Glorious First of June" was fought continuously over five days and four nights. Howe employed the new idea of separating an advance squadron from the main battle fleet, which could provide intelligence and act as a tactical reserve. Whereas at that time the preferred method for breaking the line was to concentrate mass upon a single vulnerable point, at the Battle of the First of June, Lord Howe had his whole fleet cut through the line simultaneously at all points, cutting between the sterns and bows of the nearest enemy ships. The tactic allowed the British to engage on the lee side, on which the French had neither loaded nor fully manned their guns. The tactic also was a hedge against the French escaping to leeward. Howe deserves credit as an innovative tactician, a signals specialist, and a successful commander in battle who never lost sight of the need to defeat the enemy fleet.

At the battle's end, Howe was triumphant with a victory unparalleled in the past one hundred years. Six French ships of the line were carried off to Spithead; one had been sunk, and the *mêlée* had allowed superior British gunnery to wreak havoc among the survivors. On the other hand, the French convoy of 130 ships bringing supplies from America had been allowed to escape and enter port; indeed, not a single British ship appears even to have laid eyes on the convoy. Furthermore, Howe failed to exploit fully the victory, as had Rodney at the Saints, but with more excuse—the length of the battle, Howe's age (then 68), and damage to the British fleet inflicted by the French.

This British success was followed by the formation of a combined Anglo-Portuguese fleet. Howe's *Orders for Combined Fleet* essentially envisioned the new squadron as a separate maneuver unit. Given his recent success with the disciplined Channel Fleet, it is no wonder that Howe did not attempt to integrate fully the Portuguese. There was from 1793 to 1795 a ferment of tactical and signaling developments comparable to that during the American War of Independence. It culminated in January 1796 with the issuance by Sir John Jervis, commander of the Mediterranean Fleet, of a *Secret Instruction* containing innovative tactical options. Jervis planned to unleash his captains in a general *mêlée* once he had broken the enemy line and its ships had become separated

and disorganized. Jervis also adopted the advance squadron concept used by Howe at the Glorious First of June.

Jervis' faith in the superiority of his captains was warranted. The next period of British tactical successes was due in part to the bold actions of some leading and extremely confident local commanders. Rear Admiral Sir William Cornwallis, commander of a small squadron attacked by the Brest fleet off Belle-Île (1795), fought on the offensive and succeeded in convincing the French that additional ships were en route. Then-Captain Horatio Nelson showed his aggressive fighting spirit during a series of minor engagements in the Mediterranean that same year. These battles were not of themselves important, but they began to establish Nelson as a commander who sought to exploit immediate tactical victories.

At the Battle of Cape St. Vincent (1797), where his well-trained Mediterranean Fleet attacked a Spanish force having nearly twice the firepower, Jervis demonstrated superior seamanship, innovation, and good judgment in separating the convoy from its escorts. Seeing an opportunity to deviate from the battle line, Jervis signaled to his flag officers (who included Nelson, a commodore) and captains to form whatever formations they wished in order to exploit their tactical advantage. Nelson, who had anticipated this signal, captured two ships and boldly engaged the flagship, which had nearly twice as many guns and was the most powerful ship afloat. Jervis chose not to report that Nelson's success in taking advantage of an excellent tactical opportunity had been due to his exceeding his signaled authority, thus disobeying orders.[15]

The authorship of another privately published doctrinal book, *A System of Naval Tactics*, which appeared in 1797, is attributed to D. Steel.[16] Much of the document was a reworking of works by Père Paul Hoste and Bourdé de Villehuet. The section of the book that dealt with the Royal Navy was a more readable version of Howe's fighting and sailing instructions without any reference to engaging the enemy. Apparently the security of one's fighting instructions was becoming a concern. In 1798 Parliament got into the act of naval doctrine again, passing a law that made convoying compulsory.

In late 1797, Britain secured one of its most notable victories of the era. Admiral Adam Duncan, first Viscount of Duncan, employed extremely aggressive tactics and an offensive fighting spirit in thoroughly defeating a Dutch fleet at the Battle of Camperdown. Duncan made good use of tactical signals to outsail the Dutch and bring his superior firepower to bear as rapidly as possible. Because of the fast tempo of the battle and the inferiority of their ships, the Dutch were overwhelmed before they could escape to leeward into coastal

waters. Duncan's attack, in columns of two, splitting the Dutch line from the weather side, was to be repeated by Nelson at Trafalgar.

In 1799, the responsibility for the publication of the fighting instructions went to the Admiralty, where it remained until 1914 when it reverted back to the fleet commanders in chief. The doctrine published in the *Signal Book for Ships of War, 1799*, continued to stress the line ahead, despite current practice in the fleet and combat successes with the *mêlée*. These fighting instructions were mandatory for the fleet, although the cunning Nelson was able to justify deviations when circumstances and his personal views conflicted with them.

The Nelson "Touch"

Rear Admiral Nelson's victory over the French at the Battle of the Nile (1798) gave the British their greatest victory in over one hundred years. Not only did Nelson benefit from major errors committed by the French commander, Admiral François Paul Brueys d'Aiguilliers, who tried to fight on the defensive, but he exhibited true genius in a daring night attack of a rapid tempo that overwhelmed his opponent. Vice Admiral Nelson's next victory was over the Danish at Copenhagen (1801), where he was pitted against a maldeployed stationary fleet and fortifications operating under a defensive doctrine. Although he was in range of their shore batteries the night before the battle, Nelson held a dinner party aboard his flagship. His detailed and written orders, outlining the plan of attack in accordance with the newly issued Admiralty day signal book, were given to each of his captains.

The plethora of newly issued signal books was not universally popular in the fleet, since the books did not allow communication of complex ideas. Sir Home Popham, an officer who would later rise to the rank of admiral, created an innovative and unofficial system of telegraphic signals that made use of numbers and later letters to substitute for words and phrases that combined to make sentences. This new system gave the admiral a powerful tool. Popham's model became an instant success in the fleet, although he was wise enough to disclaim it as a mere adjunct to the official system and thus avoid a formal confrontation with the Admiralty. Nelson formally adopted Popham's system of signals in 1803 and made full use of it off Toulon in the subsequently renewed war with France.

A series of minor engagements followed the renewal of warfare, but the major concern in Britain was invasion. By a series of fleet maneuvers, the Royal Navy deterred any invasion of the British Isles. With over 150,000 troops assembled with a transport fleet that was unable to sail across the Channel due

to the presence of the Royal Navy, Napoleon had to abandon his plan. The French fleet was unable to mass in sufficient numbers to meet the challenge.

The most celebrated of all battles in the age of sail, Trafalgar (1805), pitted a well-equipped fleet and combat-experienced commanders against the combined Franco-Spanish fleet, which had neither adequate training nor well-fitted ships.[17] Nelson imbued his spirit of the offensive into every one of his captains. His written plan of attack made his objectives very clear—complete destruction, *not* taking ships for the prize money.

Nelson intended to form into two parallel columns in line ahead, with himself and his second in command leading the charge (in violation of Admiralty doctrine), and then to close boldly the combined fleet as rapidly as possible, making it more difficult to be hit and minimizing the time British ships would be exposed to defensive fire. A rapid attack would also minimize the chances that the combined fleet could escape to leeward. Nelson also planned to conceal the points of his main attack until the last possible minute. Once his two squadrons broke through the enemy line, the aim was to concentrate offensive strength against the weakness of the split enemy fleet. Nelson improved upon this French concept of strength against weakness with another French concept, the *pelotons*, assigning specific tasks for specific portions of the fleet. This was a replacement of the now-centralized formalist doctrine of maintaining the line Nelson envisioned, not with just a signal for general chase but in fact with a new local doctrine of *guerre à outrance* (war to the extreme). Based upon his previous battle experience against the French, Nelson felt that he could go beyond the general chase authority granted in the fighting instructions. This would not be possible against all enemies, but it was appropriate at this time and place.

The selection of the time and place of his attack was facilitated by a superior reconnaissance plan aided by Popham's new signalling system. Nelson also used an advance squadron that could, if necessary, engage the enemy until such time as the main battle fleet arrived.

Nelson generally followed his battle plan and, although both sides fought bravely, the resulting *mêlée* was a rout of the combined fleet. The reasons for victory were, the superiority of artillery and gunnery by the British, their superiority at maneuver and mutual support, and the generally inferior condition of the combined fleet. The British fleet never formed properly into two columns in line ahead; proper formation was subordinated to the offensive spirit and tempo; keeping the battle line was no longer all-important. Speed allowed the British to survive the charge directly into the teeth of an enemy, who had in effect "crossed Nelson's T."

Doctrine, of course, *was* used by Nelson, but often in a non-written form, reflecting his decentralized philosophy of command and control that peaked at Trafalgar. As Nelson's experience grew, in lieu of formal signals and tight control during battle, he relied on, a series of meetings with his commanders before the coming battle. In these discussions he communicated his perception of the alternative courses the battle might take and the basic actions that were to be expected.[18] His famous line from his pre-battle memorandum—"No captain can do very wrong if he places his ship alongside that of an enemy"—is typical of a doctrinal style that matched his personal abilities as a charismatic leader, abilities atypical of commanders in the age of sail.[19]

Nelson's success was due in part to his style of doctrine—unwritten but clear in the minds of his subordinate commanders. It proved extremely effective.[20] Whereas Nelson's signal to form into two columns, flown at the beginning of the Trafalgar battle, might be misinterpreted today as precise instructions to be followed to the letter, his captains knew how to interpret it properly. They continued to close the enemy at all possible speed, while simultaneously attempting to form into two columns in "irregular line-ahead." This was not the type of behavior witnessed at Toulon (1744) or off the Virginia Capes (1781).

Nelson's decision-making process was more intuitive than analytic, but this should not imply that he improvised in the middle of the battle. On the contrary, he planned his battles using both his intuitive and analytic skills. Nelson was convinced that, with the proper attitude and sufficiently equipped and trained force, one need only wade into the enemy. This had been the essence of Jervis' *Secret Instruction* of 1796. Indeed, none of the maneuvers that Nelson employed at Trafalgar were new; all had been anticipated by Villeneuve. On the other hand, Nelson did not give his subordinates an entirely free hand.

There is more to Nelson's success than good doctrine and well-trained forces. There is the intangible factor of Nelson's own charismatic personality, which inspired men to greatness. Where others sought to use the signal book to bring order to the battle space, Nelson strove for chaos—within the bounds of capabilities and shaped by his personal doctrine. Nelson is thus an aberration who escaped successfully the confinement of the era's paradigm and embraced the "fog of war" as an ally.

The Admiralty signal books and fighting instructions issued by Admiral Popham after Trafalgar made use of the tactical innovations initiated by Nelson at the Nile and Trafalgar, but their authors never understood the conditions that made such innovations possible. Nelson's successors attempted to emulate the "Nelson Touch" with their own doctrinal writings, but they could not possibly

capture the essence of his brilliance in any signal book. Simply put, the style of warfare practiced at Trafalgar was the correct style for a particular set of circumstances and a uniquely charismatic leader, one whose essence could never be "bottled." The myth of the "Nelson Touch" and the attempt to duplicate it is one of the major themes around which one can study later developments in the Royal Navy.

The End of the Age of Sail

Written doctrine in the form of fighting instructions gradually fell into disuse. When faced with an enemy that did not use rigid and effective tactics based upon sound doctrine, there was no need for the Royal Navy to do so either. If defenses were not skillfully prepared, there was no need for skillfully prepared offenses. The attacker needed merely to be unleashed and pointed in the right direction.

In 1809, in what would prove to be one of a long string of amphibious failures, the British mounted the largest (to date) invasion of the Dutch coast. Designed to put pressure on Napoleon's rear and thus support the Austrian allies, the assault on Walcheren Island involved some forty thousand troops, four hundred transports and almost two hundred naval escorts. The force was evacuated eventually, and the operation stands as a case of mismatched political objectives and military operations and of poor planning for a joint operation.

The last major British naval victory in the age of sail was the controversial Battle of Navarino (1827).[21] A mere twelve years after Waterloo, Navarino saw the French, British, and Russians allied for one battle against three Turkish, Egyptian, and Tunisian squadrons. The three European squadrons fought on the offensive against Muslim ships that, under Admiral Ibrahim Pasha, were anchored in a defensive formation. The battle resulted in total annihilation of the Turkish fleet and the liberation of Greece. Unfortunately, Vice Admiral Sir Edward Codrington's victory so embarrassed the Turks that it became diplomatically expedient that he be recalled home; his career was ruined.

During the long wars with the Continental powers in Europe, British naval doctrine was, primarily, to engage the enemy fleet—to either destroy it (to sink a wooden warship was exceedingly difficult) or to capture enemy ships as prizes. Britain essentially sought general command of the seas via warfare of annihilation. If required to defend a convoy or a landing force, naval doctrine called for the escort force to engage offensively the enemy fleet, posing a threat rather than adopting a defensive position. If tasked to neutralize a threat of invasion, the fleet would engage offensively the enemy fleet posing a threat.

And to eliminate the source of power of a maritime nation, doctrine called for the destruction of the enemy fleet first and only then exploitation of command of the sea by attacking merchant shipping.

The primary tactics of the Royal Navy were to attack on the offensive from the windward side and then attempt to breach the ship's hull, kill the crew with aimed gunfire and—only if necessary—engage in close combat. In general, formal doctrine called for the strict maintenance of the line ahead, with deviations tacitly approved after the fact when commanders were successful. Between Toulon (1744) and the Saints (1782), the British fought thirteen battles to a draw, using linear tactics, while they obtained six victories by abandoning the line—clear evidence of the need to ensure that successful fleet lessons learned are accepted as new doctrine.

The Admiralty was not oblivious to these statistics. The issue was that if one formed the line ahead, one would be more likely to avoid defeat than if one abandoned the line. Hence the line ahead gave the commander his best guarantee of not failing, even though he might not succeed. The personality of many of England's leading commanders was such that they felt their individual initiative, skill, and spirit allowed them to abandon the safety of the conservative formalist school of doctrine in favor of the *mêlée*.

The Age of the Ironclad

Although maritime technology advanced in the form of steam and the screw propeller, it was some time before the Royal Navy took the next step, that of ironclads. The simple reason appears to be that the role of oceanic policeman against lower technology forces could be carried out with the old wooden ships of sail. Even when the Navy adopted the new technologies, the absence of continuous warfare put tactical and doctrinal innovation into the schoolhouse and not the active fleet. Small detached units were left to improvise their own local doctrine, which they did successfully. Technological improvements now allowed more certainty (contrasted to the uncertainty of sailing via wind power) and more distant control (via signals) as this era progressed. The improved signalling capabilities may have played a role in the downfall of doctrinal development—after all, why take local initiative when the admiral (later the Admiralty) will send orders directly?

With the formation of the Royal United Services Institute for Defence Studies (or RUSI) in 1831, an unofficial forum was created for the discussion of military issues. RUSI began publishing a journal in 1859, creating a vehicle for the publication of new ideas. Journals and societies such as these flourished

throughout the world, and they provided an arena for doctrinal development not under the thumb of official Navy bureaucracy.[22] Similarly, the Naval Records Society (founded 1893) allowed scholars to research documents from Royal Navy history. Père Paul Hoste's *L'Art des armées navales ou traité des évolutions navales* (1697) was again (but this time fully) translated into English, in 1834, by Captain J.D. Boswall, Royal Navy.

In 1843 and 1846, Captain C.R. Moorsom, Royal Navy, published two brief works on naval tactics, which included a section on the actions between steamships. Moorsom was later promoted to vice admiral; since he had not been to sea since the 1820s,[23] his subsequent *Organization and Maneuvers of Steam Fleets* (1856) built on these early ideas. Although his recommendations were, as far as is known, never employed in practice, a modification was included to subsequent versions of the general signal book. The 1857 French Ministry of Marine's *Tactique navale*, for both sail and steamships, was translated in 1859 for the benefit of Royal Navy officers. Additional privately published books, such as Sir Howard Douglas' *Naval Warfare with Steam* (1859), appeared on steamers in combat, but no changes were made in Admiralty fighting instructions. On the other hand, the Battle of Lissa (1866) gave primacy to development of the ram rather than the gun.

The impact of the ironclad was to raise once again the specter of invasion by France.[24] It was claimed that steam had "bridged the Channel" and that thirty thousand Frenchmen could rush across in a single night. The result of this technological innovation was a shift in strategy rather than doctrine. No longer would the Royal Navy alone be sufficient for defense of the realm, but a sizeable portion of the standing army would have to garrison the coastline as well.

Doctrinal development continued under the auspices of Admiral Sir Geoffrey Phipps Hornby. While in command of the British Flying Squadron (1869-1871), he experimented with tactics under steam. Hornby appears to have been the first flag officer to arrange for the ironclads of the Channel Squadron (which he commanded from 1872-1875) to act as *pelotons*, or separate tactical groups. The Admiralty approved of his concepts in 1874 and incorporated them into its signal book of 1879. Unofficial writings on naval doctrine continued to be sponsored by various professional associations that offered prizes as inducements for creative thinking and writing. It is of some small note that after the Royal Navy swept the seas of its enemies, it turned to scientific research and pursuit of discoveries.[25] This parallels somewhat the more recent shift in the U.S. Navy to military operations other than war—which include environmental concerns.

The next major expression of formal doctrinal thought was introduced in the writings of Vice Admiral Philip Colomb. The older of two brothers (both of whom wrote about naval matters), Philip retired from active service and took a position as an instructor at the Royal Naval College, Greenwich. While a commander, Philip had studied the results of the Battle of Lissa and nearly, but not totally, embraced the primacy of the ram over the gun. His later research efforts and writing concentrated on the science of naval tactics. Philip's approach was inductive, with due credit given reasoning, experience, and history. Philip Colomb's major contribution was *Naval Warfare: Its Ruling Principles and Practice Historically Treated*, first published in 1891.

Naval Warfare is more than a doctrinal book. It contains rich discussions about strategy, is unabashedly pro-Navy, and parallels the work done in the United States by Rear Admiral Alfred Thayer Mahan (which generally eclipsed Colomb's efforts). Within the pages of *Naval Warfare* one can find the doctrinal concepts of decisive battle, blockade, and fleets-in-being as means to assure command of the sea and, thereby, defense of the homeland, defense of sea lines of communications, and the ability to move the army overseas for offensive action. Colomb followed this work with his shorter *Essays on Naval Defence* (1896), reprinting a series of chapters, articles, and lectures at RUSI.

Colomb's and Mahan's writings in favor of warfare by annihilation, the decisive battle, and an offensive doctrine met with favor among those of the *matérial* school, like Admiral Lord John Fisher, who favored the expansion of the Royal Navy and development of the dreadnought. These writings may not have been official Admiralty doctrine, but they were certainly internalized by the officer corps and accepted as unofficial doctrine representing the preferred views about war. To put it simply, for the *matérial* school, war was reduced to a technical problem with mathematical and mechanical solutions; war should be fought on the offensive with superior weapons, since the new likely enemy (Germany) would have at least technological parity and maybe technological superiority.

No recounting of doctrinal development in the Royal Navy during the Victorian-era would be complete without mention of Vice Admiral Sir George Tryon, Royal Navy, and the loss of *Victoria* after her collision with *Camperdown* in 1893. Tryon had been an advocate of independent steaming and command initiative instead of orchestrated maneuvering by *pelotons* in accordance with signal books. With the blame for the collision attributed to his unorthodox ideas, it was inevitable that Tryon's reform efforts would also find a watery grave.[26]

When Japan decided to create a Western navy, it chose to model its fleet and doctrine on those of the British. In their first major fleet engagement, at the battle of the Yalu (1894), the Japanese employed aggressive British tactics in ships, maximizing speed over armor and guns, and they decisively defeated the Chinese. On the other hand, the Japanese did not charge, or ram, or seek a *mêlée*.

About this time the 100th anniversary of the British victory at Trafalgar occurred. A great celebration was held, and the myth of the "Nelson touch" was perpetuated. What was the "touch," however? Did it arise from the "band of brothers," the myth of the offense, the undisciplined *mêlée*, or the charismatic personality of Nelson himself? With the rapid development of new technology, bright naval officers looked for bureaucratic success. Also, having no enemies at sea, they turned to warfare ashore for glory. Indeed, one of the more important of the First Sea Lords of this era, Admiral Sir Arthur Wilson, earned a Victoria Cross for his fighting ashore in the Sudan in 1884.[27]

Doctrinal development in the Navy stagnated, and it was then that the myth of Nelson, carefully cultivated and perpetuated by Admiral Fisher, provided the new unwritten doctrine for warfare at sea. This unwritten doctrine included official adherence to stagnant fighting instructions, with the tacit implication that one could do no wrong if one aggressively engaged the enemy. Thus the Royal Navy simultaneously embraced, with its head, the formalism of the fighting instructions enforced by modern signals, as well as, with its heart and soul, the aggressive and relatively unconstrained spirit of Nelson.

The next major British thinker about naval doctrine was Sir Julian Stafford Corbett.[28] His historical analyses of doctrine, strategy, and tactics in the days of sail are classics: *Fighting Instructions, 1530–1816* (1905), *Signals and Instructions, 1776–1794* (1908), and *Some Principles of Maritime Strategy* (1911). To truly understand Corbett, one must see him as advocating the antitheses of the conventional wisdom of the time and knowing that he was doing it. Simply put, Corbett argued against the mindless embrace of the offensive, wars of annihilation, and the "Nelson touch," in favor of cool, historically based analyses to investigate all forms of warfare and set maritime operations into the context of the war as a whole.

Sir Winston Churchill noted that when he came to the Admiralty in 1911, he found that there was not a single moment in the career of an officer where he was obligated to read books on naval warfare, let alone be examined on them. Hence, he organized the Naval War Staff to study the lessons of history and apply them to naval war planning strategy. Corbett used history to devise permanent "principles of maritime warfare." These efforts, however, were largely discounted

by serving officers who felt that technology had invalidated the lessons of the age of sail and who were otherwise captured by the spirit of Nelson.

While Corbett served as a lecturer at the Royal Naval College at Greenwich, he published his more mainstream doctrinal thoughts in a series of classified booklets known as "The Green Pamphlet," or more properly, the *Strategic Terms and Definitions Used in Lectures on Naval History*. Although these predate *Some Principles of Maritime Strategy*, the doctrinal materials contained in "The Green Pamphlet" are more concise and specifically addressed to a navy audience. Written as it was by an appointed lecturer in Fisher's navy, this booklet came close to being written doctrine, even if it was not endorsed officially by Fisher himself. Indeed, other than the fighting instructions, there were no doctrinal documents.[29]

Corbett's writings are in fact doctrinal, and, although they were not appreciated by officers who were obsessed with the centrality of offense, annihilation, and the decisive battle, they remain of interest today. The army officer, who was included in his audience, was far too preoccupied with mobilization rates, short war, offensive doctrines, and rail timetables to understand the important role to be played by sea power.[30] It is simply that there is far more to naval warfare than seeking out and destroying an enemy fleet. Corbett attempted to explain how initiative can be part of the defensive form of warfare (the role that the fleet-in-being first employed in 1690), and that because of technological innovations, surprise no longer meant escape but could now spell disaster.[31]

It is also true that sea power alone is not enough. Corbett attached importance to joint operations. The post-Fisher Admiralty generally ignored Corbett's theses and went so far as to put a disclaimer on his subsequent documentation of the Royal Navy's performance during World War I.[32] Despite his problems in "selling" his doctrinal message, there is a great deal of value in Corbett's writings for any naval service making its operations more integrated with political objectives and in concert with other services.

World War I

Britain's naval doctrine prior to World War I stressed combined arms and was practiced in frequent battle maneuvers.[33] A good deal of flexibility was demonstrated by the fleet during the war, but upon occasion battle squadrons were tied to synchronized movements *en masse*, as they had been in the eighteenth century. September 1914 marked a return to commanders in chief having overall cognizance over the fighting instructions. New instructions,

some hundred pages in length, entitled *Grand Fleet Battle Orders*, were issued over the signature of Admiral Earl John Jellicoe.[34] These fighting instructions attempted to provide guidance for all eventualities and offered the unit commander very little opportunity for initiative. They were reissued several times during the war by Jellicoe and by his successor, Admiral Sir David Beatty.[35]

Open discussions on doctrine became more difficult during the World War I era. Discussions now took place within the Naval War Staff and involved all of the issues that one would have expected: the proper method to meet the challenge of an invasion, commerce protection, amphibious warfare, and fleet engagements. Churchill was dissatisfied with anything that reeked of passive defense, but he had no specific doctrine for how his preferred offensive was to be carried out. His offhanded political direction often distressed the Admiralty.

In one such case, Rear Admiral Sir Christopher Cradock found himself facing a superior force commanded by Admiral Graf Maximilian von Spee.[36] Although his mobilized reservist crews lacked training, Cradock sought an engagement against the Germans; he was promptly defeated at the battle of Coronel (1914). Churchill did not respond to Cradock's cable, which implied he would engage a superior force, nor did he dispatch sufficient forces for Cradock to deal with the threat. The Admiralty attempted to salvage the situation at the last minute, but it was left to a relief effort at the battle of the Falklands (1914) to redress the loss.

Cradock's decision to engage the Germans was probably influenced by public opinion that demanded something be done about German Navy raiders as well as by the ongoing court-martial of one of his colleagues who failed to engage a marginally superior enemy force. If the Nelsonian legacy of aggressiveness, as informal doctrine or new strategic culture, could ever be carried too far, it probably was at Coronel.[37] Far better to have massed sufficient forces to have dealt with von Spee than to have suffered a humiliating defeat in the first major sea battle since Trafalgar. The "cult of the offensive" can be disastrous for naval forces—the defense is an honorable alternative when appropriate, and at Coronel it would have been.

The pre-war French *jeune école* and the new technologies allowing impressive amounts of firepower to be massed in smaller, swift, expendable forces had an impact on the employment of the Channel Fleet during the war. When faced with the humiliating loss of three cruisers only six weeks after the outbreak of the war (all of which were sunk within one hour by the same submarine) as well as the ever-present threat of the High Seas Fleet in mortal combat, the Royal Navy wisely chose a distant, vice close, blockade. Simply put, navies could not allow their principal fighting machines to be whittled away

by throw-away strike forces. Essentially, the Royal Navy was replicating the fleet-in-being strategy first employed by Admiral Lord Herbert Torrington in 1690.

In the long-awaited clash between Jellicoe's Grand Fleet and Vice Admiral Reinhard Scheer High Seas Fleet off Jutland (1916), the Royal Navy paid the price for not having instilled initiative in the minds of its admirals. When Scheer executed the *gefechtskehrtwendung* (or, battle turn-away together), independently acting battle squadrons trained to seize the initiative might have taken advantage and turned the battle into a decisive victory for England. Jutland was, therefore, a strategic-level success for the allies, but Jellicoe is forever doomed to be second-guessed for having failed to send the High Seas Fleet to the bottom. Jellicoe, of course, was operating within approved doctrine when he turned his fleet away from torpedo threats and declined a night engagement.

On the other hand, after years of concentration on decisive fleet engagements, the Royal Navy fell somewhat short in their doctrine for amphibious operations. While a landing in German East Africa was neutralized, the disastrous attempt at Gallipoli resulted in a Royal Commission of investigation. The analysis did not really get to the heart of the matter, however, and it was not until after the beginning phase of the next world war that amphibious doctrine was no longer discredited but mastered.

Despite years of unofficial doctrinal writings on the proper method of safeguarding the sea lines of communication, the Navy failed absolutely to organize and maintain convoys for its vital shipments coming by sea. Parliament had been the driving force behind convoys as early as 1650, 1708, 1792, 1798, and 1803, and it now fell to the political leadership to force the Navy to adopt convoys—three years after the commencement of hostilities.[38] An internal study by younger officers in the Admiralty came to the correct conclusions but failed to convince their seniors.[39] They did convince Admiral William S. Sims, U.S. Navy, who had been sent to Britain to study ways in which the U.S. Navy might be employed as part of the Grand Fleet. Sims, in turn, had the opportunity to present his views on the value of convoys to Prime Minister Lloyd George. The prime minister forced the change.[40]

Initiative was not defunct in the Royal Navy. The old spirit of Nelson lived in the operation of submarines, Q-ships, and the flotilla craft of the Dover Patrol. These commands, however, were held primarily by junior officers; for the most part, the navy's senior leadership had lost the lessons of history and relapsed into conservatism.

The Interwar Years

Attempts to influence doctrine in the Royal Navy were also undertaken by an outspoken insider, a critical officer who managed to remain upwardly mobile—Admiral Sir Herbert Richmond.[41] Richmond was a friend and confidant of Corbett, and as Assistant Director of Operations on the Naval War Staff, he established his *bone fides* as a serious scholar and then led the "young Turks" reform movement prior to World War I. Richmond also challenged the decisive battle orthodoxy of the navy and managed to remain in active service until an enforced retirement in 1931. Richmond did not change the battleship-dominated doctrine of the day (nor, for that matter, did the opening days of World War II), but he left as his legacy the Naval Society and its journal, *The Naval Review*, founded in 1912.[42] One could write in the pages of this journal the most heretical of articles, since authorship need not be disclosed and distribution was restricted. The lessons of the Royal Navy's difficulty in abandoning the battleship-dominated decisive engagement doctrine betoken that sound doctrinal development must contain a forum for free and open discussion that is external to official channels.

Within the Royal Navy, a study of the combat experiences in the past war was undertaken at all levels of staff and at the appropriate training and educational institutions.[43] Indeed, although many have argued that the navy was obsessed with refighting the Battle of Jutland, there is good evidence of tactical innovation.[44] Some of this effort realized the desired effect, that of revisiting certain established doctrinal principles such as the avoidance of night actions. The *Grand Fleet Battle Orders* were duly revised in 1924 and 1928-1929.

The fleet experimented with alternative doctrines for war at sea during the interwar years.[45] Combined arms were used in an exercise off Bombay in 1924, and Admiral Sir A. Ernle M. Chatfield used aircraft for the long-range strikes in fleet maneuvers in the early 1930s. Blind faith was placed in the improved anti-aircraft guns (hence self-defense fighters were not sought in great numbers) and in the Asdic detection system for finding submarines.

The new fighting instructions continued to emphasize surface engagements and convoys. Although the global system of naval intelligence and the similar global system of Naval Control of Shipping (NCS) had been kept active from its World War I days, the Navy awaited German actions at sea before implementing the convoy system after the outbreak of war in 1939.[46] Convoy duty was seen as an attrition-oriented defensive style of warfare during an era when the culture of the navy emphasized the offensive and annihilation warfare.

Of the assumed possible enemies, the navy concentrated its planning against Japan and the reinforcement and relief of Singapore. A sound doctrine for war was developed in this area of operations, one that made full use of Dominion resources, distant water offensive minelaying, and minesweeping. Fleet exercises in the Mediterranean were models for planned engagements in Southeast Asia.[47]

Of the criticism that can be ascribed to the British armed forces during the interwar years, the Royal Navy may claim the least blame, given the greater success that it had in the initial stages of the next war.[48] Compared to the Royal Air Force's (RAF) shortsightedness in regard to strategic bombing and the army's noncentralized doctrine and approach to training, the navy did remarkably well in preparing for World War II.[49] All of the services, however, had poorly developed joint military doctrine and planning.[50]

World War II

Prior to the war, the navy was often criticized for relying more on new technology as the solution to combat problems than on thinking through better ways to fight.[51] Yet in subsequent battles, these new technologies would prove critical. In many ways, the navy demonstrated far more success than the army, due in part to a systematic approach to doctrine and training.

In 1939, a new set of *Fighting Instructions*, again stressing battle fleet concepts, was issued by the commanders of the Home and Mediterranean fleets, with a preface stating that they were not mandatory.[52] On the other hand, the disaster of the small squadron that initially met the German surface raider *Bismarck* can be attributed in part to strict conformance with those fighting instructions. Local commanders never again repeated that error, and most subsequent naval operations were conducted using the fighting instructions as a guide—not as compulsory directions. Perhaps it was the assimilation of aircraft into fleet operations that finally ended the navy's reliance upon the fighting instructions that had been born in the age of sail. In general, Royal Navy commanders fought surface engagements on the offensive and with a great deal of flexibility.

The introduction of aircraft into the Royal Navy is a story fraught with important doctrinal lessons.[53] One cannot fault the Admiralty for not recognizing the potential of the airplane when it was first proposed—most military services were similarly blind. Doctrinal development for fleet aviation was shaped disastrously by a decision during World War I that the naval wing of the Royal Flying Corps (RFC) form the first line of defense against German

Zeppelin attacks. Although individual aviators fought bravely, it set the tone for fleet aviation to perform auxiliary and defensive duties.

The loss of the Fleet Air Arm to the Royal Air Force (RAF) during the interwar years is a story that has been well told elsewhere.[54] The transfer led to air power doctrine being developed by another service, whose preoccupation was not maritime operations. Fleet officers relied on a small cadre of aviation officers to help them understand how to integrate their low-performance airplanes into battleship-dominated navy doctrine.[55] The culmination of these efforts was the successful combined-arms Battle of Cape Matapan (1941), in which aircraft were used as long-range strike assets (predating the same role of the U.S. Navy at the Battle of the Coral Sea).

At the last major fleet-versus-fleet battle of the Royal Navy, off Cape Matapan, Admiral Andrew Brown Cunningham demonstrated the requisite initiative and decisiveness to qualify him to be heir to the Nelson mantle.[56] Cunningham had the advantage of air cover, radar, and Ultra. The Italians had the advantage of speed, and they managed to avoid a total rout in their first and last attempt to challenge control of the Mediterranean during World War II. Perhaps due to a series of prewar exercises that experimented with naval aircraft as strike platforms, Cunningham managed to master combined operations and made good use of his assets. Upon recognizing the value of air power, the Mediterranean Fleet changed its standard tactical formation from the battle line to an antiaircraft circular formation.

Following Matapan, the influx of new Lend-Lease aircraft and pilots trained in the United States resulted in the British Pacific Fleet's (BPF) wholesale adoption of American naval doctrine. The BPF was molded into an American fast carrier task force that operated in support of amphibious landings, ground forces ashore, and in independent strikes against land targets. Because they lacked a similar logistical train and differed in the complement of the air wing, the BPF generally operated in its own area of operations rather than as an integrated player in the U.S. Pacific Fleet. It had taken nearly forty years and two world wars for doctrine in the Royal Navy to shift its prime focus from the battleship to the aircraft carrier.

Not all transfer of doctrinal information flowed from the U.S. to Great Britain, however. In the area of antisubmarine patrols, it would take the U.S. Navy its own trial by fire to conclude that offensive antisubmarine operations were not the most effective way to ensure that convoys reached their destination.[57] In an interesting contrast to its preoccupation with the destruction of surface raiders with offensively oriented hunting groups, the Royal Navy published the defensive *Atlantic Convoy Instructions* in 1941 and 1942, which

set forth the doctrinal principles for the safe arrival of convoys via escorts and for attrition warfare. These instructions were finally accepted by the U.S. Navy as well as other allied navies. Of note is the late date of publication, there being no established written doctrine prior to that.

Doctrinal Development during the Cold War[58]

Immediately after the war, some purely national doctrinal publications were produced that capitalized upon the knowledge gained during the war.[59] Cooperation between the allied navies during World War II had set the stage for drawing to a close the uniquely British way of war at sea, replacing it with allied doctrine. By the end of the war, the Royal Navy had shifted its primary striking and sea control force to the aircraft carrier, and the U.S. Navy had begrudgingly accepted (but only temporarily) the value of convoys. Naval planning shifted from a national function to an allied response, and doctrine had to be accepted by all of the nations participating at sea in the North Atlantic Alliance. The new Atlantic Striking Fleet would fulfill the role previously played by the Grand Fleet and Home Fleet of the two previous world wars. British ships operated within standing naval forces in the Atlantic, in the Channel, and in the Mediterranean. An alliance "concept of maritime operations" set the tone for subordinate standardized allied tactical publications (ATPs) and other similar manuals.

In the 1950s, the British and Americans once again debated maritime doctrine,[60] including the proper way to ensure that North American materials and supplies arrived in Europe in the event of war. The Americans wanted to fight NATO's navy forces on the offensive. The British remembered the lessons of two world wars. Finally, the Royal Navy published a definitive Naval Staff History study on the value of convoys: *The Defeat of the Enemy Attack upon Shipping, 1939–1945: A Study in Policy and Questions* (1957), which settled the matter.[61] Other doctrinal debates occurred over the role of aircraft carriers and amphibious warfare.

With the residual responsibilities of the Empire, the Royal Navy maintained a capability for limited overseas crisis response (warm wars) and peacetime presence outside of the NATO context. Attention was paid to amphibious warfare and assault by helicopter from the sea. Over time, the naval out-of-area presence was reduced, to be increased only during actual combat operations, such as during the Falklands War. Obviously, combat experience during national emergencies benefited the NATO alliance in the form of doctrinal lessons learned.[62]

The introduction of nuclear weapons into the Royal Navy similarly followed allied and American doctrine, although the British made it clear from time to time that a national decision on release might precede that made by the Alliance. Initial planning centered on allied nuclear use, whose primary purpose was ashore. On the other hand, when Americans appeared to become preoccupied with ballistic missile submarines off their own shores, it was British efforts that pushed the U.S. Navy into an offensive doctrine that would catch these submarines before they left home waters.

The close integration of the Royal Navy and the U.S. Navy in the Cold War era, especially with the U.S. Navy's maritime strategy, continues in the present era. As with the doctrinal renaissance in the U.S. Navy, there is a similar effort by the British to once again look at centralized navy doctrine.[63] This developmental effort is taking place in a doctrinal void within the context of the United Nations, NATO, and the Western European Union-sanctioned maritime operations in the Mediterranean. Efforts are being made within European nations to fill that void, and it would appear that the doctrinal renaissance will occur on both sides of the Atlantic.

This brief overview of the development of doctrine in the Royal Navy demonstrates that there is a consistent history of more than four hundred fifty years of combat doctrine in that service. Doctrine in the Royal Navy has existed in every conceivable form—from formal written centralized fighting instructions to additional written and verbal instructions by regional fleet commanders in chief and local squadron commanders. While doctrine has helped the Royal Navy win in tactical combat, from time to time it has also been the source of major problems.

