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The Constants of Naval Warfare

Frank Uhlig, Jr.

LET US CONSIDER A SUBJECT THAT not many people think about: the constants of naval warfare.

Here is how we will do it. First, we will run through some of the changes in naval technology from the days the United States was being born late in the eighteenth century to the end of the nineteenth, when it became a major player on the world scene. We will then make a brief foray into our own time.

Next, in order to lay down a base line, we will focus on what the fleet of the United States, and the fleets of its allies, did operationally in the wars during that long and eventful period. I will provide just enough examples to illustrate what was happening operationally. Neither strategy nor tactics will figure largely in this.

The busiest period that navies have ever experienced was that of the world wars in the twentieth century, when great fleets fought each other fiercely. We will skip almost all that. The reasons are, first, that so far as we can see into the future, wars of that size are not likely to come again. Second, nowadays only one country has a great fleet; for another country to engage in so long-lasting and expensive a venture as the creation of a fighting fleet powerful enough to rival it would be so threatening to other states that the cost of the venture would likely be much greater than any profits it might yield.

Still, wars are a permanent part of the scene, and the United States has had enough experience to know now that it will take part in some of them.

Adapted from remarks to the Logistical Task Force of the Naval Studies Board, delivered 19 May 1996.

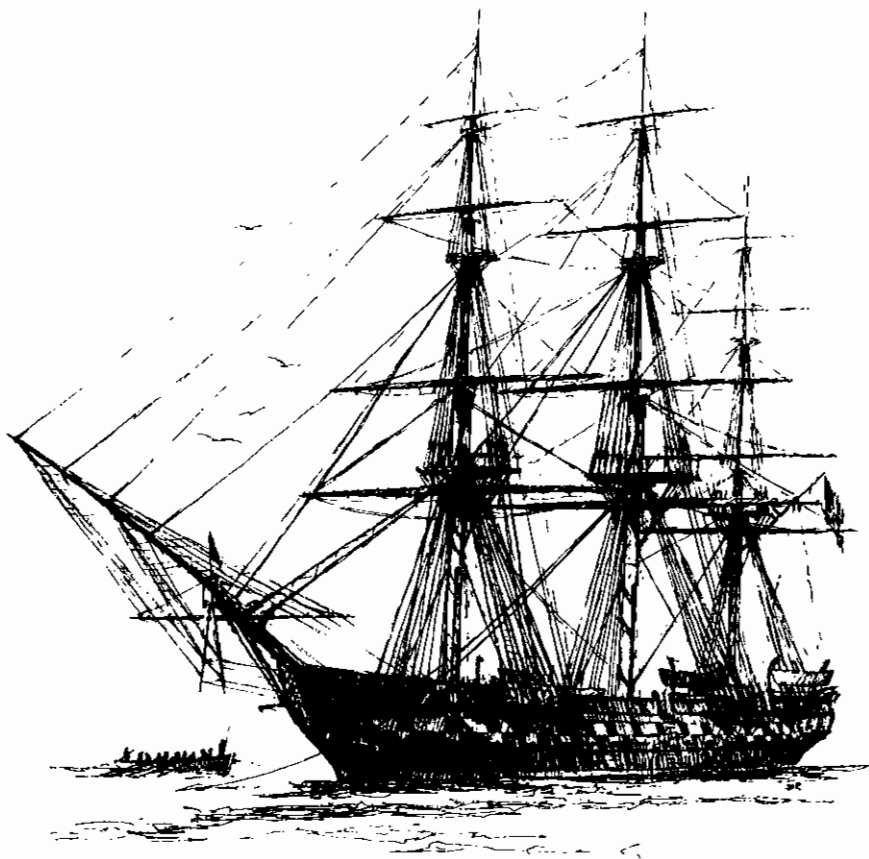
Frank Uhlig is a Sponsored Research Scholar of the Naval War College. For over twenty years he was an editor and senior editor at the U.S. Naval Institute, where he founded the annual *Naval Review*. In 1981 Professor Uhlig became the editor of the Naval War College Press (which produces this journal); he retired from that post in September 1993.

The tables are reproduced and adapted by permission from Professor Uhlig's *How Navies Fight: The U.S. Navy and Its Allies* (© 1994, Naval Institute Press). The drawing of USS *Columbia* is adapted by permission from a drawing of the "Improved 688" type by Jim Christley, in Norman Friedman's *U.S. Submarines since 1945* (Naval Institute Press, 1994). The drawing of USS *Oregon*, signed by Fred T. Jane, appeared in the first (1898) edition of his *All the World's Fighting Ships*.

