

Naval War College Review

Volume 55
Number 1 *Winter*

Article 4

2002

Naval Power for a New American Century

Roger W. Barnett

Follow this and additional works at: <https://digital-commons.usnwc.edu/nwc-review>

Recommended Citation

Barnett, Roger W. (2002) "Naval Power for a New American Century," *Naval War College Review*: Vol. 55 : No. 1 , Article 4.
Available at: <https://digital-commons.usnwc.edu/nwc-review/vol55/iss1/4>

This Article is brought to you for free and open access by the Journals at U.S. Naval War College Digital Commons. It has been accepted for inclusion in Naval War College Review by an authorized editor of U.S. Naval War College Digital Commons. For more information, please contact repository.inquiries@usnwc.edu.

NAVAL POWER FOR A NEW AMERICAN CENTURY

Roger W. Barnett

The vicious, unprecedented attacks on the United States on 11 September 2001 by terrorist extremists served to bring into sharp focus two important new factors on the global security scene. First, the United States experienced a sudden, shocking loss of homeland sanctuary. Sanctuary is another way of portraying what is usually referred to as national security. Sanctuary is the place where one feels secure. The central objective of security policy, and the reason for laws and their enforcers, is to allow citizens to enjoy their freedoms within the security of a sanctuary.

Sanctuary is not confined to fixed locations; for example, it follows U.S. citizens and armed forces wherever they go. The bombings of the U.S. Marine barracks in Beirut in 1983, the U.S. Air Force barracks at Khobar Towers in Saudi Arabia in 1996, U.S. embassies in Kenya and Tanzania in 1998, and the USS *Cole* in 2000 violated the sanctuary the United States normally provides over its federal employees and military forces worldwide. Any or all of these events might have been labeled an “act of war,” but since “act of war” is not a defined term of art but a political concept, politicians opted not to proceed down the path that leads to a declared war. Those brutal attacks, moreover, were directed against

Dr. Barnett is professor emeritus at the Naval War College, where until September 2001 he held the Jerry O. Tuttle Military Chair of Information Operations. Retired from the U.S. Navy in the grade of captain, Dr. Barnett was a member of the U.S. delegation to the strategic arms talks with the Soviet Union in 1970–71. From 1983 to 1984 he led the Strategic Concepts Branch of the office of the Chief of Naval Operations.

U.S. government employees who were at the time within another state's sovereign territorial responsibility. The 11 September attacks differed in two key aspects: they indiscriminately targeted civilians, and those civilians were located within the U.S. homeland.

The second factor was the demonstration of the devolution of control of very powerful weapons to individuals who were not associated directly with national

© 2002 by Roger W. Barnett
Naval War College Review, Winter 2002, Vol. LV, No. 1

governments. Heretofore, with only a few exceptions, weapons of mass destruction (WMD) have been exclusively under the control of governmental leaders. On 11 September, as it has been since, it was demonstrated that traditional WMD (biologicals) and other weapons of mass destruction (large civil airliners loaded with fuel) can be employed by other than central governments.

The placement of WMD into the hands of terrorists rather than governments has momentous security policy implications for all states. Most important, reliance on deterrence will necessarily have to be supplanted by reliance on protection in the form of active and passive defenses. Reestablishing sanctuary for U.S. citizens will require new emphasis on homeland security, an office with that vital responsibility having been established by President G. W. Bush only ten days after the 11 September attacks.

This change in U.S. core security objectives will be accompanied by an extension of the U.S. commitment to global security and political stability. There will continue to be objectives to be served and tasks to be accomplished beyond the purely defensive ones dictated by increased homeland security emphasis. For the most part, these international tasks will involve assisting friends to shore up their homeland sanctuaries, and penetrating the sanctuary that adversaries seek from U.S. military operations. Past objectives centering on preventing or defeating territorial aggression will be replaced by expeditionary operations to deny sanctuary to those who would harm the United States or its vital interests. That was what the operations against the Taliban and al-Qaida in Afghanistan were all about.

These new core security objectives—underwriting homeland sanctuary, helping others to create and sustain sanctuaries, and preventing successful use of sanctuary by adversaries—will have a powerful impact on the ways and means to fulfill them. Those ways and means will come burdened by their own set of associated risks.