The Royal Navy has emphasized development in tactical doctrine, which has contributed partly to the long years of successful combat by the fleet. That is not to say that strategic and operational-level military doctrine have been totally overlooked, but that the Royal Navy, like the French Navy, has primarily devoted its attention to the development of service-unique doctrine at the tactical level of warfare. This is somewhat surprising, since Britain was involved in global conventional war and numerous major regional contingencies against France and other nations for many years. The Royal Navy did not have a coherent doctrine at all levels of warfare. Only in more recent times has it given preeminent attention to strategic and operational-level multinational doctrine, specifically NATO doctrine, and even more recently to unilateral joint

doctrine. Due in part to these higher level doctrinal deficiencies, fighting at the strategic and operational levels of warfare was affected unfavorably as well.

Perhaps because doctrine focused on the tactical level of warfare, it was often issued by the fleet commander in chief rather than the Admiralty. Even Admiralty-issued doctrine generally could be modified by the fleet commander—thus there appears to have been some recognition that doctrine for a worldwide fleet might vary due to different locations, assumed enemies, and preferences for combat as intended by the local commander. The focus on tactical-level doctrine also resulted in less than full development of doctrine for more complex multinational operations.

It was a perceived void in multinational doctrinal development that in some measure caused the U.S. Navy to challenge the doctrinal leadership of the Royal Navy during the early days of the NATO alliance. The U.S. Navy did not win all these bureaucratic battles, however, and British views drove NATO concepts in a number of key areas—especially with favor toward convoy defense rather than offensive operations against attack submarines using hunter-killer groups. Independent British doctrine continues, in addition to NATO navy doctrine, to govern nationally mandated operations taken outside of the multinational environment.

The naval doctrine adopted by the British has been shaped by the nature of their government, geographic position, the assumed threat, the overall strategy being pursued, the seafaring character of their people, their unique strategic culture, and oftentimes, but not always, the lessons learned from history. During the twentieth century, doctrine has been implemented more successfully in the Navy than in the Army—leading to the conclusion that the higher competence shown by the fleet can be attributed to the Royal Navy's better understanding of and adherence to doctrine.

There have also been important negative lessons learned from British naval doctrinal development. The ever-present search for the heir to the throne of Admiral Lord Horatio Nelson led to the myth that superior combat performance is primarily a result of an aggressive and offensive doctrine oriented towards naval warfare of annihilation (decisive battles)—when history has shown clearly the need for the wise commander to select the defense and attrition warfare when it is most appropriate. As long as the U.S. Navy continues to view its roots as being those of the Royal Navy, American officers will need to come to grips with both the positive and the negative aspects of the heritage of Great Britain's doctrine—including overemphasis on the offensive.

Nelson's "touch" included his charismatic personality, audacity, and boldness in the face of the enemy, pre-battle meetings with his "band of brothers"

to share the commander's intent, and also (and Nelson knew this at the time) an enemy who was not on par with his own finely honed forces. Nelson deserves all of the credit that he earned, but as time has passed, we have forgotten the effects of the Revolution and Napoleon Bonaparte on the French Navy. Naval doctrine based upon the mindless "cult of the offensive" will doom a fleet just as it doomed millions of soldiers in the trenches during World War I.

Perhaps the greatest lesson to be learned from the British experience is how difficult it is to change doctrine. The battleship's reign survived through World War I, the long interwar years, and the initial stages of World War II. From British naval history, it should be obvious that a system is needed to ensure that success in the fleet resulting from actions taken outside of established doctrine produces timely changes in the established orthodoxy. It will take the dedicated officer much time and effort to apply both the positive and negative lessons of the history of doctrine in the Royal Navy to the issues facing navies today. We dare not ignore history.

Notes

1. Carl H. Builder, *The Army in the Strategic Planning Process: Who Shall Bell the Cat?* (Santa Monica, Calif: The RAND Corporation, Arroyo Center), R–3513–A, p. 46. Prepared for the U.S. Army, April 1987. An expanded version of this study was published as *The Masks of War: American Military Styles in Strategy and Analysis* (Baltimore, Md. and London: The Johns Hopkins University Press, 1989), p. 32.

2. This opinion was shared by one of the first U.S. Navy officers to formally advocate naval doctrine. See Dudley W. Knox (Lieutenant Commander, USN), "The Rôle of Doctrine in Naval Warfare," U.S. Naval Institute *Proceedings*, March-April 1915, pp. 344–5.

3. The age of sail and other sections of this paper are based heavily upon S.S. Robison (Rear Admiral, USN, Retired), *A History of Naval Tactics from 1530 to 1930* (Annapolis, Md.: Naval Institute Press, 1942); E.B. Potter and Chester W. Nimitz (Fleet Admiral, USN), eds., *Sea Power: A Naval History* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1960); John Creswell, *British Admirals of the Eighteenth Century: Tactics in Battle* (London: George Allen & Unwin, Ltd., 1972); Clark G. Reynolds, *Command of the Sea: The History and Strategy of Maritime Empires* (New York: William Morrow & Co., 1974); Helmut Pemsel, *A History of War at Sea: An Atlas and Chronology of Conflict at Sea from Earliest Times to the Present*, trans. i.G.D.G. Smith (Major) (Annapolis, Md.: Naval Institute Press, 1977) [translation of *Von Salamis bis Okinawa*, first published in 1975]; Brian Tunstall, *Naval Warfare in the Age of Sail: The Evolution of Fighting Tactics, 1650–1815*, Dr. Nicholas Tracy, ed. (Annapolis, Md.: Naval Institute Press, 1990); and Geoffrey Till, *Maritime Strategy and the Nuclear Age*, 2nd ed. (New York: St. Martin's Press, 1984), pp. 23–4, 39–49.

4. Alonson de Chaves, *Quatri partitu en cosmografia practica*, also known as *Espejo de navegantes* (Madri: Instituto de Historia y Cultura Naval, 1983 [original version written from 1520 to 1538].

5. "Traditional tactics, 1530: 'A book of orders for the war...' written by Thomas Audley at the command of Henry VIII, *ca* 1530," in John B. Hattendorf et al., *British Naval Documents: 1204–1960* (Hants, UK: Scolar Press [for the Navy Records Society], 1993), pp. 83–4. There is some evidence of a previous doctrinal publication, the *British Black Book*, issued in the age of oars. See William Ledyard Rodgers (Vice Admiral, USN, Retired), *Naval Warfare under Oars: 4th to 16th Centuries—A Study of Strategy, Tactics and Ship Design* (Annapolis, Md.: Naval Institute Press, 1939), p. 105.

6. The numbers of cannon at sea during major fleet engagements is an often overlooked point. For example, at the Battle of Trafalgar (1805), the gun power of Admiral Lord Horatio Nelson's fleet exceeded that massed by Napoleon Bonaparte at Waterloo (1815) by a factor of six. See John Keegan, *The Price of Admiralty: The Evolution of Naval Warfare* (New York: Viking Penguin, Inc., 1988), p. 47

7. Stephen Wentworth Roskill (Captain, RN, Retired), *The Strategy of Sea Power: Its Development and Application* [based upon the Lees-Knowles Lectures delivered at Cambridge University, 1961] (London: Collins, 1962), p. 39.

8. "Fighting instructions, 1636," in Hattendorf et al., *British Naval Documents*, pp. 160–1.

9. Historians are constantly refining these dates as they discover additional materials. These dates serve to illustrate the point that doctrinal development was on-going and constant.

10. Such a formal division of opinion into two *schools* of doctrinal thought is not clearly documented in history. On the other hand, from a review of history, it is reasonably clear that there were often two relatively distinct *views* on doctrine as demonstrated by fleet engagements and courts-martial. Historians have provided names to two "schools" which may not have existed in fact, but probably did exist in spirit.

11. Keegan, *The Price of Admiralty*, p. 45.

12. Alfred Thayer Mahan (Captain, USN), *The Influence of Sea Power upon History, 1660–1783* (Boston: Little, Brown & Co., 1890), p. 356.

13. John Clerk of Elden's book was republished with additional materials and notes by senior naval officers. For example, see John Clerk, Esq. of Elden, *An Essay on Naval Tactics, Systematical and Historical with Explanatory Plates, in Four Parts*, 3rd. ed., with notes by [Admiral

George Brydges] Lord Rodney and an introduction by a naval officer (Edinburgh, Scotland: Adam Black, 1827).

14. This battle is known simply by its date since, unlike most battles fought in the littoral during the age of sail, it occurred well out to sea, some 400 miles off the coast of Europe.

15. Alfred Thayer Mahan (Captain, USN), *The Life of Nelson: The Embodiment of the Sea Power of Great Britain* (Boston: Little, Brown, and Co., 1897 [1943 reprint], p. 239; and Admiral of the Fleet of the Italian Navy Giuseppe Fioravanzo, *A History of Naval Tactical Thought* (Annapolis, Md.: Naval Institute Press, 1979) [original manuscript prepared in 1956], p. 96.

16. "Naval tactics, 1851: Captain Alexander Milne, a Lord of the Admiralty, to Vice-Admiral Sir William Parker, Commander in Chief Mediterranean, 4 October 1851," in Hattendorf et al., *British Naval Documents*, p. 629, n.2.

17. Keegan, *The Price of Admiralty*, pp. 37–8.

18. Mahan, *The Life of Nelson*, pp. 294, 297.

19. "Trafalgar: the order of battle, 1805," in Hattendorf et al., *British Naval Documents*, p. 425.

20. Michael A. Palmer, "Lord Nelson: Master of Command," *Naval War College Review*, Winter 1988, pp. 105–16. I am indebted to Michael A. Palmer for additional analysis which will be found in the prologue, "A Regular Confusion," to his forthcoming book: *Command at Sea: Naval Command and Control since the Sixteenth Century*, draft dated February 1994.

21. William Koenig, "Navarino," *Epic Sea Battles*, S.L. Mayer, ed. (Secaucus, N.J.: Chartwell Books, Inc., 1975), pp. 62–83.

22. The Royal United Services Institute for Defence Studies (RUSI) annual essay contest for a Gold Medal often results in follow-on publications of a doctrinal nature by junior officers. For example, see Lieutenant Charles Campbell, RN, *Essay on Tactics in an Action on the Open Sea with Existing Weapons* (London: Harrison, 1880).

23. Basil Greenhill and Ann Giffard, *The British Assault on Finland, 1854–1855: A Forgotten Naval War* (Annapolis, Md.: Naval Institute Press, 1988), p. 80.

24. Norman H. Gibbs, "The Origins of Imperial Defence," *Maritime Strategy and the Balance of Power: Britain and America in the Twentieth Century*, John B. Hattendorf and Robert S. Jordan, eds. (New York: St. Martin's Press, 1989), p. 25.

25. Gwyn Prins and Robbie Stamp, *Top Guns & Toxic Whales: The Environment & Global Security* (London: Earthscan Publications, Ltd.), pp. 146, 150–1.

26. Andrew Gordon, *Conflict of Style: Jutland and British Naval Command*, draft manuscript circa November 1994, chapters 11, 13, and 16.

27. Arthur J. Marder, *From the Dreadnought to Scapa Flow: The Royal Navy in the Fisher Era, 1904–1919, Volume I: The Road to War, 1904-1914* (London: Oxford Univ. Press, 1961), p. 212.

28. See Donald M. Schurman, "Julian Corbett's Influence on the Royal Navy's Perception of Its Maritime Function," *Mahan Is Not Enough: The Proceedings of a Conference on the Works of Sir Julian Corbett and Admiral Sir Herbert Richmond*, James Goldrick (Commander, RAN) and John B. Hattendorf, eds. (Newport, R.I.: Naval War College Press, 1993), pp. 51-63.

29. In his introduction to a recently re-issued version of *Some Principles of Maritime Strategy*, Eric J. Grove argues the case for Corbett's influence on the Royal Navy, including assistance in the drafting of the 1914 *Grand Fleet Battle Tactics*. See Julian Stafford Corbett, *Some Principles of Maritime Strategy* (Annapolis, Md.: Naval Institute Press, 1988), p. xli.

30. Barry D. Hunt, "The Strategic Thought of Sir Julian S. Corbett," *Maritime Strategy and the Balance of Power*, Hattendorf and Jordan, eds., p. 111.

31. An opinion shared by Knox in "The Rôle of Doctrine in Naval Warfare," pp. 328–9.

32. "The Lords Commissioners of the Admiralty have given the Author access to official documents in the preparation of this work, but they are in no way responsible for his reading or presentation of the facts as stated," disclaimer found opposite title page of Sir Julian Stafford Corbett, *Naval Operations: History of the Great War Based on Official Documents* (London: Longmans, Green and Co., 1920).

33. Paul Kennedy, "Britain in the first World war," *Military Effectiveness, Volume I: The First World War*, Allan R. Millett and Williamson Murray, eds. (Boston: Unwin Hyman, for the Mershon Center, Ohio State University, 1988), pp. 31–79.

34. Roskill, *The Strategy of Sea Power*, pp. 101–42 is the basis of the section on World War I.

35. Stephen Wentworth Roskill (Captain, RN, Retired), *Naval Policy between the Wars, Volume I: The Period of Anglo-American Antagonism, 1919–1929* (London: Collins, 1968), p. 533.

36. William Koenig, "Coronel and Falkland," in *Epic Sea Battles*, Mayer, ed., pp. 144–59.

37. The search for an heir to Nelson within the Royal Navy can be seen in books such as John Horsfield, *The Art of Leadership in War: The Royal Navy from the Age of Nelson to the End of World War II* (Westport, Conn.: Greenwood Press, 1980). A similar search in the U.S. Navy is evidenced by Charles Benedict Davenport, *Naval Officers: Their Heredity and Development* (Washington, D.C.: The Carnegie Institution, 1919).

38. See Owen Rutter, *Red Ensign: A History of Convoy* (London: Robert Hale, Ltd., 1943).

39. "The adoption of convoy, 1917: 'Some suggestions for Anti-Submarine Warfare' by Major Maurice Hankey, R.M.A., Secretary of the War Cabinet, 13 February 1917," in Hattendorf et al., *British Naval Documents*, pp. 761–6.

40. See especially Peter Baron Hill-Norton (Admiral of the Fleet, RN, Retired) and John Dekker, *Sea Power: A Story of Warships and Navies from Dreadnoughts to Nuclear Submarines* (London: Faber and Faber, 1982), pp. 118–9, 170. The authors make the case that aversion to convoying was alive and well in the Royal Navy at the time of the writing.

41. See also Daniel A. Baugh, "Admiral Sir Herbert Richmond and the Objects of Sea Power" in *Mahan Is Not Enough*, Goldrick and Hattendorf, eds., pp. 13–49.

42. James Goldrick, (Commander, RAN), "The Irresistible Force and the Immovable Object: *The Naval Review*, the Young Turks, and the Royal Navy, 1911–1931" in *Mahan Is Not Enough*, Goldrick and Hattendorf, eds., pp. 83–102.

43. Roskill, *Naval Policy between the Wars, Volume I*, p. 533.

44. Jon Tetsuro Sumida, "'The Best Laid Plans': The Development of British Battle-Fleet Tactics, 1919–1942," *The International History Review*, November 1992, pp. 661-700.

45. Credit should be given for the use of carrier-based aircraft as long-range strike assets in the Mediterranean Fleet exercise of July 1928. The attacks, however, were against "enemy" aircraft carriers and not against the main battle fleet. Similarly, Combined Staff exercises and planning during the interwar years included air strikes from the sea against the shore. Geoffrey Till, *Air Power and the Royal Navy, 1914–1945: A Historical Survey* (London: Jane's Publishing Co., 1979), pp. 162–3, 166.

46. Marc Milner, "Anglo-American Naval Co-operation in the Second World War, 1939–45," in *Maritime Strategy and the Balance of Power*, Hattendorf and Jordan eds., p. 244; and "The protection of trade, 1937: Memorandum for the Committee of Imperial Defence by the Chiefs of Staff Sub-Committee, 2 February 1937," in Hattendorf et al., *British Naval Documents*, pp. 781–7.

47. Roskill, *Naval Policy between the Wars, Volume I*, p. 538.

48. Brian Bond and Williamson Murray, "The British Armed Forces, 1918–39," *Military Effectiveness, Volume II: The Interwar Period*, Allan R. Millett and Williamson Murray, eds. (Boston: Unwin Hyman, for the Mershon Center, Ohio State University, 1988), pp. 98–130.

49. For an extremely well-developed case study of the difficulty in changing doctrine, see Harold R. Winton, *To Change an Army: General Sir John Burnett-Stuart and British Armored Doctrine, 1927–1938* (Lawrence: University Press of Kansas, 1988), especially pp. 238–40.

50. See especially Barry R. Posen, *The Sources of Military Doctrine: France, Britain, and Germany between the World Wars* (Ithaca, N.Y.: Cornell University Press, 1984), pp. 159–63.

51. Williamson Murray, "British Military Effectiveness in the Second World War," in *Military Effectiveness, Volume III: The Second World War*, Allan R. Millett and Williamson Murray, eds. (Boston: Unwin Hyman, for the Mershon Center, Ohio State University, 1988), p. 114.

52. Roskill, *The Strategy of Sea Power*, pp. 170, 247–8, is the basis of the section on World War II.

53. See James J. Tritten, "Introduction of Aircraft Carriers into the Royal Navy: Lessons for the Development of Naval Doctrine," *The Naval Review*, July 1994, pp. 260–7; and Norman Friedman, Thomas C. Hone, and Mark D. Mandeles, "The Introduction of Carrier Aviation into the U.S. Navy and the Royal Navy: Military-Technical Revolutions, Organizations, and the Problem of Decision," draft report prepared for the Director, Net Assessment, Office of the Secretary of Defense, 12 May 1994, pp. 110–63.

54. Geoffrey Till, "Airpower and the Battleship in the 1920's," in *Technical Change and British Naval Policy, 1860–1939*, Bryan Ranft, ed. (New York: Holmes & Meier Publishers, Inc., 1977), pp. 108–22; and Bernard Acworth (Captain, RN), *The Navies of Today and Tomorrow*, (London: Eyre and Spottiswoode, Ltd., 1930), especially chapter 14.

55. "Functions of fleet aircraft, 1936: Admiralty Memorandum on Fleet Air Arm tactics and equipment, December 1936," Hattendorf et al., *British Naval Documents*, pp. 948–9.

56. William Koenig, "Matapan," in *Epic Sea Battles*, Mayer, ed., pp. 182–97; and Martin Stephen, "The Battle of Matapan," in *Sea Battles in Close-Up: World War 2*, Eric Grove, ed. (Annapolis, Md.: Naval Institute Press, 1991), pp. 48–69.

57. Milner, "Anglo-American Naval Co-operation in the Second World War, 1939–45" in *Maritime Strategy and the Balance of Power*, Hattendorf and Jordan, eds., pp. 251–4; and Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War* (New York: The Free Press, 1990), pp. 59–94.

58. Eric J. Grove, *Vanguard to Trident: British Naval Policy since World War II* (Annapolis, Md.: 1987); and Eric Grove and Geoffrey Till, "Anglo-American Maritime Strategy in the Era of Massive Retaliation, 1945–60" and Joel J. Sokolsky, "Anglo-American Maritime Strategy in the Era of Flexible Response, 1960-80," both in *Maritime Strategy and the Balance of Power*, Hattendorf and Jordan, eds., pp. 271–303, 304–29.

59. For example, two manuals were published immediately after the war: *Naval Control of Shipping in War* (1948) and *Naval War Manual*, B.R. 1806 (1947).

60. These debates should also be seen in the context of Britain attempting to reestablish its role in the world as a global and first-ranking power. Many of the doctrinal debates revolved around command. For evidence of the depth of these debates, see the declassified papers of Admiral Arleigh Burke found in the Operational Archives of the Naval Historical Center. One such example is an undated position paper, "United States/United Kingdom Differences of Opinion." I am indebted to Captain Peter Swartz, USN (Retired) for providing me with a copy of this paper.

61. Naval Staff History [Commander F. Barley and Lieutenant Commander D.W. Waters], Second World War, *The Defeat of the Enemy Attack upon Shipping, 1939–1945: A Study in Policy and Operations*, Vol. IA (Text and Appendices) B.R. 1376(51) (1A), and Vol. IB (Plans and Tables) B.R. 1376(51) (1B) (London: Admiralty Historical Section, 1957) [declassified]). See also "The anti-submarine war, 1939–45: Appendix 3 of the Report of the Maritime Air Defence Committee to the Chiefs of Staff, 3 October 1950," in Hattendorf et al., *British Naval Documents* pp. 873–5.

62. Department of the Navy, *Lessons of the Falklands, Summary Report*, February 1983.

63. "The Practical Application of Maritime Doctrine," first draft, 22 April 1994; "The Foundation of British Maritime Doctrine," second draft, 23 September 1994.

The views expressed by the author are his alone and do not necessarily represent those of the U.S. government, Department of Defense, or the U.S. Navy. The author is indebted for comments by Eric Grove, Department of Politics, University of Hull; Professor Geoffrey Till, Department of History and International Affairs, Royal Naval College, Greenwich; Professor Michael Palmer, East Carolina University; and Commander James Goldrick, RAN.

Navy and Military Doctrine in France

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IN A MAJOR REGIONAL CONTINGENCY fought some years ago, indigenous ground forces converged on a narrow peninsula in the southern part of their country, where they cut off part of the army of a foreign occupation. The foreign commander had planned to disrupt indigenous transportation from a small seaport, anticipating additional support or, if necessary, evacuation by sea. His navy was one of the best in the world; the invaded country, which had essentially no navy of its own, had sought assistance from France, a major sea power.

France, which had already provided the indigenous forces with combat-experienced ground officers and modern military equipment, now landed a major ground force in the northern part of the country, while her fleet sailed in support from a forward-deployed location. The French naval commander detached a small portion of his fleet to land additional troops and also to blockade the occupied seaport. When the enemy navy forces arrived, they were surprised to find the numerically superior French. The enemy admiral, who had assumed command only recently, was without benefit of having met with his subordinates to outline his personal doctrine or to conduct work-up exercises.

The French fleet commander, operating within an established navy doctrine, knew that if he remained in a defensive posture near the seaport, he would doom another French squadron that was due to arrive soon with additional troops, artillery, and other supplies. In keeping with his main objective, the French commander seized the initiative and tactically maneuvered his forces to meet the enemy fleet far enough out to sea to permit the safe arrival of the French resupply squadron. The enemy met the French challenge but was unable to gain an advantage. The French fleet commander engaged the enemy but husbanded his own assets without a serious decisive engagement, keeping the enemy fleet "in play" for four days.

Ships from the French resupply squadron landed their troops and equipment safely and then sailed north, embarked coalition ground forces, and brought them to the area of the occupied seaport. Coalition forces massed around the seaport and engaged in bloody but ultimately successful warfare against an entrenched enemy. The enemy capitulated in the face of the repeated assaults

and no possible escape or hope for reinforcement. The French fleet maintained station and provided security for the victorious coalition forces by deterring a second, belated attempt by the enemy to reinforce, resupply, or evacuate forces at the seaport.

The above actions were taken by the French, British (the enemy), and Americans (indigenous forces) off the Virginia Capes and at Yorktown in 1781. The United States owes the French Navy a great deal for this military victory over Great Britain, which resulted in the independence of the United States. It is appropriate, therefore, to review the legacy of the defensive navy and the French military doctrine employed during these decisive battles; perhaps there is something from which naval forces today can benefit.[1]

Doctrine of the *plume*

Although most histories of French naval thought begin with the seventeenth century, there is at least some record of prior activity.[2] Gilles de Rome, an advisor to King Philip IV (the Fair) who ruled from 1285 to 1314, proposed some novel tactical ideas in a book entitled *De regimine principum*. A much later record is the book *Débat sur le héraut d'armes* (1455), which responds to English claims to control of the seas. A few decades later, Philippe de Cleves published his *Instructions sur le fait de la guerre*, which addressed the potential of the tempo of artillery fire to dominate tactics in the same way that speed affects strategy, and he recommended maneuvering to harass the enemy and repel his attack. In 1516 (or 1520), Antoine de Conflans published *Les faisz de la marine et de la navigaie*. During the reign of Henry II, from 1547 to 1559, there appeared *Stolonomie* (or *Traité contenant la manière de dresser, fournir, équiper et entretenir en tout temps en bon ordre une armée de mer consacrée aux galères*). It was, however, with the final expulsion of England from the Continent that France began to address the development of its navy in earnest.

The events ashore that influenced the development of French Navy doctrine cannot be overlooked. During the Thirty Years' War (1618–1648), in which France became the dominant power on the continent of Europe, Marshal Henri de la Tour d'Auvergne, Vicomte de Turenne, forced the withdrawal of Holy Roman Empire forces from Freiburg and then chose not to exploit the victory with a pursuit. In a subsequent encounter, Turenne maneuvered William Frederick, the Great Elector of Brandenburg, out of Alsace without engaging him in battle.[3] Thus the inception of elements of a maneuver warfare philosophy in Europe are found in the French military—and later in navy doctrine.

Armand Jean du Plessis, Cardinal de Richelieu, the all-powerful Chief Minister, beginning in 1624, was the founder of the permanent navy of France and author of a seminal doctrinal book—*Testament politique*.[4] In 1626 he arranged for himself an appointment as *Grand Maître, chef et surintendant général de la navigation et commerce de France*. Richelieu organized a centralized navy from the surviving remnants of feudal France—four independent admiralties whose admirals rarely went to sea. Richelieu's efforts created a strong corps of administrative officers, the *plume* (the pen), who had more power and influence than the actual body of warfighting seamen—the *épée*, or the sword. The friction between these two types of officers constitutes a theme for the study of French Navy doctrine.[5]

France was one of the first modern sea powers to examine formally past sea battles to garner lessons learned. Jean-Baptiste Colbert, under Louis XIV, instituted a naval program that took advantage of what the Royal Navy had learned in its wars with the Dutch (1652-1674). The French quickly changed their preferred tactical formations to capitalize on the lessons learned by the English in combat.

Credit for doctrinal development in the French Navy belongs to Admiral Anne-Hilarion de Costentin, Comte de Tourville. Tourville proved his charismatic combat leadership against the combined English and Dutch fleets at Bévéziers (Beachy Head) in 1690 and against the large multinational Smyrna convoy in 1693.[6] He was the impetus behind the development of the French Navy into a modern fighting force. Tourville drilled his fleet into a disciplined formation that responded to his command. His *Signals and Instructions*, issued before Bévéziers, was the first such written French Navy doctrine, and it was credited, in part, for his victories. These instructions were reissued and revised between 1691 and 1693.

The French sailing and fighting instructions, signals, and orders of sailing issued by Tourville were superior to those of the English in the area of fleet organization and signalling. A strength of the French system was to issue separate books for fighting and sailing instructions; in this way, advances in one area were not held hostage to the other. Tourville's instructions of 1690 included an innovative pocket-sized signal book with an index. English and British commanders later copied and employed successfully some of the French sailing formations of this era.

The War of the League of Augsburg (1688-1697) exhausted the French treasury, leaving a dearth of resources available for the fleet and for doctrinal development. General respect for the fleet also declined tremendously

following its defeat at the Battle of La Hougue in 1692 and the subsequent slaying of its survivors in full view of the French Army watching from the shore.

Because they were unable to invade England, the French chose *guerre de course*—commerce warfare—as their strategy for fleet employment. *Guerre de course* had been favored by two successive ministers of the navy under Louis XIV and Louis XV. It also had been the subject of an influential pamphlet, *Mémoire de la course* (also known as *Mémoire sur la caprerie*), by the famous engineer Sébastien Le Prestre, Marquis de Vauban. Vauban, a Marshal of France (a reward for his work with coastal and northeastern frontier fortifications), advocated sending small squadrons to raid the rich commercial sea lines of communication as a way to replenish the national treasury. His recommendations were highly influential due to his stature in France.[7] Vauban's vision, however, included neither control of the seas nor contesting control of them. To a large degree, war at sea was turned over to privateers, such as the famous Jean Bart, who operated successfully under Vauban's doctrine of *guerre de course.*

Père Paul Hoste, a professor of mathematics at the Royal Naval College at Toulon and a Jesuit priest with twelve years of sea duty and service as a chaplain to Tourville, was influenced by the latter to write the first major French scholarly book on naval tactics, *L'Art des armées navales ou traité des évolutions navales* (1697).[8] This work codified such geometric fleet formations as the line ahead, the line abreast, and the line of bearing. Although Hoste's emphasis was on precision and control, his book also demonstrated to the officer corps what was possible with strict control of limited assets. Hoste addressed the respective advantages of fighting from windward and leeward and the question of whether a fleet of inferior strength should or could fight, and he tried to compare the doctrine of warfare at sea to that of warfare ashore. Hoste praised Tourville for his ability to prevent engagements. *The Art of Evolutions* was republished in 1727 and was still being used as a text toward the end of the eighteenth century; it was translated into Dutch, Greek, and twice into English—being published in London in 1762 and 1834.

Although these early French doctrinal efforts reduced the chaos of battle and allowed the fleet to fight as a disciplined whole, the administrative officers, the *plume*, biased navy doctrinal development in favor of the more controllable defensive. Warfare ashore was influenced by the maneuver warfare philosophy and the science of fortifications advanced by Vauban. Warfare at sea was made similarly geometric and precise; chance would be eliminated by control. Fighting seamen, those of the épée, held an opposing view. In this aspect of the

standing tension between these two types of officers during this period, the *plume* was generally dominant.

Defense and control, rather than offense and the *mêlée* (or close engagement at discretion) were stressed, although Hoste did address breaking the enemy's line. The English maintained a strict battle line; their performance against the combined Franco-Spanish fleet off Malaga in 1704 reaffirmed the defensive doctrine favoring control, as advocated by Hoste. Facing an economic crisis and invasion from the northeast, France laid up its larger ships and returned to *guerre de course*. In a larger sense, *guerre de course* was a form of attrition warfare in which pain was to be applied over time rather than in one decisive battle, i.e., a war of annihilation. In attrition warfare, a major engagement is not sought.

Although unintentional, these early doctrinal endeavors precluded the initiative of the individual commanders and their ability to seek to profit from unexpected opportunities. The French Navy continued to use Tourville's signal book and doctrine until the Seven Years' War (1756–1763). During that conflict, individual fleet commanders began to issue their own local instructions to supplement the centralized doctrine.

French Navy commanders sailing on the offensive against a convoy were obligated to capture merchants rather than attempt to sink enemy warships. In a major convoy action in October 1707, a French squadron of privateers under René Duguay-Trouin ignored this doctrinal principle and concentrated its attack on the five defending British escorts under Commodore Richard Edwards. Although René Duguay-Trouin succeeded in sinking a major escort and capturing three of the remaining four, the tactical victory was not complemented by achievement of the overall objective. The French only took about ten percent of the convoy—some twelve ships.

In the Battle off Toulon (1744), a French fleet, under Admiral La Bruyère de Court, successfully escorted a Spanish squadron under Don José Navarro through a blockading English fleet under Admiral Thomas Mathews. De Court, under orders not to fire unless attacked, offered to intermix his ships amongst the Spanish. Navarro refused, and although the subsequent tactical engagement was indecisive, the Spanish squadron made its way to Cartagena, where Navarro was decorated with the title of Marqués de la Victoria. The elderly (seventy-eight years old) de Court, on the other hand, was relieved of command for leaving the deck with only superficial wounds.

French Navy doctrine also addressed defensive interactions with merchantmen. Convoy escort commanders were subject to severe penalties for deserting the convoy that they were to protect, and merchant shipmasters could

be fined heavily for refusing to sail in convoy. If a friendly convoy could be protected with a maneuver rather than firepower, this would be done. In battles where the French Navy fought to defend convoys, escort commanders and captains often fought gallantly. For example, during the Second Battle off Cape Finisterre (1747), a significantly smaller escort force under Commodore Desherbiers, Marquis de Létenduère, was defeated by Rear Admiral Edward Hawke's attack, but his convoy of 250 merchants escaped. The French escort under Létenduère damaged the British to such a degree that they could not pursue the merchants. Létenduère thus distinguished himself as an inspirational combat leader against one of the most aggressive and successful of English commanders, even though he did not follow French Navy doctrine precisely. Unfortunately, Létenduère's force was France's last combat-experienced convoy escort squadron, and its loss diminished France's ability to ensure further safe delivery of seaborne shipments. Hence, Létenduère's selection of aggressive tactics not in conformance with doctrine suggests that such departures are not necessarily in the best interests of the nation as a whole, however stirring their accounts in history books.

In an interesting interpretation of international law, a defensive alliance with Spain obligated France to provide warships to Spain during the latter's War of Jenkins's Ear (1739–1743) with England. A French squadron of twenty-two ships operated essentially as part of the Spanish fleet and convoyed a division of Spanish ships to North American waters. This massing of forces, and the presence of French warships within them, deterred a British attack. Otherwise during this war, France claimed the rights and privileges of a neutral, although cooperative interaction between the French and Spanish fleets was extensive enough over the years to lead eventually to the development of multinational naval doctrine.

The French fleet at Minorca in 1756 operated in accordance with a defensive doctrine for maritime support of ground forces wherein the object of the tactical action between fleets was to protect the beachhead and not necessarily to sink enemy ships. The French victory under Lieutenant-Général Roland-Michel Barrin, Marquis de La Galissonnière, was not only a great triumph but resulted in major problems that plagued the defeated Royal Navy commander. As a result of a campaign for Minorca, 150 transports landed successfully some 15,000 troops who eventually took the island. Unfortunately, the subsequent disaster at Quiberon Bay (1759) once again ended France's dreams to invade England and forced her to fight the remainder of the Seven Years' War at sea, off her own shores, on the defensive.

Doctrine of the *épée*

Under Louis XV's Minister of Marine, Étienne François, Duc de Choiseul, naval doctrine was removed from the province of the *plume* and brought directly under the control of the *épée*. After assuming the ministry in 1761, Choiseul issued formal fighting instructions and created a training squadron as well as a marine corps modeled after the British. Despite his many reform efforts and excellent theories, Choiseul served a reluctant sovereign who had competing financial and political needs and chose not to bolster the fleet.[9] In the absence of a vast overseas empire, France turned her attention inward, sentencing her fleet to become a force for coastal defense and war by attrition. Raiding was once again turned over to privateers.

The two leading figures in the reforms instituted under Choiseul were Sébastien François de Bigot, Vicomte de Morogues, and Jean François de Cheyron, Chevalier du Pavillon.[10] Neither of these officers altered the fundamentally defensive nature of French Navy doctrine of war by attrition, and both sought to minimize risk. Morogues believed also that combat at sea would hardly be decisive in the overall war effort. France's particular geographical position made this true at the time. Morogues' bias, however, tended to drive naval doctrine further towards the defensive and escape as an honorable alternative to battle.

Morogues put together a textbook for cadets of the academy at Brest. *Tactique navale ou traité des évolutions et des signaux* (1763), which was published after the end of the Seven Years' War, contained the ideas that had been circulating among the officer corps for some time. Although modeled somewhat upon Hoste's work, Morogues wrote as a naval officer for naval officers, and his tactical ideas tended to be more practical than theoretical. Morogues' signalling system was far more complete than any other in practice. Interestingly, he accepted the role of *élan*, bravery, and experience as necessary ingredients for success when a smaller force faced a larger one. He even accepted the concept of outflanking and breaking the enemy battle line, although only in special cases where one had a superior force or where it was necessary to seize easy targets or to exploit a break in the line created by the enemy.

Morogues' combat experiences at Quiberon Bay (1759) reinforced his strong bias in favor of the defensive form of warfare and control and his belief in the futility of actions between forces of equal strength. Morogues argued that one should mass strength against weakness. Unfortunately, for a variety of political, economic, and cultural reasons, French governments did not normally envision

supporting a fleet that would be able to face the Royal Navy on an equal basis, regularly.

Tactique navale ou traité des évolutions et des signaux was published privately and was not in conformance with the official French Navy signal book. Though it was reprinted once, translated by the British, and published in Holland in 1779, it is difficult to establish how much impact it had on combat in the French fleet. Yet Morogues' book must have had influence there; it was a textbook at the academy, was widely read, and reinforced an emerging appreciation for innovation during battle and the idea that control and defense were the answers to British offensive power.

Captain Jacques Bourdé de Villehuet, an officer in the service of the French East India Company, wrote *Le manoeuvrier ou essai sur la théorie et la pratique des mouvements du navire et des évolutions navales* in 1765. This book included sections on the preparation of the crew for battle, boarding tactics, engaging enemy ships, and shifting from sailing formations used during transit to those employed in battle.[11] It was published in several editions and was translated into English and Dutch. Another 1765 publication, *Ordonnance du roi*, also emphasized control in reference to local freedom of action.

The second leading figure during the Choiseul reforms was Jean François du Cheyron, Chevalier du Pavillon. Pavillon developed a set of signals that was accepted by the French Navy following two meetings of flag officers, one in 1773 and the other in 1775. The signals were given trial during fleet exercises, published in 1776, and authorized for fleet use in 1778. But, individual commanders apparently were given the option to adopt them or not, as in the Royal Navy.

French Navy doctrine formula was to "exercise rigid tactical control over their fleets throughout the whole action by means of an excellent system of signals. The French used one particular flag to represent each digit, and by hoisting combinations of flags could quickly indicate any signal in the numbered signal book."[12] The French made a science of naval warfare, creating an incredibly complex system of manuals and accompanying signal books that were retained until after the end of the Napoleonic Wars. Unfortunately, the direction of the battle signals available was not towards the actual defeat of the enemy fleet.

The French victory under the command of Admiral Louis Guillouet, Comte d'Orvilliers, at Ushant (1778) over Admiral Augustus Keppel, provides an excellent opportunity to review the effectiveness of existing doctrine in both navies. Keppel operated under the centralized Royal Navy fighting instructions, supplemented by his own. D'Orvilliers used instructions prepared

and influenced by his chief of staff, the Chevalier du Pavillon. Keppel engaged d'Orvilliers without first having properly formed a battle line, and the resulting attack was ragged. The French fought generally on the defensive, and their immediate objective was to impair enemy mobility by damaging masts and sails rather than taking prizes. D'Orvilliers achieved this, generally getting the better of the British. Keppel and one of his subordinates were court-martialed after the battle for, essentially, failing to do their utmost, but both were found innocent. The same complaint could have been lodged against d'Orvilliers, since French mobility was impaired to a much lesser extent, but the French seemed less inclined than the British to initiate legal proceedings following lost or indecisive battles.