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We will discuss the nation's operational experience, and that of some of its allies, since the disappearance of its last powerful naval enemy, the Imperial Japanese fleet, destroyed at Leyte Gulf in October 1944. There has been enough experience in naval warfare since then to support some reasonable conclusions about what navies do in war under these circumstances.

Finally, I will propose briefly one potential naval scenario, and what it is that the naval forces involved in it might reasonably expect to have to do.

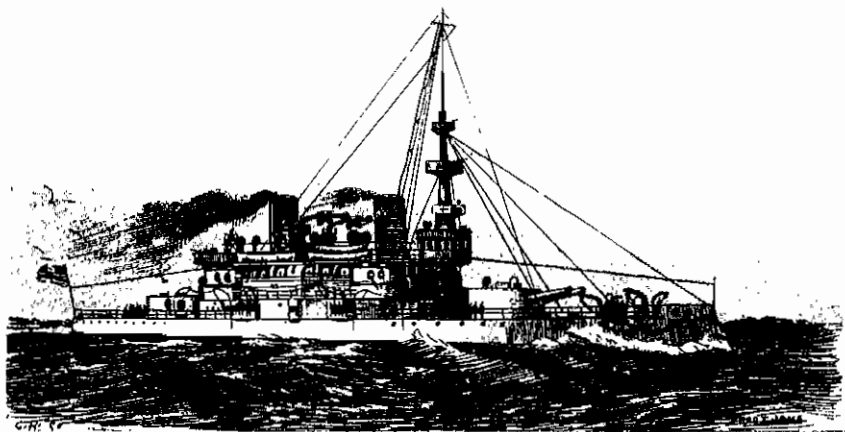


In the great days of sailing fleets—that is, late in the eighteenth and early in the nineteenth centuries—there were three main types of fighting ship. These were the ship of the line, the frigate, and the sloop of war. All were square-rigged, seagoing vessels. The ship of the line, or “line-of-battle ship,” would measure about two or three thousand tons and carry a battery of between sixty-four and 130 smooth-bore, muzzle-loading guns, of which the most important would be thirty-two-pounders—that is, they could fire a thirty-two-pound solid shot. The shot would carry for a mile or so; but if the opposing ships wished to be sure of

hitting and penetrating each other, they would have to get much closer than that. The rate of fire for a well served gun might be one round a minute.

Frigates, which served the purpose of large cruisers, were normally rated at about thirty or forty guns. Toward the end of the eighteenth century, their standard weapon was an eighteen-pounder. The American frigate *Constitution*, which soon will mark its two-hundredth birthday, was rated at forty-four guns, but seems always to have carried over fifty. The main battery consisted of twenty-four-pounders, with a number of short-range, low-velocity thirty-two-pound carronades on the spar, or weather, deck. Sloops of war, the equivalents of small cruisers, normally would carry up to two dozen six to twelve-pounders. Unlike the larger ships, many sloops were two-masted, and therefore (properly) brigs, rather than three-masted, and thereby "ships." Because they were cheap to build and operate, they were more common than either of the larger types of ship.

The *Constitution* was driven by the wind. The frigate sometimes could make twelve or thirteen knots, but it could only sail in those directions the wind allowed; without a wind the ship could not sail at all. An average speed of advance might be four knots, or a hundred miles in a day.

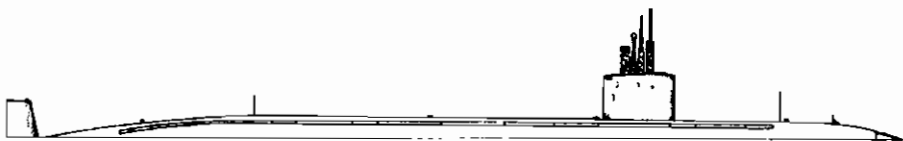


Next, consider the USS *Oregon*, a battleship commissioned in 1896, almost exactly a century after the *Constitution*. In no way does the *Oregon* resemble the *Constitution*. By the time that battleship came along, ships of the line, frigates, and sloops of war had all faded from the fighting fleets of the world. In 1896 the U.S. Navy consisted of battleships, armored cruisers, and protected cruisers; of gunboats, torpedo boats, and monitors; and of a ram and a dynamite cruiser as well.

