Selected Essays for Strategy Curriculum

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SELECTED ESSAYS FOR STRATEGY CURRICULUM

HOW ADAPTIVE HAS THE MILITARY BEEN TO TECHNOLOGICAL CHANGE?

by

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One of the more common human failings is the tendency to react to new phenomena with old reflexes. Generals are often the slaves of strategies designed for other wars and diplomats are prone to retain postures and policies based on conditions of a world that no longer exists.[1]

There can be no doubt that in many instances the military has been slow to adapt to changing technology. Perhaps it is grossly unfair, however, to single out the profession of arms for censure in this regard. Resistance to innovation is certainly prevalent in civilian life. But it is equally unjustifiable for the military to pretend that the problem does not exist. The professional approach would seem to be to recognize the malady for what it is and to identify the symptoms. Analysis with a view toward isolating the causes of the disease and an attempt to find possible remedies are also in order.

There is ample historical evidence to support the view that the military has been reluctant to accept change. Consider the classic case of resistance by the naval bureaucracy to the improved gunnery techniques of Lt. W.S. Sims. This might have been expected from the group of professionals whose antecedents had retrogressed from steam to sail following the Civil War. Isherwood must have felt the same sense of frustration that haunted Sims a generation later. More recently there were the problems experienced by proponents of naval aviation prior to World War II. Within our own period of service we have been witness to the struggle of Hyman Rickover to introduce the nuclear propulsion plant. Who knows how many good ideas may have been suppressed within the last 10 years?

Nor is the U.S. Navy the only military organization to have suffered from "mossbackism." The British and French armies, prior to and during World War I, refused to adapt to the introduction of rapid fire weapons.

The impact of modern techniques was misunderstood or disregarded. In the 80 years between Clausewitz and 1911 the rate of rifle fire had increased from three rounds a minute to 16, the range of guns from one thousand yards to five or six. Of artillery one responsible French officer said, "We have rather too much of it."[2]

British Field Marshal Haig claimed the machinegun was much overrated. Two per battalion were more than sufficient, he felt, but fortunately the number was increased to eight and then 16 under civilian pressure. Couple this attitude toward modern weapons with devotion to Clausewitz' dictum of the offensive and senseless carnage was inevitable. In one infantry charge against entrenched German machinegun positions, 10,000 Allied troops were fed into the grinder. After 3½ hours, casualties amounted to 385 officers and 7,861 men. German losses were "nil."[3]

But the French staff learned its

lessons well from World War I. The offensive had failed in the face of vastly increased firepower, so obviously the defensive offered the best form of warfare. How absurd it was to spend money on the tank and armored divisions such as a young officer named Charles de Gaulle was proposing. What a magnificent trench was the Maginot Line!

One might argue that these examples were all in the distant past. Today the Pentagon spends billions of dollars for research and development of new weapons systems. The U.S. Military Establishment is quick to adopt new techniques.

Let us examine an illustration of the type of innovation prevalent in today's modern army, the Sheridan lightweight armored vehicle (LAV). The LAV was designed to replace the World War II reconnaissance vehicle, a jeep with machinegun mounted in the rear seat. Trouble was the jeep was vulnerable to enemy small arms fire and could not stand up to the tank. It was determined that a new vehicle was needed for reconnaissance. In addition to this requirement, the paratroopers wanted an air-droppable armored vehicle. Thus was born the Sheridan at $335,000 per copy, with a Shillelagh guided missile, a 152mm. artillery piece whose casings self-destruct in the breech when fired, an M-60 machinegun, and a .50 caliber machinegun. The system is simple to operate, when it works. It takes 14 months to train a warrant officer to repair the missile system. Tested in Vietnam, it had some problems, among them 41 misfires of the artillery shell.[4]

Problems with the Sheridan are not unique and, for the most part, can be solved, given sufficient time and money. Isn't the Sheridan evidence to support a claim that the military now readily adapts to new technology? My contention is that it definitely is not. Instead, it is a new manifestation of mossbackism, the "gold-plating" syndrome. In reality, the Sheridan LAV is nothing

more or less than a fancy tank. It is, moreover, a failure as a tank. The Soviet T-54, T-55, and T-62 are more powerful. Only if the Sheridan crew detects a Soviet tank first and fires its missile does it have a chance of survival. The Army maintains that the LAV is not a tank, but it replaced M-60 tanks in the inventory.[5] Of course, the important issue is whether or not the tank is still a valid firstline instrument of war, given the advent of the helicopter.

The technological revolution affects the Army as it affects the rest of society. While it may be logical to say that the tank occupies the same position as the horse in World War II, no tank man will believe it. Give up armor? While the Soviets still have the T-34? The guns become larger, the armor plate thicker, the mechanics more complicated and costs rise. Put a missile system on it and a sensing system to complement the missile. Stay in the game![6]

Isn't there a striking resemblance between the tank now and the battleship of 1941? Which current Navy ships or systems suffer from the same goldplating syndrome?

While the tactics of bureaucratic resistance have changed somewhat, the basic strategy remains: (1) Indifference, as though the threat may go away; (2) Denial of the value of the new technology by high-ranking officers; (3) Emergence of a group of middle-grade officers who believe adaptation is necessary; (4) Nominal acceptance by the hierarchy in the face of mounting external pressure with relegation to a minor role in the mission of the service; (5) Ascendance of the new system to a position of prominence only after prolonged struggle within the organization, a struggle often culminated by catastrophic destruction of the old technology in a war.

The past two decades have been a

time of exceptionally lavish defense budgets. There has been less savage competition between old systems and new for the military dollar. The services could afford both. This has been an important factor in the emergence of the gold-plating syndrome. Unfortunately the military will not be able to afford this luxury in the future. We will be forced to choose between gold-plated obsolescence and expensive new technology. The fighting promises to be bitter.

The mossback phenomenon manifests itself in civilian life too. There it takes the form of cartels, restrictive trade agreements, absorbing of patents for potential competing systems by large corporations, and featherbedding by labor unions. There is no essential difference between a fireman riding a diesel locomotive and an aviator lobbying for the B-1 bomber. Job security is at stake. The fireman is an honest man who is dedicated to safety on the railroads. The aviator is a patriotic American whose paramount interest is national security. In each case the obsolescent function is his whole reason for existence; his self-respect is threatened. It is extremely difficult for a man with many years of intense dedication to a task to admit that his particular occupation has become superfluous, especially if he is not equipped to embark on another line of work.

The diesel locomotive fireman has a union to fight for him. In the military, the individual whose task is obsolete is often well represented at the top. Senior officers are in most cases advocates of the branch of service which spawned them, be it cavalry, bomber force, or battleship. Often they were the Young Turks of their own generation. In addition to the parochial tendencies of the men within the services, there is considerable influence from businesses with vested interest in the old technology. These firms can be very effective in

weapons, but the problem exists mainly within the uniformed services. If the professional were to go before Congress and state that a weapon was outmoded and present even a fraction of the evidence which is usually mustered to support obsolescence, there can be little doubt the lawmakers would concur in eliminating that weapon.