A combined French and Spanish fleet operated during 1779 to gain control of the English Channel. Overall commmand was exercised by d'Orvilliers, who issued a newly revised set of signals and instructions for use in both fleets—in effect, multinational navy doctrine. Although the fleets had not operated together previously, some Spanish ships were eventually able to act successfully as integral parts of French squadrons in addition to forming their own national squadron of observation, which would join the battle once the enemy was engaged. Other attempts to combine assets, such as in the Caribbean, were less successful.

French naval command was, at times, given to army officers. Jean-Baptiste Charles Henri Hector Théodat, Comte d'Estaing, an infantry officer during the Seven Years' War, was promoted to lieutenant-general, and he was subsequently and simultaneously appointed governor-general of San Domingo and the first Chef d'Escadre des Armées Navales (commodore). At the Battle of Grenada (1779), his opponent, Vice Admiral the Honorable John Byron, failed in an offensive attack, leaving himself vulnerable to counterattack or destruction of his convoy. The Comte d'Estaing, in turn, failed to use his superiority and seize upon the opportunity, being content to have prevented the British from landing troops. Regular French Navy officers, such as then-Captain Pierre Andre, Bailli de Suffren-Saint Tropez, criticized this decision and the resulting inaction.

Failure to capitalize on their superior ability to control their forces and order them to respond promptly to signals was demonstrated during Commodore Destouches' victory over Admiral Mariott Arbuthnot off the Virginia Capes in March 1781. Destouches blunted a British attack on his ships, broke off, and withdrew from the shores of Virginia rather than exploit fully the victory or land troops destined to support Major General Marie Paul Roch Yves Gilbert Motier, Marquis de Lafayette. Destouches was subsequently criticized at court,

and by some of his officers. At the end of the battle, Arbuthnot's forces remained between the French ships and Virginia.

The same criticism could have been levied against Rear Admiral François Joseph Paul, Comte de Grasse-Tilly (another former army officer), who maneuvered boldly from the Caribbean to the Virginia Capes (September 1781), but in his subsequent victory over Admiral Lord Thomas Graves, failed to act in a daring manner during the first day of the Battle of the Saints (1782). Of course, Admiral Lord George Brydges Rodney's failure to exploit the victory over de Grasse on the second day of the battle is the subject of controversy and proof that this problem was not limited to only one navy. Despite his subsequent humiliation due to his losses and capture at the Battle of the Saints, Admiral de Grasse is remembered by a grateful America for his support and success off the Virginia Capes and its resulting impact on coalition military operations ashore at Yorktown.

The one French Navy officer in whom both sides acknowledged an innovative, offensive fighting spirit was Pierre André, Bailli de Suffren-Saint Tropez. Then-Commodore Suffren engaged in a series of five battles against Admiral Sir Edward Hughes in the East Indies between 1782 and 1783. Suffren, admired as one of the greatest tactical innovators of naval history, is generally credited as the first to order his captains to attempt to break the enemy's battle line—although in fact this had been done earlier by de Grasse, under whom the Balli de Suffren had served. Suffren issued both written and verbal plans before each battle—sometimes exhorting his captains to do the best that they could under the circumstances. His personality, however, lacked the magnetism of Admiral Lord Horatio Nelson, nor did he command the devotion of his men as did Tourville. When necessary, Suffren replaced less effective captains with those who were bolder, but there is also no indication that he devoted a great deal of time to the preparation of formal standing fighting instructions.

Because his Indian Ocean squadron was of limited size and was essentially on its own without the ability to count on reinforcements or replacements of its battle losses, Suffren was forced to be content with the immediate tactical victory. Hence, he was compelled to forgo the exploitation phase of battle in order to conserve assets.[13] Upon returning to France, Suffren was promoted, rightly, to vice admiral, but one should recall that he never commanded a great battle fleet.

With its major victories over the British at Ushant and in the American War of Independence, France rested comfortably on the success of its naval doctrine and signals. Essentially, Pavillon's system seemed vindicated, and new doctrinal development now slowed considerably. All subsequent signal books

were further adaptations of the existing system. Naval commissions were formed to study the question of signals, and they reported that there was no need for further development. Two tactical books that appeared in 1787, *Mémoire sur la tactique navale* by Commodore Verdun de la Crenne and *Tactique navale* by Captain Buor de la Charouliere, advanced no new ideas in doctrine.

There were a few exceptions to this general rule, such as *L'art de la guerre sur mer, ou tactique navale* (1787) by Chef de Division (commodore) Jurien, Vicomte de Grenier, a short book about navy tactics that did advance some new concepts.[14] This succinct work is based upon combat experience and is very much oriented towards battle, not control. Grenier stressed massing strength against weakness, much as had Morogues. He exposed the weaknesses of the French line-ahead battle plan, attributing its successes to British ineptitude rather than to the virtue of this formation. Despite some rather innovative suggestions for tactical disposition of the fleet, *L'art de la guerre sur mer, ou tactique navale* was still essentially biased toward defense and wars of attrition. Although this book was written by a serving admiral, it had little impact on the French Navy. It was translated within a year into English, into Dutch in 1799, and it was apparently used by the Spanish.

Another exception that advanced new ideas in doctrine was *Tactique navale, ou traité sur les évolutions, sur les signaux et sur les mouvements de guerre* (1788) by Admiral Clause François, Comte d'Amblimont. *Tactique navale* was also based upon combat experience but stressed innovation; d'Amblimont promoted breaking the fleet into separate *pelotons*, or tactical groups, with different functions. Subsequently Nelson used this device successfully at Trafalgar (1805). *Tactique navale* advocated the unrestricted offensive, but this opinion was not shared by the fleet officers.

Generally, French Navy doctrine during the years of war with Great Britain was such that the objective of an engagement with enemy ships was to cripple their mobility.[15] Although this doctrine would result perhaps in fewer shots per engagement, it usually would not result in the *elimination* of the subsequent threat. British warships were neither taken prize nor sunk, thus allowing their subsequent refitting and eventual return to battle. According to French doctrine, the ultimate purpose of naval warfare was not necessarily to engage enemy ships. Indeed, a leeward escape to fight another day was an honorable alternative to battle. The overall strategy was to expand control over new areas of the globe rather than to contest other European powers in battles at sea. There were obvious exceptions to the rule, and in fact some British commanders used the French model rather than attempt to capture or destroy the enemy.

French tactics were normally to fight on the leeward side and fire their cannon on the upswell so as to maximize "mobility kills" by damage to masts and rigging rather than attempt to sink the ship by aiming at the hull. For the most part, except when led by Suffren, the French Navy fought from the defensive when engaging an enemy fleet of equal strength. The French Navy thus adopted a doctrine of battle avoidance and war by attrition. When coupled with their generally better built ships, sound training, and a well-formed tactical line, the French frequently bettered the more offensive Royal Navy who sought the decisive engagement. As discussed above, these successes included: Beachy Head (Bévéziers) in 1690; the Second Battle off Cape Finisterre in 1747; Minorca in 1756; Ushant in 1778; and the Virginia Capes in September 1781.

French naval writings during the years of war with Britain included many of the sophisticated doctrinal issues that were being debated in all navies. One issue was the question of correct placement of the fleet commander. Should the admiral ride in the van, at the center, in a heavily armed ship of the line or in a fast frigate? Shifting the flag to a frigate had been tried by British Admiral Lord Richard Howe off Rhode Island in 1778, and Admiral Sir George Rodney did the same off Martinique in 1780. Following the capture of de Grasse at the Saints (1782), French Navy doctrine was changed to require that commanders in chief fight from frigates; a flag officer embarked in a frigate could see better and his signals could be seen better. Fighting from a frigate resembled the placement of the general officer overlooking the battlefield. The policy was later abandoned by the new government.

Although naval doctrine under the French monarchy was extremely thorough, it was biased by factors beyond the control of naval officers. Technology remained essentially the same during this era, and the major modifications to doctrine were based upon geography, strategic culture, available resources, and government policy. The impending change in the type of government was to have a dramatic impact on naval doctrine, including the loss of rich tradition and lessons learned by monarchist navy officers who had paid for their lessons in blood.

Doctrinal Collapse with the First Republic

As the French became preoccupied internally with their own revolution in 1789 and its aftermath, neither the aristocratic officer corps (le grand corps) nor the new Republican leadership was overly concerned with advancing the finer points of naval doctrine. Many of the good ideas proposed by Grenier and d'Amblimont had simply arrived at the wrong time, and many of the valuable

lessons were lost on the guillotine. Instead, the navy of the Republic went to war in 1793 using the basic naval doctrine of the *ancien régime* against the British, who had been experimenting and exercising their new tactical doctrine, based in part on the innovations advanced in the dying days of the French monarchy. Similarly, doctrinal development ashore stagnated, and the French Army preserved the same drill regulations until 1831. Even Napoleon Bonaparte's army used the regulations of 1791.[16]

What the navy of the Republic lacked in doctrinal development, it made up for in spirit. The Battle of the Thirteenth Prairial in 1794 (known in Britain as the Glorious First of June) was one of the greatest convoy battles in naval history. Rear Admiral Louis Thomas, Comte de Villaret de Joyeuse, commanded the Brest fleet in an engagement some four hundred miles out to sea. Villaret de Joyeuse's objective was to ensure the safe arrival of a 130-ship convoy with supplies from America. The loss of the Brest fleet was an acceptable price to pay for the safe arrival of this convoy. To his credit, Villaret de Joyeuse accepted combat against the well-trained and recently exercised Channel Fleet under Lord Howe, one of the most skillful tacticians then in command. Although the Brest fleet was severely mauled during the battle, it succeeded in the overall objective and gave an extremely good accounting of itself. Despite his losses and his being of noble birth, Villaret de Joyeuse was neither court-martialed nor guillotined.[17]

On the other hand, in one of his subsequent engagements with the British, Villaret de Joyeuse, with the bulk of the Brest fleet off Belle Île in 1795, failed to capitalize on a clear advantage over a British squadron. He allowed himself to be bluffed by the British commander, Rear Admiral Sir William Cornwallis. Within one week, Villaret de Joyeuse suffered a humiliating defeat, the débandade de Groix off the Île de Groix. Clearly the French Navy was to pay a heavy price for the loss of an institutional ability to advance how it would fight in war. This era marks the low point of the French Navy.

By the end of 1795, the Committee of Public Safety resolved that the navy would henceforth send out only small divisions, whose goals would be *guerre de course* and raiding distant colonies. With this official government policy accepted subsequently even by Napoleon, doctrinal development could not help being affected. Navy reforms were initiated under a former royalist lieutenant, now Minister of Marine, Vice Admiral Jean François Truguet. But all reforms were within the context of the assumed role of raiding—not major fleet engagements.

The Napoleonic Era

Much has been written about the French loss at the Battle of Aboukir Bay, also known as the Battle of the Nile (1798). Suffice it to say that Vice Admiral François Paul Brueys d'Aigaïlliers demonstrated that he did not know how to fight at anchor, thus indicating a basic failure in doctrinal understanding and development. In his correspondence with Napoleon, Brueys expressed indecision over whether to fight at anchor or under sail if attacked. Brueys' ships could have formed into a stronger defensive position and amassed firepower against the attack; anchored closer together; loaded their guns on both sides; and opened fire at maximum rather than minimum range. His captains lacked necessary experience and there was no doctrine to address these tactical issues.

In 1802, a former naval officer, Audibert Ramatuelle, published a major book on naval tactics, *Cours elémentaire de tactique navale, dédié a Bonaparte.*[18] To his credit, Ramatuelle analyzed Nelson's success at Aboukir. Unfortunately, he did not take advantage of the lessons of the d'Orvilliers at Ushant and Suffren in the East Indies or the writings of Grenier and d'Amblimont (although he did embrace d'Amblimont's concept of the *peloton*). Ramatuelle stated that the central point of war was to hold land rather than to capture enemy ships; this reflected the strategic culture of France and its inability to come to grips with how to defeat Great Britain. Napoleon saw victory as a result of defeating the enemy's army rather than defeating the enemy's center of gravity.

A major result of the French Revolution was that it showed that men could be motivated to fight for an idea and that such men could be fielded into armies in numbers never before seen. With such numbers, commanders now had new tactical, operational, and strategic opportunities.[19] Although this was obvious in warfare ashore, it was not so clear at sea.

Napoleon's expertise in naval matters certainly is subject to question. His ill-fated plan to invade England in 1801 would probably have proved disastrous if attempted. There had been no serious doctrinal development for such an undertaking, since there had been no effort even to build a force that could contest the Royal Navy for control of the Channel. Even the types of craft selected for the invasion crossing were not the most seaworthy. The subsequent expedition to San Domingo was a success from the perspective of the navy covering force, but a military disaster ashore. When Napoleon became aware of the crude submarine that had been designed by the American Robert Fulton, his admirals dismissed it as uncivilized.

By August 1805, however, Napoleon apparently had learned what was required. He ordered his various fleets to sea and instructed them to join together

but to avoid combat until they had massed—keeping in mind the ultimate objective. The renewed plans to invade England were frustrated by Vice Admiral Pierre Charles Jean-Baptiste Silvestre, Comte de Villeneuve, who was commanding the largest fleet that was to support the transport force. Villeneuve had been engaged in extensive operations in which he sought to avoid engaging the British while he sought union with the rest of the French fleet. The British had maneuvered a large force in the Channel, and because Villeneuve felt that he could not possibly succeed in contesting control there, he was less than timely in his response to support the Grande Armée. When presented with false information about the location and strength of the British, Villeneuve abandoned the field and sailed to Cádiz. Without naval support, Napoleon turned his back to the sea and his attention to Continental enemies.

To understand the subsequent actions of the combined Franco-Spanish Fleet at the Battle of Trafalgar (1805), we must keep in mind the objective of its commander. Villeneuve was under orders to sortie from Cádiz, join with ships at Cartagena, and transport embarked troops to support an attack on Naples—Napoleon having now abandoned his invasion of England. Villeneuve knew that Nelson awaited him, but nothing in his order said that he was to engage or defeat the British fleet. Nelson was viewed as an obstacle to be overcome rather than an object with which he had to deal.

Villeneuve was a brave man, but he also understood the limitations of the combined fleet in training and the quality of its ships.[20] His misgivings were shared by officers in both fleets, as they met in a pre-battle council of war. Villeneuve, who held the advantage of being able to observe Nelson's blockading, chose to emerge from the harbor when a squadron of British ships were detached for logistical duties. The combined fleet commander thought, incorrectly, he had the numerical advantage over Nelson and had even organized a separate squadron of observation from what he believed to be his excess. Villeneuve's final instructions, issued on the day of the battle, foretold accurately Nelson's tactics but did not provide advice on how to combat them.[21] In short, French Navy doctrine did not have constructive guidance to offer him.

Once at sea, Villeneuve failed to provide for tactical reconnaissance and gained essentially no significant information on Nelson's actual strength until the morning of the battle when he hastily reintegrated the observation squadron into the main fleet. A series of poorly executed signals and missed opportunities doomed the combined fleet to fight on the defensive. Villeneuve even issued a general signal: "Every ship which by her present position was not engaging [is] to take any such steps as would bring her as promptly as possible into action."[22] In the hands of Nelson's captains, such a signal would have had meaning. For

the combined fleet, the lack of combined doctrine, training, and sound ships made the signal only an interesting footnote to history. The footnote is all the more curious because, since the signal was addressed to no one in particular, neither the French nor Spanish captains took any action based upon it. There is no question, however, of the bravery of the men of the combined fleet who fought at Trafalgar with honor.

The End of the Age of Sail

Following the defeat at Trafalgar, Napoleon ordered the fleet to resume *guerre de course* and overseas raiding. Privateers supplemented the standing fleet initially, which did attempt to engage the British in distant operations being fought over colonies and which also occasionally fought the Royal Navy in home waters. A few tactical-level defensive victories did little to stem the tide of ruin under Napoleon. Sailors from the Brest fleet were landed to serve with the army, and even commerce-raiding efforts were unsuccessful. Despite Napoleon's dismissal of the Battle of Trafalgar, he ordered the following words to be painted prominently aboard surviving French men-of-war: "France expects that every man will do his duty."[23]

The French introduced their own version of the British telegraph system in 1813 as a supplement to the official signal book. In 1815, a French Navy lieutenant, the Chevalier de la Rouvraye, published the *Traité sur l'art des combats de mer*, advocating a true offensive spirit and stressing the responsibilities of the individual captain to carry on the battle even if outnumbered. Unfortunately, the book arrived in an era when the new governments questioned even the need for a navy. In 1819, the newly restored monarchy published a new signal book reinstating the traditional signals of Pavillon and Morogues. In that same year, Father de Pradt published an *Appel à la nation française au sujet de sa marine*, in which he concluded that the downfall of the French empire was due to wasting resources on the navy. In 1819 the government decided to support a navy—but the overall employment of the fleet would be *guerre de course.*

In 1821, a French artillery officer, General Henri Joseph Paixhans, wrote *Idées pour le blindage du batteries flottantes*, advocating modern ironclads mounting only a few large guns. In 1822, he wrote *Nouvelle force maritime*, which recommended the quick building of a modern steam navy that would render Britain's existing fleet irrelevant. In the *Journal des sciences militaires*, a series of articles by a naval commander, Jacques Merigon de Montgéry, proposed ships of iron with watertight compartments as well as the use of mines,

torpedoes, and submarines. These ideas were well ahead of their time, and they had no effect on fleet building programs.

Some twelve years after Waterloo, a French squadron fought side-by-side with British and Russian squadrons in an overwhelming and decisive defeat of the Turks at Navarino (1827). The Turkish fleet, commanded by Admiral Ibrahim Pasha (with the advise of a group of French Navy officers led by Captain Jean-Marie Letellier) was anchored in fixed, semicircular defensive formation. The Europeans fought a mobile offensive under written orders that were identical to Nelson's at Trafalgar, and at the end of the battle, sixty Turkish ships had been destroyed without the loss of a single European ship.

Rear Admiral Jean Baptiste Grivel explained his concepts for fleet doctrine in his 1832 *Considérations navales en réponse à la brochure de Monsieur de Pradt.* Grivel was one of the first to attempt to deal with the overall concept of maritime power. His recommendations, however, followed existing government policies—*guerre de course.* Grivel stated that this would strike at the heart of British power. It was a doctrine of necessity, since it was clearly foolhardy to meet the Royal Navy head-on in a decisive battle. Then-Lieutenant Louis-Narcisse Chopart prepared a tactical textbook for sailing ships in 1839, which was translated into English in 1859 and used at the U.S. Naval Academy.

The French military, in general, has always considered *élan* to be one of its national strengths and incorporated fighting spirit into its military and naval doctrine. The wars of the age of sail, however, indicated that spirit alone will not compensate for material and training deficiencies. Early doctrinal decisions to fight at sea reflected disdain for the crude broadside employed by the British; unfortunately, the alternative method of more specific attacks and attempts at mobility kills did not always yield the desired results. On the other hand, a doctrine that included escape as an option allowed for some advantages over the British, whose formal doctrine was biased in favor of avoiding defeat.

Doctrine in the Age of Innovation and the Ironclad

The pioneering work of Stanislas Dupuy de Lôme in the 1840s served to introduce the ironclad into the world's navies. The first screw-driven ship of the line participated in the multinational naval operations in the Black Sea during the Crimean War (1853-1856). This war also stimulated French development of rifled artillery. Naval attention returned to fleet engagements, due to the Peace of Paris which outlawed privateering, thereby turning French

Navy emphasis away from *guerre de course*. After much effort, *La Gloire*, an open-ocean steam battleship, was launched in 1859.

Admiral Louis Bouët-Willaumez wrote a series of publications that pioneered advances in French Navy doctrine. His *Batailles de terre et de mer* (1855) was attached to a *project de tactique navale*—outlining provisional tactics for screw-propelled steamships. This doctrine included ensuring a superior force with a combined effort at the decisive point. Bouët-Willaumez annexed to his book a plan of attack with eight main orders.

Bouët-Willaumez's work was then adopted by the Ministry of Marine under the doctrinal title, *Provisory tactics* (1857). The Ministry also published *Tactique navale* that same year, outlining doctrine for ships of sail and steam. *Tactique navale* was an official naval doctrinal publication whose contents junior officers were expected to master for promotion examinations. Bouët-Willaumez's new doctrine was tested in the fleet, reviewed by the Ministry of Marine, and officially sanctioned in a new signal book in 1861. Admiral Bouët-Willaumez was well-experienced with the fleet—he finished his service as commander in chief.

These early doctrinal writings followed, rather than led, the introduction of new technologies. They were paralleled by the Second Empire, under Napoleon III; the emperor kept his naval programs in check so as not to irritate the British, who dominated at sea. In 1863 an experimental submarine was developed but abandoned due to technical difficulties. In 1864 Russian Admiral Gregoire Boutakov published a book on naval tactics which was translated by a French Navy officer and then published by the French Ministry of Marine for domestic use under the title *Nouvelle bases de tactique navale*. In 1866 the *Revue Maritime et Coloniale* provided an unofficial forum for the discussion of new doctrine and other naval matters outside of official circles.

Bouët-Willaumez's writings, such as his *Tactique supplementaire à l'usage d'une flotte cuirassée* (1865), had an impact outside of the French Navy.[24] Similarly, the offensive tactics of Austrian Rear Admiral Wilhelm von Tegetthoff in 1866 off the island of Lissa (now Vis) in the Adriatic, in the first battle between armored fleets, had an impact on the doctrinal development of the French Navy. Admiral Jurien de la Gravière took command of the squadron of evolution (charged with tactical development) in 1868, and after studying the Lissa battle he embraced the ram, the *mêlée*, as well as the "charge" employed by Nelson at Trafalgar and by Tegetthoff at Lissa. There was a worldwide debate as to which was supreme, the ram or the gun, with virtually every major navy embracing the ram.

Naval operations in support of other overseas major regional contingencies generally followed the pattern of the Crimean War.[25] The navy's role was to transport troops to foreign locations, ensure their resupply, and participate in blockades and attacks on fortifications. With no enemy at sea and operations confined to the littoral, there was little glory in duty at sea, although the French fleet in 1870 was the second most powerful in the world. Defeat during the Franco-Prussian War (1870-1871), in which sailors again served ashore as ground forces and received national recognition for their efforts, turned French military concerns back toward land warfare. After all, how could the fleet obtain the return of the lost provinces?

La grande guerre versus *jeune école*

French doctrinal development during the mid-to-late 1800s continued to include the *peloton* and to form tactical groups as parts of larger fleets. In the 1890s, France led the world in the development of the submarine as a practical weapon of war. The naval ministry supported research into alternative methods of contesting British domination of the seas. The French submarine *Narval* was launched in 1899, whereas the British Admiralty did not place orders for submarines until 1901. On the other hand, although the submarine received development in France, its full potential was not recognized. At first it was thought of as a submerging torpedo boat suitable for coastal defense. French Navy matters turned to expansion of the empire and to military operations other than war.

French naval thought flourished again at the end of the nineteenth and beginning of the twentieth centuries.[26] After years of defeat by the British, the legacy of a defensive navy doctrine, and preference for *guerre de course* and attrition warfare over warfare of annihilation and decisive battle, the French Navy considered some different ideas. Its *École supérieure de guerre de la Marine*—the French Naval War College—was founded in 1895. *La grande guerre* concept, favoring the decisive battle and deep-sea warfare (*guerre de haute mer*) in order to achieve command of the sea, was the centerpiece of a number of French Navy officers' writings in the late nineteenth and early twentieth centuries.

Writings that supported *la grande guerre* included: Admiral Jurien de la Gravière, "La marine aujourdhui," *Journal of the RUSI* (Royal United Services Institute for Defence Studies), 1874; Vice Admiral Gabriel Darrieus, *La guerre sur mer* (1907);[27] and then-Commander René Daveluy, *Etude sur la stratégie navale* (1905), *Leçons de la guerre russo-japonaise, La lutte pour l'empire de*

la mer (1906) and *L'esprit de la guerre navale* in three volumes (1909–1910).[28] These writings paralleled those of the American Rear Admiral Alfred Thayer Mahan. Although they were not official doctrine, they formed a point of departure for official debates over navy doctrine and programming. The mainstream of thought by the French naval officer corps supported concepts found in these writings.

The Naval Battle: Studies of the Tactical Factors (1910), by Lieutenant Adrien Edouard Baudry, was translated into English for use by American and Royal Navy officers. Indeed, the writings of Darrieus, Daveluy, and Baudry were provided to ships' libraries by the U.S. Navy Department. Unfortunately, thought about *la grande guerre* and *la guerre de haute mer* found a skeptical audience following the defeat of France in 1870–1871 in a war wherein sea power was clearly secondary.

An alternative view was championed by another group of officers and civilian thinkers whose movement became known as the *jeune école*. These were, primarily, Vice Admiral Baron Richild Grivel (son of Rear Admiral Jean Baptiste Grivel), *De la guerre maritime avant et depuis les nouvelles inventions, etude historique et stratégique* (1869); Admiral Hyacinthe-Laurent-Théophile Aube, *La guerre maritime et les ports français* (1882), *A terre et à bord, notes d'un marin* (1884), and *De la guerre navale* (1885); the journalist Gabriel Charmes, *La reforme de la marine* (1886); Commander Gabriel Fontin (pseudonym H. Montéchant) and Lieutenant Paul Vignot (pseudonym Commandant Z), *Essai de stratégie navale* (1893). The *jeune école* did not represent mainstream naval thought and should be interpreted as a temporary sidetrack resulting from the introduction of, and opportunities afforded by, new technologies in an austere fiscal environment.

The *jeune école* argued that capital ships were becoming vulnerable with advances in technology and that a well-designed fleet of inexpensive commerce raiders could strike at the heart of British (an assumed enemy) prosperity and cause British shippers and manufacturers to demand peace from their government. Coastal defenses should also be emphasized. Pertinent historical navy battles were offered to prove the inadvisability of contesting a superior force at sea in *la grande guerre* and *la guerre de haute mer*. Grivel in particular argued that naval battles at sea were rarely decisive for the overall war effort as were many ground battles.

The *jeune école* must also be understood in the context of the political and economic situation at the time. French governments lacked the political imperative to devote significant resources to the fleet. Professional officers like Aube and Grivel were trying to develop concepts of operations based upon these

political and fiscal realities.[29] Grivel understood especially that his government would be unwilling to compete with the British in naval force structure and was looking for an alternative theory for support for the fleet.[30] Naturally governments were attracted to doctrinal developments that promised the required political objectives at low cost.

The doctrine of the *jeune école* was offensive (at the tactical level), but the associated force structure was much less capable than that required for *guerre de haute mer*. The new high-speed torpedo boat epitomized the type of ship conceived of by the *jeune école*. As Minister of Marine, Aube argued that these torpedo boats could sortie from port and attack British ships in their own harbors, thus making squadron engagements between main battle forces more successful. These smaller ships were to be used as well in coastal defense (*guerre de côte*)—indeed defense of France from blockade by the Royal Navy was the major objective of fleet engagements. Aube also had great hopes for *guerre de course* both to scatter the Royal Navy, making possible squadron-sized engagements near France, and to strike at the basis of British power. Essentially Aube argued that France should take advantage of new technologies and that the fleet's doctrine should be based upon a division of labor.[31]

With such a force, an offensive capability at the operational or strategic levels of warfare was impossible. If France were to fight a war of revenge against Germany (another assumed enemy), it would be fought primarily on land. France began to build torpedo boats and a system of bases on the northern and southern shores of the western Mediterranean. Admiral Aube's vision was that of a far-flung network of French bases, all linked by the Panama Canal being built by French engineers.[32] Since the French Navy had been the administrator of most overseas colonies, the views of the *jeune école* were thus entirely consistent with existing government policy. At the height of the influence of the *jeune école*, France, Germany, Austria-Hungary, and Russia abandoned their battleship-building programs and even the British Admiralty appeared embarrassed by its continued development of large surface vessels.

During the thirty years between 1871 and 1901, France had thirty ministers of marine. With such changes in government, consensus on a coherent naval program was extremely difficult, as was agreement on "how to fight" doctrine. After some thirty years of debate, wild oscillations in government policies, and a shift in the threat from the British to the Germans, Italians, or Russians, the French government settled on the need to contest command of the sea by engaging an enemy battle fleet and then conducting operations against the enemy shoreline.

France's need for a high seas fleet was validated by its embarrassment during the Fashoda Incident (1898), the German naval building program, the unreliability and vulnerability of the less expensive forces demonstrated in fleet maneuvers, and the experiences of Russia and Japan in the Battle of Tsushima (1905). In addition, the low-cost option was coupled entirely to a single scenario that fell apart in the face of a multitude of possible enemies and missions. Vice Admiral François-Ernest Fournier dissented from this approach in *La flotte nécessaire: ses avantages stratégiques, tactiques et économiques* (1896), arguing that the battleship itself need not be built to obtain sea control, but that larger torpedo boats and armored cruisers would suffice. Official naval doctrine soon returned under the influence of Admiral Gabriel Darrieus and professional officers attached to the *École supérieure de guerre de la Marine*, but the ideas of the *jeune école* surfaced in France and in other nations from time to time.

Certain government ministers were weary of the years of debate and the impotence of the nation; hence the Ministry of Marine ordered the wholesale retirement of active flag officers. This second "decapitation" of the navy's leadership had a disastrous effect. Future admiral Raoul Victor Patrice Castex lamented in 1908 that the navy lacked a general staff dedicated to the development of definitive navy doctrine.[33]

The new Minister of Marine, Vice Admiral Augustin Boué de Lapeyrère, in 1909, ordered a new building program that was to be completed in 1919.[34] Unfortunately, in its desire to save money and in its preoccupation with a vulnerable border with Germany, the French government failed to pay sufficient attention to its navy prior to World War I; the French fleet slipped in world ranking from second to fifth place.[35] How much of this situation was due to the debate over doctrine is open to speculation.

Twentieth Century World Wars

During the First World War, the fleet's initial primary task was to maintain the sea lines of communication (SLOCs) with Algeria and then to patrol French maritime frontiers. The SLOCs were the vehicle that would enable a half-million colonial soldiers and two hundred thousand workers to assist France in her hour of need. Hence the navy's contributions were strategic in nature, although it did not engage in decisive battle with the German High Seas Fleet. Without a major *guerre de haute mer* role, there was no way to validate prewar decisive-battle doctrinal development from actual performance in combat. Due to the French Navy's lack of compatibility with the Royal Navy and inability to operate with the Grand and other allied fleets, the Mediterranean theater was split into

national zones of responsibility, with the French Navy assigned the lion's share.[36] The resulting over-commitment of naval resources to the Mediterranean theater was a direct result of the inability to form an allied fleet, although the French Navy did operate with the British in the Dardanelles. As in previous wars, a naval brigade, the *Brigade des fusiliers marins*, fought ashore.

Following World War I, the French Navy became influenced by the writings of Admiral Raoul Castex, whose influence endures today. His five-volume *Théories stratégiques* is perhaps the most complete theoretical survey of maritime strategy ever.[37] A sixth volume, *Mélanges stratégiques*, was published in 1976 after his death. Castex completed an additional eighteen major works and more than fifty journal articles. His *Les idées militaires de la marine du XVIIIme siècle: De Ruyter à Suffren* (1911) makes major contributions with respect to the differences between official doctrine and actual tactical practices. The essence of Castex's work can be found in a summary of some 2,600 pages of original text in French, translated into 428 pages of English in *Strategic Theories*.[38] His conclusions were that decisive naval battles were rare in history and that the enemy fleet was not always the main object of an operation or battle. Castex believed that naval doctrine should be offensive and oriented toward a decisive battle. Suffren was Castex's professional role model—standing doctrine should be abandoned if warranted by the tactical situation.[39]

On the other hand, Castex recognized that his task was to provide doctrine for a second-ranking navy, one that would never hope to challenge the British. Thus he formulated the concept of *la force organisée*, a main force that could be mustered for a limited counteroffensive against a superior enemy. There is some similarity between this concept and some of the ideas of Julian Corbett in Britain.[40] Castex gave significant attention to commerce raiding, raids, blockade, mine, and amphibious warfare. The centerpiece of his writings is strategic *manoeuvre*, not battle. Castex wrestled with the influences of technology on doctrine but concluded that the aircraft did not signal the end of the surface ship. In the final analysis, Castex is a blend of *la grande guerre* and the *jeune école*.

Castex's writings appear to have had only modest direct impact on the behavior of French governments.[41] On the other hand, his writings played the same role as did those of Admiral Mahan in the United States and elsewhere in the world—they were used as textbooks and points of departure for internal government position papers—and Castex is credited with saving the battleship. One can also trace ideas from *Théories stratégiques* to the creation of the new *Collège des hautes études de défense nationale* in 1936. The existing *École de*

guerre navale was supplemented by the *Centre des hautes études navales. Théories stratégiques* was translated into Japanese and, for the Argentine Navy, into Spanish. Various sections were translated into Serbo-Croatian, Greek, and Russian. It has been widely used in Latin America and Mediterranean countries. In 1943, the renowned American strategic thinker, Bernard Brodie, recognized Castex in his *A Layman's Guide to Naval Strategy* by stating that "the underlying value of the teachings of men like Mahan, Corbett, and Castex is still largely intact."[42]

A few other French Navy officers had some influence during World War I and the interwar years. Rear Admiral Jean-Baptiste Degouy wrote a series of articles and books which, although illogical, nonetheless demonstrated a fundamental failure of the naval officer corps to come to grips with the issue of offensive versus defensive warfare. Others wrote articles and books in which the failure of the battleship to obtain a decisive victory at Jutland was, incorrectly, attributed to the submarine and concepts previously advocated by the *jeune école.*

French Navy policy during the interwar years was also influenced by Admiral René Daveluy, who, along with Naval Minister George Leygues (minister from 1925 to 1933), became concerned with coastal defense and implementing the various naval arms control treaties that would make large-scale battles at sea obsolete. On the other hand, for the first time since the Second Empire, France had a coherent navy policy and doctrine.[43] Daveluy wrote *Les enseignements maritimes de la guerre anti-germanique* (1919), which pulled no punches and admitted that the battleship had failed to deliver as expected in the previous war. This book, however, had no real influence in France. Eventually Daveluy advocated an all-submarine fleet and a policy of "sea denial" rather than sea control—but his recommendations were ignored.

It was not until 1938, under Fleet Admiral François Darlan, that a naval construction program began in earnest. That program, however, paid insufficient attention to naval aviation, antiair warfare, and antisubmarine warfare. France had over-committed herself with the promise to defend overseas possessions. Honor prevailed, and resources that could have been devoted to a defense of France herself were squandered on naval forces that neither saved colonies nor contributed to protection of the homeland.

The French Navy participated in a number of brief operations with the Royal Navy in the very early days of World War II. Those forces of the French Navy (the fourth largest in the world at the time) that remained loyal to the Vichy government were never put into a position where they would engage in major combat actions against their former allies.[44] Hence there was generally no

opportunity on either side to validate the prewar navy doctrine developed from the thoughts and writings of Castex on general warfare. In 1940, the French *force de raid* at Mers-el-Kébir (Oran), Algeria, refused to sortie to allied, neutral, or Caribbean ports, and Vice-Admiral Marcel Gensoul rejected an ultimatum since it would have contravened the conditions of the armistice with Germany. His force was dealt with effectively in port by the British Force H under Vice Admiral Sir James Somerville. The French *force X* at Alexandria, Egypt, under Vice Admiral René Godfroy, was demilitarized, and elements in the West Indies remained out of the war. Vichy forces fought off a British and Free French invasion of Dakar later that same year. In short, the French fleet was dismantled.[45]

The value of the French Navy, however, can be measured by the efforts of former allies to ensure that the fleet remained out of Axis hands. These efforts must have been due to a healthy respect for French Navy capabilities, which were, in part, a measure of French Navy doctrine. During the years of the Vichy government, all doctrinal development ground to a halt. The French general staff forbade the updating of doctrinal manuals, fearing that changes would be interpreted by the Germans as being directed at them. This forced doctrinal development to be done in secrecy. The fleet performed no major training exercises, nor was it integrated into either the Italian or German force structure. Germany negotiated for the use of the French Navy for some time, but the bulk of the remaining French fleet at Toulon was scuttled at the end of 1942 when the Germans tried to seize it.

French forces that escaped the German occupation and chose to continue the war operated outside normal political control. Eventually, most of the Fighting Free French forces operated with the permission of General Charles de Gaulle but under the operational control and as an integral part of allied forces. Their experiences while operating with foreign forces was to forever alter French military and naval doctrine. Eventually French Navy forces participated in integrated convoy escorting and amphibious assaults. Fighting Free French forces operated at the same level of combat efficiency as their allies.

Doctrine during the Cold War

Free French Navy forces had been quick to adapt to allied naval doctrine during the war, but where there was a choice between allies, the French were usually more likely to accept the American way of war rather than the British way. Simply put, the bitter aftertaste of Mers-el-Kébir was to last many years. For example, following World War II France turned a good deal of its attention

to the recovery and defense of overseas colonies. Most of this effort did not require forces for fleet-versus-fleet interaction, yet the French concepts for operations from the sea, using aircraft carriers, were based upon American doctrine rather than the extensive British history.

One of the more interesting authors on naval matters during the 1950s was Vice Admiral Pierre Barjot. Admiral Barjot embraced the American method of antisubmarine defense (offensive striking forces) and not the British (convoys). Admiral Barjot wrote a number of substantive documents that were strategic, doctrinal, and programmatic in nature.[46] An unabashed supporter of aircraft carriers and naval aviation, Barjot authored *Vers la marine de l'âge atomique* (1955) and *Histoire de la guerre aéronavale* (1961).[47] Admiral Adolphe Lepotier prepared some excellent articles for publication in the *Revue de la défense nationale* as well as two books, *Mer contre Terre* and *La guerre dans les trois dimensions*. Unfortunately, these works were never followed up with additional in-depth strategic thought.

On the other hand, France developed her own doctrine for naval diplomacy. Rather than having large numbers of overseas-stationed combat forces as the Americans did, or the "swing-through" doctrine of the Royal Navy, the French often achieved the same political purpose with station ships of limited combat potential. Although France still maintains the limited ability to intervene overseas, the formal *Force Amphibie d'Intervention* was disbanded in 1969.[48]

France was an original member of the North Atlantic Treaty Organization, and even though it did not routinely participate in its military command structure during most of the Cold War, the French Navy developed into a serious combat force with the most modern implements of war. Technological innovation continued, with France leading the West in development of surface-to-surface cruise missiles. France did not attempt to challenge the superpower navies of the United States or the Soviet Union but rested comfortably with its status, which was equivalent essentially to that of Great Britain. French Navy doctrine was developed for interactions against fleets of minor powers or to deny a major power the full use of its fleet.