The *Oregon* displaced over ten thousand tons. The ship's main battery consisted of four thirteen-inch guns, each able to fire a 1,100-pound explosive shell about four miles, though with no great accuracy. The rate of fire was one round every two or three minutes. The ship also carried an assortment of eight-inch

guns firing 250-pound shells, six-inchers firing hundred-pound shells, six-pounders, one-pounders, and machine guns. The *Oregon* even had some eighteen-inch torpedo tubes, for which it never found use.

Driven by coal-fired steam boilers powering reciprocating engines and twin screws, the ship was designed for 15.5 knots and could steam in any direction necessary. During the war with Spain in 1898 the *Oregon* made a fourteen-thousand-mile voyage from the West Coast through the Strait of Magellan to Florida at an average of 11.6 knots, counting only time underway. But, unlike a sailing ship, if a steam-powered ship failed to enter port and refuel it would become helpless and useless. In the cruise to Florida the *Oregon* made three coaling stops. In 1898, refueling at sea could be done, but it was not a practical matter. For coal burners it seldom was.



Now let us turn to a new ship, the submarine USS *Columbia*, commissioned in 1995, almost a hundred years after the *Oregon*. In no way does the *Columbia* resemble either the *Constitution* or the *Oregon*. The attack submarine has joined a fleet that includes a wide variety of ships, but it is a fleet without any battleships, armored cruisers, or protected cruisers. Neither are there any gunboats, torpedo boats, or monitors, and not a single ram or dynamite cruiser. This ship's battery includes twenty-one-inch torpedoes that can home in on a ship ten or twenty miles away and strike a deadly blow, as well as Tomahawk missiles capable of delivering with great accuracy a thousand-pound warhead on an object ashore hundreds of miles distant. The *Columbia* is able to steam about twice as fast as the *Oregon* could on a good day, and do it for tens of thousands of miles at a stretch. And this ship will do these things while submerged, invisible to eye, to space-based camera, or to radar, and inaudible to all but the most sensitive and most fortunately placed of sonars.

* * *

With such vast changes in the instruments of naval warfare, how dare we seek out "constants"?

We dare because, even before we can be sure if they have ever existed, it seems useful to find out if they have. If they did ever exist, and were true constants, then they still do. If so, they can be guides for thought on the future uses and the future shapes of navies. But they will be guides only to those who know about them.

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Constants do exist.

In fact, despite the variety of wars that navies have fought in the last two centuries and the vast changes in their instruments, there is a remarkable constancy in how they go about their business. The ways of naval warfare that have shown themselves to be most robust, most resilient, are five in number:

- The strategic movement of troops (and now, of armies and air forces alike);
- The acquisition of advanced bases as close as possible to the scene of action, by either military force or civil means;
- The landing of armies on a hostile shore and their support then and thereafter by means of fire and logistics;
- The blockade; and,
- The struggle for mastery of the local sea.

The two tables show all the wars the U.S. Navy and its allies have fought, from the first in 1775 to the most recent, in 1991. They also show all the different ways the fleets fought in those wars, such as commerce raiding, moving armies across the seas, and so forth. Table 1 shows not only all the wars (across the top) but also all the ways of fighting that showed themselves in the first century or so. Table 2 shows those ways of fighting that revealed themselves only in this century. The heavy black squares symbolize important activities with important results; empty white blocks denote the absence of activity. All other symbols mean something in between, with tall up-arrows meaning a good result for not too much effort, and short down-arrows meaning quite the opposite.

Now mentally let us remove most of that busy middle section on our first table. It shows all the intense activity in this century's world wars, and, as we said, we are not going to consider a new world war. That leaves us, on the left, with the wars from the American Revolution, a six-year struggle beginning in 1775, to the Spanish-American War, a hundred-day affair in 1898. On the right we see those wars beginning with the last ten months of the struggle in the Pacific, when the Japanese had almost no fleet with which to fight, right through the seven-month DESERT SHIELD and DESERT STORM, where the enemy had even less of a fleet.

Where we find heavy black boxes and up-arrows is where the useful action is. Those horizontal columns in which you find them concentrated are where the constants lie.