When the decision is made to use or threaten the use of military force in pursuit of strategic goals, *doctrines* and *strategies* define the ways, and *military* forces the means. *Risks* articulate the closeness or lack of fit between ends, ways, and means. If the ends sought are too ambitious for the means available, or if the ways necessary to attain them involve the possibility of significant loss for marginal gain, the ends, ways, and means are not in harmony, and the risks must be assessed as high. Sometimes high risks must be accepted, but often decision makers have a poor understanding of the magnitude of the risks or of the consequences of the actions they are contemplating. In the framework of these relationships, this article will discuss the available ways in which naval power can contribute to the accomplishment of the new strategic ends, the naval means to

effect the strategies, and the kinds of risks that will have to be accommodated. It will be argued that the U.S. Navy's participation in the ways to accomplish the ends sought are, in fact, limited in number, and that if sufficient resources are not forthcoming to undergird the optimal strategy, high risks will ensue.

WAYS

Doctrines and *strategies* comprise the ways, the "hows," by which military force is employed or threatened. They are closely related. Doctrine says, in essence, "All things being equal, this is how we would prefer to operate"; however, it is unspecific as to time, place, or adversary. Strategies, in contrast, recognize the key factors that are never "equal." Strategies deal with concrete opponents in particular places at specific times. How one operates, doctrinally or strategically, has but two operational components: offense and defense. These are tightly interwoven, and because they cannot be entirely separated, they also cannot be prioritized. In order to succeed, a military force must be able to operate on both the offensive and defensive, concurrently and well.

All this is little more than a truism, yet it exposes the conceptual shallowness of the approach of the Joint Chiefs of Staff documents *Joint Vision 2010* and, more recently, *Joint Vision 2020*. Those documents set forth four operational concepts: dominant maneuver, full-dimensional protection, precision engagement, and focused logistics. In that sense they represent little more than a restatement of the eternal verity noted earlier—ways for the application of military force consist of offense (precision engagement) and defense (full-dimensional protection). Support (focused logistics) and maneuver (dominant maneuver), however, are misplaced in this conceptual framework; neither support nor maneuver is ever undertaken for its own sake but only in order to optimize offense or defense.

Maneuver in itself makes no independent contribution to success. It is maneuver combined with attack or the threat of attack or maneuver, combined with defense, that works to produce the desired effect. While Muhammad Ali characterized his fighting style as "Float like a butterfly, sting like a bee," a perceptive defense analyst, probably Edward Luttwak, observed that the results of maneuver might well be, "Float like a butterfly, sting like a *butterfly*." It is not the "float" that makes the difference but the "sting." No choice can be made between maneuver and "fires" (broadly, campaign-level attacks); they are not binary opposites. Because maneuver is *relational*, one maneuvers for the purpose of rendering the offense, the defense, or both, more effective.¹ Similarly, support provides logistical depth to the offense or the defense. One is left with the straightforward understanding that warfare, the application of military force, is composed of offense and defense enhanced by maneuver and support. This is

not very satisfying. One must delve, therefore, in greater detail into the levels of warfare at which specific approaches can be identified.

STRATEGIES FOR THE EMPLOYMENT OF NAVAL FORCES

With regard to the employment of naval power, six discrete strategies have historically been adopted by states: fleet battle, blockade, commerce raiding, fleet-in-being, coastal defense, and maritime power projection.²

Each of these strategy choices involves a different blend of offense and defense, underwritten in various degrees by maneuver and support. Moreover, as often as not, the strategies are not pursued separately but combined or pursued sequentially—sometimes even concurrently—during the course of a conflict. States with large, powerful navies have typically opted for the more offensively oriented battle, blockade, and power projection, while states less well endowed with naval power have selected one or more of the remaining three.

The contributions that naval forces make to the overall military strategies of the states they serve have value only insofar as they can influence political processes, which invariably take place on land. To sink an enemy fleet in isolation from an effect ashore—even a long-term, indirect effect—is to have accomplished nothing. Blockades that fail to alter policy are impotent. Power projection that does not succeed in deflecting the actions or intentions of an adversary is squandered.