The commitment by various governments to maintain a navy portion of the *force defrappe* limited France's development of conventional warfighting capability.[49] A lack of resources precluded both a nuclear and a serious conventional warfighting capability. The French recognized that nuclear warfighting at sea might be required if nuclear weapons had already been used ashore. The only major role for conventional naval forces might be to sweep the seas ahead of a missile-firing submarine to ensure that it would get to its launch position unaffected by enemy antisubmarine forces.[50] The aircraft

carrier represented a pre-strategic but nuclear-capable force that permitted some operational flexibility.

Admiral Marcel Duval's new courses at the *École supérieure de guerre de la Marine* enhanced doctrinal development. Then-Commander Michel Tripier completed the "Fondements et principes de stratégie maritime" (1977), but this paper was circulated within only navy circles until an extract appeared in 1990 in the journal *Stratégique*.[51] Rear Admiral Hubert Moineville, French Navy (Retired), published an excellent book, *La guerre navale* (1982), which was translated into English.[52] Although most of the book is devoted to overall military strategy, the last three chapters deal with choices to be made in advance of naval actions and the problems in conducting them. *La guerre navale* examines many of the doctrinal issues that were being debated during the Cold War, among them the issue of using conventional, or general purpose, forces to ensure the combat stability of nuclear missile submarines.

Admiral Moineville correctly concludes that the introduction of long-range nuclear-armed missiles into navies has altered fundamentally the role of first-rank navies. For example, he reasons that the threat of using nuclear weapons is now inherent in grand-scale naval warfare. His analysis of nuclear naval warfare was in keeping with the thinking of most admirals and navies—nuclear war at sea must be deterred because one weapon detonation would result in the loss of a ship, if not an entire formation.

Old French patterns of interest in *guerre de course* can be found in Moineville's appreciation for the economic vulnerability (especially with respect to oil) of modern nations. In general, Moineville appreciates the widening political role of naval forces but, like most naval officers, fails to get into the doctrine for the use of nuclear weapons when used against shore targets.

In 1981 Admiral Pierre Lacost published *Stratégies navales du présent*, which was well received in France. A more recent work outlining the history of naval thought in France and elsewhere is *L'évolution de la pensée navale*, edited by Herve Coutau-Bégarie (1990-1993). Although not on doctrine directly, *L'évolution de la pensée navale* provides an excellent source of doctrinal history and should be translated into English for the wider audience that it deserves. Finally, Vice Admiral Michel Tripier completed *Le Royaume d'Archimède* in 1993, just prior to his untimely death.[53]

Military Doctrine in the French Army

The French model would not be complete without an analysis of doctrine in the French Army.[54] The Belgian-invented and French-developed Montigny

mitrailleuse (machine gun) was introduced by the French Army during the Franco-Prussian War of 1870–1871.[55] Although the *mitrailleuse* increased the effective firepower on the battlefield over the rifle by an order of magnitude, its introduction failed to turn the tide of that war in favor of the French. The reasons were that the French Army guarded their new capability too well and were caught up on the technical details of development; it failed to devise an effective doctrine for the new weapon or to test various tactics. Furthermore, the *mitrailleuse* was assigned to artillery units, where it was viewed as only a rather short-range weapon that was extremely vulnerable to counter-battery fire. Although the introduction of the *mitrailleuse* alone might have swung the war in favor of France, its operational employment was disastrously ineffective. The machine gun, however, was rapidly assimilated into the German and Russian ground forces.

At the outbreak of World War I, the French Army was committed to the defense of France, which would occur via a decisive engagement fought under an offensive doctrine. The moral superiority of the offensive would yield an *élan* that would be decisive. The defense of France would be achieved by a clash against the German armed forces fought on foreign soil. An offensive war of annihilation was thought to be short, cheap, and more effective than the defensive, but a correct analysis of the technology available at the time would have concluded that the defensive was the proper doctrine to follow. (In fairness, the same criticism can be made of the Union army during the American Civil War.)[56]

When the war did not develop as planned, and the defense of France required a defensive doctrine, the army proved incapable of adapting, and millions of men died in military operations that had no significant political purpose. The French Army had a virtually inexhaustible supply of troops that it could throw into mindless attacks—a by-product of the French Revolution.[57] This same army was governed by a doctrine that did not allow for individual judgment to resolve crucial questions and assumed that preplanned violence was enough to overcome the enemy.[58]

The conduct of the First World War on the ground has led some scholars to conclude that "military professionals ... usually incline toward the offensive."[59] There is the obvious need to motivate troops in the face of obstacles.[60] When the political leadership of a nation assumes that the military is an acceptable tool to obtain decisive political results, the military themselves will probably be forced to favor an offensive doctrine from which decisive and positive results will be obtained.[61] Perhaps another lesson from World War I is that *élan* can

and should be exhibited at the tactical level of warfare, but it need not exclude fighting on the operational and strategic defensive.

The catastrophic and unexpected failure of the French Army in the early days of World War II can be attributed, in great part, to their strategy, and doctrine for war.[62] In general, the strategy and doctrine were compatible, but the French Army doctrine was based upon a fatally flawed strategy, and the strategy was based upon an obsolete operational concept. Simply put, the French Army attempted to fight an attrition-styled war based upon defense, firepower, centralization, and control in a series of sequential, methodical battles, while the German Army had adopted a maneuver warfare doctrine of one continuous battle that made the French response inadequate and self-defeating. Unfortunately, due to the nature of French Army doctrine, there was no alternative. When the need for change was recognized after defeats in the first phase of the war, it was, simply, too late.

Essentially, France created an army that could not cope with the unexpected or respond to limited threats. One of the very few officers who dared to criticize the overall plan for defense, General Charles de Gaulle, found his opinions subsumed by political necessity. French military doctrine in the interwar years became too pedantic and too theoretical; it was impractical, more suited for the classroom than the battlefield. Yet in the classroom, officers were rewarded for repeating huge quantities of rote data rather than for innovation.

The French Army had in fact changed its doctrine from that of the annihilation-based approach of World War I to that of attrition, but did not do so quickly or thoroughly enough. Technological developments in France were not viewed as "revolutions in military affairs" but rather as minor modifications on the existing consensus. Perhaps because the German Army had to divest itself of equipment following World War I, it was better able to view the essence of the new technological opportunities.

French Air Force doctrine was similarly deficient. Not only had the Air Force failed to prepare a correct doctrine for the war, it overlooked significant voids for employing existing forces in the war for which the army prepared. France simply did not have the right type or a sufficient number of aircraft to contest local air superiority. During the interwar years, the air force and army had engaged in a bitter struggle over whether the proper role for aviation was annihilation by independent strategic bombing or by cooperating tactically with the land forces engaged in attrition warfare. The result of this struggle was a compromise force that was supposed to do both, but could do neither.

Blame for the fall of France can be laid at the feet of the political leadership for its improper preparation of the army (poor high command structure, terms

of service, and the size of the active duty officer and non-commissioned officer corps), although the officer corps as well deserves censure. The military leadership of France was more concerned with bureaucratic details than with the development of strategy and doctrine and with asking hard questions.

Even this brief review of over three hundred years of French Navy and military doctrine in France reveals a treasure trove of lessons that should have been learned. As the Royal Navy has, so the French Navy has emphasized the development of tactical-level service-unique doctrine. That is not to say that other forms of military doctrine have been ignored, but this is clearly where the emphasis has been. There are many interesting lessons to be learned also by contrasting the differences as well as noting the similarities between French and British navy doctrine.

Contrasting French and British navy doctrine is somewhat unfair—an unfairness compounded if we rely upon only traditional English language sources that stress Britain's offensive victories. The French monarchy had a sophisticated concept of attrition warfare and defensive doctrine for its fleet. The Royal French fleet achieved levels of success that were appropriate for France's geography, strategic culture, overall strategy, and available resources. The fact that the French naval doctrine would not have been appropriate for the Royal Navy of Great Britain is immaterial and misleading.

Quite frankly, the hubris displayed by many American officers and scholars in rebuffing French Navy doctrine because of the lack of combat victories by the French Navy during the Revolution or under Napoleon is shocking. We should be looking for the lessons of doctrinal development and not prejudging its value based upon what happened ashore or the actions taken by army officers or governments who set policies for the navy. To disregard the lessons of the French Navy based upon such reasons is extremely poor scholarship and considerably shortsighted. In the words of a well-respected scholar, "France has had little just cause to be ashamed of her navy: the navy may have had some just cause to be ashamed of France."[63]

When the Comte de Grasse came to the aid of an embryonic United States fighting for independence, his decisions off the Virginia Capes in 1781 were shaped by a defensive doctrine that gave primary importance to the protection and support of actions ashore rather than the taking of enemy ships as prizes. It is because of those decisions and actions that de Grasse supported successfully General George Washington and earned that officer's praise. America remembers the strategic and operational-level vision of Admiral de Grasse, a

former army officer, rather than his modest tactical abilities at sea, defeat at the Battle of the Saints, and eventual humiliation.

A review of French Navy doctrine practiced by a variety of commanders reveals the strengths and weaknesses of defensive doctrine and warfare by attrition. Reviews of French Army warfare of both annihilation and attrition, and offensive and defensive doctrine, also demonstrate the inherent weaknesses and strengths of these four methods. These positive and negative lessons have value today—most importantly, that there is no one correct military doctrine for all times and all places. French soldiers have paid heavily for their search for the one correct doctrine that could ensure victory—"a cult of the correct military doctrine." The search for such enduring and eternal principles can discourage the adaptability and flexibility that is required in successful doctrine. Doctrinal rigidity can also impede appreciation of potential technological improvements.[64]

Unlike doctrinal development ashore, France had few such major doctrinal debates at sea—there was general consensus on the defensive doctrine and *guerre de course*—although doctrine continued to evolve, even while technology remained relatively constant. Even with a defensive doctrine, at times France was able to meet Britain as an equal at sea, while devoting her primary attention to events ashore. The defensive doctrine and *guerre de course* warfare of attrition employed by the navy often allowed significant victories at minimal cost—a conservation of effort at sea. This was highlighted in the years 1780–1782 with convoy victories and Suffren's operations in the Indian Ocean.

France also deserves credit for pioneering work on successful multinational naval doctrine, major innovation in fleet organization as an aid to unity in action, as well as for accepting the concept of fighting spirit, *élan*, as part of combat potential. Clausewitz noted the valuable contribution of *élan* to the Grande Armée of Napoleon Bonaparte; however, the unfortunate consequence of the concept of *élan* was an unwarranted faith by French governments that superiority in spirit would make up for material and training deficiencies. Furthermore, the history of French military doctrine reveals the dangerous consequences if *élan*, as a concept to motivate warriors, is transferred from the tactical level of war, where it belongs, to the operational and strategic levels or to programming, where it does not.

One of the more interesting differences between French naval and military doctrine was their treatment of *élan*. The navy fully accepted the fighting spirit as part of a *defensive* doctrine that would lead to strategic level victory, while army general officers, especially prior to World War I, assumed that a defensive doctrine would signal moral weakness and lead to strategic defeat. Naval history

suggests that fighting spirit and initiative can be an integral part of a *defensive* doctrine—meaning that these terms do not necessarily need to be synonymous with *offensive* warfare.

That the individual field commander ashore was often not granted the degree of judgment accorded the commander at sea is another significant difference between the French land and sea forces. To some extent, this can be explained by the lack of modern long-range communications systems, but perhaps it was due also to the lack of familiarity with warfare at sea by the governments ashore, which resulted apparently in far less oversight and fewer courts-martial of naval officers by French governments than were suffered by officers in the Royal Navy.

The brutal effects wrought on doctrine by the changing governments in France following the Revolution or during and after World War II may still be instructive today. During the drastic changes in French governments, the officer corps, in general, suffered greatly. When the corporate memory of an officer corps is lost, the potential arises for both wholesale change (as during and after World War II) and a period of danger. During the first years of the Republic and Napoleon, the French Navy fought without benefit of the experience gained by its royalist warriors—experiences that had yet to be reflected in official written doctrine. Had the French monarchy not been overthrown and its military leadership not decapitated, subsequent naval battles against the British might have ended quite differently. A lesson worth learning here is that military services should bridge drastic changes in governments as well as wholesale doctrinal modification.

On the other hand, the speed with which great changes occurred in navy doctrine during and after World War II were probably possible only because of government changes brought about by that war. Although the changes in government resulted in massive losses of corporate military knowledge, the ability to rapidly substitute new ideas also unfolded. Today, when we witness the wholesale release of combat-proven officers into civilian life, we risk losing the corporate knowledge of how to fight unless we take the time to document that knowledge in formal written doctrine, but we also have the opportunity for major doctrinal change. It is well to note that doctrinal change is most easily feasible when there is a change in a government or during events that lead to massive disruption of an officer corps.

Without combat to stimulate doctrinal development, we must turn to other sources for such kindling. One source of doctrinal stimulation is new technology. Generally, new technologies are often thought to lead automatically to improvements in combat potential. The *jeune école*, however, teaches us that

unless the full implications of new technologies are explained to governments, there is a good chance that governments will seize the opportunity to reduce force structure (and therefore capability), resulting in impaired military services. Today we face similar challenges.

Force structure reductions may nonetheless come about if governments are told that a new technology also allows attainment of political objectives at reduced cost. In short, before revealing new technologies to government, military specialists ought to well understand the potential negative consequences. On the other hand, many of the officers of the *jeune école* have earned an unfair reputation for being short-sighted when, perhaps, they were trying to do the best that they could under the reality of their political and fiscal circumstances.

The governments of France have generally issued specific orders for the overall missions of their fleets. Navy missions rarely, if ever, have included the enemy fleet as the main objective. As at Trafalgar, the enemy fleet was an obstacle to be overcome, not an objective. One problem of such a system is that it assumes that the top governmental leadership understands what fleet missions should be. Generally, however, governments consist of "landlubbers" with no real knowledge of fighting at sea. Whose responsibility is it, then, to ensure that the fleet is properly tasked?

The history of the French Navy is one of mismanagement by governments who *could* have known better. If the navy itself does not educate its government, then who will? If it is the role of the navy to educate its governments, then there may be a need for officers who are skilled in administrative tasks and bureaucratic maneuvering within the shore establishment and at the headquarters level. There is a rich history of such officers in the French Navy, but there is no clear-cut answer as to which efforts were more successful in doctrinal development, those of the administrative officer or those of the warfighter. Perhaps it would be more correct to view the relationship between administrative and combat officers as a partnership that makes a complete whole. Clearly, doctrine must be acceptable to those at sea, but there is a long history of superior warriors who departed the field of battle without leaving behind a legacy of doctrine or even lessons that were worthy of their triumphs.

The French and British navies operated under formal doctrine during the better part of their histories. They faced similar concerns but used different approaches in their attempts to solve doctrinal issues. By comparing and contrasting the history of doctrine in these two great navies, we can examine doctrinal issues that all navies undoubtedly need to address, regardless of the technologies involved or the government being served. Simply put, a

comparative approach to the history of naval doctrine yields the process common to both.

Notes

1. I have drawn heavily upon Alfred Thayer Mahan (Captain, USN), *The Influence of Sea Power upon History, 1660–1783* (Boston: Little, Brown, 1890), pp. 189, 252, 263, 353, 449–67; Alfred Thayer Mahan (Captain, USN), *The Influence of Sea Power upon the French Revolution and Empire, 1793–1812* (New York: Greenwood Press, 1968) [reprint of Little, Brown edition of 1892], vol. I, pp. 35–69, 160, 179; S.S. Robison (Rear Admiral, USN, Retired), *A History of Naval Tactics from 1530 to 1930* (Annapolis, Md.: U.S. Naval Institute, 1942); E.B. Potter and Chester W. Nimitz (Fleet Admiral, USN), eds., *Sea Power: A Naval History* (Englewood Cliffs, N.J.: Prentice-Hall, 1960); Ernest H. Jenkins, *A History of the French Navy: From Its Beginnings to the Present Day* (London: MacDonald and Jane's, 1973); Clark G. Reynolds, *Command of the Sea: The History and Strategy of Maritime Empires* (New York: William Morrow & Co., 1974); Helmut Pemsel, *A History of War at Sea: An Atlas and Chronology of Conflict at Sea from Earliest Times to the Present*, trans. G.D.G. Smith (Annapolis, Md.: Naval Institute Press, 1977) [translation of *Von Salamis bis Okinawa*, first published in 1975]; Geoffrey Till, *Maritime Strategy and the Nuclear Age*, 2nd ed. (New York: St. Martin's Press, 1984), pp. 23, 34–38, 49–51; Brian Tunstall, *Naval Warfare in the Age of Sail: The Evolution of Fighting Tactics, 1650–1815*, Nicholas Tracy, ed. (Annapolis, Md.: Naval Institute Press, 1990); and Raoul Victor Patrice Castex (Admiral, French Navy), *Strategic Theories*, edited with an introduction by Eugenia C. Kiesling (Annapolis, Md.: Naval Institute Press, 1994).

2. Hervé Coutau-Bégarie, "Reflexions sur l'école française de stratégie navale," in *L'évolution de la pensée navale [I]*, Hervé Coutau-Bégarie, ed. (Paris: Fondation pour les Etudes de Défense nationale (FEDN), 1990), pp. 31–56.

3. Hans Delbrück, *History of the Art of War, Volume IV: The Dawn of Modern Warfare*, trans. Walter J. Renfroe, Jr. (Lincoln, Nebr. and London: Univ. of Nebraska Press, 1985), pp. 335–7 [original German version published in 1920].

4. See Hubert Granier, "La pensée navale française dans la première moitié du XVIIe siècle (1600–1661)," in *L'évolution de la pensée navale [II]*, Coutau-Bégarie, ed. (1992), pp. 52-3. I am indebted to Hervé Coutau-Bégarie for the information on *Testament politique*.

5. The distinction between the *plume* and the *épée* was also illustrated by the social or class distinction between these officers. Although not always the case, the administrative officers were often noblemen, also known as the *rouges* or the *grand corps*. The warfighters were often, but not always, of non-noble birth and were referred to as the *bleues* or the *petits corps*. See Ronald Chalmers Hood III, *Royal Republicans: The French Naval Dynasties Between the World Wars* (Baton Rouge: Louisiana State Univ. Press, 1985), pp. 14–5, 19–20.

6. Étienne Taillemite, "Le chef charismatique: une alchinie mystérieuse," *Cols Bleus*, 12 March 1994, pp. 7–8; Admiral Anne-Hilarion de Costentin, Comte de Tourville was also the commander at the disastrous Battle of La Hougue (1692), also known as the Battle of Barfleur. Due to his failure to pursue a defeated enemy and exploit the victory at the previous Battle of Bévéziers (1690), Tourville may have been under some degree of scrutiny by the king. Mortification may have compelled him to launch his desperate attack, which had disastrous results. On the other hand, French sources emphasize the poor weather, conditions aboard Tourville's ships, and poor coordination as reasons for the failure to exploit the tactical victory. Although Tourville was in command during the attack against the Smyrna convoy (1693), blame for the failure to exploit the victory can be laid directly at the feet of a subordinate who allowed most of the convoy to escape while maintaining the battle line and awaiting his commander's arrival.

7. Henry Guerlac, "Vauban: The Impact of Science on War," *Makers of Modern Strategy: Military Thought from Machiavelli to Hitler*, Edward Mead Earle, ed. (New Jersey: Princeton Univ. Press, 1943), pp. 26–48.

8. For four excellent reviews of Père Paul Hoste's contributions, see Robison, pp. 215–24; John Creswell, *British Admirals of the Eighteenth Century: Tactics in Battle* (London: George Allen & Unwin, Ltd., 1972), pp. 41–9; Michel Depeyre, "Le Père Paul Hoste fondateur de la pensée navale moderne," in *L'évolution de la pensée navale [I]*, Coutau-Bégarie, ed. (1990), pp. 57–77; and Gabriel Darrieus, "Les Livres des tactique français du Père Hoste

au XIXe siècle," in *L'évolution de la pensée navale [III]*, Coutau-Bégarie, ed. (1993), pp. 209–31. Of these four, Depeyre is the most controversial because he argues that Hoste was not totally devoid of an appreciation for the offensive and his tactics were not mere formations of maneuver.

9. Claude Farrère, *Histoire de la Marine Française* (Paris: Flammarion, 1962), p. 237.

10. Hubert Granier (Contre-amiral, French Navy), "La pensée navale française au XVIIIe siècle jusqu'à la guerre d'amérique," in *L'évolution de la pensée navale [III]*, Coutau-Bégarie, ed. (1993), pp. 33–56; and for additional information on Sébastien François de Bigot, Vicomte de Morogues, see Robison, pp. 257–62.

11. For additional information on Captain Jacques Bourdé de Villehuet, see Robison, pp. 262–4; and Granier, "La pensée navale française au XVIIIe siècle jusqu'à la guerre d'amérique," pp. 33–56.

12. Brian Tunstall, *The Realities of Naval History* (London: George Allen & Unwin, Ltd., 1936), p. 139.

13. Giuseppe Fioravanzo (Admiral of the Fleet of the Italian Navy), *A History of Naval Tactical Thought* (Annapolis, Md.: Naval Institute Press, 1979), pp. 91–3 [original manuscript prepared in 1956].

14. François Caron (Capitaine de vaisseau, French Navy), "Le vicomte de Grenier, héritier de Bigot de Morogues ou fils spirituel de Suffren?" in *L'évolution de la pensée navale [III]*, Coutau-Bégarie, ed. (1993), pp. 57–83.

15. This point has been made, and refuted, over the years. For a more in-depth substantiation with citations from French publications, see Robison, pp. 530–5.

16. Delbrück, *History of the Art of War, Volume I: Warfare in Antiquity*, trans. Renfroe, p. 400.

17. Louis Thomas (Rear Admiral), Comte de Villaret de Joyeuse, had apparently been told by Maximilian Robespierre that he would lose his head if he lost the convoy. His survival may have been due also in part to his absence from the center of all such activities.

18. For additional information on Audibert Ramatuelle, see Robison, pp. 453–5.

19. Delbrück, *History of the Art of War, Volume IV: The Dawn of Modern Warfare*, trans. Renfroe, pp. 390, 398, 402, 414.

20. See especially John Keegan, *The Price of Admiralty: The Evolution of Naval Warfare* (New York: Viking Penguin, Inc., 1988), pp. 37–8.

21. Pierre Charles Jean-Baptiste Silvestre (Vice-Adm ral), Comte de Villeneuve's instructions on the eve of the battle can be found, with analysis, in Adrien Edouard Baudry (Lieutenant, French Navy), *The Naval Battle: Studies of the Tactical Factors* (London: Hugh Rees, Ltd., 1914), pp. 228–32 [original French version in 1910]. Villeneuve desired to *avoid* the enemy so that he might reach his destination.

22. Tunstall, p. 256.

23. John D. Harbron, *Trafalgar and the Spanish Navy* (Annapolis, Md.: Naval Institute Press, 1988), p. 16.

24. Fioravanzo, p. 136.

25. French squadrons fought alongside the British in the Crimea, against the Boxers, and aga nst Chinese nationalists.

26. This section is also based upon Theodore Ropp, "Continental Doctrines of Sea Power," *Makers of Modern Strategy*, Earle, ed., pp. 446–56; and Ropp's classic, *The Development of a Modern Navy: French Navy Policy, 1871-1904*, Stephen S. Roberts, ed. (Annapolis, Md.: Naval Institute Press, 1987) [revised version of original written in 1937].

27. For an interesting analysis of the contributions of Admiral Gabriel Darrieus, see Henri Darrieus and Bernard Estival, "Darrieus et la renaissance d'dune pensée maritime en France avant la Premiere guerre mondiale," in *L'évolution de la pensée navale [I]*, Coutau-Bégarie, ed. (1990), pp. 89–117. Darrieus' *War on the Sea* was translated into English and published by the U.S. Naval Institute in 1908. This book resulted from a series of lectures delivered at the French Naval War College. Darrieus was so highly regarded in Germany that the French Navy General Staff eventually prohibited his publishing under the concern that he was helping the enemy. The original title of *La guerre sur mer* was *La doctrine*. I am indebted to Hervé Coutau-Bégarie for this point.

28. Then-Commander René Daveluy's *The Genius of Naval Warfare* was translated into English and published by the U.S. Naval Institute.

29. Coutau-Bégarie, "Reflexions sur l'école française de stratégie navale," in *L'évolution de la pensée navale [I]*, Coutau-Bégarie, ed. (1990), p. 44.

30. See Étienne Taillemite, "Un théoricien méconnu de la guerre maritime: L'amiral Richild Grivel," in *L'évolution de la pensée navale [II]*, Coutau-Bégarie, ed. (1992), p. 97.

31. Romeo Bernotti (Admiral, Italian Navy), *La guerra maritima, studio critico sull'impiego dei mezzi nella guerra mondiale* (Florence: Editoris Carpigiani Zipoli, 1923), p. 24, cited in Hervé Coutau-Bégarie, "Reflexions sur l'école française de stratégie navale," in *L'évolution de la pensée navale [I]*, Coutau-Bégarie, ed. (1990), p. 46.

32. Admiral Hyacinthe-Laurent-Théophile Aube's colonial view must be supplemented by that of Admiral Baron Richild Grivel, who first developed a French global view of naval warfare. The navy generally took on the *mission civilisatrice* outside of North Africa. Admiral Amédée Courbet became a national hero following his conquest of Indochina and the colony became known as the "admirals' preserve." See Hood, *Royal Republicans* p. 10.

33. Étienne Taillemite, *L'histoire ignorée de la marine française* (Paris: Librairie Académique Perrin, 1988), p. 112; citing Raoul Victor Patrice Castex, *le Grand État-Major naval* (Paris: 1909), p. 199.

34. Douglas Porch, "The French Army in the First World War," *Military Effectiveness, Volume I: The First World War*, in Allan R. Millett and Williamson Murray, eds. (Boston: Unwin Hyman, for the Mershon Center, Ohio State Univ., 1988), pp. 204–5.

35. Taillemite, *L'histoire ignorée de la marine française*, pp. 390–1.

36. Paul G. Halpern, *The Naval War in the Mediterranean, 1914–1918* (Annapolis, Md.: Naval Institute Press), 1987.

37. Raoul Victor Patrice Castex (Admiral, French Navy), *Theories stratégiques*, in 5 vols. (Paris: Société d'Editions Géographiques, Maritimes et Coloniales, 1929–1935).

38. Castex, *Strategic Theories*, Kiesling, ed..

39. Taillemite, *L'histoire ignorée de la marine française*, p. 216.

40. Castex had Julian Corbett's *Some Principles of Maritime Strategy* (1911) translated in 1932. See Hervé Coutau-Bégarie, "Corbett and Richmond in France," *Mahan Is Not Enough: The Proceedings of a Conference on the Works of Sir Julian Corbett and Admiral Sir Herbert Richmond*, James Goldrick (Commander, RAN) and John B. Hattendorf, eds. (Newport, R.I.: Naval War College Press, 1993), p. 284.

41. Students at the *École de guerre navale* were still educated in traditional French naval doctrine of *guerre de course*, whereas students from foreign nations flocked to the *École supérieure de guerre* to study the latest developments in the art of war ashore. See Ronald Chalmers Hood III, *Royal Republicans: The French Naval Dynasties between the World Wars* (Baton Rouge, La: Louisiana State Univ. Press), 1985, pp. 83–4, 143–6.

42. Bernard Brodie, *A Layman's Guide to Naval Strategy* (London: Oxford Univ. Press, 1943), p. x. On the other hand, one must note the conspicuous absence of Castex (as well as Mahan and Corbett) from a French publication of notable maritime personalities. See Jean Riverain, *Dictionnaire des marins célèbres des temps lointains à nos jours* (Paris: Librairie Larousse, 1967).

43. Étienne Taillemite, *L'histoire ignorée de la marine française* (Paris: Librairie Académique Perrin, 1988), pp. 408–9.

44. This section is based upon Ronald Chalmers Hood III, "Bitter Victory: French Military Effectiveness during the Second World War," in *Military Effectiveness, Volume III: The Second World War* (Boston: Unwin Hyman, for the Mershon Center, Ohio State Univ., 1988), pp. 221-55.

45. The history of the French Navy in World War II can be found in a series of books readily available in English. These include: Rear Admiral Paul Auphan, French Navy (Ret.) and Jacques Mordal [pseud.], *The French Navy in World War II*, trans. Captain A.C.J. Sabalot, USN (Ret.) (Annapolis, Md.: U.S. Naval Institute, 1959) (Admiral Auphan served as Chief of Naval Operations and Minister of Marine during the Vichy regime); Henri Le Masson, *Navies of the Second World War: The French Navy*, 2 vols. (Garden City, N.Y.: Doubleday &

Co., 1969) (more oriented towards hardware); and Charles W. Koburger, Jr., *Franco-American Naval Relations, 1940-1945* (Westport, Conn.: Praeger, 1994).

46. Translations of comments by Vice Admiral Pierre Barjot during the 1950s can be found in declassified issues of the *ONI (Office of Naval Intelligence) Review*. Many of these can be found in the Operational Archives of the Naval Historical Center. For example, in a series of translations entitled "The Postwar French Navy," *ONI Review*, May 1954, p. 195, Admiral Barjot discussed the American and British methods of antisubmarine defense. I am indebted to Captain Peter Swartz, USN (Ret.) for providing me with copies of materials he gathered for his own research.

47. A section of *Vers la marine de l'âge atomique* (Paris: Aimont Dumont, 1955) discussed French naval doctrine (pp. 43–58). In general, this book favors the U.S. Navy as a model for the French Navy.

48. A discussion of the "Force of Manoeuvre" can be found in Joffre A. Heineck, "French Naval Development under Charles de Gaulle," unpublished thesis, Newport, R.I.: Naval War College, 14 April 1969.

49. There are only a few writings about nuclear strategy and doctrine by French military officers. The one major exception is the important writings of General Pierre M. Gallois, such as, his *The Balance of Terror: Strategy for the Nuclear Age*, trans. Richard Howard (Boston: Houghton Mifflin, 1961).

50. James Cable, *Gunboat Diplomacy, 1919–1979: Political Applications of Limited Naval Force*, 2nd ed., (London: The Macmillan Press, Ltd., 1981), p. 138.

51. Commander Michel Tripier, "Les missions navales," *Strategique*, April 1990.

52. Hubert Moineville (Rear-Admiral, French Navy, Ret.), *Naval Warfare Today and Tomorrow*, trans. P.R. Compton-Hall (Commander, RN, Ret.) (Oxford: Basil Blackwell Publisher, Ltd., 1983).

53. Michel Tripier (Vice Admiral, French Navy), *Le Royaume d'Archimède* (Paris: Fondation pour les Etudes de Défense nationale (FEDN), March 1993).

54. This opinion was not shared by one of the first officers in the U.S. Navy to recognize the need for naval doctrine. See Dudley W. Knox (Lieutenant Commander, USN), "The Rôle of Doctrine in Naval Warfare," U.S. Naval Institute *Proceedings*, March-April 1915, p. 337.

55. This section is based upon: Generalmajor Frederick William von Mellenthin and R.H.S. Stolfi with Colonel E. Sobik, *NATO under Attack: Why the Western Alliance can Fight Outnumbered and Win in Central Europe without Nuclear Weapons* (Durham, N.C.: Duke Univ. Press, 1984), pp. 12–6.

56. I am indebted to Major General I. B. Holley, Jr. (USAFR, Ret.), for raising this point during his lecture, "Doctrine: The What, the Why, and the How," delivered at the Air Force Doctrine Center, Langley Air Force Base: 1 June 1994.

57. Stefan T. Possony and Étienne Mantoux, "Du Picq and Foch: The French School," in *Makers of Modern Strategy*, p. 229.

58. Michael Howard, "Men against Fire: The Doctrine of the Offensive in 1914," *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, Peter Paret, ed. (New Jersey: Princeton Univ. Press, 1986), p. 520, documents two famous lectures to the officers of the general staff by Colonel François-Jules-Louis Loyzeau de Grandmaison, director of military operations [subsequently published as *Deux conférences faites aux officers d l'état major de l'armée* (1911)] and the *Regulations for the Conduct of Major Formations of October 1913*, influenced by de Grandmaison, which declared the attack and the offensive as French Army doctrine. On the other hand, Howard wrote earlier that these speeches were not so much doctrine as they were echoes of the national mood. See his article "Men against Fire," *International Security*, Summer 1984, p. 57. See also, Gideon Y. Akavia, *Decisive Victory and Correct Doctrine: Cults in French Military Thought before 1914* (Stanford, Calif.: Center for International Security and Arms Control, Stanford Univ., November 1993), pp. 43–63.

59. Jack Snyder, *The Ideology of the Offensive: Decision Making and the Disasters of 1914* (Ithaca, N.Y. and London: Cornell Univ. Press, 1984), p. 199; and Stephen Van Evera, "The Cult of the Offensive and the Origins of the First World War," *International Security*, Summer 1984, pp. 58–107.

60. Howard, "Men against Fire: The Doctrine of the Offensive in 1914," p. 526, cautions the reader not to draw too close a correlation between the doctrine of the offensive and the terrible losses incurred during World War I.

61. Akavia, *ecisive Victory and Correct Doctrine*, pp. 1–6, 65–69.

62. This section is based upon: Barry R. Posen, *The Sources of Military Doctrine: France, Britain, and Germany between the World Wars* (Ithaca, N.Y.: Cornell Univ. Press, 1984), pp. 105–40, 220–44; Robert Allan Doughty (Lieutenant Colonel, U.S. Army), *The Seeds of isaster: The Development of French Army Doctrine, 1919–1939* (Hamden, Conn.: Archon Books, 1985); his subsequent *The Breaking Point: Sedan and the Fall of France, 1940* (Hamden, Conn.: Archon Books, 1990), pp. 19–32, 321–32; and his chapter, "The French Armed Forces, 1918–40," in *Military Effectiveness, Volume II: The Interwar Period*, Millett and Williamson, eds., pp. 39–69; Philip D. Shutler, (Lieutenant General, USMC, Ret.), "Thinking about Warfare," *Marine Corps Gazette*, November 1987, pp. 22–23; and Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War* (New York: The Free Press, 1990), pp. 197–230.

63. Jenkins, *A History of the French Navy*, p. 344.

64. David Jablonsky, (Colonel, USA, Ret.), "US Military Doctrine and the Revolution in Military Affairs," *Parameters*, Autumn 1994, p. 33.

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Doctrine in the Spanish Navy

James J. Tritten

THE FIRST WRITTEN NAVY DOCTRINE was issued in Spain in the year 1270 by the king of Castile.[1] Ten laws formed the legal code of maritime warfare, the first of which stated that warfare at sea and warfare ashore are different and that each requires its own type of individual. The code also recognized two basic forms of naval warfare—that between major fleets and that between only a few ships. The second law discussed the types of men required for maritime warfare. The third through the sixth dealt with the necessary qualifications and selection of admirals, ships' captains, navigators, and other officers. The seventh law considered what types of ships are to be employed for warfare at sea, and the eighth drew a comparison between the support requirements of ships and horses. The ninth law stated that ships must be supplied in order to fight, and it established what stores warships were to carry. The last law readdressed the differences between land and sea warfare; it also explained how to divide the profits of victory.

Early Years—Close Aboard Battle

The union of Castile and Aragon in 1479 formed the embryonic modern state of Spain. The next substantive work of navy doctrine was written by Alonso de Chaves between 1520 and 1538, during the reign of Carlos I (and during two wars with France—1521-1529 and 1535-1538).[2] De Chaves advanced the concepts of squadron formations, the use of artillery, and the taking of the weather gauge (i.e., the upwind side) during battle. This is the earliest written record that we have of fighting formations and tactical principles. De Chaves' work was adopted and modified by King Henry VIII of England and became the first written navy doctrine issued in Britain.[3]

De Chaves argued that when two fleets meet, one formation is usually better than the other. With this in mind, he recommended battle formations that would maximize combat potential. His concept called for close-order engagement based upon galley tactics. But de Chaves failed to take into account the uncertainty of seamanship with ships of sail and assumed mistakenly that

relative positions could be maintained easily. In other words, navy doctrine failed to account for the new technological environment.[4]

The navy was finally separated from the army in 1586, and from the mid-sixteenth through the seventeenth centuries Spain maintained divisions and squadrons of naval forces in the Atlantic, the Mediterranean, and the Pacific. In addition to operational missions, the divisions performed administrative and logistical functions. The Capitán General de la Mar Océano held overall command of the Atlantic division, an ocean-going fleet of three subordinate squadrons based at Vizcaya, Guipúzcoa, and Portugal, as well as the Guard of the Straits of Gibraltar. The Atlantic division also included an independent squadron at Dunquerque (which maintained station in los Paises Bajos [the low countries]) and an independent Armada de Barlovento based in the Antilles. The Capitán General de la Mar commanded the Mediterranean division, which consisted of subordinate squadrons in Spain, Naples, Sicily, and Genoa. The Pacific division consisted of the Armada de Peru (also known as the Armada del Mar del Sur) as well as task groups of various sizes that were deployed to the Philippines.

From 1568 to 1648 Spain and England fought the Eighty Years' War (otherwise known as the Dutch War of Independence), largely over control of Holland. In 1588, the one hundred thirty ships of the Spanish Armada, manned by 30,000 men (two-thirds of whom were soldiers), attempted to invade England. The concept of operations for the Armada was to fight a close-in battle at sea, which would enable the Spanish to use their superiority to board enemy ships. After all, Philip II's brother, Don John of Austria, had used this same galley-oriented doctrine to win at the recent Battle of Lepanto (1571), as had Philip's own forces, who achieved success over the French in the Battle of Punta Delgada in the Azores (1582). The overall tactical objectives in these battles were to select an opponent and board in a general *mêlée*.[5] The battle of 1582 in the Azores, under the command of Captain-General Don Álvaro de Bazán, Marqués de Santa Cruz, reinforced the need for sailing ships that could engage in distant water combat. The undefeated Santa Cruz planned the Armada and would have been its commander had he not died (in 1588).[6] Copies of the instructions that Santa Cruz issued at sea in July 1587 to govern the fight near the island of San Miguel in the Azores are housed in the national archives at Simancas.[7] The instructions to the Armada from Philip II in April 1588 are also stored there.[8]

The English recognized that the sailing skills of the Spanish, the size of their forces, and their tactics gave them the advantage. The ships of England therefore kept their distance and used long-range artillery to wreak havoc on the defensive galley-oriented formations of the Armada. The English held a logistical

advantage, being close to their ports for reprovisioning, and while the Spanish commander, Don Alonso Perez de Guzman, Duke of Medina Sidonia recognized this, his written sailing orders made clear that he expected Spain's religious and moral superiority to overcome that advantage.[9] The previous destruction of twenty-three merchant ships at Cádiz in 1587 and the failure of the Armada in 1588 began a major naval decline in Spain. As a result of a combined Anglo-Dutch effort in 1596, Cádiz was occupied and the Spanish fleet again neutralized.