The question which should concern us as members of the profession is whether or not there are factors peculiar to our calling which tend to promote mossbackism, and is there anything we can do that would alleviate the influence of these factors.

Are military men necessarily more susceptible to mossbackism than other groups in society? In order to answer that question one must first define the conditions which nurture creativity and compare those conditions with the environment presented by the military society to its members. Victor Thompson has enumerated the following conditions as conducive to creativity: (1) Psychological security and freedom; (2) Great diversity of inputs; (3) Personal commitment to search for solutions; (4) Structure or limits to the search situation; (5) Moderate amounts of benign competition. If we accept this list as a reasonable description of the creative environment, the next step in our analysis should be to define the nature of the military environment.

I choose to define the military as a hierarchy consisting of superior-subordinate relations. The top echelon initiates all activity. Subordinates in the chain of command make each order more specific to the next lower level until specific individuals are carrying out specific instructions. There is complete discipline from the top down. Duties are narrowly defined. There is only one point of legitimacy, the senior man. The organization is not a coalition, therefore coalition and conflict-resolving activities take place in a penumbra of illegitimacy. Individual will and cre-

activity are suppressed in favor of the corporate will. Submission to this discipline is unnatural, and it is therefore necessary for the hierarchy to reward docility and compliance with rewards such as money, medals, power, and status.[7]

The military organization is the closest approximation of the monocratic stereotype of organization defined by Max Weber. Monocratic societies require outside help from other social and religious groups in order to achieve their production goals. In the case of the military this is especially true. One has a duty to his country to sacrifice for the good of the service. A job is not necessarily enjoyable according to the work ethic. The good man is the successful man, and success consists of moving up the hierarchy. The higher one progresses, the more vague and subjective are the standards by which one is judged. Opportunity for growth is controlled by arbitrary authority, which fosters conformity in subordinates. Whereas creativity is promoted by intrinsic rewards such as peer esteem and benign competition, hierarchical rewards must, by nature, be extrinsic and competition is inherently cutthroat.[8]

Failure is an inherent part of the experimental process which leads to new technology. Innovation consists of one success after a multitude of dead ends. In a monocracy, one's function is very carefully delineated and exclusive. Exclusive distribution of activity implies exclusive distribution of praise and blame. Failure is attached to an individual (at least most people think this is so), and one feels he cannot fail even once, given the nature of the promotion process. Since failure is defined by the senior, conformity is the rule rather than creativity.

The military social structure gives an inherent advantage to those who choose to veto new ideas. The first reaction to innovation is most likely: "How does it

affect us?" If it is a threat to the status quo, it will be resisted. Such resistance can be prolonged and intense. Commenting on Billy Mitchell's bombing tests against old battleships in 1921, Capt. William D. Leahy, then Director of Naval Gunnery (a post brought to a position of eminence by Lieutenant Sims), said to the Secretary of the Navy: "The entire experiment pointed to the improbability of a modern battleship being either destroyed or put out of action by aerial bombs."[9] CNO Adm. E.W. Eberle, stated: "Aviation has introduced a new and highly important factor in warfare . . . [and] its influence on naval warfare undoubtedly will increase in the future, but the prediction that it will assume paramount importance in sea warfare will not be realized."[10] It is extremely difficult for an individual, faced with a system where advancement is a reward for compliance with the "party line" and where competition is so intense that a single "failure" may be the end of one's career, to actively push an unpopular idea.

Morison indicates that reform from within the organization is difficult, if not impossible. In every case he contends there was an outside force working for acceptance of new technology (i.e., President Roosevelt imposed Sims upon the Navy as Gunnery Inspector).[11] Billy Mitchell's unification proposals were the greater evil which led to Navy acceptance of the aircraft.[12] Enthoven has contended that external pressure in the form of the whiz kids is a necessary counter to mossbackism in the uniformed services.[13]

Reform from within is not an easy task. The most obvious reform would be a change in the basic structure of the military society. The Russians tried this approach after the Bolshevik Revolution and it failed. Complete abolition of the hierarchical structure of command is not possible because of the nature of warfare. So long as men must fight and

die, authoritarian systems of organization will be a necessity for combat units. But is a strict hierarchical relationship required in all aspects of the military society? Here at the Naval War College rank structure has been submerged by means of civilian clothing and the use of first names. Blind obedience to senior is a necessity in combat, and men are trained to function under that set of rules. Prolonged rational debate, however, is necessary when billions of dollars and the national security are at stake. It requires the best efforts of well educated men who also have practical experience. The problem has been that it is very difficult for men who have learned to live with regimentation to readily switch to a new set of rules when they serve a tour in the Pentagon. We need a dual system of organization in order to promote innovation. Wild ideas should have an official channel through which to bypass the bureaucracy and reach the top. Dissent concerning issues other than immediate military operations must be specifically encouraged. Such a system should permit military officers legitimate access to civilian DOD personnel and the press, with no prejudice to the innovator. Because we are a monocratic society, only the very top can give legitimacy to such a dual system. Experience with the Z-grams and CNO advisory groups illustrate that such a dual system is necessary and can have beneficial effects.

The *Naval Institute Proceedings* might be a more useful tool for expressing new and controversial ideas if it were removed from the censorship system currently used to screen articles submitted for publication. Vincent Davis relates that: "Not so much as a single sentence can be found in the thirty-six issues of [USNIP] during the immediate pre-World War II years suggesting that the carrier based aircraft could or ever would replace the big guns of the battleship as the main offensive punch of the fleet."[14] Is it mere happenstance that there have been no recent articles in the *Proceedings* which are critical of the aircraft carrier in its present form?

There are new trends within the military which will contribute to reduction of parochialism and mossbackism. Programs of education for the officer corps which make the individual less dependent on his initial service or corps specialty will tend to reduce close identification with a particular type of weapon and lead to promotion of true "general officers." Downgrading of stereotyped career patterns as criteria for flag selection boards is a welcome sign of change. Service on joint staffs and attendance at schools of a different branch also serve to moderate parochialism.

Reform we must. Every time a service gains bad press because it refuses to accept innovation or constructive criticism, it loses status with the Nation and ultimately loses control of its own destiny. The alternative to internal reform is to accept greater civilian control and ultimately loss of our right to be called a true profession.