Historically, belligerents had difficulty in directly attacking enemy centers of gravity (or coming to grips with the sources of enemy power); strategies for the employment of naval forces have typically taken extended periods of time to exert their effects.³ Decisive battles among fleets have been few and far between, and their impacts have sometimes taken years to be felt. Blockades (nowadays, “embargoes”) tend to be notoriously slow in acting. Power projection, therefore, the most direct expression of naval power, has come to be emphasized. Note that there is a positive relationship between the effectiveness of a strategy and the degree to which the adversary’s sanctuary is threatened. The emphasis on power projection can also be seen as a by-product of the atrophy of many naval fleets. The lack of opposition to the establishment of sea control has permitted the few large and powerful navies to reorient their focuses in a landward direction.

The United States today has no adversary fleets to engage, nor may it reasonably expect to for the time being. Commerce raiding is incompatible with achieving U.S. objectives. “Fleet in being” strategies have historically been used by weak navies for purposes of deterrence or defensive response. For more than a century the United States has been the preeminent practitioner of “forward presence”—employing naval forces away from its homeland to deter adversaries, to reassure allies and friends, and to shorten the time for crisis response. This

could be considered a different form of a “fleet in being” strategy, which the United States undertook in expanded fashion after World War II.

Increased participation in the homeland defense mission will involve the employment of ships as a sea-based adjunct to national missile-defense, and probably also to extend ballistic missile defense umbrellas over the territories of friends and allies. In addition, there will have to be an increase in U.S. coastal surveillance and reconnaissance, and in patrol capability. Antismuggling, anti-infiltration, and ship inspection functions at the more than 350 American ports will tax current and programmed U.S. Coast Guard assets significantly. Unquestionably, the number of units assigned to these tasks will have to increase, and the extra burden will have to be shouldered by the Navy—given the Coast Guard’s size and breadth of assigned duties, which include major devotion to at-sea public safety and rescue, interdiction of maritime drug trafficking, and protection of American fisheries. The requirement here will be for air reconnaissance and surveillance, and for numbers of small ships, minimally armed. One advantage enjoyed by the United States that, in general, is not shared among its allies is that most U.S. ports (except those close to Mexico or the Caribbean islands) can be approached only by capable, seagoing vessels. The threat of infiltration or smuggling by means of submarines, while it cannot be ruled out entirely, appears unlikely and small enough not to devote tailored resources to it.

DIMENSIONS OF MILITARY FORCE

From another perspective, “ways” address how to meld the three dimensions of the application of military force—*space*, *time*, and *intensity*. Examination of these dimensions provides insights into how naval forces can be optimally employed in the future to secure American security objectives.

The key characteristic that will be shared among the dimensions of military force in the future is *nonlinearity*. In space—that is, the geographic dimension of strategy—nonlinearity exists when few lines can be perceived in the battle area that describe or organize opposing forces. Such linear constructs as the forward edge of the battlefield, forward line of troops, fire support coordination line, and even the entire notions of front, rear, and flanks are the result of drawing lines in the battlespace. But forces in the future battlespace cannot be expected to array themselves in lines; attempts to visualize the battlespace in linear terms seem already anachronistic at best. As a consequence, geography and force positioning relative to geographic features will have far less impact on operations in the future, but there is a major exception to this generalization. When the strategy involves protecting targets that are geographically fixed—national infrastructure, for example—the battlespace will be rigidly linear. Nonlinearity will apply

for the most part to offensive operations, and it is strongly related to sanctuary, because movement is one of the most effective ways to establish and sustain sanctuary.

In the time dimension, linearity manifested itself in the battlespace as *sequential operations*. One was obliged to perform one action before another could be undertaken. Tactical success was a prerequisite to operational or strategic efforts. Forces were required to be synchronized in time, and plans typically were prepared with time-phased branches and sequels—actions that took place successively in time. Today and foreseeably, however, many actions will, by preference, be performed simultaneously—in parallel, not in sequence—which will render moot many notions associated with linear, sequential operations.