Combat instructions used by the fleets of the sixteenth and seventeenth centuries were modified to abandon galley concepts. These changes were contained in various books and instructions issued by local commanders throughout these years. The fundamental source of navy doctrine through the eighteenth century was Bernardino de Mendoza's *Theorica y práctica de guerra* (1596). It contained the basic fundamentals of theories of war, including warfare at sea, for the Spanish.

During the Eighty Years' War, Spain battled France (1635-1659) and suffered naval defeat at the hands of the French embryonic fleet. The Spanish battled the Dutch throughout the Eighty Years' War, but it was the Battle of the Downs (1639) that confirmed Spain's naval eclipse. The consequences of a subsequent Anglo-Spanish War (1654-1659) were also unfortunate for Spain.

After years of war with England, Spain found it essential to devise a method that would ensure the security of treasure ships, and in the mid-sixteenth century it introduced the concept of convoy escorts.[10] These escort ships were essentially armed merchantmen, and although they were stable gun platforms because of the large cargo capacity of their hulls, they lacked maneuverability, even with improved designs.

Command of Spanish ships of the line was divided: one officer was in charge of the soldiers at sea, and another commanded the ship's company. This system of dual command lasted for nearly a hundred years. The command and manning policy reflected a naval doctrine that called for a warship to be both a platform for small-arms shooting by troops as well as a platform for artillery fire by seamen. This result was that Spanish crews were generally half of marines and half of seamen—consequently they could do the job of neither kind of platform very well.

French Influence

In 1700, under Philip V (the first Bourbon king, a Frenchman and a descendent of Louis XIV), a true national navy, the *Armada Real*, was organized in Spain. Early on, during the War of the Spanish Succession (1701-1714), this new

national navy did not have a particularly successful record. A Spanish treasure fleet escorted by a French squadron under Admiral Châteaurenault was attacked successfully in port at Vigo in 1702 by the Dutch and the English. The engagement of the Dutch and English against the combined Franco-Spanish fleet off Malaga in 1704 reaffirmed the defensive control-oriented doctrine advocated by the French naval theorist Père Paul Hoste,[11] who influenced Spanish Navy doctrine until the early nineteenth century.[12] Spain could not prevent an army from landing in Catalonia, and Madrid was subsequently captured. The War of the Spanish Succession at sea was largely a *guerre de course*; both sides lost some 1,500 merchantmen.

The Bourbon rule in Spain instilled many bureaucratic and administrative reforms in addition to the creation of a national navy. There was the important provision in 1717 that midshipmen would serve as the Royal Company of Marine Guards. This young national fleet, under the command of Vice Admiral Antonio Gaztañeta y de Iturribálzaga, was virtually destroyed by British Admiral George Byng at the Battle of Cape Passaro (1718) (also known as the Battle of Messina). The defeat at Passaro, a battle that was initiated just prior to the formal declaration of the War of the Quadruple Alliance (1718-1720), resulted in Spain's further loss of control of the Mediterranean Sea and the subsequent inability to defend her coastline from disastrous English raiding attacks. Although the defeat of the escorting force at Cape Passaro did not interfere with the arrival of the 340 transports with 33,000 troops that recaptured Sicily, it did affect Spain's ability to support a distant army. The defeat at Cape Passaro and the end of the wars with the Quadruple Alliance resulted in a resurgence in Spanish naval construction.

Founding a Modern Navy

Admiral Gaztañeta, who had fought at Passaro, was the father of modern Spanish Navy shipbuilding methods. He wrote *Proporciones de las medidas más esenciales ... para la fábrica de los navíos y fragatas de guerra, que pueden montar desde ochenta cañones hace diez* ... (1720), an excellent book on warship design. Gaztañeta also served as the First Director of Naval Construction. Spanish fleet construction shifted to warships designed to provide convoy escorts rather than fight decisive engagements against an enemy battle fleet.

Francisco Cornejo's *Instrucciones y ordenes* (1732) furnished naval doctrine and planning for an amphibious operation at Oran between June and November 1732. A Spanish fleet of some fifty escorts and five hundred transports brought

an army of 30,000 men who captured a large fortified city being defended by Bey Hassan.

José Patiño, the father of the modern Spanish Navy, was Intendent and later Minister of the Navy—one of the Bourbons' better appointments. His early service to the crown was with the army as an administrator. Patiño's main task was to rebuild the navy and develop shipyard locations that could be defended, thereby making them safer and less vulnerable to British attack from the sea. Under Patiño the fleet expanded its capabilities with ships of the line that were designed for decisive sea battle. At the time of his death in 1736, Spain possessed a professional fleet of considerable strength.[13]

In an interesting interpretation of international law, a defensive alliance with Spain obligated France to provide warships to Spain during the latter's War of Jenkins's Ear (1739-1743) with England. A French squadron of twenty-two ships operated essentially as part of the Spanish fleet and convoyed a division of Spanish ships to North American waters, deterring a British attack on the Spanish. Otherwise during this war France claimed the rights and privileges of a neutral. Cooperative interaction between the French and Spanish fleets over the years led eventually, however, to the development of multinational navy doctrine.

The worst defeat the British suffered at the hands of the Spanish in the eighteenth century was the abortive amphibious invasion of Cartagena de Indias, led by Admiral Edward Vernon and General Wentworth between 1740 and 1741. The defending Spanish naval commanders—Vice Admiral Blas de Lezo and General Sebastián Eslava, Viceroy of New Granada—fought with 6,000 sailors and troops in their defended fortifications against 30,000 troops and 120 ships. Admiral de Lezo, a Basque, fought with courage and tenacity. He had served at Oran in 1732 and put his knowledge into practice in the subsequent defense of Cartagena; he fought the English at the outer fortifications and refused to surrender. His personal presence was reminiscent of Admiral Lord Horatio Nelson; Admiral de Lezo fought with one leg, one arm, and one eye. He had lost the leg fighting at Velez-Malaga in 1704 and his eye at Toulon.[14]

The Spanish Navy again demonstrated its strength against the English during the War of the Austrian Succession (1740-1748), in actions off Cape Sicíe (1744), near Toulon. In that battle, a French fleet under Admiral La Bruyère de Court escorted a Spanish squadron under Don Juan José Navarro through a blockading English fleet under Admiral Thomas Mathews. De Court, who was under orders not to fire unless attacked, offered to mix his ships amongst the Spanish. Navarro refused and, although the subsequent tactical engagement was

indecisive, the Spanish squadron made its way to Cartagena, where Navarro was decorated with the title of Marqués de la Victoria. Spain remained neutral during the Seven Years' War (1756-1763), although she took advantage of the opportunity to recapture Minorca from the British.

In 1759 Carlos III took the throne and ushered in another era of administrative reform. In 1776, then-Lieutenant José de Mazarredo Salazar wrote a tactical treatise for junior officers.[15] *Rudimentos de táctica naval para instruccion de los oficiales subalternos de marina* contained only minimal sections on how to actually fight an enemy, but it did introduce innovative methods for breaking the line and using fireships. Mazarredo later wrote a signal book that bore the strong influence of French works by Jean François de Cheyron, Chevalier du Pavillon. This signal book was prepared for use in combined operations of the Franco-Spanish fleets; it was far simpler than the French book that was actually used. The close cooperation between the French and the Spanish fleets was no doubt a result of common Bourbon rule.

A combined Franco-Spanish fleet in 1779, during the American War of Independence, prompted the issuance of French Navy doctrine for both fleets. Admiral Louis Guillouet, Comte d'Orvilliers, was given overall command, and he prepared a revised instruction and signal book to be used by both fleets. Spanish ships were integrated within the French fleet as well as maintained as a national force in a separate Squadron of Observation that would join the battle once the enemy was engaged.

Under the command of Admiral Lord George Brydges Rodney, a considerable portion of the British Channel Fleet seized the opportunity to attack a Spanish convoy and then a Spanish squadron under the command of Admiral Langara, at the Battle of Cape of Santa Maria (also known as the "Moonlight Battle," or the Battle of Cape St. Vincent, 1780). British convoys were lost in subsequent strikes by the combined fleet, and in 1780 and 1781 Admiral of the Fleet Luís Córdoba y Córdoba inflicted two of the most destructive attacks on English convoys. In the 1780 victory by a combined fleet under Spanish command, fifty-five British ships, 3,000 sailors, and weapons and supplies bound for Jamaica were captured. Between 1779 and 1782, Spain unsuccessfully engaged in a siege and an amphibious campaign against the British at Gibraltar. On the other hand, between 1779 and 1782 Carlos III supported the American and Spanish forces, capturing eastern Florida (1780) and the Bahamas (1781). In 1782 the Spanish once again recaptured the naval base at Minorca from a British garrison.

Spanish Navy doctrine was now influenced by two additional French theoretical works.[16] The first was *L'art de la guerre sur mer, ou tactique navale*

(1787) by Commodore Jurien, Vicomte de Grenier. This succinct work was very much oriented towards battle, not control. Grenier stressed massing strength against weakness. Despite some rather innovative suggestions for tactical disposition of the fleet, he was essentially biased in favor of defense and wars of attrition. Admiral Clause François, Comte d'Amblimont, wrote in 1788 an influential book, *Tactique navale, ou traité sur les évolutions, sur les signaux et sur les mouvemens de guerre*, which also emphasized innovation. D'Amblimont advanced the idea of breaking the fleet into separate *pelotons*, or tactical groups, with different functions.

Toward the end of his reign (1759-1788), Carlos III ordered the formation of "working-up squadrons" to train crews in navigational exercises and tactics. Retired senior officers with proven combat experience provided their services to the two squadrons that were eventually formed. Because of the humiliation he had suffered at the hands of the Royal Navy in 1744 while King of Naples, Carlos III now gave a great deal of support to the Spanish Navy. In 1785 the navy was officially christened *La Armada Española* (a title it retains today despite the subsequent frequent changes of government). In 1793 navy regulations were issued to prepare ships for battle—a battle that was to occur immediately;[17] France declared war on Spain in 1793. By 1795 the two nations had made peace with each other, but one year later Spain and France were once again at war, with Britain.

Development during the French Revolution

While they had excellent signal books and tactical manuals, the Spanish fleet during this era was not well trained and was wanting in men and supplies. As a consequence, an escort under the command of Vice Admiral Don José de Córdoba y Córdoba, accompanying an extremely valuable convoy, suffered a crushing defeat against the well-trained British Mediterranean Fleet at the Battle of Cape St. Vincent (1797). The British had benefited from the experiences of frequent combat against the French and were thus fighting at the height of their combat potential. Fortunately for Spain, the British commander at Cape St. Vincent, Rear Admiral John Jervis, did not understand the value of the convoy to the Spanish economy and concentrated his attack on their warships rather than on the capture of their transports.[18]

Admiral José de Córdoba's report following his defeat at Cape St. Vincent, which was published in the *Gaceta de Madrid* (1797), indicates that he was quite unprepared for command and battle fleet maneuver. During this era, the Spanish Navy was inundated with officers who had little experience in

aggressive sea duty. This was in direct contrast to the leadership and command qualities of the Royal Navy officers, whose practical knowledge drew from longer periods at sea and longer periods of combat engagement.[19] Undermanned ships with crews that lacked camaraderie compounded Spain's problems.

José de Mazarredo Salazar, whose next publication was *Advertencias para caso de combate* (1797), achieved a fine combat record and eventually rose to the rank of vice admiral. He was never defeated at sea, but because he publicly expressed concern over the condition of the fleet and its lack of combat capability, he was never entrusted with major fleet command at a critical moment during Spain's history. Mazarredo also criticized the Spanish method of manning ships, which denied interchangeability of tasks among crew members by devoting a large part of the crew to one task (marines shooting small arms) and the other crew members to another task (sailors manning long-range cannon). Mazarredo also had the audacity to question Spanish foreign policy.[20]

Commodore Cosme Damián Churruca y Elorza was another fine combat officer and superb seaman. He wrote *Instrucción sobre punterías para el uso de los baxales del Rey*, a publication that attempted to deal with the problems of naval artillery, advanced mathematics, and navigation. He served as a consultant on seamanship to the French Navy, and had he not died at Trafalgar, he certainly would have been destined for higher leadership in the navy.

Tratado de señales de dia y noche, e hipótesis de ataques y defensas, dispuesto por el Estado Mayor de Marina para auxiliar la instruccion de este ramo (1804) is one of the most sophisticated tactical and signalling books ever produced. This official navy doctrine book excelled in its analysis of battle tactics and clearly put the offensive first. An extremely complex signalling system allowed the commander to indicate some 576 signals by flag. The book also includes a translation of two of the major doctrinal fighting and signalling works published by British Admiral Lord Richard Howe as well as summaries of the extremely innovative works of Grenier and d'Amblimont.

Napoleonic Era

During the Napoleonic Wars (1803-1815), Spain again fought the British, and at times Spain also fought the French. At the Battle of Trafalgar (1805), the Spanish and French fleets operated as a combined force, although in separate national squadrons. Prior to the battle these two navies had not exercised as a combined fleet and therefore had not attempted to tack thirty-three warships from south to north, a maneuver made all the more awkward by light winds that

prevented the formation of a solid defensive battle line.[21] Admiral Don Federico Gravina, perhaps more pliant and diplomatic than the cantankerous Mazarredo (who probably would have made a more effective commander), was unable to override the defensive doctrine of the French Navy and put into practice the new offensive Spanish doctrine outlined in *Tratado de señales*.[22] Mazarredo certainly would have objected to his ships being manned with crews that were combined of marines and other infantrymen, which resulted in a close-aboard battle rather than engagement of the British at a distance. The bravery of the Spanish officers and men at Trafalgar cannot be questioned, and we can only speculate on what the outcome might have been had the Spanish fleet operated under their new navy doctrine and under a proven combat leader such as Mazarredo. Given Gravina's role as a diplomat in France prior to Trafalgar, his selection as the commander of the Spanish fleet is understandable. The disaster at Trafalgar, however, resulted in another major decline in Spanish naval preparedness.

The immediate threat was from the French forces that crossed the border in 1808. As with France's preoccupation with the Germans later in the nineteenth century, neither the French nor the Spanish fleets could affect the outcome of more important threats from across the border. Cádiz, from which the combined fleet sailed, became the hotbed of resistance to French occupation forces and the seat of the government in exile. The Bourbon king abdicated in 1808 and was replaced by Joseph Napoleon—Bonaparte's brother. By the next year, France had conquered most of Spain.

With the loss of her overseas colonies, Spain faced the immediate need to resolve the problem of lost income. Using her limited naval forces, Spain attempted to pacify her American colonies during the Spanish-American wars of independence (1810–1824) but was unable even to protect them from privateers. Her weakened navy proved incapable of supporting such a major undertaking.[23] Great Britain, which used its fleet to thwart Spain's attempt to regain the colonies, thus secured for itself a favorable trade status. The newly independent Latin American republics secured the services of foreign seamen who successfully defended their new status.

Napoleon was defeated in 1814, and the Bourbon monarchy was reinstated. Civil unrest in Spain followed and resulted in another French invasion to quell the unrest. Spain turned increasingly inward during the nineteenth century and undertook to set up a constitution to address various uprisings and separatist movements; the first Spanish Republic was proclaimed by 1873. During this era, which introduced the ironclad, there could hardly have been consistent advancement in navy doctrine.

The Spanish Navy followed the doctrine advocated by Mazarredo and contained in *Tratado de señales* until Lobo Malagamba prepared a revised text on naval tactics in 1862.[24] This first such doctrine for Spanish Navy steam ships was the basic doctrine for fleet employment during the campaign in the Pacific in 1866 against Chile and Peru, under the command of Rear Admiral Méndez Nuñez.[25]

The next two doctrinal publications were written by Federico Ardois in 1884—*Cuaderno de evoluciones* and *Código de escuadra.* These two publications governed fleet actions during the Spanish-American War (1898) and were kept as the basic doctrine for the fleet (with modifications in 1929 and 1935) until the end of World War II. The absence of continuous combat (it was also true for the British Navy) appears to have discouraged naval thought.

The Spanish-American War

Spain's major combat at sea following Trafalgar was the war with the United States in 1898. Two major maritime campaigns were fought in the Spanish-American War. In the Philippines Campaign, Rear Admiral Patricio Montojo recognized the inferiority of his forces and planned to fight at anchor, supplementing his naval guns with artillery from shore batteries. The crew's inadequate practice in gunnery, the ships' anchorage beyond the range of most shore batteries, and a surprise attack at night by Admiral George Dewey, U.S. Navy, made the Battle of Manila Bay a one-sided contest—though Dewey himself congratulated Montojo for the bravery of the Spanish sailors. Responsibility for the debacle can be assigned to the government that sent the ill-prepared forces and to the colonial leaders in Manila who would not allow a retreat. Montojo's error was primarily in allowing the Americans to enter the bay unopposed, much the same as had the Turks at the Battle of Navarino (1827). Had Montojo fought at the outer part of the bay, he might have succeeded in forcing the Americans to blockade rather than engage. Montojo was court-martialed but exonerated—due partially to the support that he received from Admiral Dewey![26]

The Caribbean campaign was more interesting and controversial, starting with the recommendations of Admiral Pascual Cervera, who recognized that the offensive strikes and blockade ordered by the government were beyond the capability of his small fleet. Cervera believed that his forces were capable of merely defending the homeland. Despite this, he was ordered, and at least attempted, to defend Puerto Rico. Cervera outmaneuvered the American fleet and managed to enter the harbor at Santiago, Cuba, where he maintained a

fleet-in-being. The Americans eventually drew out the fleet as a result of joint actions taken ashore and at sea, and Cervera was defeated in the resulting battle.[27]

The Twentieth Century

Spain remained neutral during the First World War. Spanish naval actions during the Civil War (1936–1939) consisted primarily of blockading and breaking blockades. After years of constitutional and governmental upheaval, some degree of stability arrived with the rule of General Francisco Franco, who maintained Spanish neutrality during the Second World War. After 1945, the navy accepted an American light aircraft carrier into her fleet. Spain undertook a major revision in navy doctrine in 1966 with efforts by the National War College faculty and an ad hoc group of senior officers.[28] Most of their work appears to have been programmatic in nature—defining future navy requirements rather than basic battle doctrine. With Franco's death on 20 November 1975, a constitutional Bourbon monarchy was restored. While Spain entered into NATO in 1982 and adopted Alliance navy doctrine, there remain a few national concerns that are outside NATO's area of operations and for which Spain must maintain her own separate concepts of operations, such as defense of North African territories.

Establishing doctrine was easy for the Spanish Navy. The predominance of Catholicism in the nation may be an explanation for why the average officer accepted easily the concept of doctrine. Indeed, professional writings in the United States have noted this parallel between doctrine and religion.[29] As in other navies, doctrine was not the province of just the warrior; it often involved participation of those outside the navy. Perhaps the most important lessons to be learned from Spain's experiences with written navy doctrine are:

- It took a very long time to change doctrine in the Spanish Navy, that is, to shift from close-aboard battle to long-range artillery engagements and to update basic steamship doctrine, which remained unchanged until the end of World War II.
- Doctrinal development moved along an oblique path, due to the frequent changes in Spain's government as it gradually became a modern nation.
- Close doctrinal cooperation between France and Spain during the age of sail was a disaster for true Spanish interests—a result of political rather than military considerations.
- Successful innovation was virtually impossible without a champion at court.

- Doctrinal innovation does not build and develop without frequent combat.
- And, finally, for reasons of history, officers of the Spanish Navy take for granted that there will always be written navy doctrine.

Notes

The age of sail and other sections of this paper are based heavily upon: S.S. Robison, (Rear Admiral, USN, Retired), *A History of Naval Tactics From 1530 to 1930*, (Annapolis, Md: U.S. Naval Institute, 1942); E.B. Potter and Chester W. Nimitz (Fleet Admiral, USN), eds., *Sea Power: A Naval History* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1960); Clark G. Reynolds, *Command of the Sea: The History and Strategy of Maritime Empires* (New York: William Morrow & Co., 1974); Helmut Pemsel, *A History of War at Sea: An Atlas and Chronology of Conflict at Sea from Earliest Times to the Present*, trans. Major i.G.D.G Smith (Annapolis, Md: Naval Institute Press, 1977) [translation of *Von Salamis bis Okinawa*, first published in 1975]; Brian Tunstall, *Naval Warfare in the Age of Sail: The Evolution of Fighting Tactics, 1650–1815*, Dr. Nicholas Tracy, ed. (Annapolis, Md: Naval Institute Press, 1990).

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The History of Italian Naval Doctrine

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MILITARY DOCTRINE AND NAVAL DOCTRINE are terms used only rarely by Italian authors, and when used, they often mean military art, naval art, and sometimes, strategy. To consider, therefore, what is meant by military or naval doctrine in Italy, it is necessary to address first these concepts of military and naval art and strategy.

To Italians, art is the combination of techniques or methods used to achieve goals (for example in a profession or in a business). Military art, therefore, is the complex of knowledge, techniques, and methods acquired through study or experience and used to prepare the military instrument. The purpose is to obtain a sound decision-making instrument and an effective combat leadership. The goal is victory.

Lieutenant General Raimondo Montecuccoli, an Italian, fought for the Austrian Hapsburg empire in the seventeenth century. He won more than forty battles and wrote extensively on military art. His major work was *Trattato della guerra* (Treatise on War). The quality and originality of his thoughts deserve to be mentioned, as they have a dignity equal to that of Clausewitz.[1] The military art of Montecuccoli is the art of fighting well to win.

Another interesting definition of military art has been proposed by Rear Admiral Luigi Fincati in his book *Military Aphorisms* (1882). Military art for him was "the complex of knowledge and capacities needed to coordinate, move, and lead a group of armed men against the other side, obtaining the best from each element and maintaining the group's cohesion at the same time."[2]

According to Admiral Giuseppe Fioravanzo, in his *A History of Naval Tactical Thought* (1956), military art is a combination of strategy and tactics, wherein strategy is defined as "the art of conducting war" and tactics as "the art of fighting war."[3] This latter definition of military art, which seems incomplete and excessively general, shows how difficult it is to circumscribe the meanings of some words. In Italian usage, the term doctrine has also meant tactics when referring to tactical-level doctrine.

Strategy in Italy is generally understood as the concept of using the battle for the purposes of war, or using military means in support of politics. Today's military strategy is usually defined as the element of general strategy that

specifies the way the military should act to achieve the objectives of national military politics, an alliance, or a coalition.

The term military politics is commonly used to denote a distinct component of general politics. It is based on the nation's historical and social background and is driven by a current situation and the resources available. Military politics establishes the general objectives to be achieved by the military to fulfill the needs of the country, associated international institutions, or alliances. It must operate to preserve, support, and integrate the overseas policies where and when relationships have been established.

According to current Italian interpretations, the term doctrine is the whole of notions or principles, organically elaborated and ordered, to be considered either as an object to study or as a standard for theory and practice, or the whole of knowledge acquired and coordinated through study, which forms the culture of a person or of an organization. Doctrine, therefore, can be either firmly prescriptive, as in religion or in a political ideology, or basically descriptive. As a complex of principles, military doctrine may deal with more than one area. It is therefore acceptable that this term be used as a substitute for military politics, strategy, or tactics.

In Italy, therefore, the term military doctrine is controversial and allows several interpretations. Many writers believe it should be mainly descriptive, leaving the necessary freedom of action to deal with particular events or exceptional situations. For the purpose of this study, it is sufficient to consider military doctrine as the collection of rules and principles that specify how to conduct military operations with the aim of fulfilling strategic objectives. Doctrine takes into account the lessons of history, the decisions in military politics, and the strategies chosen to deal with crises, conflicts, and so on. This definition places military doctrine on a level of hierarchy that stands below military politics and strategy, and above tactics.

Doctrine is closely connected to military art. A graphical representation could be a circle wherein lie military politics, military strategy, military doctrine, naval doctrine, and tactics, connected sequentially but also linked with one another by lines indicating reciprocal influence and dependence. Synonymous with naval thought, doctrine includes the preparation of assets and their planned use in war or in emergencies. Doctrine impacts on the navy's organization and administration, training of personnel, naval strategies and tactics, and the procurement of armaments. Hence, the core of naval doctrine is the set of principles (as well as beliefs and values) that guides a naval organization in war or in carrying out other maritime operations in peacetime or during crises. These rules indicate what the navy must be, who or what it

must represent, how it must behave, and for what future contingencies it must prepare itself. It must also consider all forms of cooperation with other services and allied nations, all possible missions, as well as associated specialized doctrine for cooperation with air forces and doctrine when operating under NATO or United Nations Organization auspices.

Naval doctrine, therefore, represents the essential link between strategy and tactics: if there is no doctrine, strategy cannot be translated into tactical actions. Doctrine generally has a long lifetime, while strategy and tactics are more dynamic. Naval doctrine is also subordinate to military doctrine and must be a guide and reference point for the navy on all occasions and for all undertakings.

In reconstructing the history of naval doctrine in Italy, it is well to bear in mind that, while military literature on land operations boasts a very rich ancient bibliography, there is little treatment of naval doctrine. This lack of doctrinal literature probably resulted because events at sea were not suitable to academic inquiry, and naval operations were often seen as complementary and paralleling those ashore. With this in mind, we will undertake to ascertain the navy's actual doctrine through observations of its behavior and from examples of the literature that codified the doctrine.

Early Italian Navies

Some of the greatest medieval battles were fought in the Mediterranean by the maritime republics of Genoa, Pisa, and Venice. A fourth republic, Amalfi, had a merchant navy tradition. The maritime tradition established by these republics has been kept alive, and their coats of arms have been carried on the Italian Navy flag since the republic was established in 1946.

The battle of Meloria in 1284 (between the Pisans and the Genoese), Curzola in 1298 (between the Venetians and the Genoese), and Bosphor and Loiera in 1352 (between the Genoese and a coalition led by the Venetians) provide examples wherein tactical art was written "at sea" by successful admirals in the age of oar. Firearms were used aboard ships at the Battle of Zierikzee in 1304, where the Genoese admiral, Ranieri Grimaldi, defeated the Flemish.

At the Battle of Curzola, Genoese Admiral Lamba Doria's superior tactics resulted in the defeat of the numerically more powerful Venetian fleet. The admiral's tactics were, essentially, to close in on the enemy quickly, break through their defensive formation, concentrate his force against only a part of the enemy line, and then commit his reserves at the height of battle. Reserves were considered so important that they were maintained even at the expense of a reduction in main forces. The Genoese were the unbeaten masters in applying

this doctrine. Their attacks were always carried out at the right moment, in a very decisive way, and using stratagems such as hiding the reserves.

Written fighting instructions were issued occasionally by various naval commanders operating in Renaissance Venice. The earliest of these efforts was the *Orders and Signals* of the Venetian Fleet in 1365.[4] These orders included specific operational formations as well as signals to indicate the fleet commander's intent.

By the time the Battle of Lepanto (1571) occurred, the primarily *unwritten* doctrine and tactics of galley warfare in the Mediterranean had been perfected to the degree that each side could have been considered a master of the naval art. Indeed, the battle was fought much the same as a joust between knights, with all of the formalities accorded gentlemen under arms. Although the Christian commander at Lepanto, Don John of Austria, was Spanish, many ships were from Italian city-states, the largest contribution coming from Venice. The Christian fleet numbered well in excess of two hundred galleys, galleasses, and subsidiary ships of sail, and the Turkish fleet had roughly the same strength. The Christians, who held superiority in numbers of cannon (roughly 2.4:1), fought as an integrated multinational force. Overall political objectives were set by Pope Pius V and Philip II of Spain.

Before sailing, each Christian captain received written orders from Captain-General Don John outlining specific cruising and battle stations. The overall tactical objectives were to select an opponent, ram, and then board in a general *mêlée*. The Turkish commander in chief, Ali Pasha, fought a brave battle but in the end lost his life, and his force was defeated. In part, this was due to Christian superior firepower, technology (ship construction, providing protection for the crew, and personal armor), new ship design (galleasses), favorable winds, and doctrine/tactics (galleasses placed ahead of the galleys and cannon used more freely and at point blank range). Lepanto signalled the virtual end to traditional galley tactics and the age of oared ships, and the superior ships of sail were ushered in.

The general concepts of doctrine were rarely described by the admirals or routinely codified on paper during medieval times. Doctrine at that time was deduced from events that happened at sea. One significant exception to this rule was Pantero Pantera, who was an academic and a ship commander of the Pontiff's navy. His *L'armata navale* (The Naval Fleet), in two volumes (1614), managed to condense all that was known about the art of warfare at sea.[5]

Pre-Unitary Navies: 1750–1861

During most of this period, pre-unitary navies carried out independent campaigns and rarely fought as a single fleet. It is important to examine their

histories separately, up to the birth of the Italian Navy after the establishment of the Kingdom of Italy in 1861.

Among the navies of the Italian peninsula, those of Naples and the Kingdom of Sardinia were most significant, although they were minor in comparison to great oceanic navies such as those of England, France, and Holland. Most of the time, the navies of the Italian peninsula were used in cooperation with the British or French fleets to counter piracy in North Africa or contain wars in progress in the Mediterranean. Warfare at sea consisted primarily of combat involving single ships or squadrons, naval blockades, and off-shore bombardments.

The frequent foreign invasions and the ever-present political instability in the numerous states affected the preparedness of the fleets. Navy personnel, especially the officer corps, were often recruited from the army, from other Italian states, or from foreign nations. A truly national consciousness of a national navy would have to await unification.

Neapolitan Navy. The history of Naples is intertwined with that of Spain, hence Neapolitan Navy doctrine has a strong Spanish influence. In the mid-1700s, the situation in the fledgling Kingdom of Naples's navy was anything but good. It was not well organized, and it had no recognized doctrine for the employment of its forces. The arrival of the British adventurer, Admiral John Edward Acton, in 1779 marked a clear turning point. Acton, who was summoned by Bourbon King Charles III, had served previously in the French Navy and with Tuscan naval forces. He started a thorough renewal program with the objective of providing the navy with more wide-ranging international experience. Acton brought experienced foreign officers and skillful engineers to Naples, and he sent Neapolitan officers and technicians to other countries to be trained. Several Neapolitan officers embarked on Spanish and French ships and took part in the American War of Independence.

Acton's concept of naval force employment went beyond coastal defense; it counseled an active role in distant-water multinational operations. Neapolitan ships were active and successful during the hostilities between Spain and Algeria in 1784 as well as in other circumstances. In a few years, the Neapolitan fleet reached the level of capability needed for the political role to which the Kingdom of Naples aspired. At that time Naples was the major coastal state in Italy.

With the outbreak of the French Revolution, Naples fought bravely with Britain to defend Toulon. In 1795 the Neapolitan Navy fought at Capo Noli with a British squadron commanded by Admiral Lord William Hotham, against

the French fleet led by Rear Admiral Pierre Martin. One British ship was commanded by Horatio Nelson and a Neapolitan frigate was commanded by Admiral Francesco Caracciolo.

Naples was subsequently conquered, and King Ferdinand IV escaped to Palermo, Sicily, on board one of Nelson's warships, escorted by a Neapolitan naval division commanded by Admiral Caracciolo. The remainder of the fleet was burned to prevent its capture. After this mission, Caracciolo returned to Naples. He was disappointed by the surrender of his king and turned against the British. Caracciolo was eventually captured by Nelson, court-martialled, condemned, and hanged on board the Neapolitan corvette *Minerva* that he once commanded when he held the rank of commander.

Despite various contrasting evaluations, Caracciolo is considered a patriot by many. This episode reveals how the doctrines of the Royal Navy and the Neapolitan Navy differ in duty and loyalty. Nelson was governed by his duty as a commander to maintain absolute loyalty to his sovereign under all conditions and in all situations. Caracciolo, however, could no longer be inspired with duty and loyalty toward a sovereign who had abandoned the capital under foreign threat; Caracciolo felt that supporting the new ideals of liberty, equality, freedom and justice was his first duty as a citizen and as a soldier.

This sense of perceiving and interpreting is found again in the history of the Neapolitan and Italian navies. In this period, the old Neapolitan Navy was divided in two—fighting each other. A small Neapolitan Navy was allied to the French, while the larger Sicilian Navy was allied to Britain. The conduct of the Neapolitan Navy was very aggressive and they showed determination against a far more powerful British fleet.

In 1814, an interesting book by Giulio Rocco (who had served in the Spanish Navy), titled *Riflessioni sul potere marittimo* (Considerations on Maritime Power), was printed in Naples. *Considerations on Maritime Power* introduced the term maritime power, which was nearly unheard of at that time. The book defined the term's most important elements and the relationships between those elements.

After the defeat of Napoleon in Russia, the Bourbons returned to Naples (1815) and once again the navy was reorganized. Maritime responsibilities were shared between three maritime areas (Naples, Palermo, and Messina) and new doctrine was established. Admiral Acton's doctrine was updated with the publication of the *Regulations of the Royal Navy*, which was also influenced by French and Spanish doctrine.

For example, as contained in earlier Spanish doctrine, some Neapolitan officers (vessel officers) were tasked to fight, while others, known as pilots,

were responsible for seamanship. Vessel officers were predominantly of noble origin, while the pilots came from all classes. Enlisted specializations were similarly split into artillery cannoneers, whose duty included vigilance over the ship, and sailors who handled the sails and other seamanship duties. The Neapolitan Navy had a fleet with good material condition, but one that was not particularly useful because of the poor level of training for officers and crews. Military and patriotic spirit were lacking, and the cannoneers were not convinced either of the sailors' good will toward them or of their own good chances for survival.

During the periods 1820-1830, the Neapolitan Navy became aware of the new technical possibilities in propulsion. In the 1830s the Kingdom of the Two Sicilies (Naples and Sicily) built many steamships of excellent quality. In 1825 Neapolitan ships had carried out a bombardment against Tripoli to convince the Bey of Tripoli to suspend his piracy activities. A similar operation was carried out in 1833, in conjunction with Sardinian ships, against Tunisia.

The Neapolitan Navy did not normally deploy outside their national waters. The government feared that crews could be contaminated by liberal thinking, and given the 1820 revolt in Naples as well as elsewhere in Italy, its fears were probably justified. One exception to this rule was its deployment of ships to Brazil and to the Rio della Plata in 1843.

In 1848 the Neapolitan Navy deployed with some sections of the army to the Adriatic Sea where they joined Sardinian and Venetian ships to defend a new republican government in Venice against Austria. This campaign was led by Admiral Raffaele de Cosa. Later, after facing a revolt in Naples, the king withdrew his ships and troops and sent them to attack republican secessionists in Sicily. This withdrawal created severe problems of conscience for Admiral de Cosa, who was torn between obedience to the king's orders and his desire to participate in events that were crucial to the independence and unity of Italy. De Cosa resigned from the navy in a situation similar to that faced by Francesco Caracciolo.

The Neapolitan Navy operated for the last time in 1860 in an unsuccessful opposition to the landing in Sicily of General Giuseppe Garibaldi and his corps of volunteers. The navy also supported the abortive attempt to retake the island. During the conquest of Sicily, Garibaldi set up a small but aggressively trained Sicilian navy. It created its own regulations and was equipped with crews and ships that were mostly from the merchant navy. The Sicilian Navy captured Neapolitan ships and supported landing operations which resulted in the eventual capture of Naples.

Sardinian-Piedmontese Navy. The island of Sardinia also has a mixed heritage, with Spanish ancestry. Piedmont is located near the French border in the region of Turin. These two regions were once combined as the Kingdom of Sardinia. The establishment of a Sardinian-Piedmontese navy, or Sardinian navy, took place sometime after the founding of the Kingdom of Sardinia under the leadership of Savoy (part of Piedmont). It was originally a small navy with light units, dedicated mainly to battle with the pirates infesting the coasts of Sardinia. By 1764, this navy had grown to include frigates that could be operated at a considerable distance from the shoreline. Crews were composed mainly of Ligurians (Genoa's region). The service was managed in the British custom, and commands were given in French. This small navy also had a naval infantry that was used more to defend coastal areas than for offensive tasks.

Sardinia defended itself successfully against French attacks under Napoleon. In 1796, the king, Carlo Emanuele IV of Piedmont, escaped to and obtained refuge in Sardinia. The navy continued its primary activity of coastal defense and actions against pirates—but now in cooperation with the British. Napoleon could not tolerate having Sardinian ports available to the British and attempted, unsuccessfully, to prevent their use of Sardinian waters.

After the Napoleonic wars (Vienna Conference, 1815), Sardinia reclaimed Piedmont and acquired Liguria. The Sardinian Navy became better regulated, and a new navy commander, Admiral Giorgio des Geneys, established two naval infantry regiments that included their own organic artillery. The maritime areas of Genoa, Villafranca, and Cagliari, and a marine school (1816) were established as well. The number of ships was increased, and the Sardinian Navy became a particularly efficient instrument. Ships were used for diplomacy and to support a coup at Tripoli (1822).