In summary, it is safe to say that the profession of arms has been reluctant to accept innovation in the past. At present there is still resistance to give up any old weapons, thus giving rise to the "gold-plating syndrome." This phenomenon is not limited to the military society alone, but it is more of a problem for the military because of the profound effects which military decisions may have on the lives of millions of people. Basic military education, training, and the inherent constraints of a hierarchical system tend to promote parochialism and mossbackism. The pace of technological change is such that we cannot afford the luxury of mossbackism. Positive internal reforms are required, including institutional modifications to encourage innovation and a continuing program of education for the officer corps.

FOOTNOTES

1. James A. Donovan, *Militarism, U.S.A.* (New York: Scribner, 1970), p. 217.

2. J. Monteilhet, *Les Institutions Militaires de la France,* 1932, p. 262, quoted in Sir John W. Hackett, *The Profession of Arms* (London: Times, 1962), p. 49.

3. Hackett, p. 51.

4. Ward S. Just, *Military Men* (New York: Knopf, 1970), p. 151-175.

5. *Ibid.*

6. *Ibid.,* p. 173-174.

7. Victor A. Thompson, *Bureaucracy and Innovation* (University: University of Alabama Press, 1969), p. 15-18.

8. *Ibid.*

9. Vincent Davis, *The Admirals Lobby* (Chapel Hill: University of North Carolina Press, 1967), p. 78.

10. *Ibid.*

11. Elting E. Morison, *Men, Machines and Modern Times* (Cambridge: MIT Press, 1966), p. 38-39.

12. Davis, p. 76-77.

13. Alain C. Enthoven and K. Wayne Smith, *How Much Is Enough* (New York: Harper & Row, 1971), p. 95.

14. Davis, p. 81-82.

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THUCYDIDES ON THE INFLUENCE OF SEA POWER

by

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One need not look far in Thucydides' historical saga *The Peloponnesian War* for a clear exposition of his views on the influence of seapower. In the very first chapter of the First Book, after presenting his minihistory of the birth and growth of naval power, he concludes:

> All the same these Hellenic navies, whether in the remote past or in the later periods, although they were as I have described them, were still a great source of strength to the various naval powers. They brought in revenue and they were the foundation of empire. It was by naval action that the islands were conquered . . . There was no warfare on land that resulted in the acquisition of an empire.[1]

Even Alfred Thayer Mahan, the great apologist for seapower 2,300 years later, never stated the case more strongly. It is unfortunate that Captain Mahan never read, or at least never discussed, Thucydides. Both understood so clearly the influence of seapower on history. Both were military men who became, more or less by force of circumstance, historians. And Thucydides would certainly have agreed wholeheartedly with Mahan's statement that "the history of sea power, while embracing in its broad sweep all that tends to make a people great upon the sea or by the sea, is largely a military history."[2] For *The Peloponnesian War,* while it is obviously a military history, is preeminently a history of seapower.

Many a reader of Thucydides has come away with the impression that *The Peloponnesian War* is an account of a classic struggle between a landpower and a seapower. But on closer scrutiny,

this view seems somewhat simplistic. In the final analysis, the war was won not on land, but at sea. The crushing defeat which Nicias' "Grande Armée" (if you will permit an anachronism) suffered at Syracuse, and from which Athens never fully recovered, would never have occurred if the Athenian Fleet had not been so ignominiously routed in the great harbor. And when the coup de grâce was delivered to Athens 9 years later, it was again at sea, in the scintillating victory of Lysander at Aegospotami, which Thucydides' unfinished work unfortunately does not describe, but which Xenophon and Plutarch have related in some detail.

Lest I, too, be accused of a simplistic rationale in ascribing all historical development to seapower, I readily admit that there were many other factors at work in the world-shaking events related by Thucydides. To historians who view events in terms of political science, the development of Athenian democracy, its later excesses, the conversion of the Delian League into an Athenian tyrannical empire (when the confederacy could conceivably have provided the international political order required by the times)[3] are equally important factors. To historians who view events in terms of economics, the economic revolution that transformed self-sufficient city-states into interdependent colonial powers requiring markets for the export of their specialized wares was also a dominant factor in the evolution of Greece. To humanists, the great moral principles involved, the freedom for self-development in democratic Athens, even the argument for "the de-humanizing effects of war" were the determining features of the Peloponnesian struggle.

All of these different outlooks have some, indeed a great deal of, validity. However, throughout the fabric of all such varying points of view is a single notable thread—seapower. Without sea-

League, no Athenian empire. Without seapower there would have been no economic revolution, no search for markets. And without seapower it is difficult to imagine the flourishing of culture, the arts, and self-expression that Athens engendered. Surely no landlocked, introspective society could have accomplished what Athens did in the short time she did it. Land travel in Greece, given its terrain features, was severely limited. There were no airplanes to waft visitors about. Only the sea permitted the contacts, the exchange of ideas, the sampling of new things that are so indispensable to the progress and development of a society.

To Thucydides, the influence of seapower on all of these factors was incontrovertible. Seapower brought wealth, which allowed one the luxury of time to devote to the arts. It brought political power with the establishment of an empire. Without seapower, no empire would have ever been established. And without an Athenian Empire, the "glory that was Greece" could never have been.

If Thucydides was correct in his evaluation of the influence of seapower and if, as he tells us, Athens at the outbreak of the Peloponnesian War was the greatest seapower ever known up to that time, one may ask, "How could Athens possibly lose the war?" Thucydides provides the answer, not in a single sentence or paragraph, but in that thread running throughout his account of the war: how the Athenians used their seapower. Like all historians, Thucydides views the age of Pericles as the Golden Age of Greece. But more than most historians, Thucydides unabashedly pays hero worship to Pericles, for it was Pericles who best understood the principles of naval warfare and the wise use of seapower.

Themistocles had been the first to enunciate the concept of Athenian seapower. As Thucydides tells us, "... [Themistocles] considered that if

the Athenians became a seafaring people

they would have every advantage in adding to their power. Indeed it was he who first ventured to tell the Athenians that their future was on the sea."[4] Pericles, a worthy successor to Themistocles, elaborated this basic idea and developed it to its logical conclusion: Athens should become an island. As Pericles put it, "Sea power is of enormous importance. Look at it this way. Suppose we were an island, would we not be absolutely secure from attack? As it is, we must think of ourselves as islanders . . . "[5] And so Athens did become an island, for all practical purposes, by the construction of its great walls. As the French naval historian Vice Adm. Jurien de la Graviere, writing in 1886, saw it:

> Forty-eight kilometers of walls, thick enough for two wagons to pass abreast, and rising to a height of 56 feet, enclosed Athens, Phalerum, and Piraeus. It took 16,000 men to guard the walls. Thanks to these embattlements, Athens had become an island. She could be assaulted only from the sea, and the sea was Athenian.[6]

From this impregnable fortress, Pericles was convinced, he could outmaneuver and outlast anything the Peloponnesians could launch. He proposed to conserve his forces for a war of attrition during which the Athenian Fleet would guard the Empire and Athens' supplies and wear down the enemy by seaborne raids. Hence we see his initial naval campaign aimed at establishing a net of naval blockade around the enemies of Athens while keeping her own sealanes open and secure. That Pericles had complete confidence in Athens' ability to eventually defeat Sparta, if only the Athenians followed his advice on the use of seapower, is evident from his speech urging the rejection of the Spartan ultimatum:

> I could give you many reasons why you should feel confident in ultimate victory, if only you will make up your minds not to add to the empire while the war is in progress, and not to go out of your way to involve yourselves in new perils. What I fear is not the enemy's strategy, but our own mistakes.[7]

(How heartwarming to present-day advocates of management systems analysis to see Pericles' long-range planning for the optimal use of scarce resources!)