* * *

Let us take some examples. We will start with the French Navy in the American Revolution, from 1778 to 1781. This was a sailing ship navy. What did it do for the colonists? The first thing was to escort an army under General (and Count) Rochambeau safely across the Atlantic from France to Newport, Rhode Island, in 1780. But mainly this fleet's achievements centered on its work under the

Table 1

	CONTINENTAL NAVY, 1775-1783	FRENCH NAVY, 1778-1783	QUAS-AND BARBARY WARS, 1798-1805	WAR OF 1812, 1812-1815	MEXICAN WAR, 1846-1848	CIVIL WAR AT SEA, 1861-1865	CIVIL WAR ON THE RIVERS, 1861-1865	SPANISH-AMERICAN WAR, 1898	WORLD WAR I, ALLIED NAVIES, 1914-1917	WORLD WAR I, U.S. NAVY, 1917-1918	WORLD WAR I, ALLIED NAVIES, 1939-1941	WORLD WAR I, U.S. NAVY, ATLANTIC AND MEDITERRANEAN, 1941-1945	WORLD WAR II, PACIFIC, DECEMBER 1941-FEBRUARY 1942	WORLD WAR II, PACIFIC, FEBRUARY 1942-OCTOBER 1944	WORLD WAR II, PACIFIC, OCTOBER 1944-AUGUST 1945	KOREAN WAR, 1950-1953	VIETNAM WAR, 1964-1975	LEVANTINE WAR ISRAELI NAVY, 1973	LEVANTINE WAR U.S. NAVY, 1973	SOUTH ATLANTIC WAR, 1982	PERSIAN GULF CRUISE WAR, 1981-1988	PERSIAN GULF WAR, 1990-1991
1. COMMERCE RAIDS				↓																		
2. STRATEGIC MOVEMENTS OF AN ARMY	×	×	×	↑	↑	↑											↑	↑	↑			↑
3. ASSAULT LANDINGS																						
4. AMPHIBIOUS LANDINGS	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
5. RAIDS			↑																			↑
6. FLEET IN BEING	↑																					
7. PROTECTION OF CITIES	×			↓																		
8. ATTEMPTS TO CAPTURE ENEMY HELD CITIES				↑																		
9. CUTTING OF ENEMY LINES OF COMMUNICATION (MILITARY BLOCKADE)	↑	×	×	↑	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	↑
10. ATTEMPTS TO GAIN LOCAL MASTERY OF THE SEA	↑		↑						↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
11. CRUISES AGAINST ENEMY RAIDERS			×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
12. PROTECTION OF SHIPPING			×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
13. ACQUISITION OR SEIZURE OF ADVANCED BASES			↑	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	↑
14. BLOCKADES			×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
15. BOMBARDMENT OF FORTIFIED CITIES			↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
16. LOGISTICAL SUPPORT OF TROOPS																						↑
17. FIRE SUPPORT OF TROOPS																						↑
18. FORT FIGHTING																						↑
19. SUPPORT OF ISOLATED POSITIONS																						↑
20. TACTICAL MOVEMENTS OF TROOPS																						↑
21. SCOUTING																						
22. CUTTING OR INTERCEPTING OF VERBAL COMMUNICATIONS																						?
23. SEIZURE OF ISOLATED POSITIONS																						?
24. TACTICAL DEMONSTRATIONS																						?
25. STRATEGIC DEMONSTRATIONS																						?

-  IMPORTANT ACTIVITY, IMPORTANT RESULT
-  NO ACTIVITY
-  MINOR ACTIVITY, MINOR RESULT
-  GOOD RESULT FOR THE EFFORT
-  MID-LEVEL ACTIVITY, MID-LEVEL RESULT
-  POOR RESULT FOR THE EFFORT
-  ? INFORMATION STILL CLASSIFIED