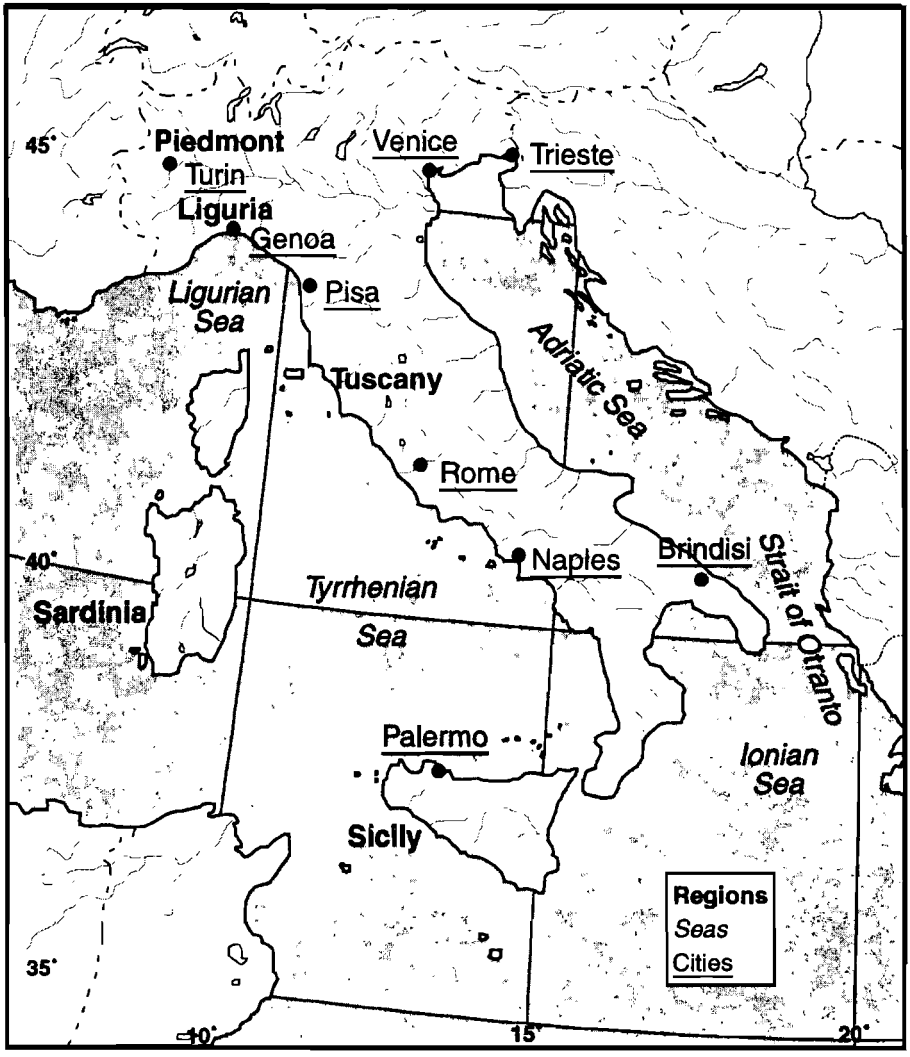
In 1826 Admiral des Geneys published a new set of regulations concerning service, discipline, uniforms and artillery, and the administrative regulations were enacted in 1830. All regulations were in French; the Italian language became obligatory later.

During the Greek War of Independence (1821-1830), the Sardinian Navy was used to protect the merchant traffic of Sardinia and its consulates in the Mediterranean. From 1834, Sardinian warships operated in South American waters, especially off Brazil and in the Mar del Plata. Cruises to the Pacific were made via Cape Horn.

In 1837 steam propulsion was introduced, starting with merchant ships and corvettes. In March 1840, the Sardinian Navy was reorganized once again, and a general staff of the combined forces was introduced. A solid merchant fleet

developed gradually alongside the navy, and Giuseppe Garibaldi was one of the captains of this merchant fleet.

After the Milan uprising in 1848, King Carlo Alberto declared war against Austria. Sardinian naval infantry took part in the land campaign, while a squadron under Admiral Giuseppe Albini was sent to the Adriatic and joined the Neapolitan fleet in support of the new Republic of Venice. On 15 April 1848, Sardinian ships hoisted for the first time the Italian tricolor flag with the



Joseph R. Nunes. Jr.

Savoy's coat of arms. The Sardinian squadron was involved in actions against the forts and in blockades of Trieste and in action along the Venetian coast. Following the Armistice, the Sardinian Navy cooperated extensively with the French and the British.

In 1855, the Kingdom of Sardinia participated with France and Great Britain in the Crimean War against Russia. A 15,000-man expeditionary corps was sent by sea to the Crimean peninsula. The Sardinian Navy, in cooperation with the British, sustained the main logistic effort, assuring the continuous flow of supplies from Italy and managing merchant ships' requisition and hire. Its integration with the allied naval forces was outstanding, and the experience acquired was extremely important five years later when the Sardinian Navy became the core of the Italian Navy.

Venetian Navy. The Venetian Navy was famous for its rigorous regulations, healthy administrative principles, and the close relationships between its Superintendents and the Senate of the Republic. In wartime, the Republic selected a Captain General to whom absolute power was given. When the war was over, the Captain General was not to return directly to the city of Venice itself; he was to berth his ships in some other port and travel from there to Venice in civilian clothes. There, his action was judged by the Senate.

Trade relations with the East, which once constituted the fortune of the Venetian Republic, were reduced greatly after the discovery of America, when trading interests switched from the Mediterranean Sea to the Atlantic Ocean. The Venetian Navy, which had maintained absolute dominion of the Adriatic Sea and part of the Mediterranean for centuries, became a modest one, operating in a limited number of areas after the loss of foreign bases. By the middle 1700s, Venice had become an advocate of peace and neutrality. Yet the Venetian Navy still held some military power and could not be ignored. On the other hand, it lacked the spiritual and political energy necessary for a warfighting force.

In 1749 the Republic conceived a league with the Knights of Malta's naval forces, those of the Kingdom of the Two Sicilies, and the Pontiff's fleet to counter the threat of North African piracy. In 1767 Venice took the initiative and sent a naval squadron under Admiral Angelo Emo, which landed in Algeria and forced the Bey of Algiers to take action. In 1784 Venice sent Admiral Emo again to North Africa, where he bombarded the port of Susa, set a naval blockade at Tunis and Susa, and then monitored from Malta the pirates' activities. Admiral Emo's transport of heavy cannons through shoal waters deserves mention. Cannons were off-loaded on special rafts; thus he surprised the enemy and created a tactic that since then has been copied by many others.

After Napoleon's conquest of Venice in 1797, many of the best ships and crews of the Venetian Navy were incorporated directly into the French Navy. When Napoleon was defeated, Venice was turned over to Austria and its navy became the Imperial Royal Venetian Navy. In 1848, the Venetians rose up against Austria and proclaimed a short-lived republic. Many of the Imperial Royal Venetian Navy ships stationed at Venice, whose crews were mostly of Italian origin, chose to side with the new republic. The biggest part of the fleet was stationed at Pola (on the Istrian Peninsula) and remained loyal to Austria. The Venetian Republic was reincorporated into Austria in 1849 and remained within the Austrian empire until its cession to Italy in 1866.

Other Pre-Unification Navies. There were many other states in pre-unification Italy that had navies. Two of them are covered here—the navies of the Pontiff and that of Tuscany—although their influence on Italian Navy doctrine is negligible.

The main objective of the Pontiff's navy was to take an active part in the struggle against the non-believers, the Moslems. The Vatican navy was particularly active in the sixteenth century when it participated, with a large number of ships, in all important naval encounters of that period—including Lepanto (1571). It also cooperated with navies belonging to several knightly military orders. When Napoleon conquered Rome in 1808, the Pontiff's navy was disbanded; and in 1860 all papal ships were incorporated by the Italian Navy, when the papal port city of Ancona became part of the Kingdom of Italy.

The Tuscan Navy, inheritor of the medieval Pisan Republic Navy, decayed progressively over the years due to the constant reduction of budget. Despite this, Tuscan ships participated, along with the Venetians, in battles against the Turks. Its last major combat was during a war over Corfù (1715-1718). From the mid-1700s, the Tuscans limited their naval operations to defense against the Turkish and the North African pirates infesting the Tuscan coasts. In 1775, a Tuscan squadron operating off North Africa was under the command of John Acton, who later went on to serve with the Neapolitan Navy.

Due to the limited number of ships available, the Granducato of Tuscany eventually needed the help of other Italian states to protect his trade lines along the North African coast. Generally, it was the Kingdom of Naples that supported this suppression. In the nineteenth century the Tuscan Navy was reduced to even more modest dimensions.

The Birth of the Italian Navy: 1861-1882

The official date of the birth of the Italian Navy is 17 March 1861, when the Sardinian, Neapolitan, and Tuscan navies, and a few remaining ships from the Pontiff's navy, joined together. The intent of the new Kingdom of Italy was to create a navy appropriate for the international role the government wanted to fulfill. This became evident when Camillo Benso di Cavour, the first prime minister, stated that "it is the duty of a state located in the middle of the Mediterranean to create [the basis for] the widest development of its naval resources, taking advantage of the elements of force of its own provinces."

But Italian naval policy was strongly conditioned by the prevalent land mentality of the politicians. The ships belonging to the kingdom were extremely diverse, with crews of different cultures and no common doctrine. From the doctrinal point of view, an autonomous Italian idea was slow to emerge. Even the recent events of the American Civil War were not well known, and the technological innovations adopted in those circumstances received only minimal attention. On the other hand, the tactics of French Admiral Luis Bouët-Willaumez and Russian Grigorij Boutakov were followed closely.

Bouët-Willaumez wrote a series of publications that pioneered advances in navy doctrine. His *Batailles de terre et de mer* (1855), attached to a *Project de tactique navale*, outlined provisional tactics for screw-propelled steamships. Bouët-Willaumez's work was then adopted by the French Ministry of Marine in the form of their own doctrinal books. They were published in 1857, outlining doctrine for ships of sail and steam. These French ministry doctrinal works and Bouët-Willaumez's other writings, especially his *Tactique supplementaire: à l'usage d'une flotte cuirassée* (1865), were adopted by the Italian Navy in 1866 as the *Regolamento di tattica* (Tactical Regulations).[6] This doctrine paralleled a government decision in 1863 to shift from sail to steam and ironclads.

The tactical principles of French doctrine were applied, at least theoretically, in the famous and instructive Battle of Lissa (1866). They included principles of war—rules for combat—and movements of war—maneuvers to be executed by the main body and the flanks of the steam-propelled fleet to gain advantageous positions for combat. The general strategy for employment of the fleet at sea was to form up with the French, Spanish, or British against a common foe. Yet in its first battle, the Italian Navy fought alone.

In 1866, the Italian fleet, under Admiral Count Carlo Pellion di Persano, met an Austrian force, commanded by Rear Admiral Wilhelm von Tegetthoff, off the island of Lissa (now Vis) in the Adriatic in the first battle between armored fleets. Persano's objective was to cover an abortive landing operation. Upon

sighting the Austrian fleet, the Italians sortied their ironclads from the landing area to engage the enemy. Tegetthoff committed both his ironclads and wooden ships and scored a resounding defeat of the Italians, preventing the seizure of the island and driving off the Italian fleet.

Persano's fleet had twice the combat potential of the Austrians. Persano, however, had neither conducted practice drills nor met with his captains to discuss how best to employ an ironclad fleet in conformance with the new doctrine. Instead, he assumed that the standing instructions and the new tactical doctrine were all that were needed and would be followed. The result was a disastrous *mêlée*. The embryonic Italian Navy had not yet had the time to exercise its new doctrine or formulate a national officer corps. It certainly had not had the years of experience that Horatio Nelson could count on when he trusted his "band of brothers" to carry out his standing orders.

In what has been described as one of the most unfortunate ideas that an admiral could have ever conceived, Persano changed his flagship while his battle line was still forming and did not inform anyone; due to a squall, his subordinates did not see it. Unfortunately, Tegetthoff observed the slow-down of ships and a break in the line. He aggressively maneuvered his force to take advantage. After the presumed flagship was sunk, one of Persano's subordinates signalled for chase and freedom of maneuver, but that signal was cancelled by Persano who, in doing so, made it known that he was aboard another ship.

The lessons of the Battle of Lissa weighed heavily upon the Italian Navy for many years hence. Although most analysts have demonstrated how this battle mistakenly influenced warship construction for the next thirty years (a resurrection of the ram), it was also to have a dramatic impact on understanding the importance of doctrine. Persano formed his fleet to maximize the performance of their guns, rather than the ram, but then spoiled the plan with his decision to shift flags. The Italians failed to take advantage of their superiority in combat potential or their formation's superiority over that of the Austrians (who were formed to maximize ramming).

The defeat must be imputed primarily to the lack of understanding between Admiral Persano and his commanders and to the modest qualities of the admiral himself. Persano did not take advantage of the greater flexibility of his line formation against Admiral Tegetthoff's wedge. Furthermore, after losing two ships, he did not counterattack despite the fact that he still outnumbered the Austrians. Austria used older and less well-armed ships, but the strong personality of Admiral Tegetthoff fixed trust in his crews and commanders, leading them to success.

The negative results of the Battle of Lissa had serious political and moral repercussions for the navy. The battle, however, increased the public's and politicians' awareness of conditions in the navy. Political leaders began to understand the importance of sea control and its relationship with land operations. They began to realize that the transport of troops and coastline defense were not the only roles that navies played in influencing land operations directly and strategically.

The Battle of Lissa also marked the starting point of new naval thought. The *Rivista Marittima* (Naval Journal), born in 1868, became an important vehicle for the discussion of new doctrine and strategy. Its writings captured the attention of the public and Parliament. It demonstrated the importance of the navy. It proposed new fleet assets and organizational reforms as a consequence of the lessons learned from the defeat at Lissa and of new technological innovations. It was recognized that many of the ships that had fought at Lissa lost in one-against-one battles, so shipbuilding concepts shifted toward larger ships.

The follow-on debates on the pages of this journal helped to obtain the funds necessary to achieve qualitative and numerical levels comparable to those of both the Spanish and Austrian maritime forces. Despite some disagreements, from there on, the navy was considered an indispensable instrument in the conduct of solid foreign policy, ruling the colonies and assuring territorial defense.

The total renovation of the fleet was conceived and committed with a ten-year plan. In 1869 and in 1871, the Minister of the Navy, Rear Admiral Augusto Riboty, presented an *Organic Plan for the Navy* to the Parliament. In 1870, planning started for new battleships as well. These included the first warships with revolving towers and 450mm caliber naval artillery; they were considered by many, especially the French, to be the most powerful ships of the time.

Italian Navy units stationed in the Red Sea from 1879 on, sometimes for very extended periods, carried out naval diplomacy missions in support of Italian colonies. The ships also carried out operations in direct and indirect support of the army, using arms and providing logistic sustainment, especially during the occupation of Eritrea (1882-1890).

In 1881 the navy was debated again. The debate, involving both officers and Parliament, was about building battle cruisers instead of battleships. Numerous boards on the subject expressed different views. The new technologies had introduced many innovations, which gave rise to numerous questions about how to proceed. Old prejudices slowed down innovations. Despite the positive

results obtained with the new warships, many people believed that the navy was too ambitious; they argued for a fleet of smaller units.

The supporters of large ships used examples from the British and American navies' experiences as ammunition against the idea that large ships were too slow or awkward in modern combat. Big ship supporters also had to refute the idea that the combat potential of a small number of large ships could be obtained equally by adding together the tonnage of a large number of small ships. Such an approach provides only equivalent tonnage and has no bearing on combat potential. This discussion was useful to define criteria for shipbuilding and to start considering political-military objectives, given financial possibilities.

Under Minister of the Navy Ferdinand Acton (1880-1883), Italian naval shipbuilding programs and doctrine were strongly influenced by the French *jeune école*. Italian ship procurement shifted to fast, lightly armored ships. The navy supported coastal fortifications and mine fields in conjunction with small well-armed naval units in defense of the coast. A few large battleships were also maintained, not to contest command of the western Mediterranean but to act rather as a mobile fleet-in-being. If actually used in combat, they would act primarily as coastal defenders, breaking up enemy formations that attempted a landing, or engaging in shore bombardment.

Acton's program was opposed by Admiral Simone Pacoret de Saint Bon and Admiral Benedetto Brin. Each wrote books in 1881, *La questione delle navi* (The Question of the Ships) by Saint Bon, and *La nostra Marina Militare* (Our Military Navy) by Brin, which sought to argue the case for large capital ships and the decisive battle.

The role of the navy during the occupation of Somalia was to support the initial invasion and subsequent diplomatic and military actions. During this period, the navy gained vast experience in distant operations. Numerous diplomatic missions outweighed efforts to limit the navy to the defense of maritime boundaries, and naval expeditions in the Far East and in South America supported this expanded role. Some twenty-one circumnavigations around the world also contributed to developing the navy's views and to supporting a greater role for the navy.

People became more aware of the need for harmonizing the basic preparation of naval officers. The two existing naval schools at Genoa and Naples were unified to form a single naval academy in Livorno, between 1878 and 1881. In the meanwhile, some profound changes were occurring in the international situation. The French conquest of Tunisia in 1881 affected Italian interests and drew Italy out of isolation. France, rather than Austria, became the assumed enemy. A costly arms competition with France overtaxed Italian resources and

left its navy with an excellent theory of naval construction but inadequate assets in the water.

From 1882 to World War I

In 1882 Italy signed the Triple Alliance Treaty with Germany and Austria-Hungary. The main objective of this treaty was the defense of the coastal regions. The French threat was assumed to be an initial strike at the Italian fleet, bombardment of the Ligurian and Tyrrhenian coasts, then neutralization of the railways followed by an amphibious landing which would cut Italy in two and outflank the land front. The Treaty was renewed in 1891.

Admiral Giovanni Bettolo, Minister of the Navy at the turn of the century, succeeded in starting a new shipbuilding program. His plan consisted of building small, fast, armored ships carrying large caliber artillery, as well as new torpedo units.

One of the more important naval theorists of the 1880s and 1890s was Commander Domenico Bonamico. Bonamico first attained prominence with the publication of *La difesa marittima dell'Italia* (Maritime Defense of Italy) in 1881. In this first work, Bonamico argued that navies were as important as land forces for the defense of Italy. Bonamico's ideas evolved with the publication of a subsequent book, *La situazione navale mediterranea* (The Naval Situation in the Mediterranean). In this later book, Bonamico aimed to develop a new regional organization able to control the vital points of the Mediterranean and thereby prevent general European wars.

Bonamico's major work was *Il problema marittimo dell'Italia* (The Maritime Problem of Italy) in 1899. Bonamico accepted the increased role for the navy in the defense of the national coastline. He outlined the fleet's main tasks as cooperation with the army, control over the Tyrrhenian Sea, prevention of attacks from the sea, and monitoring the mainland and island coastal areas. Additional duties were the protection of coastal cities and installations against naval bombardments, the defense of maritime trade, and the safety of the colonies. Following his prescriptions, Italy established a series of fortified naval bases on its own soil, from which the fleet-in-being would maintain its vigil.

In another major work, *Il potere marittimo* (Maritime Power), Bonamico detailed the movement and dynamics of maritime power. Using historical case studies from the age of sail, he introduced the basic principles of war at sea. Bonamico argued that the military importance and influence of navies was no less than ever before. Bonamico states that: "the entity and the character of a fleet must depend, first of all, on the objectives that the nations wish to achieve."

Bonamico pointed out that while French strategy had to be essentially against Britain, Italian strategy should be based on defense against maritime invasions. Without having attained success in defense against maritime invasions, success in other mission areas was irrelevant.

By the end of the nineteenth century, the writings of Captain Alfred Thayer Mahan in the United States, Vice Admiral Philip Colomb, and Major Charles E. Callwell in Britain had also added to the knowledge of naval war in the age of sail. Bonamico, Mahan, Colomb, and Callwell collected lessons of maritime history and recorded the naval doctrines of the time. These authors had a resounding effect on the Italian Navy. Bonamico even wrote a book about Mahan and Callwell.[7] Mahan and Bonamico are considered to be, in Italy, the most important philosophers of naval theory because of their ability to learn the proper lessons of naval history.

Another significant author at the century's end was Commander Augusto Vittorio Vecchj, also known as Jack La Bolina. Vecchj's book, *Storia generale della Marina Militare* (General History of the Military Navy) in 1892, documented the history of the Italian Navy, an essential step in the formulation of doctrine. Between 1898 and 1902, Camillo Manfroni wrote a complete history of medieval Italian navies from the middle of the first millennium to the Battle of Lepanto. Manfroni developed historical information on construction techniques, naval customs, crew composition, armaments, and the nature of expeditions and the organization of the fleets.

Italian naval doctrinal thought received a further impulse from Lieutenant Giovanni Sechi. Sechi, an instructor at the Naval Academy, published his *Elementi di arte militare marittima* (Elements of Military Maritime Art) in two volumes between 1903 and 1906. In addition to a standard and orthodox treatment of naval strategy, emphasizing war at sea and the decisive battle, Sechi's book expressed an interest in combined operations and the role of logistics.

Sechi emphasized principles of naval strategy based on a clear definition of objectives, followed by a deduction of the operations that are possible, given the capability of the fleet. He completed a theoretical treatment indicating which situations required temporary and which the absolute control of the sea. Sechi argued that strategic success, not tactical, could be pursued with two possible alternatives: a strategic offensive war or a strategic defensive war. Unusually, he interpreted the concept of fleet-in-being as an option that maintained naval forces deployed at sea rather than in port. Sechi, who influenced the Italian government to obtain fast dreadnoughts, was promoted eventually to admiral and served as Chief of Staff of the Navy after World War I.

Two additional books, *Storia delle evoluzioni navali* (History of Naval Evolutions) in 1899 and *Tattica nelle grandi battaglie navali* (Tactics in the Great Naval Battles) in 1898 by Rear Admiral G. Gavotti, were mostly descriptive but again formed the basis of an understanding of how navies fought so that doctrine could be formulated by the navy. Lieutenant Lamberto Vannutelli attempted to analyze night combat between ironclads and torpedo boats.[8]

Lieutenant Romeo Bernotti published a series of articles in *Rivista Marittima* which addressed doctrinal issues being debated in the fleet. His book, *Fondamenti di tattica navale* (Fundamentals of Naval Tactics) in 1910, was translated into English and published by the U.S. Naval Institute.[9] This book addresses both elements of maneuvering as well as specific tactical maneuvers and the conduct of battle as a whole. Bernotti argued that "war is decided by means of a decisive battle." He also addressed the dividing of fleets into principal and flying squadrons (whose job it was to execute an envelopment maneuver, or crossing the "T"), the proper distance for engagements as being that which allows the employment of all the fleet's assets, tactical versus strategic victory, and warfare of annihilation versus attrition. Bernotti did not develop historical examples for his doctrinal and tactical discussions but rather assumed the reader already knew these.

The writings of foreign naval scholars also received attention in Italy. The pro-*jeune école* book, *Essai de stratégie navale* (1893), by French Commander Gabriel Fontin (pseudonym H. Montéchant) and Lieutenant Paul Vignot (pseudonym *Commandant* Z), was translated into Italian. Sir Julian Stafford Corbett's historical analyses of doctrine, strategy, and tactics in the days of sail, *Some Principles of Maritime Strategy* (1911), was also studied in Italy. Russian Admiral Stephan O. Makarov wrote a book, *Rassuzhdeniia po voprosam morskoi taktiki* (Discussion of Questions in Naval Tactics) in 1898, which was translated into Italian.

At the beginning of the new century, the Triple Alliance had begun to weaken and appeared somewhat unreliable. Rivalry and disagreement arose with Austria. By the end of 1905, Austria was again a potential adversary, stimulating an Italian-French reconciliation. The navy was encouraged to strengthen coastal defenses around Venice and to improve the support capability of the port of Brindisi. Joint exercises with the land forces were intensified. More attention was given to increasing the combat potential of the fleet. The lessons learned from the Battle of Tsushima (1905) led to the construction of dreadnoughts and other fleet modernization efforts.

There were still many disagreements in the country and controversies over the utility of the fleet and expenses needed to improve it. Building was started

on coastal armored ships and lightweight submarines designed to operate in the Adriatic. Naval strategic thought was inspired by Admirals Bettolo (Chief of Staff from 1907 to 1911) and Thaon di Revel (Chief of Staff from 1913 to 1915 and from 1917 to 1919). The navy budget was increased in 1909 and in 1911, allowing the acquisition of new fleet units.

In the meanwhile, the training of officers was becoming much more appropriate to the level of technological and doctrinal progress in the navy. The School of Naval Warfare was established at La Spezia in 1908 and was transferred after World War I to its present location in Livorno with the new name of Institute of Maritime Warfare. The school was the location of official naval doctrine development.

Around 1910, Italian naval preparation begin to consider the difficulties associated with warfare in the Adriatic. The Adriatic's geography was a challenging factor.

- Its shallow waters facilitated minelaying but hampered the employment of submarines.
- Well-protected enemy coasts were close by.
- The Austrian fleet could move with relative safety through the islands of the Dalmatian coast.
- Italy lacked bases between Venice and Brindisi.
- The low national coastline made defense difficult.

The mainstream of the Italian Navy concluded that a potential war with Austria, therefore, had to be fought on the offensive at sea. Results of the analysis fueled additional debates between the proponents of battleships and those who desired to reinforce the coastal defenses.

In the meanwhile, the Italian Navy saw extensive service in the war with Turkey (1911-1912). The main Italian flotilla was under the command of the Duke of Abruzzi. The navy supported the successful landings of troops and took much territory. Coastal towns were shelled and blockades were maintained. Successful amphibious landings were made in Tripolitania, Cirenaica, and some of the Dodecanese Islands.

After the war, the navy began to plan for amphibious landings along the Adriatic coastline. Plans were made and assets prepared to carry them out, taking into account the experience gained with the successful conquest of Tripoli during the 1911 war against Turkey. At Tripoli, new doctrine was developed that required the support of sailors specially trained as land fighters. These seagoing soldiers prepared the way for the follow-on landing of regular army troops, which were to be transported to the objective by the navy.

Also during the war against Turkey, aircraft were used by Italy for military purposes (in Libya) for the first time in history. Chief of Staff Admiral di Revel realized the importance of aircraft in naval war and directed the Navy General Staff to study and develop this element. Additional articles on the subject of naval operational art by then-Commander Bernotti appeared around this time, and some of them were translated into English and published in the U.S. Naval Institute *Proceedings.*[10]

World War I

The Italian Navy's situation before World War I, with its commitments to the defense of Libya and the Dodecanese Islands, appeared to be anything but easy. The opinion was that the navy was far from prepared to support Italian foreign policy. When hostilities broke out involving Austria, Italy's position was not initially clear. The navy began preparation to fight in the Adriatic. Training was intensified, the defense of ports increased. Light units prepared to sortie and plans for landings on the eastern Adriatic coast were reviewed. Landings on the coast in support of the Italian Army were intended to distract the Austrian forces from the northern theater.

At the beginning of 1915 a sound plan for operations in the Adriatic was drawn up. It required Italy to maintain an offensive posture with its larger ships against a more prudent Austrian Navy, and assumed that the enemy would use mines and submarines. The Triple Alliance with Germany and Austria-Hungary officially ended in May 1915. A new agreement between Italy and the Entente (France and the United Kingdom) was signed on 10 May 1915, and Italy entered the war against Germany and Austria-Hungary. The combined naval assets of the Entente and Italy allowed them to dominate the Adriatic instead of just preventing Austrian transits through the Strait of Otranto.

The contribution the Italian Navy gave to the war effort was important. The strategic objectives of the navy's employment were:

- To cut off Austria from the rest of the world by interrupting its sea lines of communication.
- To protect the maritime flow of friendly supplies to and from Albania and in the Mediterranean.
- To prevent enemy naval operations along the coast.
- To provide naval support in the Northern Adriatic to Italian land operations.

Since the Adriatic is essentially a narrow gulf, clashes between large naval formations were unlikely and did not take place. During the Italian Army's withdrawal to the Piave River in December 1917, Lieutenant Commander Luigi

Rizzo sunk the Austrian battleship *Wien* inside the port of Trieste, using two motor torpedo boats. He pioneered a new form of attack in ports against major units that refused to fight at sea.

Italian destroyers and motor torpedo boats struck against the Austrian fleet at Porto Buso, Trieste, Parenzo, Fasano, and Buccari. Assault teams attacked enemy naval forces twice at Pola. During the latter of these two actions the Austrian battleship *Viribus Unitis* was sunk by a slow-speed, two-seat, manned torpedo called a *mignatta*. The Italian Navy also was instrumental in the withdrawal operation of about 112,000 soldiers of the Serbian Army and 10,000 horses from Vlore (in Albania) to Corfú (Greece), and later the transportation of an allied expeditionary corps consisting of 97,000 men from Italian harbors to Vlore.

A 66-kilometer-long antisubmarine barrier made of nets was laid down in the Strait of Otranto to prevent the transit of Austrian submarines to the Mediterranean. This measure was extremely effective and the Austrians tried to destroy the barrier. Initial Austrian attempts to break through the Otranto Strait barrier ended with a naval clash against Italian and Allied units based in Brindisi. The Italians used their motor torpedo boats effectively, hindering the Austrian effort. During a second attempt, on 10 June 1918, near the island of Premuda, the Austrian battleship *Svent Ivstan* was sunk by a motor torpedo boat from a section commanded by Lieutenant Commander Luigi Rizzo. Rizzo became a national hero, and this date was chosen as Italian Navy Day.

The Italian Navy also gave a valuable contribution to the development of maritime aviation. In 1914 a special aviation organization operated at sea, and later, two seaplane support ships were built. During the war Italy used six hundred and fifty seaplanes and twelve airships for bombardment, aerial search, and blockade operations. The navy's aircraft were also used against ships, but with no significant results.

During the First World War, Italian naval employment was tempered by a fear of risking their fleet on unfavorable terms against the Austro-Hungarian fleet.[11] The navy developed an excellent doctrine for the use of their torpedo boats and achieved remarkable results at very low cost. The Italian Navy took no part in Allied convoy efforts and refused to put its fleet under a Mediterranean multinational command. It did, however, form combined units with the French. In the closing days of the war, Italian naval forces executed a successful amphibious operation at the head of the Adriatic.

Now-Captain Bernotti continued his writings in *Rivista Marittima* during the war and his work was again translated into English and appeared in the U.S. Naval Institute *Proceedings*.[12]

Interwar Years

At the end of World War I, Italy, like many other nations, faced very difficult financial conditions. The difference between pre-war doctrine and on-the-field results was debated, and opinions fell initially into two main camps. One opinion was that the lessons of the *jeune école* had been validated by the war. Large capital ships had proven vulnerable to small vessels. Now-Admiral Bernotti accepted that Italy should take advantage of new technologies afforded by the *jeune école* and that fleet doctrine should be based upon a division of labor.[13] Bernotti wrote that war "had several forms: guerrilla, military and commercial blockade, troop transport, coastal actions, combined operations with the Army." He also noted that during the past war, the main battle fleets had been almost inert, while escorts and submarines operated freely. The other school asserted that the mere presence of the armored battle squadrons as a deterrent to other main fleet units had allowed the smaller vessels more freedom of action. German Admiral Reinhardt Scheer's statement that "the force of bigger armored ships was the handle of the dagger and the blade was the submarine force" was appreciated in Italy as well.

Several Italian military experts supported the so-called "underwater revolution," which emphasized the role of submarines, considering them to be a decisive weapon. These experts were countered by others who believed that the submarines' success in World War I was due to the lack of preparation of surface ships and their low speed. They also considered submarines to be unsuitable for night or defensive operations.

Eventually two main theories emerged on the type of surface naval units to be built. One, which we will call the "naval tradition," supported the concept of a kernel of traditional warships with large caliber guns and robust self-defenses. Despite their self-defense capabilities, additional antiair and antisubmarine protection would be provided by escort ships. The other theory, which may be called the "naval compromise," highlighted the role of quick, light, and heavily armed cruisers against primarily non-first-level navies. Their employment was, however, limited to offensive operations and required aircraft carriers for support.

During this era, Commander Oscar di Giamberardino wrote extensively about these issues. Although di Giamberardino recognized the need to prepare for both offense and defense, he was primarily a supporter of the offensive form of warfare, i.e., destruction of the enemy fleet and forcing the enemy to fight in decisive combat. He recognized the usefulness of a small fleet of assault vessels, such as in commando-type operations, but considered them

non-decisive. The most important of di Giamberardino's works was *L'arte della guerra in mare* (The Art of War at Sea) in 1937, in two volumes. Its theories influenced many politicians and military men, and di Giamberardino was eventually promoted to admiral.

Even more influential were the writings of Commander Giuseppe Fioravanzo. In a 1925 article in *Rivista Marittima*, he postulated the need for what would eventually become command ships (LCC) in the U.S. Navy. Fioravanzo also wrote *La guerra sul mare e la guerra integrale* (War on the Sea and War as a Whole), in two volumes (1930–1931). Fioravanzo examined the relationship between politics, strategy, and maritime power, and he became a supporter of the defensive form of warfare. He defined the defensive in terms of an operational-level strategy used to protect the sea lines of communications by means of a navy employed on the tactical offensive.

Fioravanzo felt that the most important characteristic of a military unit designed to operate in a relatively small sea, such as the Mediterranean, had to be invulnerability. On the other hand, the most important quality of forces designed to operate in the open oceans had to be autonomy. Fioravanzo's conclusion was that in narrow-sea areas light cruiser types were the worst option, as they were "not small enough to be naturally immune, but not big enough to be artificially immunized."

In 1922, Admiral Bernotti was asked to reestablish the Instituto di Guerra Marittima (Naval War College) in Livorno. He wrote a series of important books, including *Fondamenti di strategia navale* (Fundamentals of Naval Strategy) and *Il potere marittimo nella grande guerra* (Maritime Power in the Great War) in 1920; and *La guerra maritima* (The Naval War): *studio critico sull'impiego dei mezzi nella guerra mondiale* in 1923. *Fondamenti di politica navale* (Bases of Naval Politics) was published in 1927.

In *The Naval War*, Bernotti discusses how the navy should be linked to politics, the general naval policies of various nations, the maritime character of the World War, and new strategic possibilities. He believed that sea lines of communication had to be defended with methods other than those used during World War I, and he advocated a mixed system of direct protection, including antisubmarine and antiair capabilities, and indirect protection. The latter was to be achieved by means of offensive actions against enemy forces in port and at sea.

Bernotti shifted his favor to large warships, but he warned that the type of ships available in the late 1920s were no longer adequate and could create unrealistic illusions, hiding real and urgent problems. Admiral Bernotti supported the need for aircraft carriers, recognizing that even if Italy was in a central

position in the Mediterranean, "a naval force needing aircraft at any time had to include units capable of transporting a relevant number of aircraft."

Bernotti rejected the construction of a ship—half as an aircraft carrier and half as a light cruiser—as a compromise solution to the need proposed at that time for naval air power. Admiral Bernotti's thoughts stimulated debates with the air force over the control of naval aviation and conflicted with the views of Admirals di Giamberardino, Angelo Iachino, and Virgilio Spigai, who were against the construction of aircraft carriers. In the end it was Fioravanzo's theory of defense that influenced the navy's leaders and resulted in the actual employment of the fleet during the next war.

The theories of General Giulio Douhet received attention as well. Because airplanes appeared to be so capable, he assumed that in future wars the greatest effort would be sustained in the air. Douhet's doctrine considered the sea to be just a space to be flown over. He suggested that the air force would lead offensive action, and that the navy and army would intervene *a posteriori* to exploit the results of the air battle. In Douhet's opinion, cooperation between the armed forces was not necessary, since the action carried out by "one head only" was better. Those who supported Douhet's air theories thought that a naval war could be won by aircraft alone. Air power advocates held the view that surface ships could not be defended successfully from air attack. It would become evident that the sea allowed surprise air bombardment missions against land targets, and fleets would be unsafe when in port.

In 1923, the Regia Aeronautica was established, and all the aircraft were put under the control of this new service. The consequences were that for many years air doctrine in support of maritime operations was inadequate, and the effectiveness of airborne assets in naval warfare was reduced, with grave consequences.

Most Italian strategic decisions were made without consideration of the naval elements. This problem was typified by the experiences of war in Ethiopia (1935-1936), which was fought to enlarge the empire, but without consideration of the increased vulnerability at sea. Italy now had to use the sea and was pitted against the strongest maritime nations of the world. Italy's successful participation in the Spanish Civil War from 1936-1939 created false illusions of Italian naval strength; success had actually resulted from the enemy's weakness.

Italian naval thought between the two world wars developed doctrine based on a strategy that called for little more than interference with a superior fleet or convoys in the Mediterranean. The Mediterranean was especially suited to light and swift forces built by Italy, which would quickly sortie from bases and strike

at a fleet offshore. The fleet would naturally retain a role for coastal defense. Another logical role for the Italian Navy was safeguarding the sea lines of communication to North Africa.

In 1940 Admiral Guido Po, historian of the navy, wrote *La guerra sui mari* (War at Sea), which stated that current Italian naval strategy was based on:

- The offensive use of warships and extensive use of submarine packs.
- The exploitation of Italy's geographical position in the Mediterranean to disrupt the enemy's communication lines.
- Seeking the maximum cooperation with the Regia Aeronautica to overcome the lack of aircraft carriers.

The Italian Navy did not completely follow this doctrine in the next war.

Before World War II, Italian naval plans were to keep forces together to maximize combat effectiveness against the presumed enemy, France. Due to the preponderance of French naval power in the Mediterranean, Italian doctrine was defensive, consciously avoiding doctrine for distant operations or even *guerre de course*.[14] More difficult to understand was the lack of doctrinal development for counterblockade techniques, night operations, or even convoy defense.

World War II

Italian Navy units that fought during the war were conditioned by interwar-era doctrine. For example, cruisers were capable of very high speeds, since speed rather than armor was believed to be the best weapon to use against numerically and technically superior navies. Despite doctrinal debates on the vulnerability of surface ships and the theories of air power, the navy entered the war without its own aviation forces, aircraft carriers, and many of the latest technical improvements that might have aided air defense. Night-fighting equipment and radar were not introduced into the fleet until after their lack was felt in actual combat.

Pre-war doctrinal development and training proved to be inadequate. There was no doctrine for joint actions with the Regia Aeronautica, and insufficient attention had been given to the management of maritime shipping and its protection, the doctrine for night fighting, and the role of aircraft in war at sea. The lack of aircraft carriers and inadequate cooperation by the Regia Aeronautica in maritime missions afflicted the navy throughout the war.

Fascist government policy was ambitious, and it overestimated the level of military preparedness. The Italian military was told by Benito Mussolini in March 1940 to plan for an air-naval offensive in the Mediterranean; a ground

offensive in Yugoslavia, while the army maintained a defensive posture in Albania, Libya, and the Aegean; and a wait-and-see attitude on the French border. In April 1940, the Chief of Staff of the Navy, Admiral Domenico Cavagnari, summarized the navy's key shortfalls to the head of the government. Cavagnari believed that the only possible strategy was defensive, but his recommendations were made to an Italian Supreme Command dominated by Mussolini and the army, neither of whom understood naval warfare.