That Thucydides considered Pericles' strategy wise is equally clear. It safeguarded the city, the fleet, and the Empire—the sources of Athens' financial and naval strength. As Thucydides noted,

> [Pericles] appears to have accurately estimated what the power of Athens was . . . and after his death his foresight with regard to the war became even more evident. For Pericles had said that Athens would be victorious if she bided her time and took care of her navy, if she avoided trying to add to the empire during the course of the war, and if she did nothing to risk the safety of the city itself. But his successors did the exact opposite.[8]

No consideration of Pericles' views on the value of seapower would be complete without one final quotation which, more than any other, gives us an insight into the almost religious fervor in which he held seapower. At the end of the second year of the war, things were going badly for the Athenians. Large segments of Attica had been laid waste by the Spartans, but far worse than this was the terrible plague that struck Athens itself. It was at this moment, the darkest day Athens under Pericles had known, that he addressed them. It was as though he had saved this, his most convincing argument, for just such a day—for a moment of despair when the people were grumbling about his leadership and questioning his wisdom. After listing various reasons

why the Athenians should not be overly disheartened, he adds:

> But there is this point also which I shall mention. In thinking of the greatness of your empire there is one advantage you have which, I think, you have never yet taken into consideration, nor have I mentioned it in my previous speeches. Indeed, since it sounds almost like boasting, I should not be making use of this argument now if it were not for the fact that I see that you are suffering from an unreasonable feeling of discouragement ... The whole world before our eyes can be divided into two parts, the land and the sea, each of which is valuable and useful to man. Of the whole of one of these parts you are in control—not only of the area at present in your power, but elsewhere too, if you want to go further. With your navy as it is today, there is no power on earth —not the King of Persia nor any people under the sun—which can stop you from sailing where you wish.[9]

Such, then, was Pericles' view of the influence of seapower, and so, indeed, was Thucydides' own. But with the death of Pericles, Athenian seapower as he had conceived it began its decline. His successors were soon to forget his wise counsel. True, Athenian fortunes prospered for a while. Athens recovered from the devastating effects of the plague, and her power seemed to grow. The short-lived truce known as the peace of Nicias permitted further consolidation. But at the very height of this resurgence, contrary to the fundamentals of Periclean strategy, Athens embarked upon the folly of the Syracusan campaign. Clearly this was precisely the sort of action Pericles had warned the Athenians about when he cautioned them against seeking to add to the

Empire during the course of the war. The disaster of the campaign can hardly be overestimated. Thucydides himself called it "the greatest action we know of in Hellenic history," and the defeat "the most calamitous."[10] It marked the death knell of Athenian democracy, the passing of the Golden Age.

As mentioned earlier, while the final debacle of the Sicilian campaign came on land, the defeat of the army was made possible only by the poor strategy and unimaginative tactics of the Athenian naval forces. How could the proud, experienced Athenian Navy have been so completely defeated by the fledgling naval forces of Syracuse? It will always remain one of the great ironies of history that the Athenians, eulogized for their inquiring, creative, and innovative thinking, were, in the end, defeated by the creative and innovative tactics of the Peloponnesians, whom historians have portrayed as dully conservative. One of the more startling examples of such innovative tactics was that devised by the Corinthian Admiral Polyanthes, who, as William Rogers observes, deserves a much higher place in the history of naval tactics than has been granted him.[11] The Corinthians wished to disable the enemy's ships without making much demand on nautical skill, in which they were lacking. Polyanthes' answer was to strengthen the "epotis," a sort of "cathead or other form of cheekpiece on the round of the bow, so placed as to crush in the bow of the enemy and sweep away his oars."[12] The tactic was first used in the otherwise unimportant battle in the Gulf of Corinth at Erineus. But it was later to become the core of Syracusan naval tactics. To de la Graviere, the importance of this development can hardly be overstated: "Take careful note of this event, for it marks the beginning of what is really a revolution in naval tactics; bow ramming, replacing the broadside ramming that had been common up to now ... "[13] It was to remain the main tactic of galley

warfare until the advent of the sailing ship.

With their new-found confidence in their own naval prowess and with the realization that the Athenians were not, after all, undefeatable at sea, the Peloponnesian allies were to apply the lessons learned in Sicily in future engagements, even to the final stratagem by Lysander that ended Athenian seapower at Aegospotami.

Unfortunately, Thucydides' history stops short of the bitter end. One could wish to have a final word from the son of Olorus on the influence of seapower upon the final outcome of the Peloponnesian War. But he knew the eventual outcome when he began his history, so it would not be illogical to look back to his earlier words and, developing his thought to its ultimate conclusion, say that just as seapower was the foundation of the Athenian Empire, so it was seapower—the Athenian misuse of it and the Peloponnesian development thereof —that led to its eventual downfall. Or, as Mario Levi concludes, "So the Athenian revolution perished at sea, surviving the Egyptian disaster only to succumb at Syracuse."[14]

FOOTNOTES

1. Thucydides, *The Peloponnesian War,* trans. by R. Warner (Baltimore: Penguin, 1954), p. 21.

2. Alfred Thayer Mahan, *The Influence of Sea Power upon History 1660-1783* (New York: Hill and Wang, 1957), p. 1.

3. See T. Walter Wallbank and Alastair M. Taylor, *Civilization Past and Present* (Chicago: Scott, Foresman, 1954), p. 135-6.

4. Thucydides, p. 65.

5. *Ibid.,* p. 95.

6. Jurien de la Graviere, *La Marine des Anciens* ("The Navy in Ancient Times") (Paris: E. Plon, Nourrit et Cie, 1886), p. 104. (The translation is my own.—ET)

7. Thucydides, p. 95.

8. *Ibid.,* p. 134.

9. *Ibid.,* p. 131.

10. *Ibid.,* p. 488.

11. William Ledyard Rogers, *Greek and Roman Naval Warfare* (Annapolis: U.S. Naval Institute, 1937), p. 162.

12. *Ibid.*

13. De la Graviere, p. 253.

14. Mario Attilio Levi, *Political Power in the Ancient World,* trans. by J. Costello (New York: The New American Library, 1965), p. 104.