Nonlinearity exists also with respect to *intensity*, to the extent that small actions can produce completely disproportionate effects. Systems that have significant feedback mechanisms tend to react in this non-Newtonian way. Outcomes, because they might bear little linear relationship to inputs, can thus produce elements of shock and surprise.⁴

In nonlinear situations, particular aspects of place, time, and intensity cannot be factored out and then reassembled. The ability to disaggregate and then reintegrate at will—called “additivity” or “superposition”—does not exist in nonlinear systems: “The heart of the matter is that the system’s variables cannot be effectively isolated from each other or from their context; linearization is not possible, because dynamic interaction is one of the system’s defining characteristics.”⁵

Nonlinearities compress, or flatten, the levels of warfare—tactical, operational, and strategic. When geography interposes no impediment to addressing strategic targets directly, when time does not require a sequence of actions to achieve success, when small (tactical) actions can have effects of great (strategic) consequence, and when variables cannot be isolated, the classic levels of warfare lose much of their distinctiveness. On operations and planning, the impact of these trends toward nonlinearity is significant. Many of the precepts of the Joint Operational Planning and Execution System (JOPES) are brought into question. Indeed, current operations and planning systems seem incapable of performing well under such conditions.

Yet, all of these nonlinearities have been characteristic of warfare at sea throughout history. Few true “lines” have ever delineated or organized the maritime battlespace—not even the “sea lines of communication” about which some observers of naval matters have written metaphorically, and the “sea-lanes” along which the German navy in two world wars sought to interdict the transoceanic passage of forces and supplies. Naval strategists have long recognized that sea communication is most effectively interdicted at its termini, underscoring the point that the open sea provides much better sanctuary than

geographically fixed ports. If ports of embarkation or debarkation can be closed, neither commerce nor seaborne reinforcement or resupply can flow. Thus are the “sea-lanes” rendered irrelevant. Only when ports cannot be cut off does attacking shipping at sea become necessary.

Naval warfare, since the advent of the aircraft and the submarine, has been truly three-dimensional in ways that other forms of warfare have not. An adversary’s forces were never to be located across the battlespace on the other side of the “front lines.” They could be virtually anywhere, even below the surface. In addition, in the maritime battlespace all targets are moving. In land warfare maneuver is a variable, an option; in the maritime battlespace, maneuver is a constant—a fact of life.⁶

Naval commanders and strategists have known for many decades that in such an environment—a nonlinear, three-dimensional battlespace in which maneuver is a constant rather than a variable—the most difficult problem is *finding the adversary*. This point brings us to two insights about warfare at sea. First, as mentioned above, sea-lanes are most effectively interdicted at their ends, not along their length. Secondly, most naval battles throughout history have occurred within the sight of land, where ships can more easily be located—thus, of course, the importance of maritime choke points.

Tracking an adversary once found is orders of magnitude easier than finding it, and putting a weapon on target is easier still. Of course, this explains why in the maritime environment submarines and aircraft have been exceptionally difficult adversaries; both enjoy a powerful comparative advantage over surface forces in their ability to create and sustain sanctuary for themselves and deny it to their foes.

The historical characteristics of the maritime battlespace have now begun to typify as well the landward battlespaces that U.S. forces can anticipate in the future. Wherever they might be, adversary forces can no longer be expected to be arrayed in lines, for lines confer few of the advantages they once did, either for defense or for the offensive massing of forces. Adversaries will employ all the dimensions of warfare to both offensive and defensive advantage, and they will endeavor not to present stationary targets—which afford no sanctuary, for they can now be attacked with great precision from long ranges. Potential adversaries already understand that finding the *right* target is the cardinal challenge for present and future forces. They will attempt to ensure that their forces cannot be found, identified, located, tracked, or attacked. They are seeking, in other words, to establish sanctuaries. Distance offers sanctuary, as does darkness, and as do stealth, secure locations such as caves or the depths of the seas, bad weather, and passive and active defenses—armor or anti-missile defenses, for example. Factors that increase the difficulty of finding targets aid and abet sanctuary.

Mobile Scud launchers in DESERT STORM, the ensuing years of severe targeting difficulties in Iraq, and the targeting fiascoes in the Kosovo conflict have offered only early glimpses of what will be a migration ashore of maritime characteristics, the land battlespace too will be nonlinear and three-dimensional, and all important targets will either move or be obscured by deception. Of course, adversaries will attempt to attack targets for which sanctuary is very difficult to provide—large, fixed, valuable nodes of national infrastructure will be prime.