Concepts for initial operations in the Mediterranean were released by the Chief of Staff on 29 May 1940, about two weeks prior to Mussolini's declaration of war. This initial guidance directed the navy to maintain a defensive attitude but to exploit opportunities for medium-sized clashes. The navy was to prepare to defend itself and act as a fleet-in-being. In fact, no decisive clash occurred during the war, although there was a series of minor engagements throughout.

Mussolini assumed that the resupply of Libya would not become an issue and mistakenly predicted a short war. Hence, more than two hundred ships of the merchant fleet were located and captured outside the Mediterranean at the beginning of hostilities.

The command organization of the Italian forces included a Chief of General Staff and three high commands for each of the three armed forces. These high commands were headed by the respective service chiefs of staff. Strategic-level tasks were issued by the Chief of the General Staff. Centralized strategy and doctrine were oriented toward the centralization of responsibilities. Supermarina, the high command of the navy, converted these strategic-level directives into orders and forwarded them to subordinate naval commands. These Supermarina orders were very detailed, leaving little freedom of action to local commanders. The tactical commander was given only limited decision-making authority.

After the brief conflict with France and the removal of the threat of the Toulon fleet (i.e., the French fleet), the Italian Navy was tasked with interdicting British ships resupplying Malta and Alexandria; preventing the massing of the British fleet; and attacking the British in port. The navy was also told to protect Italian shipping going to North Africa. Due to the limited capacities of North African ports, the navy had to form numerous small convoys instead of a few big ones; more than 1,200 convoys were formed in one thirty-six-month period. The need to protect its own convoys drained resources and limited the Italian fleet's freedom of action against the British. Navy tasking was eventually modified to require offensive operations in only the central Mediterranean.

Raids against British convoys to Malta produced a number of important clashes between the British and Italian fleets.[15] The most memorable are: Punta Stilo (9 July 1940); Cape Teulada (27 November 1942); Channel of Sicily (10 January 1942); Sydra (17 December 1941); and operations "Mid-June" (12-16 June 1942) and "Mid-August" (11-14 August 1942).

When Germany strongly suggested to Italy that it sortie a fleet to disrupt British sea lines of communication to North Africa, the Italians complied. The resulting Battle of Cape Matapan (28 March 1941) was an unequal match between the British (who had radar, air support, and "Ultra" cryptanalysis data), and the Italians (who had none of these).[16] Admiral Angelo Iachino, Commander in Chief Afloat, paid heavily for his fleet's inability to fight at night and for its lack of proper weapons—a price that arose from the positions that he himself had adopted in programming debates prior to the war. Although the severe losses suffered at Matapan are traditionally imputed to the lack of radar and suitable doctrine for night fighting, the lack of information and of a clearly stated mission are to blame as well.

Both opponents used the strategy of attacking the enemy in port. The British used shipborne planes at Taranto (12 November 1940). The Italian Navy was successful using assault vessels at Souda Bay (27 March 1941), midget submarines at Alexandria (19 November 1941), and in later attacks at Gibraltar, Haifa, and Malta. Forces were trained during the 1930s for the now well-developed doctrine for raids by assault. During the war, Italy also employed naval forces outside of the Mediterranean. Italian Navy submarines operated in the mid-Atlantic during the war, and they achieved a high degree of combat success, perhaps in excess of that of the average German U-boat. The German high command requested assistance for naval operations on the Black Sea against the Soviet Union and the Italian Navy obliged. Additional units fought against the Soviets on Lake Ladoga.

By the end of 1942, the strategic conduct of war became solely defensive, but the effort to maintain the sea lines of communication with Tunisia continued. On 10 July 1943, the Allies landed in Sicily. As this phase of the war approached an end, Italy attempted to maintain what was left of its fleet for use in diplomatic negotiations. This decision disappointed many crews and commanders who wanted to prove their worth in combat. When the armistice was declared (8 September 1943), 65 percent of the remaining Italian fleet was moved to Malta in accordance with the orders of the new government; the rest were scuttled, disabled by the crews, or taken over by the Germans.

War against Germany was declared by Italy on 13 October 1943. Its ships began to cooperate with the Allies for escort operations, withdrawal of Italian

soldiers from the Balkans, and for special missions. The San Marco Naval Infantry Regiment had an active role in the struggle for the liberation of the peninsula. Many cadets from the Naval Academy fought under the command of the Italian Corps of Liberation.

Not everyone had originally supported Italy's 1940 entry into the war, but everyone in the navy did his job, nonetheless, even when all was lost. On 8 September 1943, each individual had the opportunity to choose on which side to fight. Some went with the ships to Malta, and some decided to stay or to move to the North because they believed their duty was to continue the war supporting the Germans. Such complications for naval personnel, rare in many navies, appear to be frequent in the history of Italy.

There have been many assessments of Italy's performance during the war. According to Admiral Iachino, commander of naval forces from 1940 to 1943, Italy found itself fighting a modern war with an obsolete naval organization.[17]

In 1956, retired Admiral Bernotti clearly and concisely evaluated Italian naval performance in the Second World War in *I principi della guerra nel secondo conflitto mondiale* (The Principles of War in the Second World War). He affirmed that the lessons learned from history emphasized that war presupposes risk and that the necessary aggressive attitude consists of both the will and the capability to act. In Bernotti's opinion, the policy of avoiding battle with superior forces was flawed. Bernotti also argued that centralized commands should not expect automatic and passive obedience to orders but should encourage initiative and ingenuity by subordinates in combat.

Italian naval doctrine in World War II can also be criticized because it did not acknowledge that when a defensive posture is applied, it must be pursued to the end. Cooperation between the armed forces was not efficient, due to the absence of joint doctrine. Furthermore, doctrine did not provide for an assessment of risk that considered the advantages that can be gained even from lost battles when the behavior of the forces has been admirable. The gallant behavior of officers and crews, even in defeat, must be mentioned because it led directly to some of the Italian successes.

Italian Navy doctrine in World War II was probably proper for the conditions at the time. The problems that beset the fleet were beyond the navy's ability to correct. Given the resources provided, the overall strategy of the war effort, individual service and overall strategic culture, geography and demographics, and the type of government, the Italian Navy performed about as well as could be expected. Italy had been a unified nation for about only a hundred years, and its navy's performance against the Royal Navy during the war, despite serious handicaps, speaks well of its combat effectiveness.[18]

After World War II

At the end of the 1940s and at the beginning of the 1950s, the tasks of the navy were defined as "the defense of the Adriatic and Ionian maritime fronts against Yugoslavia." Italy's naval role changed over the years as it adhered to the North Atlantic Treaty, the European Economic Community, and the Western European Union, and due to its strategic position in the Mediterranean. Italy became the link between Europe, North Africa, and the Middle East. Although Italy had become a medium-sized power, it had first-class responsibilities and duties.

NATO's southern flank was generally considered less vulnerable to direct Soviet aggression, but the likelihood of an air-naval threat in the Mediterranean placed a great deal of responsibility on the Italian Navy and imposed the need for adequate numerical and qualitative strength. When Italy first joined NATO, its tasks were "the protection of merchant and military shipping, coastal defense, and mine countermeasures operations." Over time, the navy's main tasks shifted to providing support to the U.S. Sixth Fleet, contributing to the maintenance of sea control and to the protection of the sea lines of communication in the Mediterranean.

The General Staff of the Navy published a white paper in 1973 entitled *Prospettive e orientamenti di massima della Marina Militare per il periodo 1974–1984* (Principal Perspectives and Orientations for the Military Navy in the Period 1974–1984). The white paper defined the navy's missions and tasks:

- A credible and continuous presence.
- The protection of trade.
- Offensive operations wherever required.
- The direct and indirect participation in the protection of the allied naval deterrent.
- Limited-scope immediate reaction with amphibious forces.

It further outlined fleet improvements that would be required if the navy were to be expected to carry out autonomous missions. This document was very important because it represented the first exhaustive official statement on the naval situation since the end of World War II.

In the post-World War II period, most commentary on the navy derived from unofficial sources. The lack of forceful personalities able to express their ideas on naval policy and doctrine was felt strongly. Old writers like Admirals Bernotti, Fioravanzo, and di Giamberardino continued to express ideas based on their experiences in war and how they applied in the new international situation.

Admiral di Giamberardino wrote a short piece entitled *Il prossimo conflitto mondiale* (The Next World Conflict) in 1947. He also updated his classic *L'arte della guerra in mare* (The Art of War at Sea). In the revised version, di Giamberardino stated that "doctrinal preparation in the world war turned out to be in part erroneous and lacking." He explored the relations between politics and the art of war, and defined the way in which strategic maneuver and the employment criteria for naval air forces should be conceived.

Admiral Bernotti retired in 1940 but continued to write on tactics and doctrine for many years. His later works included *La Guerra sui mari 1939–1941* (The War at Sea 1939-1941) in 1947. He published several articles defining a new naval strategy for the Mediterranean and supported emerging NATO strategies. In 1956, Admiral Bernotti wrote a final piece for the U.S. Naval Institute *Proceedings* in which he attacked the former fascist regime in Italy during World War II.[19] This article criticizes the Regia Aeronautica for its overly optimistic claims and overriding influence. Bernotti's *Cinquanta anni nella marina militare* (Fifty Years in the Military Navy), in 1971, was extremely well received.

In 1956 Admiral Fioravanzo wrote the *Storia del pensiero tattico navale* (A History of Naval Tactical Thought) in which he discussed the appropriate doctrine for the new international situation in which the use of nuclear weapons was possible. The book is a concise work that summarizes naval tactics, tactical concepts (doctrine), and provides illustrative battles in the age of oared ships, the age of sail, the age of the screw propeller, and the age of naval aviation. It was translated into English and published by the U.S. Naval Institute in 1979.[21]

Fioravanzo also wrote that the disarmament policies of the interwar years stimulated scholars and engineers to find legal technological improvements to warships, resulting primarily in increased speed and weaponry. Because of the inevitable security leaks and the resulting exchange of information on technological progress, retaining superiority in any one area became impossible. Fioravanzo advocated a compromise between speed, weaponry, and armor. Admiral Fioravanzo co-authored *The Italian Navy in World War II*, which was published in 1957 by the U.S. Naval Institute.

Another post-war author was Admiral Virgilio Spigai, who became Chief of Staff of the Navy in 1968. Spigai documented the Italian Navy's shortcomings in relation to its tasks in *Il problema navale Italiano* (The Italian Naval Problem), in 1963. He always worked to have the navy's problems expressed in terms of the broader issues of global naval strategy

and developments. Spigai dedicated himself to convincing the politicians that Italy, a nation that was deeply involved with the sea for its economy and security, needed a strong navy.

Other writers, many of whom were civilians, wrote also on naval matters, but their approach was more historical than doctrinal. These writers included Commander Marc'Antonio Bragadin, Admiral Angelo Iachino, Mr. Franco Micali Baratelli, Professor Virgilio Ilari, Professor Alberto Santoni, Dr. Giorgio Giorgerini, Commander Ezio Ferrante, Professor Carlo Maria Santoro, and many others.

Italy, according to the current Chief of Staff of the Navy, Admiral Angelo Mariani, will be called to a more active participation in international affairs and must reconsider the relationships between foreign policy and military capabilities. Italian Navy units have contributed to multinational operations in Lebanon (1981-1984), the Persian Gulf (1987-1991), Somalia (1992-1994), and the Adriatic (1992-ongoing).

Even if it will maintain a limited numerical level, the Italian "naval instrument" must be able to support a maritime-oriented policy no longer dedicated to the defense of the national boundaries. According to this vision, Sir Julian Corbett's joint strategic concept is considered more important than the one, typically naval, expressed by Admiral Alfred Thayer Mahan.

One of the most important outcomes of this research is the conclusion that finding a word that equals the term doctrine in other countries is very difficult. When looking for parallels, it is necessary to explore the full range of possible topics that are sometimes referred to as strategy, operational art, tactics, military art, and naval art and science, etc. Whereas in the U.S., doctrine is generally considered guidance, in many other nations doctrine is more directive in nature. Hence, there are problems in finding parallel meanings. These problems must be overcome before any meaningful discussions on doctrine can take place.

Second, because the doctrine of many navies was not written, in order to uncover past doctrine, it is necessary to ascertain behavior by reviewing navy and military history. This does not mean that doctrine did not exist—on the contrary, naval doctrine always existed but not necessarily in the form most recognizable by those more familiar with land armies.

Third, the difficulties in building a true national Italian Navy doctrine can be compared to current efforts to build multinational navy doctrine. Italy attempted to integrate a number of national fleets and found that integrating the

traditions and doctrines of the Sardinian and Neapolitan navies appeared to be the best solution.

Next, it seems that the influence of doctrine in foreign navies was strong in the case of Italy. Similarly, there has been a great deal of interest in Italian naval doctrine in the United States—evidenced by the frequent translation of many important theoretical works by the U.S. Naval Institute. All of these theoretical works that were translated were written by serving or retired uniformed officers. Apparently, in Italy, writing theoretical works on naval warfare is not an impediment to promotion. Civilians do not appear to have had nearly the impact that they do in other nations.

Fifth, there appears to have been a great deal of doctrinal innovation in the Italian Navy. Whereas in other navies, the age of sail shifted emphasis from the improvement of combat capability to the procurement of new hardware, the Italian Navy has a tradition of continuing to look for improvements to combat potential by attempting to fight better with the technologies that have been made available.

Sixth, the Italian case study is important because there is no tradition of superpower status for unified Italy. France, Spain, and Britain all enjoyed superpower status at one time, whereas modern Italy has only attempted to be a dominant regional power. Hence, the Italian Navy is an excellent case study for the concept of a medium-power navy. Medium power does not mean less than first class, rather it only refers to the desire to "try to create and keep under national control enough means of power to initiate and sustain coercive actions whose outcomes will be the preservation of its vital interests."[21] Italy's naval strategies, art, doctrine, etc., appear to have been in conformance with its national self-identity.

Finally, Italy has a strong tradition in the analysis of past wars and lessons learned. Needless to say, although the navy may have learned the proper lessons, they do not appear to have discovered the "magic elixir" to explain those lessons to politicians who are unfamiliar with the sea environment.

Notes

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"Revolutions in Military Affairs," Paradigm Shifts, and Doctrine

James J. Tritten

THE U.S. NAVY AND MARINE CORPS established the Naval Doctrine Command, which is charged with the preparation of multiservice naval doctrine, navy service-unique doctrine, and multiservice input to joint and multinational doctrine. As part of that process, new concepts for the use of naval power are being addressed in the context of what many claim to be an ongoing "revolution in military affairs" today.

This paper describes the role that military—including naval—doctrine could play in such a revolution in military affairs and associated paradigm shifts. It also looks at lessons from historical shifts in past paradigms and "revolutions in military affairs." This study suggests that we need a theory of "revolutions in military affairs" and paradigm shifts. The military today is being asked to embrace a new revolution in military affairs, or at least a new paradigm of warfare, and cannot do so without understanding how major changes in warfare occur. It is also suggested here that "maneuver" warfare is a new paradigm that needs to be managed once we have developed appropriate theory. This essay is intended to be suggestive rather than prescriptive, but it questions the basic assumption that technology leads doctrine in a "revolution in military affairs."

Revolutions in Military Affairs

A revolution in military affairs is a fundamental shift in military strategy, doctrine, and tactics, which occurs generally, but not always, because of a change in technology. With a revolution in military affairs comes the need to reconsider all existing military theory and a transition to a new process of warfare. New types of military formations have caused new types of military organizations, tactics, doctrine, and military strategy. Heavily armored, mounted knights disappeared from the battlefield as a new branch of troops and artillery appeared. This kind of example is common in history.

At sea, the introduction of firearms resulted in a fundamental shift in the form of combat, from ramming, boarding, and hand-to-hand fighting as the decisive

form, to that of stand-off destruction by artillery. This shift from close to distant combat was not well recognized initially. During the defeat of the Spanish Armada (1588), the Spanish concept of combat operations remained a close-in battle by boarding enemy ships in a general *mêlée*. The English recognized the Spanish sailing skills, numbers, and close-in tactical abilities and kept their distance, using long-range artillery to wreak havoc on the Armada.

The introduction of artillery on warships changed both the design of ships and how they would be used in battle. Eventually navies learned how to mass their firepower in the maritime battle space and introduced the line of battle—similar to lines of battle found ashore. Today we still see surface ships using firepower to engage distant opponents, although with new technologies and without formal lines of battle.

The shift of paradigms to distant battle with artillery did not occur overnight. Boarding and hand-to-hand combat, which were initially considered a complement to artillery, lasted for many years. Although boarding and hand-to-hand combat may occur occasionally today, they will never again determine the outcome of a fleet engagement. Ramming also died out, although it resurfaced for a short time following its success at the Battle of Lissa (1866).

The subsequent development of rifled firearms and machine guns contributed to a new revolution in military affairs ashore—the demise of lines of battle in ground warfare and their replacement by the infantry skirmish and forms of maneuver warfare. The new weaponry increased the spatial and temporal scope of combat, requiring better logistics support and planning. Imperial Germany attempted to master this new revolution in military affairs with its domination of Europe via the Schlieffen plan and short wars with quick decisive battles. Rather than a quick war of annihilation, however, Germany fought an extended war of attrition from 1914 to 1918.

At sea, the introduction of rifled artillery, steam propulsion, armor, and modern communications systems all contributed to new combat uses for the fleet—but they did not constitute a revolution in military affairs. New forms of warships appeared that had combat potential far exceeding their nominal tonnage—giving rise to the French *jeune école* (new school) theory of less capable forces. New designs of ships, such as HMS *Dreadnought*, could make entire national fleets obsolete. Steam power and radio allowed many ships to assemble temporarily for decisive engagements. Navies were less at the mercy of the wind and could steam more autonomously to meet temporal commitments. Also, steam-powered transportation could affect the maneuver of strategic-level formations of ground forces.[1]

Navies, however, despite all the infusion of technology, thought they were still about "slugging it out" with an enemy line of battle in artillery duels. The battle of Jutland (1916) became the model to be studied at naval war colleges throughout the interwar years, because fundamentally war at sea seemed not to have changed. Therefore, for every revolution in military affairs ashore, there is not necessarily a parallel at sea.

The marriage of airplanes, tanks, and mobile artillery gave rise to another shore-based revolution in military affairs. The *blitzkrieg*, a form of maneuver warfare that doomed positional warfare, gave rise to the theory that rapid annihilation warfare could again be practiced ashore. Although Nazi Germany succeeded initially, and in many cases continued to do so at the operational and tactical levels of warfare throughout the war, Germany was unable to win an extended war of attrition.

By the end of World War II, allied military forces were engaged in multiple, simultaneous, strategic-level combat actions in more than one theater of a global war. One of the most successful examples of *blitzkrieg* was the August 1945 Soviet Manchurian Campaign of annihilation, which achieved the unheard of sustained rate of advance of up to fifty kilometers a day, and on individual days between ninety and one hundred kilometers a day.[2] This campaign became a model for the type of maneuver *blitzkrieg* warfare that the West anticipated would be waged by the Warsaw Pact against NATO.

At sea, there was a revolution in military affairs that paralleled, although not exactly, the *blitzkrieg*. The development comparable to the *blitzkrieg* was the mobile fast carrier task force and its accompanying logistics train. Such forces were able to roam the oceans, virtually at will, in search of enemy battle fleets that could be engaged at vast distances from one's own fleet. Alternatively, naval task groups could be formed to attack enemy shore installations, using their own form of maneuver warfare which bypassed strong points. The battle line, with surface ships "slugging it out," finally died at Surigao Strait during the Battle of Leyte Gulf (October 1944), and naval artillery generally yielded to the airplane and the missile. Naval warfare had finally changed from the basic battle line artillery duel to a more complex form of combined arms warfare.

The most recent revolution in military affairs occurred when nuclear warheads were married to intercontinental delivery systems. Due to the massive accumulation of nuclear weapons in the mid-1950s, the main and decisive arm of warfare shifted from ground forces to nuclear forces. In the U.S., the Eisenhower administration used the arrival of nuclear weapons as justification for the "New Look"—a massive downsizing of conventional war-fighting capabilities. Similarly, NATO chose not to field a credible conventional

warfighting force capable of defeating the Warsaw Pact, opting instead to use nuclear weapons as a substitute.

The postwar revolution in military affairs also caused nations to reevaluate military theory. Some theorists said that nuclear warfare could not possibly be war in the Clausewitzian sense—there could never be a political purpose to it. Others questioned the need for war termination strategy, since nuclear warfare would be irrational and therefore devoid of theory. Many disagreed and argued that all wars in the future between nuclear powers would automatically be nuclear wars. Hence, policies, strategy, and doctrine were required for the continued deterrence of nuclear weapons during the initial conventional phase of future war.

A tremendous amount of literature was generated in the former Soviet Union over the concept of a revolution in military affairs, which had occurred at the end of World War II. Their army was large and needed to be modified significantly to fight under the new technological conditions. In 1946, for example, there were still over one million horses in the Soviet armed forces. The term "revolution in military affairs" was selected as a Communist Party slogan that would explain the changes in warfare that would be required in the nuclear age.[3] A series of pamphlets was prepared by the Soviet armed forces from the 1960s into the 1980s to explain how the revolution in military affairs affected each branch of service and combat arms.

In addition to the nuclear revolution in military affairs, the Soviet military argued that there was an on-going final stage of the latest "revolution in military affairs," which was being caused by the introduction of radio-electronics and cybernetics. During their last years, the military of the USSR worried that advancements in technology would permit conventional ordnance to perform tasks assigned previously to nuclear weapons, resulting in a new revolution in military affairs.

There has been substantial discussion recently over a revolution in military affairs, with emphasis on the technical aspects of it.[4] For example, a shift in paradigms occurred with the introduction of stealth technology into the air combat environment. Stealth allowed a shift from active to passive defense of individual aircraft. Due to increased costs and fewer platforms, stealth drove the need for even greater precision in delivered ordnance. With the capability to deliver conventional ordnance safely and with increasing accuracy, we might be able to usher in a counter-revolution in military affairs, whereby nuclear weapons could be replaced with modern conventional ordnance, some of which could be delivered via unmanned systems. Such capabilities could result in

major shifts in doctrine, drastic shifts in military organizational development, and parallel shifts in programmatics.

The Basic Model of the "Revolution in Military Affairs"

The general, or basic, model for the "revolution" is that new technological opportunities must parallel organizational and doctrinal development. One common approach in the thinking is for industry, or the research community, to present new technological opportunities to the military, who will then consider development of new capabilities and a doctrine for their employment.[5] From these technological opportunities, major shifts have occurred in the very nature and theory of warfare, requiring new strategy, doctrine, and tactics.

An example of technology that led a paradigm shift and a revolution in military affairs was the introduction of artillery at sea. Naval artillery changed the fundamental nature of war at sea from close to distant battle. Eventually professional navies were needed to master its potential, which resulted in the demise of the privateer. The end of privateering and the dual use of commercial ships as warships was a major paradigm shift for naval warfare.[6] All of these events were caused by the opportunities that technology afforded.

Revolutions in military affairs usually cause changes in a military organization. In antiquity, the basic branches of combat forces included the infantry, chariot troops, elephant troops, and cavalry.[7] The infantry eventually learned how to defeat chariots and elephant troops, and these exotic formations disappeared from armies. Cavalry, although not as numerous as infantry, was the decisive branch. With time, cavalry became a supporting arm, eventually being replaced by new troops—armor. Further, the marriage of tanks, aviation, and mobile infantry led to other types of ground force units being formed which capitalized on the doctrine of *blitzkrieg* warfare.[8] We now have mechanized infantry and aircraft in close support of armor.

As mariners mastered the revolution in military affairs that added artillery to ancient sail, navies were able to take on other missions, and fleets were soon reorganized accordingly under national command and control.[9] Parts of fleets remained subordinate to the desires of European ground force commanders in need of support on their maritime flanks. Other naval forces, including ground forces, were organized into distant-water expeditionary forces. Some units were dedicated to the interdiction of the sea lines of communication and others for the protection of the sea lines. Main battle fleets were retained to deal with their enemy counterparts.

With the introduction of long-range ballistic missiles and nuclear weapons, some nations formed new and independent military services to field these weapons. Where new services were not created, the operational chain of command for nuclear weapons release was distinct and separate from that of conventional warfighting, and new classes of weapon systems were produced to carry the new weapons. For the first time, navies were capable of direct attack on the centers of gravity of continental powers and determining decisively the outcome of a global war.

Inadequate Doctrinal Development Can Stifle A "Revolution in Military Affairs"

Case studies demonstrate that many opportunities for a revolution in military affairs have been lost when technologies were available but military doctrinal development lagged behind. This suggests a rather strong relationship between the need for both technology and parallel doctrine development. For example, we have the case of the French Army failing to adapt to the Belgian-invented and French-developed Montigny *mitrailleuse* (machine gun), first introduced during the Franco-Prussian War of 1870-1871.[10] Although the *mitrailleuse* increased the effective firepower on the battlefield by an order of magnitude and might have swung the war in favor of France, its introduction during this war failed to turn the tide because its initial operational employment was judged ineffective.[11] On the other hand, the machine gun was rapidly assimilated into the German and Russian ground forces, and it was the Germans who developed new and successful military doctrine by capitalizing on the technological opportunities presented by the gun.

The blending of the tank, aircraft, mobile artillery, and the radio into a powerful tool for "maneuver" *blitzkrieg* warfare—or the fast carrier task force counterpart at sea—is a similar story. Yet it was not the individual technological opportunities afforded by any one specific weapon system that constituted a revolution in military affairs; the revolution in military affairs occurred when someone put together all of the pieces. Synthesis of how to use individual components occurred during doctrinal development.

Paradigm Shifts

There have also been less dramatic but nonetheless significant examples of major changes in warfare that do not meet the full criteria of a revolution in

military affairs. These major changes in how we go to war are described more correctly as paradigm shifts and will be considered next. For the purposes of this paper, a paradigm shift is an important change in military policy, programmatics, strategy, doctrine, or tactics, which is important but does not fundamentally alter the nature of warfare.

Some examples of paradigm shifts are related to a concurrent revolution in military affairs. For example, with the advent of modern aircraft with extremely accurate delivery systems, air forces no longer needed the capability or doctrine for massed bomber formations attacking enemy cities as was done in World War II. This paradigm shift in strategic bombardment was not significant enough to be a revolution in military affairs, but it nonetheless was important. The bomber paradigm shift was due both to improved conventional delivery systems—creating the capability for precision strikes by single aircraft—and the understanding that strategic bombing would be carried out using nuclear weapons that did not need to be delivered so accurately.

With the nuclear revolution in military affairs, some nations chose to forgo the manned bomber altogether and to rely instead on new long-range missile systems. Forgoing manned bombers required new strategic-level doctrine for the completion of strategic-level tasks. This paradigm shift was the result of both the nuclear revolution in military affairs and the qualitative improvements in antiaircraft defenses.

Nuclear propulsion, a by-product of the nuclear revolution in military affairs, resulted in new opportunities for endurance and stealth, making it possible for submarines to deploy long-range missiles with nuclear warheads. In turn, this resulted in a major paradigm shift whereby navies were able to influence directly the outcome of general wars through strikes and the threat of strikes by the decisive weapons of war.

The nuclear revolution in military affairs spawned other shifts in existing paradigms, such as how best to defend Europe, achieve strategic objectives against distant centers of gravity, and fight tactical engagements at sea. The Soviet Union, and subsequently NATO, considered the nuclear revolution in military affairs so successful that it permitted the attainment of strategic tasks at a fraction of the previous cost—maximizing the benefit-cost ratio. Benefit and cost analysis dominated Western programming during the Cold War. Along with the multitude of fundamental changes caused by the end of the Cold War was yet another that made affordability as important as military capability.

Yet nations that faced severe budgetary restrictions have managed to be innovative and produce prototypes of new and sophisticated hardware—interwar Germany being the classic case in point. Doctrinal and technological

innovation continued in the U.S. even during the Great Depression. In other words, affordability need not stifle creativity. There is no reason that efforts to increase efficiency cannot be part of a current revolution in military affairs or a paradigm shift undertaken during time of severe fiscal austerity.

Other major postwar paradigm shifts, such as the mass introduction of the jet engine into air forces, were not necessarily by-products of the nuclear "revolution in military affairs" and are not sufficiently significant to constitute their own "revolution in military affairs." For example, the jet engine resulted in increased aircraft speed requiring reduction in decision time for the man-in-the-loop. This paradigm shift has had an enormous impact on aviation, but is insufficient to be termed a "revolution in military affairs."

Recent Naval Paradigm Shifts

With the end of the Cold War and associated reductions in military expenditures has come a shift in the paradigm of fleet versus fleet being replaced by fleet versus shore. The most important message contained in "...From the Sea" was that the U.S. Navy is now focused on naval operations in the context of a joint task force involved in a major regional contingency rather than as a semi-independent force engaged in global conventional war.[12] With this paradigm shift, the Navy moved its focus from fleet engagements to power projection ashore, and the Naval Doctrine Command was founded to explore fully the implications of this move.

In 1994 the U.S. Navy and Marine Corps published their initial centralized multiservice doctrinal publication, *Naval Warfare*, NDP-1.[13] This document serves as an overview and introduction to the more substantive follow-on doctrinal publications that address naval intelligence, operations, logistics, planning, and command and control. Of note is the naval services' embrace of the three levels of warfare, the concepts of center of gravity and critical vulnerability, and the principles of war—none of which are doctrine, but all of which are major statements of policy.

The doctrine in *Naval Warfare* establishes that naval forces will be organized by task and will favor offensive and maneuver warfare. The document reviews the historical and current roles, missions, and functions of the naval services and highlights inherent operational capabilities emphasized under current conditions. *Naval Warfare* also commits the naval services to full partnership in joint and multinational operations. This commitment to jointness and multinational operations is another example of a major paradigm shift.

Likewise, the fundamental consideration in procurement has been revolutionized. When the new attack submarine was first developed as an alternative to the *Seawolf* SSN 21, programmatic directives made it clear that capability was important, but cost was more important. Similarly, naval aviation's stealth aircraft was doomed, in part, by the budget cutter's ax because of this new paradigm, regardless of the capability that the A-12 would have brought to the fleet. This consideration is now paramount, and the Clinton administration has made it clear that we need to free resources if we are to build the "next Navy."[14]

Problems with the Existing Model of "Revolutions in Military Affairs"

Examination of historical examples suggests that the model of technology leading a revolution in military affairs is inadequate. In some cases, a new technology has not been recognized immediately as having caused a revolution in military affairs or given rise to the need for new doctrine. The failure of cavalry and infantry to adapt to the firearm during the Renaissance is perhaps the classic case in point.[15] The firearm was not initially recognized as having caused a revolution in military affairs; it took about four centuries for these weapons to become so perfected that the transformation was complete.[16]

During the Middle Ages, foot soldiers gradually lost their ability to fight as cohesive units and were upstaged by men on horseback. The Swiss Confederation discovered, however, that infantry could counter the men on horseback by improving tactical formations *alone*. In short, a doctrinal solution was found to counter the threat of the mounted knight.

The knight was countered by infantry squares, resembling the old Macedonian phalanx, armed with an equally old technology—very long pikes or spears—which permitted the foot soldier to withstand the charge of a mounted horse. Having been kept at bay, the horse was attacked with hand weapons, resulting in the dismounting of the knight who then lay helpless on the ground.[17] These changes in tactical doctrine unseated the knight, although this lesson has been lost and folklore persists that the demise of the man on horseback was due to the invention of the firearm.

A lesson learned from studying the age of knights is that improved military doctrine does not necessarily need to have a technological push-pull. Combat potential can be improved by perfecting how to fight with existing, or even antiquated, skills and procedures. Eventually, however, the scope of the

firearm's capabilities came to be understood, and the fundamental nature of warfare changed, resulting in a revolution in military affairs.

Paradigm shifts, however, do not necessarily have to result from technologies developed at that time—the knight was defeated by the infantry's use of old techniques and weaponry. Similarly, it was the use of unsophisticated contact mines that caused the U.S. Navy to focus again on mine warfare—a paradigm shift for the U.S. Navy to again be seriously concerned with a lesser technological threat. And the Strategic Defense Initiative (SDI) explored the use of optical sighting of incoming delivery systems.

Are there other capabilities and mature technologies that could be resurrected and used in modern warfare? Might not some of these "obsolete" methods of warfare result in a new revolution in military affairs? If the threat from non-state armed groups continues to develop, what good will existing theories of warfare be? Is this not a revolution in military affairs?

Even if one were to accept the leading role of technology in a revolution in military affairs, emerging technologies do not necessarily need to be developed from independent original research funded by every service. The Navy and Marine Corps can and should borrow liberally from technologies developed by others, such as those developed by one combat arm for use by another—or borrowed by one nation from another. All services should look at doctrine developed by other types of forces for similar problems. Advocates of a current revolution in military affairs appear to suggest major new research programs, even though existing knowledge might be sufficient if applied in an innovative manner.

For example, modern stealth bomber doctrine could capitalize on the doctrine for the employment of equally covert submarines searching for and attacking important defended targets. Similarly, modern submarines planning to operate in closer proximity to underwater terrain might learn from the doctrine and technological needs of infantry. When Karl von Clausewitz stated that the means of protecting long lines of communication were very limited, he considered a standard solution to this dilemma at sea—the convoy—only a *special* means to be employed ashore.[18] Perhaps Clausewitz might have learned something from studying naval models. In short, rather than focusing attention on emerging technology in the research labs, military services might better benefit from field technology deployed elsewhere.

By focusing on unexploited technologies, nations might skip entire development cycles, thus avoiding the need to develop their own revolution in military affairs technology base. For example, there was some degree of borrowing of American technology that stimulated the Soviet revolution in military affairs

brought on by the marriage of long-range delivery systems and nuclear warheads.

On the other hand, it is not clear that a military can advance from one basic form of warfare without first passing through the next stage. Could navies have moved from boarding and close-in battle directly to fast carrier battle groups without first having passed through the artillery stage? Can navies move from technology-based warfare directly into a fourth generation of idea-based warfare without first mastering maneuver warfare?[19]

An underlying assumption about revolutions in military affairs and paradigm shifts is that nations will undertake actions to capitalize upon new technologies. Hence, if the technology "genie" gets out of the bottle, we need a technology "fix." A more detailed study of technological opportunities that have been known to nations strongly indicates alternative models of national behavior.

For example, by the mid-1930s, the Imperial Japanese Navy (IJN) recognized that, despite all of the technological and industrial efforts being made to upgrade the fleet, its projected capabilities would not be sufficient to meet the rapidly improving U.S. Navy in a decisive battle at sea—both sides preferred doctrine for war at sea. The IJN, therefore, gave impetus to the development of night tactics and eventually formed specialized night combat groups (*yasengun*) that could weaken the U.S. Pacific Fleet to such a degree that, subsequent to night battle between main fleets, daylight battle would be an assured victory for the Japanese.[20]

Thus a technological threat was met with a doctrinal, *not* a technological, solution that theoretically negated the new technologies. In fact the IJN fought exceptionally well at night during World War II, frequently bettering the U.S. Navy, until the U.S. Pacific Fleet mastered radar. This prowess, however, was insufficient to offset the advantages that the Allied powers brought to the war in the Pacific.

For another example, as the United States developed new technologies that could be used to enhance long-range nuclear missiles, the preferred solution of the Soviet Union was to ban the new technology with an arms control agreement. The Soviets displayed similar behavior as the U.S. explored SDI. Most, but not all, nations have agreed to keep the chemical and biological warfare "genie" in the bottle, and they have not used such weapons.

Another model for responding to new technologies is to ignore them. Nations with the clear ability to participate in a revolution in military affairs have not always chosen to do so. Sweden, for instance, has yet to develop its own nuclear weapons, although it clearly has the potential to become a nuclear power.[21]

There are also examples of revolutions in military affairs that probably have no foundation in new technologies. For example, Napoleon Bonaparte caused a major paradigm shift in ground warfare when he successfully mobilized citizens to fight for ideas and not money.[22] The shift to mass armies caused a shift in the basic object of warfare ashore from seizure of territory to defeat of the enemy army. Under this paradigm, both sides in World War II considered certain parts of the enemy economic base as legitimate military targets due to whole nations generally being mobilized for war.

Did technology play a role in causing this major paradigm shift in warfare, a shift to considering the entire nation as being in arms, or did technology merely react to a new vision for warfare? Certainly, modern industrial capability was required for such an effort, as technology allowed for attacking the full breadth and depth of an enemy nation and population. While some consider the nation in arms as a legitimate revolution in military affairs, it is not at all certain that the Napoleonic revolution in military affairs was caused by technology.

There are cases where technology has been given the opportunity to lead the way in developing new forms of warfare, but introduction of the new technology was hampered because it was developed outside of the government, without an internal advocate. In such cases, where a new vision of a future battle space is advocated by someone "outside the system," associated technology development is often opposed by those in the government. When there is an absence of an internal constituency for systems for which a doctrinal or other need has not been established, paradigm shifts and revolutions in military affairs take longer to occur.

For instance, the technological opportunities afforded by the development of the light-weight radial aircraft engine were not appreciated by the Royal Navy during the interwar years. Because of this, Great Britain, and the Fleet Air Arm in particular, were found wanting early in World War II. Indeed, it was not until late in the war that the Royal Navy changed its concepts of operation to center around the aircraft carrier, altering the paradigm of warfare at sea.

On the other hand, the U.S. Navy capitalized on the development of the light-weight radial aircraft engine, and interwar peacetime doctrinal development for carrier warfare outpaced all other nations.[23] In the 1920s and 1930s, the U.S Navy laid the basis for a doctrinal change from decisive battle centered around the battleship to the ability to engage the enemy battle fleet as well as influence the shore with the aircraft carrier. This change was permitted by the development of the radial aircraft engine and of new concepts of operations by a group of heretical officers who believed in the potential of naval aviation.[24]

Paralleling the technological innovation was a series of organizational developments that permitted the upward mobility of aviation officers into command positions during World War II. Similarly, the Bureau of Aeronautics was created to sponsor conceptual and technological development. These organizational changes facilitated fleet experimentation with the new technology. Fleet exercises were paralleled by the development of concepts of operations that were tested at the Naval War College. Hence, when the main battle fleet was sunk on 7 December 1941, the U.S. Navy was able to respond quickly to the requirements of war with a new Pacific Fleet centered around the aircraft carrier. This reconstituted force was able to use the airplane as its main striking arm because of the pioneering work that was done between the wars by a few believers in naval aviation. The revolution in military affairs at sea that paralleled the *blitzkrieg* was inculcated into the U.S. Navy.