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UNION VICTORY: MANPOWER, MANAGEMENT OF RESOURCES, OR GENERALSHIP?

by

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When it was finally recognized that the Civil War would not be of short duration, the complexion of the war effort took on a different hue. From the earliest months of the war, the North demonstrated its ability to rapidly mobilize its manpower. To put these forces to work on the military problems confronting the North, however, also required marshaling of large economic and fiscal resources, resources which were not in a position to guarantee victory early in the war. When these assets were finally brought to bear on the frontlines, Lincoln subsequently found the proper combination of military leadership in the field and in Washington to push the whole war effort toward a decision.

It is proper, therefore, to attribute the Union's victory ultimately to the combined, effective use of manpower, resources, and generalship. The relative importance of each factor, however, changed during the course of the conflict. The following discussion is intended to illustrate the contribution which each of these factors made to the ultimate victory of the Union.

Manpower. The population of the South at the outbreak of the war was about 9 million, including over 3 million slaves, less than half the population in the North. The regular standing U.S. Army before the war totaled 16,000 officers and men, a level considered adequate at the time for the Nation's defense. In the first 9 months of the war, Washington clumsily, and at a high cost, raised and placed in the field a half a million men and concurrently built an

establishment to sustain them. The reins of control over this army were slowly developed by the War Department in a fledgling attempt to prosecute the war in an efficient manner.

In spite of the corruption and weakness of Simon Cameron's stewardship as Secretary of War, the Federal Government was able to make some significant strides in organizing the manpower and logistics needed for a long war:

● strong control in Washington over the militia and volunteer components of the manpower reserves

● more experienced military personnel for the Washington headquarters

● revised recruiting policy

● increased materiel availability

● centralized War Department purchasing[1]

After Cameron's fortunate reassignment to an ambassadorship in January 1862, more effective control and management of the War Department was introduced by the new Secretary of War, Edwin Stanton. His task was to bring order out of confusion and profiteering tolerated by Cameron. Additional Assistant Secretaries of War were authorized along with the necessary staffs to handle the increasingly complex business of running a large army in wartime. To a great extent the arrival of Stanton on the scene marked a turn of the tide in the Union Government's prosecution of the war. In the spring of 1861, the situation for the Union was maintained by the actions of the war governors and volunteer agencies in raising and fielding large military forces; by the end of 1861, the situation was further maintained by the central ef-

ficiency of the War Department military leaders like Quartermaster General Meigs.[2]

During the course of the war, the strength of the Union Army reached 2,700,000 compared with an estimated Confederate strength of between 600,000 and 700,000. By the end of the war, Union manpower reserves had not been exhausted, with about 2,000,000 men still available for service.[3] Union military policy had failed to make effective use of the expanding army throughout 1861, probably because of the loss to the South of the best of the professional active duty officers of the prewar army. The job of commanding the North's wartime forces therefore fell to a small number of experienced but retired officers recalled to service, like McClellan, Grant, and Sherman.

The ongoing task of recruiting manpower for the Union Army depended for 2 years on the state volunteer and militia system. The South adopted conscription in April 1862, the North not until 1863. About 50 percent of the South's manpower was raised by this method, 45 percent in the North. Total enrollments on both sides approached 4,000,000 during the course of the war—a figure unprecedented in the history of warfare.[4]

The fighting quality of both Northern and Southern soldiers was equal. While the South had the better leadership for the first 2 years, everything else was in favor of an ultimate victory by the North. Washington's failure to recognize the importance of revolutionary inventions in the conduct of war served only to prolong the conflict. Nonetheless, at war's end, the manpower raised by the North had created an on-the-line force 3 to 4 times greater than the dwindling forces put in the field by the South.[5] To this extent, the sheer size of the manpower of the North, actual and potential, probably saved the North from a decisive defeat in the chaotic months of 1861 and

gained the vital time necessary to transform the North's sizable economic and industrial resources into war materiel.

Management of Resources. The superiority in potential material strength of the North over the South at the beginning of the war did not automatically doom the South. The final decision was sealed by the North's ability to translate potential might into strength mobilized on the battlefield.[6] The Union's success in war depended significantly upon the organization and application of its men, materiel, and money.[7]

The development of manpower has been outlined above. The management of the materiel and money resources of the North, from 1862 to the war's conclusion, provided the essential leverage which subsequently enabled Lincoln and his senior military leaders to succeed militarily.

For the first time in modern history, armies of immense size were fielded by both sides. The logistics problems attendant to this effort in the North were staggering. The Army of the Potomac in 1862, for example, contained about 100,000 men requiring 600 tons or 150 wagonloads of supplies each day. It was estimated that armies of 10,000 to 15,000 could forage for themselves in the South almost indefinitely. Armies of 20,000 to 30,000 were restricted largely to rich areas of the countryside. An army in excess of 50,000 men, however, depended on supplies brought up by railroads except for brief periods. For the size of armies raised in 1861, living off the land in the South was difficult and in some areas almost impossible in the presence of a vigorous enemy. Such field forces required very large wagon trains to attain even a limited mobility, but these logistics did not permit pursuit of a defeated force.[8]

The task of supplying such forces was handled by Quartermaster General Meigs. As one of the few senior officers

who held tenure throughout the war in the same position, Meigs ran the operation smoothly and ensured that after the summer of 1861 no major operation would fail for lack of food, forage, or transportation. The Union soldier, on balance, was better provided for than any soldier before in history. The success of quartermaster services in the North can be rightfully contrasted to the failure of its Confederate counterparts.[9]

The Quartermaster General's office accounted for over $600,000,000 in transactions during the war of which $240,000,000 was for transportation.[10] From less than $1,000,000 spent in the first quarter of 1861, the Quartermaster General accounts rose to $8,000,000 by June 1861, quintupled a year later, peaked at $285,000,000 in 1864, and leveled off at $226,000,000 in 1865.[11]

Virtually every kind of small firearm in existence was used, but breech-loading rifles were commonly regarded as untested and imperfect in 1861. Recognizing the decided advantages such a weapon would give the soldier, Lincoln unsuccessfully kept pushing his Chief of Ordnance to adopt the weapon in 1861 and 1862.[12] The conversion of old arms and the manufacture of the new breech-loaders finally was decided in 1864 when it could just as easily have been done in 1861. Under Brigadier General Dyer in 1864, the Ordnance Office of the War Department brought its arsenal production to the high state of efficiency necessary for war.[13]

The industry for war production did not exist in the South to the extent that it did in the North. The Southern industrial economy was centered on only one major enterprise, the Tredegar Iron Works in Richmond.[14] Clearly, one of the Confederacy's greatest handicaps was its lack of mechanical industries to supply the war effort. Of all the industries which contributed to the war effort on both sides, the iron mills rank highest.[15]