Table 2

	WORLD WAR I, ALLIED NAVIES, 1914-1917	WORLD WAR I, U.S. NAVY, 1917-1918	WORLD WAR II, ALLIED NAVIES, 1939-1941	WORLD WAR II, U.S. NAVY ATLANTIC AND MEDITERRANEAN, 1941-1945	WORLD WAR II, PACIFIC, DECEMBER 1941-FEBRUARY 1943	WORLD WAR II, PACIFIC, FEBRUARY 1943-OCTOBER 1944	WORLD WAR II, PACIFIC, OCTOBER 1944-AUGUST 1945	KOREAN WAR, 1950-1953	VIETNAM WAR, 1964-1975	LEVANTINE WAR, ISRAELI NAVY, 1973	LEVANTINE WAR, U.S. NAVY, 1973	SOUTH ATLANTIC WAR, 1982	PERSIAN GULF CRUISE WAR, 1987-1988	PERSIAN GULF WAR, 1990-1991
26. FORTRESS FLEET	■	■												
27. EVACUATION OF ENDANGERED TROOPS	■	■						■						
28. PROTECTION OF MILITARY POSITIONS	■	■						■						
29. SEEKING, MAINTAINING, OR REGAINING OF GENERAL MASTERY OF THE SEA	■	■	■	■	■	■	■							
30. RESCUE OF FRIENDLY GOVERNMENTS					×									
31. RESCUE OF CIVILIANS			×	×	×									
32. ATTACK ON ENEMY'S DOMESTIC SHIPPING			×	×	×									
33. DENIAL OF ENEMY USE OF PORTS			×	×	×									
34. EFFORT TO FRUSTRATE INVADERS					■			▲		▲				
35. PORT SALVAGE AND REPAIR				×	■					▲				
36. FLAG-SHOWING				×									×	
37. GAINING LOCAL AIR MASTERY				×						■				
38. RESCUE OF KEY INDIVIDUALS				▲						■				
39. RESCUE OF DOWNED AVIATORS										■				
40. SUPPORT OF AIR FORCE OPERATION						■	■	■	■	■				
41. AIR SUPPORT OF ARMY						■	■	■	■	■			×	
42. ATTACK ON ENEMY INDUSTRIAL SITES								■	■	■			×	
43. TAKE PART IN AIR OPERATION								■	■					■

- IMPORTANT ACTIVITY, IMPORTANT RESULT
- NO ACTIVITY
- × MINOR ACTIVITY, MINOR RESULT
- ▲ GOOD RESULT FOR THE EFFORT
- ◆ MID-LEVEL ACTIVITY, MID-LEVEL RESULT
- ▼ POOR RESULT FOR THE EFFORT
- ? INFORMATION STILL CLASSIFIED

command of Admiral (and, again, Count) de Grasse in the late summer and early autumn of 1781.

After a long, hard campaign in the southern colonies Lord Charles Cornwallis had brought his British troops—they were half the army Britain had in North America—to what, so Cornwallis thought, was the safety of a deep-water port on the Chesapeake, at Yorktown, Virginia. There the British fleet could either resupply and reinforce his troops or rescue them from more powerful enemies. A small American force under European commanders, the Marquis de Lafayette and Baron von Steuben, kept watch on Cornwallis's army.

Beginning in August 1781, Rochambeau's French army joined Washington's Americans just above New York City, which the British had held since 1776. Together the French and Americans marched south to Yorktown, while Admiral de Grasse sailed north from the Caribbean; their joint purpose was to besiege and blockade Cornwallis's force. In support of that aim another French admiral, the Count de Barras, sailed his squadron from Newport toward the Chesapeake, escorting the French army's siege guns and supplies. Because he was well informed of Barras's movement, the British admiral, Thomas Graves, also sailed for the Chesapeake from New York, intent on capturing that convoy.

Instead, what Graves met when he reached the Chesapeake was de Grasse's fleet, one more powerful than his own. Then, while de Grasse and Graves sailed south in the course of a long battle, Barras's convoy slipped in behind them and delivered its cargo to the care of Lafayette. Having failed, Graves's battered fleet returned to New York for repairs, while de Grasse's ships returned to the Chesapeake for the same purpose. De Grasse sent Barras's now empty transports to the head of the Chesapeake to carry the allied armies the rest of the way to Yorktown. Cornwallis, besieged, bombarded, and attacked by the allied armies on his front, and blockaded on his rear by de Grasse's fleet, held out for six weeks, and then surrendered. The next step was peace and the independence of the United States.

What do we see here? We see the strategic movement of an army by sea, first from France to Newport, next of that army's guns and supplies from Newport to Yorktown, and finally of the army itself, once again, from the Elk and Severn rivers to Yorktown. When Graves's fleet tried both to interfere with this great strategic concentration and to reopen Cornwallis's line of communication to New York, we see de Grasse's fleet simultaneously gaining local mastery of the sea by its victory over Graves and cutting that line of communication to Cornwallis's only source of help.

Now let us move on for a century and more, to the steam and steel fleets of 1898.