It is worthwhile to take note here that doctrinal rigidity can have a marked negative influence on a military service's appreciation of the new warfighting opportunities that may be afforded by a revolution in military affairs.[25] An organization can overcome the tendency to ignore new ideas if its focus is a shared vision to create improvement. The relationship between doctrine and new technologies and how it might lead to a revolution in military affairs is a critically important topic for investigation.

The Need for a Theory of "Revolutions in Military Affairs" and Paradigm Shifts

Since revolutions in military affairs and paradigm shifts do not happen instantaneously, theory is needed to help them reach fruition. Although it perhaps no longer takes centuries to understand and shape current or future revolutions in military affairs, it does probably take decades. At a minimum, a theory of revolutions in military affairs and paradigm shifts should assess the integration of anticipated different and emerging technological opportunities into existing bureaucratic organizations. Military services should understand the general method by which they change and the role that various groups and organizations play in causing successful change.

New theory will need to address cases where new technologies are countered by doctrinal solutions alone—absent a revolution in military affairs or even a major paradigm shift. A theory of change in military services must also address the many cases where they benefit from new and visionary approaches to warfare by gifted specialists, contributing to a

revolution in military affairs or paradigm shift. A theory will also have to make use of case studies of failed paradigm shifts as well as successful revolutions in military affairs.

Among the last, a very interesting case study is that of the interwar development of the dirigible. The Navy first developed concepts for warfare in the Pacific under the then-revolutionary organization of a joint Army-Navy war-planning staff. The story of the brilliant work done in developing War Plan Orange and the subsequent Rainbow Plans is well known. As part of that overall effort, the Navy recognized the need for long-range reconnaissance and surveillance of Japanese home waters. The inadequate technology of the time—dirigibles with on-board fighters—however, did not meet the needs of the fleet. Fulfilling the requirement for distant surveillance had to await the development of long-range patrol aircraft, subsurface, and space assets.

The excellent ideas developed by Major Earl H. Ellis, U.S. Marine Corps, for expeditionary amphibious operations across the Pacific in support of War Plan Orange languished on the shelf until the intervention of Commandant of the Marine Corps, General John Russell. General Russell retired senior officers who were unwilling to make the shift to amphibious warfare. The Marine Corps needed only to borrow the technology from Japan that permitted the development of modern amphibious landing craft and ships.[26] This case represents both a failure to change the paradigm and a subsequent success.

Another case study of a changed paradigm involves the World War II U.S. Navy submarine service. Although a group of submarine officers explored alternative concepts of operations for their combat arm prior to the outbreak of war, submariners in general entered the war prepared to be integrated with the battle fleet; to be used against combatants; and with a doctrine that assumed their antisubmarine adversary would be able to sink them if he attacked.[27] During the initial period of the war in the Pacific, these three conditions changed. The submarine operated independently on long and distant patrols, and the targets for submarine attack shifted to merchant ships that generally did not fight back. Finally, submariners learned that enemy antisubmarine capabilities were not as good as expected, and that their own ships stood up well to attack. The sum of these three major changes was that the submarine could be used in a manner not necessarily well exercised before the war—boldly, on the surface at night, with immediate re-attacks rather than attack and hide. The submarine service officer corps went through a catharsis during the war, and commanding officers who were unable to adapt to the bold, new wartime paradigm were reassigned.

In general, the three major concepts in a paradigm shift are:

- The idea
- The messenger
- A senior officer who permits its development.

The first American to understand that the striking power of aircraft at sea could equal that of the battleship was Lieutenant Commander Henry C. Mustin, U.S. Navy. Like Ellis, Mustin needed senior flag and general officers within the established organization to protect his new ideas and allow them to grow.[28] Mustin found his protector in the form of Rear Admiral William Moffett, U.S. Navy, just as Ellis had found General John Russell for amphibious operations.

The experiences of Spanish Vice Admiral José de Mazarredo Salazar strongly suggest that just having the good idea is not enough. De Mazarredo was the author of excellent doctrinal works and many good recommendations for improving the Spanish fleet prior to the defeat at Trafalgar (1805). Although de Mazarredo was never defeated at sea and thus had the credibility of a proven warrior, his outspoken criticism of the state of the fleet and its lack of combat preparedness, as well as his audacity in questioning Spanish foreign policy, doomed all of his good ideas to the history books. He therefore did not cause any actual improvement in the combat potential of the Spanish navy.[29]

Even with gifted personnel in the various levels of the bureaucracy, the organizational climate within the bureaucracy itself can doom good doctrinal development and therefore advancements in revolutions in military affairs or changes to paradigms. For example, the distinctly secondary place afforded to the IJN led directly to the lack of sound warfare capabilities development. Coupled with a number of missed opportunities, this lack of good doctrinal development eventually led to the defeat of Japan in World War II.[30] Had the IJN, or similarly the Royal Navy in the case of carrier aircraft development, been allowed to pursue what warfare specialists knew were important mission areas, the performance of these services during World War II would have been better.

Relationship of Military Doctrine to "Revolutions in Military Affairs" and Paradigm Shifts

The basic model of a revolution in military affairs, which gives a leading role to technology, is incomplete. Revolutions in military affairs and paradigm shifts are not wholly responsive to technology—they can also be stimulated by

doctrinal development. New doctrinal concepts can create a can start a cycle during which doctrine pulls the future development of technology. Advances in technology then result in subsequent alterations to organization and to doctrine.

In such an alternative case, military leaders first outline a vision, concepts, or doctrine for warfare and then refine the vision in terms of capabilities desired—a concept-based requirements system. The role of industry under this approach to a revolution in military affairs is to respond to these visions, concepts, and doctrinal development. President Ronald Reagan's visionary speech on the SDI is a classic example of such an approach. Unfortunately, a leader's vision is often thwarted by the bureaucracy's failure to exploit emerging technologies. Hence, there must be a theory for translating leaders' visions into change within large organizations. Military services should draw upon the excellent work that has been done by business schools and management consulting firms in their investigations of "learning organizations" and the special skills required of leaders in such organizations.[31]

A good example of military doctrine leading technology was shown by the Japanese during the interwar years. The IJN's doctrine called for deep ocean battles, preferably in a short war of annihilation, and the IJN generally insisted on technological superiority in each weapon system that it produced. This resulted in a search for new technological opportunities to carry out the preferred vision of the future battle space. As a result of their doctrine's leading role, the IJN fielded the *Yamato*-class super-battleship and the Mitsubishi Zero fighter—two of the numerous examples of good doctrine that led to the fielded technology that was useful in war.[32] This is essentially the same model for the relationship between doctrine and technology that has governed U.S. Navy programming since World War II.

The U.S. Army also appears to accept this exact model of doctrine that leads revolutions in military affairs. The U.S. Army Training and Doctrine Command (TRADOC) recently issued a new pamphlet, *Force XXI Operations*, TRADOC Pamphlet 525-5, which attempts to shape the on-going revolution in military affairs with a visionary statement of the future battle space.[33] Following this pamphlet is one that is more authoritative, with an introduction signed by the Chief of Staff and the Secretary of the Army.[34]

These examples are intended to show that the rudimentary, albeit popular, model of a revolution in military affairs is flawed in its fundamental assumption that doctrine depends upon technology as its major input and output. For example, the Napoleonic revolution in military affairs was certainly more a product of political, social, and economic conditions than of a specific military

technology. Hence, we need to look at these other factors that impact on doctrine in order to understand how doctrine influences revolutions in military affairs and paradigm shifts.

How Doctrinal Inputs Influence "Revolutions in Military Affairs" and Paradigm Shifts

A review of where doctrine originates, or what influences doctrine, informs us that technology is merely one of many possible inputs.[35] Others include current policy, available resources, current strategy and campaigns, current doctrine, threats, history and lessons learned, strategic culture, geography and demographics, and forms of government. If doctrine follows merely the push or pull of new technology, then it misses the opportunity to develop new concepts of combat operations—and new doctrine—based upon all other inputs. Let us consider some good examples of factors other than technology that have recently changed doctrine.

First, nations often make major changes to doctrine and organization after reviewing newly published policy and strategy, without giving consideration to new technology. This is what happened when the U.S. Navy and Marine Corps founded the Naval Doctrine Command (NDC) after publishing their major white paper, "...From the Sea." The United States shifted its interests in the world from a primary focus on containment of communism and the USSR to more diverse and regional interests. With this change in interests came alterations in the focus on different types of warfare. Similarly, the U.S. Navy changed its orientation from open-ocean deep water operations to joint operations in the littoral and maneuver warfare. With changes to policy alone came new doctrine and organization, such as NDC, and interest in new technologies to support new warfare interests. If there is an on-going revolution in military affairs, it will be affected by the current interests of the U.S. Navy and Marine Corps in maneuver warfare doctrine.

Normally, when a new technology is introduced into the military, an existing organization acts as its sponsor. Later, as the technology is refined and a doctrine is formulated, a separate organization is created, whose central identity is the new technology. This occurred with the creation and evolution of offices within the U.S. Navy that were responsible for aviation during the interwar years. These new offices evaluated the new aviation technologies within the framework of the doctrine for their intended use in the fleet.[36]

In cases where a doctrinal concept precedes a demonstrated technology, it may occur that an organization will manage both doctrine and technology development. A good example is the Strategic Defense Initiatives Office (SDIO), which was charged with developing the doctrine for war in space in the absence of an organization dedicated to this purpose. Today, we see a series of doctrine organizations, centers, and commands created by the armed forces, all charged with improving how to fight. None of these new organizations came into being to manage new technology; all have the license to develop new doctrinal concepts to shape the development of new technology.

Second, there is ample evidence that nations make major changes in doctrine after understanding the latest decisions in resources to be made available to the military services—resource decisions that are not dependent upon new technologies. The 1993 changes in U.S. Army doctrine from the AirLand Battle version of FM 100-5[37] were a direct result of a drastic change in the amount of resources that were going to be allocated to the Armed Forces, and not due to technological opportunities. Correspondingly, the U.S. Air Force is exploring the concept of maneuver warfare as a result of similar budget decisions.[38] Hence, budgetary reasons have caused these two services to change their doctrine, and this new doctrine influences their view on any on-going revolution in military affairs. Very simply, if we cannot afford ample new technology, must we also postpone any on-going revolution in military affairs?

Third, another "trigger" for changes to doctrine is newly published military doctrine and campaign concepts, some of which result from existing, not new, technology. As the Naval Doctrine Command publishes its multiservice doctrine for the U.S. Navy and Marine Corps, it will have a direct impact on service-unique doctrine issued by each of those military services. A case in point is the maneuver warfare doctrine found in *Naval Warfare*, NDP-1. First adopted as part of the multiservice naval doctrine, the concept of maneuver warfare will next find itself articulated in doctrine for the U.S. Navy.

Similarly, new joint doctrine will impact on multiservice naval doctrine. As joint campaign concepts are developed by the new U.S. Atlantic Command (USACOM), they will affect all forms of joint, multiservice, and service-specific military doctrine. The doctrine of the U.S. Air Force has been influenced directly by the exploration of maneuver warfare concepts by the U.S. Army. Should the U.S. Army succeed in developing its vision for mobile strike forces, such new doctrine would obviously again affect air power doctrine. Hence,

doctrine from outside one military service can have an enormous effect on the desire for a revolution in military affairs.

As long as the services have primary control over programmatics, they will retain the development of programmatic doctrine, i.e., doctrine that supports programming and is not necessarily reflective of how they will actually fight. Operational combat doctrine, however, is the province of joint doctrine. For example, the U.S. Marine Corps has fully embraced maneuver warfare doctrine, but such doctrine is not yet a part of joint or multinational doctrine for actual warfighting. If only the services embrace a revolution in military affairs, we will not necessarily see a change to operational combat doctrine.

Recent attempts to make the chairman of the Joint Chiefs of Staff more directly responsible for a military programmatic input to the annual budgetary debate constitutes a major change in U.S. defense practices and will enhance the influence of joint doctrine. Efforts being made by Admiral William Owens, vice chairman, include an enhanced role for the Joint Requirements Oversight Council (JROC) to set overall military programming priorities.[39] Until now, in the programmatic world, service doctrine has been dominant. If joint doctrine is to predominate over service doctrine, then major changes in joint doctrine must address future, not just current, warfare concepts.

Fourth, a major cause of revised military doctrine can issue from reviews of actual and emerging threats, especially those not foreseen during earlier programmatic deliberations. Before any war, there is an anticipated enemy for which military doctrine is designed. When the intelligence community misrepresents the capabilities of the enemy, it is likely that prewar doctrine will be deficient. Naturally there are difficulties with capabilities versus intentions estimates. Hence, it is likely that the correct doctrine for actual warfighting depends largely on accurate intelligence (along with a solid understanding of the capabilities and intentions of one's own forces). It follows, then, that opportunities will be lost for revolutions in military affairs unless the military services fully back programming in support of intelligence.

Today, the expected enemy has changed dramatically. The U.S. no longer faces the Soviet Union and cannot treat all other threats as lesser included cases. The threat challenge is complicated, as is the challenge to attempt to model the behavior of the wide diversity of potential actors with whom the U.S. will have to interact in the future. In the past, American defense planners had the luxury of a well-developed concept of operations by the expected enemy and the benefit of campaigns and operations planned by a long-standing alliance structure. Today, they lack the internal resources to predict accurately the

behavior of every potential enemy. Military commanders will have to deal increasingly with non-governmental organizations, including private volunteer organizations and an aggressive and technologically sophisticated media not dependent upon government for information. In such an environment, will doctrine by based on old familiar threats, generic new threats, or threats based on someone's estimate of the "most likely" future threats? Is it safe to assume that the real new revolution in military affairs will allow Americans to plan to be able to do almost anything militarily that they want to do against a Third World enemy?

A fifth manner in which doctrine changes is by reviewing the lessons of history. For instance, the doctrine for military planning was changed in many nations of the world once they reviewed the victories of Prussia in the Seven Weeks War (1866) against Italy, Austria, Hanover, and Bohemia, and in the Franco-German War (1870–1871). Dramatic and rapid campaigns of annihilation brought about intense analyses of the Prussian victories with a consensus that the General Staff had been, to a large degree, responsible.[40] This in turn led to a worldwide imitation of the Prussian General Staff—a major paradigm shift.

Although one might assume that all nations review their military history before doctrinal development, in fact, doctrine has been developed prior to such studies. When nations start up new doctrine centers and commands, they have the opportunity to take a comprehensive look at previous military history and extract the lessons of past attempts at doctrinal development. When full appreciation of prior lessons is available to current doctrine writers, this can lead to a new vision of how best to create concepts of warfare which, in turn, can stimulate a "revolution in military affairs."

Sixth, one would expect doctrine writers to make full use of the prior studies of nations' strategic cultures before preparing their doctrine. In recent times, we have witnessed newly emerging nations created out of old nations, wherein the strategic culture of that new nation does not necessarily reflect immediate history. In such cases, because of the changes in population, geography (borders), or government, the new nation has the opportunity to make significant doctrinal changes. Even modifications in government alone have afforded nations the opportunity to embody major doctrinal changes. An excellent example of this is the change in navy doctrine that France incorporated following the replacement of the Vichy regime by the Fourth Republic.[41]

In the days when the Soviet Union faced NATO and saw itself essentially encircled by imperialism, its military doctrine was appropriate for its high-technology adversary. Today, Russia can afford to develop a series of parallel military doctrines, making the assumption they are technologically inferior in the western theater of military operations but superior in the southern theater.[42] This change in threat has nurtured new doctrine, perhaps a doctrinal revolution similar to that proposed above.

Formal navy doctrine encountered a setback with the introduction of new technologies and the end of the Anglo-Franco wars during the age of sail. Doctrine was developed and refined frequently during the wars between Britain and France over hundreds of years. During the age of sail, there were long periods of warfare with essentially the same technology. Hence, improvements to navy warfare occurred via other avenues of advancement. Additionally, modern recruitment techniques had yet to be discovered, hence, improvements in personnel and leadership was not yet the method for improving combat potential. Advances in the naval art had to arise from doctrine. Debates over doctrine and the existence of written doctrine was normal practice. As navy doctrine advanced, so did combat potential.[43]

Since the early part of the nineteenth century, two events have had a profound effect on the nature of navy doctrine: technology and the frequency and participants of war. From the time that the ironclad was introduced, navy technology has changed so quickly and so often that navies have seldom had the time to deal with doctrinal issues for forces on hand. By the time of the Battle of Lissa (1866), between Italy and Austria, warship designs were advancing before navy doctrine could be reevaluated and rewritten. Navies turned more of their attention to dealing with improvements to naval art and combat potential by improving technologies and programming rather than learning to fight "smarter."

Many non-technological factors that often result in new concepts for military doctrine can have major impacts on revolutions in military affairs. All of these issues must be considered by doctrine commands and centers if there is to be a true doctrinal renaissance that makes possible a revolution in military affairs. As navies become more comfortable with the concept of centralized written doctrine, they will have many opportunities to develop new doctrinal concepts with ideas that originate outside the realm of technology.

More often than we would like to admit, there has been no accepted military doctrine for the use of newly introduced technologies. Increasingly, therefore, improvements to combat potential were attributed to effective programming skills rather than skills that assess warfighting doctrine. Today, the focus should shift from introducing new technologies to other, less expensive, methods of improving combat potential, namely, navy doctrine as a force builder. The continued search for "silver bullets" in new technology threatens to distract professional officers from perfectly good solutions that may make possible advances in the next revolution in military affairs.

The difficulty in changing paradigms, doctrine, and recognizing revolutions in military affairs can best be studied in the detailed and fully developed case studies that result from specific lessons learned. For example, Stephen Rosen's *Winning the Next War: Innovation and the Modern Military*, is an excellent examination of change in military organizations.[44] It contains a number of cases that provide the military doctrine supervisor with a quick overview of the problems of change during peacetime as well as during war.

To get to the heart of change, however, more in-depth, book-length individual case studies should be consulted. One such study of an organization's attempt to come to grips with a new technology is Harold R. Winton's *To Change an Army: General Sir John Burnett-Stuart and British Armored Doctrine, 1927–1938.*[45] After studying such cases, one can more easily accept the need for recommendations contained therein, such as, support at the top, a mechanism for the building of consensus, and a "learning organizational" climate that accepts rational analysis as the basis for doctrine and force structure.

In learning organizations, individuals "continually expand their capacity to create the results they truly desire, [it is] where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together." Learning organizations also have a shared vision of the future—indeed a shared vision is one of the five cornerstones necessary for such organizations.[46] The German Army was a "learning organization" during World War I when it assessed recent combat experience and then made changes to their doctrine as the war progressed. An untold story is how the U.S. Navy learned from its combat experience and changed its doctrine during World War II[47]—the German Army is *not* the only military "learning organization" that has existed.

Whether or not there is a current and on-going revolution in military affairs is still being debated. What the next paradigm will be has yet to be decided. We do know, however, that revolutions in military affairs and paradigm shifts will

occur. We need to manage these changes and create processes and organizations to deal with these issues; Naval Doctrine Command is an organization that is concerned with managing change. Good doctrinal development can create revolutions in military affairs.

It is time for the Navy to become a learning organization that holds a shared vision of the future as well as a shared vision of continued improvement. Leadership in such an organization is similar to that required of process designers, stewards of the vision, and teachers who foster learning. This new type of leader is charged with building an organization "where people continually expand their capabilities to understand complexity, clarify vision, and improve shared mental models."[48]

For the next paradigm we must question if it will be a logical outgrowth of the ongoing revolution in military affairs, recognizing the importance of affordability or the opportunities permitted by stealth. Will this paradigm result from new technological opportunities, such as unmanned air and subsurface vehicles? Unmanned systems allow distant decision making, reduced costs, and subsequent changes in cost versus risk calculations. Will a new paradigm be oriented on speed—hypersonic vehicles? Increased speed will again reduce decision times and make fundamental changes in basing requirements. Increased range supports the more grandiose theories of air power once advocated by Alexander DeSeversky and Billy Mitchell. On the other hand, is the new warfare paradigm framed by ideas and the information explosion? It is very likely that fourth generation warfare, idea-driven or information-based warfare, is indeed a major paradigm shift away from warfare based upon technologies. Whatever the new paradigm, one must not overlook the leading role that doctrine can play to stimulate technological development.

The model for doctrinal development in support of paradigm shifts and revolutions in military affairs instructs that the first step is to communicate a vision of the future battle space, then develop concepts for operations, and then, after testing those operations by interactions with the fleet and analytic community, develop prototype doctrine. Approved doctrine can result in hardware and software requirements as well as direct improvements to combat potential, irrespective of technological change.

The introduction of new ideas into the military and the management of change to a new paradigm are difficult tasks requiring both combat leadership skills and experience as well as the administrative and bureaucratic skills of the Washington "in-fighter." Critical thinking, the temperament of combat-experienced leaders, and the administrative competence are needed to ensure that the most promising ideas are accepted and implemented by the Navy.

Notes

1. During World War I, France transported by sea a half-million colonial soldiers and two hundred thousand workers to aid her in her hour of need. This was in addition to two million U.S. troops received by sea from North America.

2. P. A. Zhilin (General-Lieutenant), ed., *The History of Military Art* (Moscow: Voyenizdat, signed to press 23 January 1986), translated in JPRS–UMA–87–004–L (Washington: 27 March 1987), p. 233; and V. Larionov et al., *World War II: Decisive Battle of the Soviet Army* (Moscow: Progress Publishers, 1984), p. 510.

3. Harriet Fast Scott and William F. Scott, *The Armed Forces of the USSR*, 3rd ed. (Boulder: Westview Press, 1984), p. 48.

4. David Jablonsky (Colonel, USA, Retired), "U.S. Military Doctrine and the Revolution in Military Affairs," *Parameters*, Autumn 1994, pp. 18–36. In April 1994, the U.S. Army War College and the Strategic Studies Institute (SSI) hosted a conference, "The Revolution in Military Affairs: Defining an Army for the 21st Century." A number of papers presented at this conference have now appeared as SSI monographs. For example, see Jeffry R. Cooper, *Another View of the Revolution in Military Affairs*, 15 July 1994; Paul Bracken and Raol Henri Alcalá, *Whither the RMA: Two Perspectives on Tomorrow's Army*, 22 July 1994; and Stephen Metz and James Kievit, *The Revolution in Military Affairs and Conflicts Short of War*, 25 July 1994; all published by the U.S. Govt. Print. Off., 1994.

5. Philip D. Shutler (Lieutenant General, USMC, Retired), "Thinking about Warfare," *Marine Corps Gazette*, November 1987, pp. 18–20; John W. Bodnar (Captain, USNR), "The Military Technical Revolution: From Hardware to Information," *Naval War College Review*, Summer 1993, pp. 7–21; Paul Bracken, "The Military After Next," *The Washington Quarterly*, Autumn 1993, p. 159; and James R. FitzSimonds (Commander, USN) and Jan M. van Tol (Commander, USN), "Revolutions in Military Affairs," *Joint Force Quarterly*, Spring 1994, pp. 24–31.

6. The parallel ashore to privateering was the *condottieri*. Originating in Italy during the fourteenth and fifteenth centuries, the *condottieri* was a mixture of entrepreneurs and warriors. They eventually spread to France, Spain, Alsace, and Switzerland. Their ultimate demise came about with the formation of standing mercenary armies and was not due to technology. See Karl von Clausewitz, *On War*, trans. O.J. Matthijs Jolles (New York: The Modern Library, 1943), p. 577; and Hans Delbrück, *History of the Art of War, Volume III: Medieval Warfare*, trans. Walter J. Renfroe, Jr. (Lincoln, Nebr. and London: Univ. of Nebraska Press, 1985), pp. 506–8 [original German version published in 1923]; and *History of the Art of War, Volume IV: The Dawn of Modern Warfare*, trans. Walter J. Renfroe, Jr. (Lincoln, Nebr. and London: Univ. of Nebraska Press, 1985), pp. 16–7, 224 [original German version published in 1930].

7. Zhilin, pp. 6–7.

8. K. V. Zababashkin (General-Major), "The Structure and Organization of Formations, Units and Subunits of the Armed Forces," in N. A. Lomov (General-Major), ed., *Scientific-Technical Progress and the Revolution in Military Affairs* (Moscow: Voyenizdat, signed to press 15 November 1972), translated and published under the auspices of the U.S. Air Force, Washington: U.S. Gov't. Print. Off., 1980, pp. 113–5.

9. F. F. Gayvoronskiy (General–Colonel), ed., *The Evolution of Military Art: Stages, Tendencies, Principles* (Moscow: Voyenizdat, signed to press 4 May 1987), translated in JPRS–UMA–89–012–L, 12 October 1989, p. 32.

10. Frederick William von Mellenthin (Generalmajor) and R.H.S. Stolfi with E. Sobik (Colonel), *NATO Under Attack: Why the Western Alliance can Fight Outnumbered and Win in Central Europe without Nuclear Weapons* (Durham, N.C.: Duke Univ. Press, 1984), pp. 12–6. The Gatling gun—introduced in 1862–worked on different principles.

11. The reason for its failure on the battlefield was primarily that the French Army guarded their new capability too well and they were caught up on the technical details of development. They failed to devise an effective doctrine for the new weapon or to test various tactics. Furthermore, the *mitrailleuse* was assigned to artillery units where it was viewed as a rather short-range weapon that was extremely vulnerable to counter-battery fire.

12. Department of the Navy, White Paper, "...From the Sea: Preparing the Naval Service for the 21st Century" (Washington: U.S. Gov't Print. Off., 28 March 1994).

13. Naval Doctrine Command, *Naval Warfare*, NDP (Naval Doctrine Publication)-1 (Washington: U.S. Gov't. Print. Off., 28 March 1994).

14. John H. Dalton, "A Vision of the Navy After Next," remarks as delivered by the Honorable John H. Dalton, Secretary of the Navy, Sea-Air-Space Exposition, Washington, D.C., 30 March 1994. For the concept of a military after next, see Bracken, "The Military After Next," p. 157.

15. Hans Delbrück, *History of the Art of War, Volume II: The Barbarian Invasions*, trans. Walter J. Renfroe, Jr. (Lincoln, Nebr. and London: Univ. of Nebraska Press, 1985), p. 411 [original German version published in 1921]; *History of the Art of War, Volume III: Medieval Warfare*, pp. 327, 468, 635, 650–6; and *History of the Art of War, Volume IV: The Dawn of Modern Warfare*, pp. 41, 126.

16. Vasily Danilovich Sokolovskiy (Marshal of the Soviet Union), ed., *Soviet Military Strategy*, 3rd ed., with an analysis and commentary by Harriet Fast Scott, ed. (New York: Crane Russak, 1980), 1st paper ed., p. 229.

17. Richard A. Gabriel and Karen S. Metz, *A Short History of War: The Evolution of Warfare and Weapons*, Professional Readings in Military Strategy, no. 5 (Carlisle Barracks, Penna.: U.S. Army War College, Strategic Studies Institute, 30 June 1992), pp. 50, 70–1.

18. Clausewitz, pp. 306, 493, 545.

19. William S. Lind, Keith Nightingale (Colonel, USA), John F. Schmitt (Captain, USMC), Joseph W. Sutton (Colonel, USA) and Gary I. Wilson (Colonel, USMC), "The Changing Face of War: Into the Fourth Generation," *Marine Corps Gazette*, October 1989, pp. 22–6; Martin van Creveld, *The Transformation of War* (New York: The Free Press, 1991); Antulio J. Echevarria (Captain, USA) and John M. Shaw (Captain, USA), "The New Military Revolution: Post-Industrial Change," *Parameters*, Winter 1992–93, pp. 70–9; Robert J. Bunker, "The Transition to Fourth Epoch War," *Marine Corps Gazette*, September 1994, pp. 20–30; William S. Lind, John F. Schmitt (Major, USMCR), and Gary I. Wilson (Colonel, USMCR), "Fourth Generation Warfare: Another Look," *Marine Corps Gazette*, December 1994, pp. 34–7.

20. David C. Evans and Mark R. Peattie, *Kaigun [Navy]: Strategy, Tactics and Technology in the Imperial Japanese Navy, 1887–1941*, August 1994 draft book manuscript, chapter 8.

21. Terrence R. Fehner, "National Responses to Technological Innovations in Weapons Systems, 1815 to the Present," History Associates, Inc., Germantown, Md.: 7 January 1986.

22. B. V. Panov, V.N. Kiselev, I.I. Kartavtsev et al., *The History of Military Arts: A Textbook for Military Academies of the Soviet Armed Forces* (Moscow: Voyenizdat, 1984), translated in JPRS–UMA–85–009–L (Washington: 21 March 1985), pp. 2–3.

23. For additional information, see James J. Tritten, "Introduction of Aircraft Carriers into the Royal Navy: Lessons for the Development of Naval Doctrine," *The Naval Review*, July 1994, pp. 260–7; and Norman Friedman, Thomas C. Hone, and Mark D. Mandeles, "The Introduction of Carrier Aviation into the U.S. Navy and the Royal Navy: Military-Technical Revolutions, Organizations, and the Problem of Decision," draft report prepared for the Director, Net Assessment, Office of the Secretary of Defense, 12 May 1994.

24. Charles M. Melhorn, (Commander, USN, Retired), *Two-Block Fox: The Rise of the Aircraft Carrier, 1911–1929* (Annapolis, Md.: Naval Institute Press, 1974).

25. Jablonsky, p. 33.

26. Japanese amphibious warfare doctrine developed in parallel with that of the U.S. Marine Corps. The Japanese Army was in a different position vis-à-vis the navy than in the United States and was able to secure earlier cooperation in the development of landing craft. The *Shinshu Maru*, the world's first ship specifically designed for amphibious operations—a prototype for what would later become the landing ship dock—was laid down in 1933 and completed in 1934—years before anything similar in the U.S. Japanese amphibious landing ships were observed by a U.S. Marine Corps officer stationed in the Far East, and his reports led eventually to the building of similar craft and ships in the U.S. See Evans and Peattie, chapter 14.

27. Dean Allard, "The U.S. Navy Prepares for War," presented at the World War II in the Pacific Conference, Alexandria, Va.: 10 August 1994.

28. Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military* (Ithaca, N.Y. and London: Cornell Univ. Press, 1991), pp. 70, 82–5.

29. John D. Harbron, *Trafalgar and the Spanish Navy* (Annapolis, Md: Naval Institute Press, 1988), pp. 98–102.

30. Evans and Peattie.

31. Peter M. Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization* (New York: Doubleday, 1990), pp. 339–63.

32. Evans and Peattie, chapter 17.

33. U.S. Army Training and Doctrine Command (TRADOC), *Force XXI Operations: A Concept for the Evolution of Full-Dimensional Operations for the Strategic Army of the Early Twenty-First Century*, TRADOC Pamphlet 525–5 (Fort Monroe, Va.: TRADOC, 1 August 1994) [with 8 September 1994 errata], pp. 1–3, 3–20, 4–2.

34. Department of the Army, Congressional Activities Division, *Army Focus 94: Force XXI* (Washington: September 1994), p. 18.

35. These ideas were first developed in James J. Tritten, "Naval Perspectives for Military Doctrine Development," *Naval War College Review*, Spring 1995, pp. 26–31.

36. I[rving] B[rinton] Holley, Jr., *Ideas and Weapons: Exploitation of the Aerial Weapon by the United States During World War I: A Study in the Relationship of Technological Advance, Military Doctrine, and the Development of Weapons* (Washington: U.S. Gov't. Print. Off., 1983, for the Office of Air Force History), p. 19 [originally published in 1953 by Yale Univ. Press].

37. Headquarters, Department of the Army, FM (Field Manual) 100–5, *Operations* (Washington: U.S. Gov't. Print. Off., 14 June 1993).

38. Martin van Creveld, with Steven L. Canby and Kenneth S. Brower, *Air Power and Maneuver Warfare* (Maxwell Air Force Base, Ala.: Air Univ. Press, July 1994), p. 268.

39. William A. Owens (Admiral, USN), "JROC [Joint Requirements Oversight Council]: Harnessing the Revolution in Military Affairs," *Joint Force Quarterly*, Summer 1994, pp. 55–7; John Boatman, "The Jane's Interview" (with Vice Chairman of the Joint Chiefs of Staff Admiral William A. Owens, USN), *Jane's Defence Weekly*, 23 July 1994, p. 32; address by Admiral William A. Owens, USN, to the Military Operations Research Society JROC [Joint Requirements Oversight Council] Process Workshop, Arlington, Va.: 17 October 1994; Vincent C. Thomas, Jr., interview with Joint Chiefs of Staff Vice Chairman Admiral William A. Owens, USN, "The Necessary Elements of Warfighting," *Sea Power*, December 1994, pp. 9–13.

40. John E. Tashjean, "A Military Aspect of Circulation of Elites," *Cahiers Vilfredo Pareto*, no. 11, 1967, p. 71.

41. For additional information, see "Navy and Military Doctrine in France," in this volume, pp. 37–75.

42. A Savelyev, vice president of the Institute of National Security and Strategic Studies, "Does Russia Need a 'Potential Enemy'?" *Krasnaya zvezda* (Moscow) in Russian, 19 March 1992, p. 2 (FBIS-SOV-92-100), 22 May 1992, pp. 33–5.

43. For further details see James J. Tritten, "Lessons and Conclusions from the History of Navy and Military Doctrinal Development," NDC Technical Report 3-00-007, Norfolk, Va.: Naval Doctrine Command, January 1995, p. 9.

44. See Rosen.

45. Harold R. Winton, *To Change an Army: General Sir John Burnett-Stuart and British Armored Doctrine, 1927–1938* (Lawrence: Univ. Press of Kansas, 1988). Another good example is James S. Corum, *The Roots of Blitzkrieg: Hans von Seeckt and German Military Reform* (Lawrence: Univ. Press of Kansas, 1992).

46. Senge, pp. 3, 9, 205–32.

47. Admiral W.H. Standley, Chief of Naval Operations, doctrinal *War Instructions: United States Navy, 1934*, F.T.P. 143 (Washington: U.S. Govt. Print. Off., signed 28 March 1934; these instructions governed fleet actions during the initial stage of World War II, and stressed the future of joint warfare. F.T.P. 143 revised an earlier version that drew upon the lessons of World War I. During World War II, Admiral E[rnest] J. King, Commander in Chief,

United States Fleet and Chief of Naval Operations, issued revised *War Instructions: United States Navy, 1944*, F.T.P. 143 (A) (Washington: U.S. Govt. Print. Off., 1 November 1944). This and other doctrinal publications made full use of the lessons of the early stages of the war. Immediately following World War II, the U.S. Navy convened a Tactical Publications Panel, which consolidated doctrinal publications and resulted in the Chief of Naval Operations' *Principles and Applications of Naval Warfare: United States Fleets, 1947*, USF–1 (Washington: Off. of the Chief of Naval Operations, 1 May 1947), signed by Admiral of the Fleet Chester W. Nimitz, USN. USF–1 was applicable to both the Atlantic and Pacific Fleets and made full use of lessons from all stages of the war.

48. Senge, p. 340. See also Bracken, "The Military After Next," p. 171, for a discussion of the need for "organizational learning"; and Peter M. Senge et al., *The Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning Organization* (New York: Doubleday, 1994).

The views expressed by the author are his alone and do not necessarily represent those of the U.S. government, Department of Defense, or the U.S. Navy.

About James J. Tritten

Dr. Tritten serves as a special advisor to the commander of the Naval Doctrine Command, Norfolk, Virginia—an organization created in 1993. He holds advanced degrees from the University of Southern California and formerly served as a faculty member and chairman of the National Security Affairs Department of the Naval Postgraduate School. Dr. Tritten's publications have won him a number of awards, including the Alfred Thayer Mahan Award for Literary Achievement from the Navy League of the United States, two awards from the U.S. Naval Institute, and the George Washington Honor Medal from the Freedom's Foundation. His two most recent books address our new regionally focused national security strategy. Dr. Tritten retired from active duty with the U.S. Navy in 1989 after serving as the Assistant Director of Net Assessment in the Office of the Secretary of Defense, as a joint strategic planner in the Office of the Chief of Naval Operations, and previously in the fleet as a carrier-based naval aviator.

Dr. Tritten's current research interests include the theory and history of naval doctrine, the concept of maneuver warfare, and combat leadership for the sea services. Some of his most recent publications include: "Let's Put 'War' Back into Warfighting," *Strategic Review*, Winter 1995; "Opérations interarmées: l'Historie à la lumière de la doctrine moderne," *Cols Bleus*, January 1995; "Naval Perspectives on Military Doctrine," *Naval War College Review*, Spring 1995; and "Maneuver Warfare at Sea," U.S. Naval Institute *Proceedings*, September 1995.

About Vice Admiral Luigi Donolo, Italian Navy (Retired)

Luigi Donolo was born on 21 September 1935 in Santo Stefano Magra (La Spezia). He completed the normal course at the Italian Naval Academy in 1958.

Admiral Donolo specialized in antisubmarine warfare and is qualified as a raider-frogman. He attended the first course for senior staff officers at the Italian Naval War College in Livorno, where he was later assigned as a teacher and director of courses.

Admiral Donolo commanded several minesweepers, the frigates *Umberto Grosso*, *Carlo Bergamini*, and *Perseo*, as well as the 5th Frigate Squadron. He also commanded in 1993 and 1994 the Italian naval group in Lebanon for the protection of the Italian troops ashore. Other assignments included duty as Chief of Staff of Maritime District of the southern Tyrrhenian Sea, Deputy Chief of Staff to the Commander in Chief of the Italian Fleet, commander of the prestigious group "Teseo Tesei" (a naval division of raiders, frogmen, and divers), and commander of the Italian Naval War College.

In addition to numerous essays, he is the author of "War Gaming," in *Simulation* (1989), edited by Franco Angeli, and "The Problems of Security in Europe from 1990-1992" (Italian Naval War College, 1992). Admiral Donolo has lectured in Italy and abroad. He addressed the symposium at Georgetown University (Washington, D.C.) in March 1994 on the "Role of International Navies after the Cold War," and he also addressed the "Twelfth International Seapower Symposium" at the Naval War College, Newport, Rhode Island, in November 1993.

On 30 December 1994, Vice Admiral Luigi Donolo retired from the Italian Navy.