The scandals, profiteering, and corruption associated with expenditures of large amounts of money in the War Department offices were a severe blow to national prestige. Army fiscal integrity and administration, however, was more quickly and more completely recovered than in other branches of military affairs.[16] Important and far-reaching reforms and innovations in wartime fiscal and monetary policy for the Federal Government were introduced in 1862 by Secretary of the Treasury Chase. Chase managed to finance the war without an excessive debt or exorbitant interest compared with subsequent experiences in World Wars I and II. The threat of inflation was more effectively curbed than it was in World War I, without rationing, price controls, or central banking. An experiment in public finance was also tried with the imposition of the first income tax.[17]

The evolution of fiscal and monetary policy for the war was complex. Once Chase and the Congress agreed to use paper money in the Legal Tender Acts of 1862 and 1863, virtually every resource of the Nation was mobilized to achieve eventual victory.[18]

In comparison with Washington's growing experience and efficiency in administering a national war effort, the Confederacy's record stands in stark contrast. By the end of the war, Southern wealth had shrunk to almost half of its 1860 value. During 4 years of conflict the South gradually lost agricultural capital, acreage under cultivation, and agricultural production. Land values depreciated, industry was stifled, and commerce demoralized. High rates of interest accompanied totally inadequate banking and currency facilities.[19]

As we have seen, the North outranked the South early in the war in actual and potential manpower, and the North's material resources were considerably greater. By 1864 Northern Armies held positions deep in the heart

of the Confederacy. The final push to victory came on the crest of this combined war effort with the ultimate settlement of the war's longest and most vexatious problem for Lincoln—the effective command and control of the army.

Generalship. A modern command system finally emerged for the Union in 1864. In 1861 there was in effect no army, few good weapons, no officers trained in the higher art of war, and an inadequate and archaic system of command. The policy of the North was to restore the Union by force; its strategy was offensive—the destruction of the Confederate Armies.[20]

Until 1864 there was generally great confusion in control of the army and in its relationship to civil authority. With the appointment of Grant as General in Chief in March 1864 and Halleck as Army Chief of Staff, a new arrangement was found which worked and was superior to anything in Europe until Moltke formed the General Staff in 1866.

Grant had the advantage of learning from the mistakes of his predecessors. He had a good appreciation of the existing political-military relationship and seldom overstepped proper limits. Only McClellan and Grant had the real opportunity as General in Chief to evolve operations in grand strategy. Both generals excelled in their grasp of the importance of naval power and joint land-sea operations.[21] Four of the seven commanders of the Army of the Potomac proved to be incompetent—McDowell, Pope, Burnside, and Hooker. On balance, McClellan, Meade, and Grant were professionals, and while none were perfect, all were earnest and patriotic. Not until December 1864, however, were the last of Lincoln's "political" generals removed.

Grant had the facility to make decisions and execute them, and in this he towered over McClellan. With Halleck as Chief of Staff, the Union found a brilliant but unloved administrator. Checks and balances emerged between Grant and Halleck. The success of the system was best indicated by Lincoln's voluntarily reducing himself to exercising only an occasional veto on purely military matters.[22]

Unselfishness by Halleck, initiative by Grant, and a sense of responsibility to a common cause by all those who served under them were instrumental in knitting together a successful military team. The role of personality in such a relationship and the understanding of human nature was finally recognized to be as important for victory as technical knowledge and military accomplishments.[23]

FOOTNOTES

1. Alexander H. Meneely, *The War Department, 1861* (New York: Columbia University Press, 1928), p. 322.

2. *Ibid.*, p. 374-377.

3. James G. Randall and David Donald, *The Civil War and Reconstruction* (Lexington, Mass.: Heath, 1969), p. 529-530. These figures are significant when compared with casualties on both sides: for the South, 258,000 dead and an uncertain number wounded; for the North, 360,222 dead and 275,175 wounded. Total casualties exceeded a half million: 12.4 percent of those engaged, 1.3 percent of the total population.

4. John F.C. Fuller, *The Conduct of War, 1789-1961* (New Brunswick, N.J.: Rutgers University Press, 1961), p. 103.

5. Allen Nevins, *The War for the Union, Vol. IV, The Organized War to Victory, 1864-1865* (New York: Scribner, 1971), p. 254. In 1865 the strengths of the armies were:

Union—960,000 (600,000 on duty)
South—358,000 (160,000 on duty)

6. R.F. Weigley, *Quartermaster General of the Union Army. A Biography of M.C. Meigs* (New York: Columbia University Press, 1956, 1959), p. 5.

7. Emory Upton, *The Military Policy of the United States* (Washington: U.S. Govt. Print. Off., 1912), v. XI.

8. John G. Moore, "Mobility and Strategy in the Civil War," *Military Affairs*, v. XXIV, pt. II, p. 73-77.

9. Weigley, p. 4-5.

10. Fred A. Shannon, *The Organization and Administration of the Union Army, 1861-1865* (Cleveland: Clark, 1928), v. I, p. 70. Army contractors handled about $1 billion during the war with considerable profiteering in the early years. The Commissary General of Subsistence spent $369,000,000 and the Ordnance Bureau $163,000,000.

11. Weigley, p. 316-317.

12. Randall, p. 327-328.

13. Shannon, p. 142 and fn. 302.

14. Charles B. Dew, *Ironmaker to the Confederacy, Joseph R. Anderson and the Tredegar Iron Works* (New Haven: Yale University Press, 1966), p. 320. In the fall of 1861, the Tredegar Company was rolling the armor plate for the *Merrimack,* producing naval guns, coast defense cannon, gun carriages, artillery projectiles, and light field artillery, p. 1.

15. *Ibid.,* p. vii.

16. Shannon, p. 71.

17. Randall, p. 353-354.

18. Robert P. Sharkey, *Money, Class and Party. An Economic Study of the Civil War and Reconstruction* (Baltimore: Johns Hopkins Press, 1959, 1967), p. 16. The author gives two reasons for successful money raising by the Treasury:

   a. the issuance of greenbacks created the purchasing power and the inflationary condition necessary to sell bonds at par.

   b. private banking interests created the marketing organization which appealed to prospective purchasers, small town bankers, and businessmen, rather than metropolitan capitalists on the grounds of patriotism rather than profit. (p. 298)

19. Randall, p. 517.

20. T.H. Williams, *Lincoln and His Generals* (New York: Knopf, 1952), p. 3, 7.

21. Warren W. Hassler, Jr., *Commanders of the Army of the Potomac* (Baton Rouge: Louisiana State University Press, 1962), p. 262-263.

22. Stephen E. Ambrose, *Halleck: Lincoln's Chief of Staff* (Baton Rouge: Louisiana State University Press, 1962), p. 195.