ACCESS

The key concept for conducting expeditionary operations is *access*—the aggregated ability to deny sanctuary. Given access, targets can be selected, located, identified, tracked, and attacked (or threatened) to produce the desired effects;⁷ without it, they cannot be. If a target can be selected but not located, one does not have access to it. If it can be selected and located but not identified, access has been stymied. If it can be selected, located, identified, and tracked but no attack can be delivered, access has not been achieved. Access does not require an actual attack. A credible threat to deliver a weapon or an attack of another form (computer network attack, for example) suffices to consummate access.

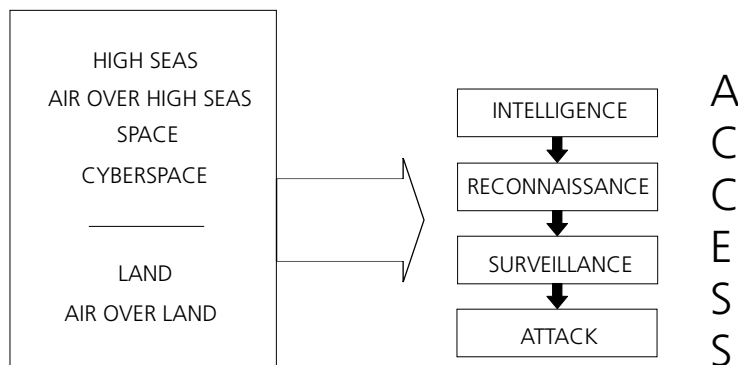
The kind of access suggested here might be thought of as instrumental access. That is, it is more than access to infrastructure located in a geographic area—such as air bases or staging points for army equipment. It is also more than just “being there.” Having established such access, forces can undertake a variety of tasks. Access is prerequisite to power projection (striking or raiding targets on the land with explosives or with troops), blockade and quarantine, rescue and assistance, most types of information operations, and to essentially every conceivable operation in war or “military operations other than war.”⁸

Access is vital, because most operational and strategic-level targets will be located on land. Operational-level targets are those that if successfully attacked result in changing the course or outcome of campaigns or major operations; strategic targets, by comparison, involve the course or outcome of the war. Conceivably, with the demise of battle fleets (and the unlikelihood of their resurrection), the only strategic or operational targets that it will be possible in the future to encounter at sea or in littoral waters will be ballistic missile-launching submarines and a state’s commerce moved by ship.

As Colin Gray has written, “Very prominent among the distinctions of U.S. superpower was, and remains, its unique global military reach. *That global reach is maritime in character for any operation with dimensions beyond those of a raid.*”⁹ The end of “reach” is access, and (aside from raids) that access must have duration, a time dimension. Access is attained by reaching across one or more of the physical realms: sea, space, cyberspace, land, and air. Naval forces emphasize,

in their attempts to secure access, those realms that are politically uncontrolled. The high seas, space, cyberspace, and the air above the high seas are free for all to use essentially without restriction, and they provide realms through which access to adversaries can be gained.¹⁰ Figure 1 illustrates the relationships.

FIGURE 1



access to adversaries can be gained.¹⁰ Figure 1 illustrates the relationships.

The use of the politically uncontrolled realms emphasized by naval forces incurs only minimal cost. The remaining realms—land, and air over land—are politically controlled, and costs are exacted for their use, whether they are controlled by friends, adversaries, or neutrals.

The price might be monetary or political, or it might be in terms of casualties. But any use of those realms invariably involves payment.

Access constitutes the strategic and technical dimensions of targeting. But targeting includes a third dimension—the political. Once access has been gained, considerations that are essentially political surge to the forefront. First, there is the question of rules of engagement. Are the selected targets legitimate under the laws of armed conflict and in terms of the engagement policy? Then comes an assessment of collateral effects and unintended consequences. Will attacking the target result in unacceptable collateral damage, or can unintended consequences be foreseen? Next, one must consider fratricide. What is the risk to friendly forces? Targeting must focus on platform selection. Is a precision weapon or a “dumb” bomb the right attack weapon? Should one use a cruise missile or an aircraft to attack the target? Attack prioritization is an important part of targeting. What should be the priority in which targets are attacked, and why? Also, what will be the domestic political implications, if any, of the attack under consideration? Finally, attack timing must be considered. How does the proposed attack, and the target to be struck, mesh with the overall plan? What should be the interval between attacks? Should targets be struck simultaneously? All these decisions lie beyond the requirement to assure access through intelligence, reconnaissance, surveillance, and arraying the means of attack within range of the prospective target. None of these decisions, however, is pertinent in the absence of access.