When war with Spain began that spring, Commodore George Dewey's half dozen small cruisers and gunboats sailed the six hundred miles from Hong Kong

to Manila Bay, where they sank a Spanish squadron huddled under the guns at Cavite. Thus the Spanish army on Luzon that was fighting to keep the Philippines under Spanish rule suffered the same fate that Cornwallis's army had at Yorktown, for Dewey had isolated that army from any help. Once they knew that the Spanish squadron was sunk, the Americans dispatched an army of their own from California. That army landed on the shores of Manila Bay and helped the Filipino patriots besiege the Spanish army in Manila. With his victory at Manila Bay, Dewey achieved another purpose important to him: when the war began, he had had no base of his own, but now he had acquired one, by seizing the enemy's navy yard at Cavite.

At the same time, another Spanish naval force, four cruisers and a pair of destroyers sent from the homeland to the Caribbean, took refuge at Santiago, a small port on Cuba's southeastern coast. Commanded by Admiral William T. Sampson, the American North Atlantic Squadron was unable either to entice the Spaniards at Santiago into battle at sea or to seal them in port by sinking a ship across the channel. So, escorted by elements of the fleet, an armada of transports carried seventeen thousand American troops from Tampa, Florida, to Daiquiri, Cuba, just east of Santiago. There they made an amphibious landing and besieged the Spaniards in Santiago. Again, the situation resembled that at Yorktown. But in 1898 warships needed coal, and coal could only be moved safely and reliably from colliers to combatants in calm, sheltered waters. So Sampson landed a Marine battalion at Guantanamo Bay, forty miles east of Santiago, and thus gained such a site, safe from interference by Spanish troops nearby.

Besieged by the U.S. Army, the Spanish ships at Santiago sailed, seeking safety in flight. Instead, they met destruction in battle with Sampson's North Atlantic Squadron. The *Oregon* was the most outstanding performer in Sampson's command.

A large Spanish army still garrisoned Cuba. But, like that of Cornwallis at Yorktown and the other Spanish army at Manila, it was blockaded and thus isolated from all help from across the sea. Surrender soon came and, not long after that, the end of the war.

What do we see here in 1898? We see the strategic movement of U.S. armies, both from California to the Philippines and from Florida to Cuba. We see amphibious landings on hostile shores both at Manila Bay and Daiquiri; we see blockade in the Philippines and on the coast of Cuba; and we see the acquisition of advanced bases at Cavite and Guantanamo Bay. What we do not see is a struggle for mastery of the sea, for both Spanish admirals had conceded that mastery to the Americans even before the war had begun.

Nearly half a century later, in the final months of 1944 and the first few of 1945, we see two U.S. fleets that are centered neither on battleships nor protected cruisers but (in one case) on carriers and (in the other) on amphibious ships. Only

a few remnants remained of the once-powerful Japanese fleet. Now one of the American fleets, protected by the other, was landing an army at Lingayen Gulf on Luzon in the Philippines. The Japanese had a powerful army on Luzon; but just as Cornwallis had been in 1781 and the Spaniards in 1898, that army was cut off from either reinforcement or rescue—both by submarines and by other U.S. warships between them and their only source of help, in Japan. There were two main differences, however, from earlier times. One was that the Japanese army, trapped though it was, would not surrender. It struggled until it perished. The other was that while Japan had hardly any fighting ships left, it had plenty of combat airplanes. No longer possessing the skill to fight the U.S. Navy in conventional fashion, its pilots turned themselves into a form of guided missile and flew their bomb and gasoline-laden aircraft in suicide attacks into the American warships. As it turned out, the Japanese conducted this form of war against the American fleet for nine months. But the Americans kept moving ever closer to Japan.

What we see here are the strategic movement of U.S. armies, the landing of those armies on a hostile shore, and the blockade of the isolated enemy army on that shore. We also see an unexpected struggle for mastery of the local sea between a normal fleet of its time, which had just triumphed over its enemy, and a new, unforeseen, and very powerful foe attacking from ashore—the kamikazes.

Had the kamikazes won, the U.S. blockade of Japan as well as that of Luzon probably would have held anyway, for the kamikazes had no way of finding, much less harming, the U.S. submarines that were the main instrument of blockade. But if the surface warships had been driven away from Luzon, the merchant ships supporting the American army on that island would also have been driven away. The Americans would have had either to evacuate their army, in a bloody affair reminiscent of the British navy's evacuation of its country's army from Crete in 1941, or to leave it there to fend for itself on that distant, hostile shore, just as had occurred in that very same place, with the same general, in 1942.