23. E.W. Sheppard, "Policy and Command in the American Civil War, 1864-1865," *Army Quarterly,* January 1939, p. 294.

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THE ROYAL NAVY'S DEFEAT OF THE FRENCH AT SEA
IN THE YEARS 1793-1815

by

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The British Navy defeated the French at sea in the years 1793 to 1815 because the British Navy had more ships, the crews were better trained, and officers were experienced, aggressive, and willing to engage the enemy. This will be developed further by a brief examination of factors such as strategy, tactics, and personnel.

Strategy. The French merchant fleet had carried approximately one-third of French commerce, but after war was declared on England the fleet remained in port. French colonies in the West Indies were of little commercial value because of local uprisings and anarchy during the preceding 4 years. Imports and exports, though not as vital to France as they were to England, were carried in neutral ships. Thus France, without important colonies and with no merchant fleet of her own to protect, adopted a strategy similar to what Corbett described as a "fleet in being," although it is debatable whether their ships remained "in active and vigorous life."[1] By avoiding contact with the British even when her fleet had a numerical advantage, the French Navy would serve as a continuing threat to the British.

It was taken for granted that French ships would remain in good condition in port while the British ships wore out at sea. French raiders were very active and threatened British commerce to the extent that the British Navy was forced to keep a large number of cruisers in and near the approaches to the English Channel.

British naval strategy, on the other hand, emphasized engaging the French at every opportunity, but for this strategy to succeed it was necessary to force the French to leave port. Attempts were made to blockade French ports, at times denying all access even to neutral shipping. The blockade was also imposed to limit French expansion by sea and to destroy forces which were intended for the invasion of England.

Tactics. The British were superior to the French in both seamanship and gunnery. Their tactics were based on an effective gun range of about 500 yards, the limited degree of train and elevation of guns, and slow speed and lack of ship maneuverability. Seamanship and gunnery were highly coordinated. In Mahan's words "the ship and its guns together formed one weapon, a moving battery which needed quick and delicate handling and accurate direction in all its parts."[2] The object was to maneuver the ship to bring all guns to bear and cause sufficient damage to force surrender or render defense useless and take the opponent by boarding. Explosive shot was not yet in use, and wooden ships normally could not be sunk by solid shot unless a secondary explosion could be triggered.

In single ship encounters, opponents of equal size and maneuverability generally fought beam to beam at close range where the outcome was decided by the accuracy and rate of gunfire. In this way the British frigate *Nymphe* captured the French *Cleopatre* in 1793. Captain Pellew wrote "we dished her up in fifty minutes, boarded and struck her colors."[3] When a ship had an advantage

in maneuverability, as did the frigate *Crescent* over the *Reunion*, an effective tactic was to maneuver under the adversary's stern, rake the length of the ship with broadsides, and damage the stern and rudder.

Even though ship for ship the British were superior to the French, the outcome of the war was not decided by single ship engagements. Sea battles between fleets offered a much larger margin of victory to the commander who could maneuver his ships to concentrate gunfire on a portion of the opposing fleet. Marcus, in *The Age of Nelson*, shows clearly that the French lost because the British outmaneuvered them.

To initiate an attack from windward was an advantage in terms of maneuverability. The commander on the windward side was in the better position to select both the point and time of engagement because range could be closed more expeditiously to leeward. This position was also preferred because the closing maneuver required little handling of sails and freed deckhands for gunnery duties. Ships in battle carried as little sail as the tactical situation permitted.

The disadvantage of the attack from windward in a stiff breeze was that the leeward gunports could not be opened because they shipped water. This precluded use of the heaviest guns which were mounted on the lowest deck.

While the French were reluctant to fight and were usually under orders to avoid battle if they could, the British were aggressive and, weather permitting, preferred to attack from windward. They attempted to cut the French line of battle, to subject their opponents to raking fire, and continue the battle from leeward. The leeward side not only insured that all guns could be fired but also put the British in a better position to board ships that drifted down on them when they themselves might be

position was preferred by the British because of a fundamental difference in British and French gunnery tactics. The British directed gunfire at French hulls where it dismounted guns and otherwise impaired the capability of French ships to return fire or defend themselves. The French gunners, on the other hand, were not only less accurate but also directed their fire at the superstructure in an attempt to dismast the British and limit their maneuverability. As a result the British had less damage and fewer casualties and were frequently able to board French ships after an engagement.

Ships and Armament. The capability of British and French ships, including guns, were about equal from the standpoint of design. The British may have had a small advantage in gunnery due to the introduction of the short-range carronade in 1779. Both countries had problems in maintaining the material condition of ships. The French Navy suffered from a shortage of naval stores because of the blockade. The British Navy, however, was subjected to heavy weather, wear, and a lack of upkeep because the ships were kept at sea. Nevertheless, the differences in ships, guns, and material condition, whatever they might have been, did not influence significantly the outcome of the war.

In February 1793 England had 400 ships, of which 115 were of the line. Eighty five to 90 of the latter were in good condition, but only 20 or so were in commission. By comparison, France had 246, of which 76 were of the line and 27 were in commission.[4] Thus France started the war with a Navy apparently one-half the size of England's, but by the end of the war England's fleet had grown to include 1,168 ships, of which 240 were of the line, while France had only 103 ships of the line and 157 frigates.

Officers. Conditions in France and England in regard to officers at the

outbreak of the war strongly favored the British. In England large numbers of capable officers who had fought in the American Revolution were ashore on half pay and eager to go to sea. By contrast, the French Navy lost most of its officer corps to emigration because of various actions taken by the revolutionary government. An ordinance in 1791 removed the distinction between the merchant marine and the navy. Jeanbon Saint-Andre, who had a fanatical hatred of the formerly aristocratic profession, was given the task in September 1793 of organizing a Republican navy. To fill the void left by the abolition of the aristocratic officer corps, the Minister of Marine was permitted in 1793 to fill flag and other officer positions without regard to existing laws and from any grade whatever. Patriotism was emphasized to the exclusion of training and experience.

In addition to harm which resulted from direct legislation of the revolutionary government, the government's failure to enforce discipline all but destroyed the French Navy. Nelson wrote to his wife from Leghorn in September 1793 that the crew of a French frigate "deposed their captain, made lieutenant of marines captain of the ship, the sergeant of marines lieutenant of marines and the former captain sergeant of marines."[5] Under conditions such as these, the few capable officers who were still in France refused to go to sea with inept patriots. Discipline declined even further due to the inability of inexperienced officers to maintain law and order. As matters became worse, town authorities were allowed to intervene on the behalf of discontented sailors. Mutinies were condoned, and officers were often beaten by unruly mobs, imprisoned or replaced by one of the mutineers.

When the Montagnards came into power, insubordination was outlawed by decree. Nevertheless, most of the displeasure of the committee with the

deplorable conditions in the navy fell on the admirals and captains. Many were relieved from command and some were executed.[6]

After changes in the policy and practices of the government regarding promotion and appointment of officers had taken their toll, the experience of French officers who participated in the first great sea battle of the war on 1 June 1794 is best shown by a comparison of the grades in which they had served 3 years earlier. The commander-in-chief, Admiral Joyeuse, had been a lieutenant; two other flag officers, one a lieutenant and the other a sublieutenant; of 25 captains, three had been lieutenants, 11 sublieutenants, nine captains and mates in merchant ships, one a seaman and another a boatswain.[7]

Numerous other examples could be cited to show the disparity in the experience of British and French officers early in the war, but it is even more significant that the gap widened as the war continued. The British officers sharpened their skills at sea while the French languished in port.

Seamen. The 1791 ordinance which abolished the aristocratic officer corps in the French Navy also disbanded the marine artillerists because they, like the officers, were viewed as an elite group. The revolutionary government was determined to eliminate class distinction and did not heed the warnings of French admirals that such action would put the navy at a serious disadvantage. Almost every engagement during the war proved the admirals' fears were well founded.

The French found it difficult to maintain the strength of the navy even though a large number of seamen must have been available from a merchant fleet which did not go to sea after war was declared on England. Inexperienced hands never received training because the French were reluctant to go to sea early in the war and were later pre-

vented from doing so because of the British blockade.

Contrasting to these debilitating measures taken by the French Government, the British sought to revitalize their declining fleet. In December 1792, only 6 weeks before the war, Parliament authorized an increase in naval strength from 16 to 24,000 men. Conditions in the navy at this time were bad. Peace since the American Revolution caused the military establishment to slacken, and because of waste and inefficiency the money available would support only a small navy.

The large merchant fleet was a source of experienced seamen and permitted the navy to expand rapidly. While merchant seamen forced into the navy objected strenuously because of the strict discipline and low pay, the navy nevertheless increased from 24,000 in 1793 to 120,000 in 1797, and to 140,000 by 1814. An approximate breakdown by category was: volunteers 15 percent, pressed men 50 percent, quota men (draftees) 12 percent, foreigners 15 percent, and boys 8 percent.[8] Some of the foreigners were later freed, but most were unable to obtain release.

Crews gathered from such sources led to what Admiral Collingwood called a "mass of mischief" capable of any crime and hence strict discipline was needed.[9] In many ships punishment was harsh and tyrannical. Cruises were long and shipboard life was unpleasant, hazardous, and unhealthy, and pay had not been increased since the mid-1600's. During the war over 100,000 seamen were lost: 84,000 to disease, 12,000 to shipwreck, and 6,000 in battle. Desertions during the war amounted to 113,000. The latter problem was so serious that when even in their home-ports, men were not normally allowed to visit their families. The mutinies of 1797 involved legitimate grievances. In spite of the deplorable conditions, however, the British Navy remained strong and effective in battle, a tribute to the leadership of her officers.

There were, in fact, a large and growing number of officers among both strong and lax disciplinarians who looked upon the health and well-being of their crews as a matter requiring their primary attention. Some rather remarkable results were obtained at a time when methods of sanitation, medicine, and food preservation were very elementary. Nelson, while on a cruise which lasted 2 years, during which time he did not leave his ship even to visit another, spoke with pride about the health of his crews. After he chased Villeneuve's fleet to the West Indies, he wrote "we have lost neither officer nor man to sickness since we left the Mediterranean," a period of 10 weeks.[10] The men in his ships numbered about 7,000. The French and Spanish were less fortunate during this cruise. Even though they had left port only a few weeks before, they lost at least a thousand men during their brief stay in the West Indies.

Summary. The extent of the defeat of the French in major battles is evident from the data below.[11]

French ship losses during the war were 377. Of these 238 were frigates of

	British			French			
Battle	Killed	Wounded	Total	Killed	Wounded	Captured	Total
1 June 1794	287	811	1,098	1,500	2,000	3,500	7,000
Cape St. Vincent	73	227	300	430	570	3,157	4,157
Camperdown 1797	203	622	825	540	620	3,775	4,935
The Nile 1798	218	677	895	1,400	600	3,225	5,225
Copenhagen 1801	253	688	941	790	910	2,000	3,700
Trafalgar 1805	449	1,241	1,690	4,408	2,545	7,000	13,953
TOTALS	1,483	4,266	5,749	9,068	7,245	22,657	38,970

50 guns or less, and 139 were of the line as follows:

No. of Ships Lost	Decks	Guns
9	3	100 or more
19	2	80
87	2	74
24	2	64

245 of the 377 ships lost by the French were eventually put into service by the British.

The British battle losses amounted to 10 ships: one 74 guns, one 50 guns, and eight frigates. To these must be added 84 which were wrecked, seven foundered, and 10 which burned or blew up, 101 in all.

In the absence of any technological superiority of the British ships and guns and given that material conditions were poor in both navies, ships of the same size had potentially the same capabilities. The British maintained a superiority in numbers of ships throughout the war, but inasmuch as their navy operated over a large area, they could not gain the advantages of concentrating their forces into large fleets without leaving some quarter without protection.

The success of the British Navy can be attributed to the naval strategy employed, the leadership of her officers, aggressiveness in battle, and the training of the crews in her ships. The French were reluctant to fight and their attitude was not without reason, in view of the lack of underway time and training. Additionally, the French Government, with concentration on the land war, neglected seapower and failed to appreciate its importance until it was needed. Napoleon, whose actions contributed to the defeat of the French Navy, was sarcastically critical of its performance against the British and summed up the matter with "the moral is to the material as three to one."[12]

FOOTNOTES

1. Sir Julian S. Corbett, *Some Principles of Maritime Strategy* (London: Longmans, Green, 1918), p. 191.

2. Alfred T. Mahan, *The Influence of Sea Power Upon the French Revolution* (Boston: Little, Brown, 1892), v. I, p. 39.

3. Geoffrey J. Marcus, *The Age of Nelson* (New York: Viking), p. 26.

4. Norman Gibbs and Christopher Lloyd, "Armed Forces and the Art of War," *The New Cambridge Modern History, Vol. IX, War and Peace in an Age of Upheaval, 1793-1830* (Cambridge, Eng.: University Press, 1957), p. 79.

5. *Ibid.*, p. 380.

6. Mahan, p. 63.

7. *Ibid.*, p. 57.

8. Gibbs and Lloyd, p. 85

9. Mahan, p. 71.

10. *Ibid.*

11. Michael A. Lewis, *A Social History of the Navy, 1793-1815* (London: Allan and Unwin, 1960), p. 346-362.

12. *Ibid.*, p. 389.

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