The struggle between the ships of the U.S. Pacific Fleet and Japan's shore-based kamikazes was the first that characterizes our own times: the struggle, to use a phrase given us by the late Soviet Admiral Sergei Gorshkov, of a "fleet against the shore."

How has the naval side of these modern wars developed? We will look in detail at just one more of these, a war of which most people do not even know that there *was* a naval side. This was the Levantine War of October 1973, which not only involved the forces of Syria and Egypt against those of Israel but also came close to drawing in the forces of the Soviet Union and the United States against each other.

Our picture of that war is of armies breaking across the unusable Suez Canal, of huge armored formations clashing bloodily in the Sinai Desert, of Soviet-made

Egyptian surface-to-air missiles (SAMs) downing scores of American-made Israeli jet aircraft, and of the threat of nuclear weapons. That is an accurate picture, but it is not a complete one.

On the war's first night, five of Israel's new missile boats sailed north and sank three of Syria's nine Soviet-built missile boats. Two nights later, six Israeli boats sailed in a southwesterly direction and, encountering four Egyptian missile boats, sank three of them. Just as with the ironclads USS *Monitor* and CSS *Virginia* in 1862, those battles attracted attention, for they were the first ever between missile-armed opponents. Our purpose here, however, is to find out what these little sea battles meant to the course of the war: what they meant was that Israeli coastal cities were free from bombardment by enemy boats, while Syria's were not; and that ships filled with the goods of peace and war could safely unload in Israel's harbor of Haifa, while similarly laden ships could not do the same in Syria's ports. Taking advantage of these successes, Israeli boats then sank several neutral freighters, including one belonging to the Soviet Union, in Syrian ports. When an old Egyptian destroyer began hunting Israeli-bound shipping near the Strait of Messina, a report that a pair of the Israeli missile boats were hunting for her persuaded the essentially defenseless Egyptian ship to leave.

As a result of these encounters, merchant shipping, which at the beginning of the war had stopped flowing to Haifa, resumed, according to one Israeli journalist, "when it became evident that the Arab surface vessels were bottled up. . . . As the war stretched into its third week the seaborne cargo, including tanks, artillery shells, and other armaments, became increasingly vital to Israel's staying power. . . . During the three weeks of the war, more than a hundred merchant ships entered and left Haifa harbor."

The most important thing we see here is a successful struggle on the part of the Israeli navy for the mastery of the local sea, with as its essential results that friendly shipping could flow and that hostile shipping could not. It is worth noting that during the same period, far away where the Red Sea meets the Indian Ocean, a couple of Egyptian destroyers were engaged in a successful blockade of their own, cutting Israel's supply of oil from Iran.

The big fleets of the great powers were engaged in this struggle, too, and in novel ways. The U.S. Sixth Fleet strung itself out in a long column from just east of Spain to just south of Cyprus. It did so in order to provide navigational, refueling, and rescue services to U.S. pilots flying supply and replacement aircraft to Israel, as well as to provide a measure of defense against interdiction originating in North Africa. Two carriers provided tanker support for the overflying F-4 fighters and A-4 attack aircraft, and the third made room for the small A-4s on the flight deck overnight. When Washington sensed that the Soviets might be

* Abraham Rabinovitch, *The Boats of Cherbourg* (New York: Henry Holt, 1988), pp. 297-8.

preparing to airlift a division of their own troops to Egypt, the scattered carriers were swiftly concentrated south of Crete. There they were positioned to be able both to protect Israel-bound shipping and air flights and to destroy Soviet shipping and air flights bound for Egypt.

The Soviet fleet in turn concentrated within fighting range of the U.S. carriers and moved SAM ships to where they could provide defense to air transports bound for Egypt. Fortunately, the war ended before either side could take any further steps.

Much as did the small navies of Israel and Egypt, what we see the big navies doing here is preparing themselves to attack hostile traffic and to protect friendly traffic. What is new here is that this traffic included not only ships but also aircraft flying over the sea.

Nine years later, in 1982, in the seventy-five-day Falklands War between Britain and Argentina, the latter's transport aircraft became targets of the British blockading task force. As it turned out, no British weapon managed to shoot down any Argentine transport, except for one acting as a scout. But by making plain its intentions, and by using its ships' small 114-millimeter guns against the airstrip at Port Stanley and against any aircraft that might be on that strip, the Royal Navy managed to reduce the number of Argentine supply flights into Port Stanley from five hundred in April, before the British task force arrived, to only thirty-three for the remaining six weeks of the war.

In this war, among other things the British navy also engaged in the strategic movement of both troops and their armament (using not only amphibious ships but also swiftly requisitioned commercial shipping); in the acquisition of an advanced base (by retaking South Georgia early on); in the landing first of an army on a hostile shore (at San Carlos Bay) and then in the support thereafter of the troops with fire and logistics; in the blockade (using submarines, aircraft, and surface ships) against both enemy supply ships and airplanes; and in the struggle for mastery of the local sea (mainly by carrier-based aircraft defending the amphibious force against Argentina's shore-based naval and air force aircraft).

* * *

In general, the foregoing makes plain that while naval ships, armament, and equipment never stay the same, naval tasks seem ever to remain the same.

What about the future? Is it likely to resemble DESERT STORM, with the Navy serving chiefly as an adjunct to the Air Force? If a situation such as that in the Kuwaiti desert rises again, the answer is probably yes. But there are plenty of other possibilities.

Let us look for a moment at what might happen should incompetence and ill fortune turn the long-standing dispute between China and Taiwan into a military

confrontation. What must China then try to do? It might try to blockade Taiwan. That is a good thing to do, but by itself a naval blockade never proves to be enough. It could attack the population with bombs or missiles; but bombing serves mainly to turn those on the receiving end into determined foes. Only an invasion offers the possibility of a decision by military means. An invasion of Taiwan must be carried out by sea. That requires China to have both an amphibious force and a landing force large and skillful enough to make a lodgement strong enough to seize both a seaport and some airports through which other forces can enter the invaded land and complete the destruction of its distinctive existence. Attack by bombs or missiles (on Taiwanese military headquarters, bases, and forces; on roads, railroads, and bridges; and on seaports and airports) and actions to establish mastery of the sea about the island (so neither ships nor aircraft friendly to the islanders' cause can either enter or leave its ports and fields) may both be essential preliminaries. In no way is China prepared to do any of these things. But since we are merely hypothesizing, we need not confine our thoughts to the immediate future.*

In a case such as I hypothesize, what would Taiwan (and perhaps any friends it possessed) need to be able to do? Foremost, of course, would be to forestall or foil an invasion. That would require means for discovering the timing, nature, size, departure areas, and objective areas of the invading force. It would require forces based ashore, aloft, or afloat able—while fending off the enemy's own naval and air elements—to attack the invading army before and while it gathered at its embarkation points, while it was afloat, and—if it got that far—at the intended amphibious objective areas and landing zones.

It would also require the ability to assure the safe and timely arrival in Taiwan of shipping and aircraft filled with arms, supplies, and perhaps reinforcements. Therefore, it would also require that seaports, airports, and other essential services be defended against attack by aircraft, cruise missiles, or ballistic missiles, all of which may bear warheads of the most terrible nature. It probably would require the ability to keep open the channels into Taiwan's very few ports, to repair essential shoreside establishments and equipment, and to salvage damaged ships, in particular any that might have been sunk in one of the channels. At some early point it would almost certainly require the ability, probably under intense fire, either to withdraw the garrisons on Quemoy and Taiwan's other offshore islands or to reinforce and resupply them indefinitely. It might require as well the ability to blockade effectively the flow of commercial shipping into and out of China's big civil ports.

* For a fairly recent article on both China's current military capabilities and thoughts on subduing Taiwan without invasion (or American intervention), see Patrick E. Tyler, "China's Military Stumbles Even As Its Power Grows," *New York Times*, 2 December 1996, p. 1.

In this discussion of an imaginary struggle, we have, purposely, not focused on particular platforms, weapons, sensors, or communications systems. We have focused on the kinds of tasks that likely would need to be done by somebody's armed force—and especially somebody's navy—if a situation such as we have described ever came to pass. Perhaps Taiwan is not the right example; but such tasks are the right things for us to keep in the back of our minds when we think about how to shape, train, equip, and supply the U.S. Navy in the future. These considerations should be, not a highly visible part of the nation's high-technology naval structure, but the almost invisible foundation upon which that great edifice rests.

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