Naval forces can work to gain access to strategic and operational targets ashore, but because they have little control over the targeting constraints that might be imposed, their effectiveness will be negatively affected by those constraints. Adherence to them directly increases the risks of failure. Of course, few of those constraints affect the operations of adversaries; thus, their effect is both negative and strongly asymmetric.

The subject of asymmetric warfare has basked in the limelight in recent years, without much rigor attending either its meaning or its impact. In general, it conveys the idea of adversaries taking advantage of one's weaknesses while emphasizing their own strengths. A clearer, tighter understanding of asymmetric warfare would focus on actions that adversaries can take against which the United States and its allies have no direct counters in kind. As examples one can cite terrorism but also hostage taking, siting one's weapons at or near protected targets (such as hospitals or religious shrines), using human shields, and conducting chemical and biological warfare. In this sense, the spawning ground of asymmetric warfare is in the realm of actions the United States cannot or will not take in its own defense. The battlespace is tilted by the constraints the United States places on its own use of force; asymmetric warfare describes an adversary's ability and willingness to take advantage of that unlevel field.

ANTI-ACCESS

The "flip side" of access is anti-access. Adversaries, of course, will seek to deny U.S. forces access to potential targets. In their attempts to discourage U.S. forces from gaining access they will use the same physical realms as the United States does to gain it, and they will face similar technical and strategic challenges, the central one being how to find the right target. For these reasons, adversaries will seek to increase the effective size of their defensive battlespace (to conceal their vulnerabilities) and to decrease the effective size of their offensive battlespace—to confine the attacker to a well defined killing zone.

"We're clearly moving to the point where it's going to be possible to track all ships every moment of the day and night. As it becomes easier and easier to find ships, they become more and more subject to unexpected attack."¹¹ This prediction dates from 1982, but it accurately describes the beliefs of many contemporary defense analysts. The assumption persists that modern intelligence-gathering systems of adversaries, coupled with longer-range and more accurate weapons, will aggravate the dangers to those who would approach their territory from the sea. In this regard, one analyst asserts, "It can hardly be imagined, given the state of current designs, that ships will be able to fulfill mission profiles and cope with naval antiship missile threats after about 2005."¹² An Air Force study weighs in with the claim that "in the 21st Century it will be possible to find, fix, or track

and target anything that moves on the surface of the earth.”¹³ In other words, there will be no sanctuaries.

However technology reduces it, the difficulty of locating the right target in the battlespace will remain. As one perceptive observer notes, “You may look at the map and see flags stuck in at different points and consider that the results will be uncertain, but when you get out on the sea with its vast distances, its storms and mists, and with night coming on, and all the uncertainties which exist, you cannot possibly expect that the kind of conditions which would be appropriate to the movements of armies have any application to the haphazard conditions of war at sea.”¹⁴ One fundamental reason for this difficulty is recognized by sailors—the curvature of the earth.

Another reason is that those who appreciate the central difficulties of a maritime battlespace also recognize a corollary implied above—that forces operating in a very large, spherical, nonlinear, three-dimensional battlespace in which all targets are moving will take every precaution to ensure that they cannot be detected; if detected, not identified; if identified, not tracked; if tracked, not attacked; and if attacked, not hit. Even if the Air Force claim is fulfilled—which would require, at a minimum, a large constellation of active space sensors and extensive command and control arrangements—forces at sea can thwart access by breaking the adversary’s intelligence, reconnaissance, surveillance, command and control, and attack chain. If any link (and surveillance is just one of them) is broken, the chain fails. Accordingly, in the battlespace of the future, as in the maritime battlespace of the past, the survivability of a force can be significantly improved by offensive operations designed to attack the adversary’s eyes and brains: his capabilities for command, control, communications, computers, intelligence, surveillance, and reconnaissance.

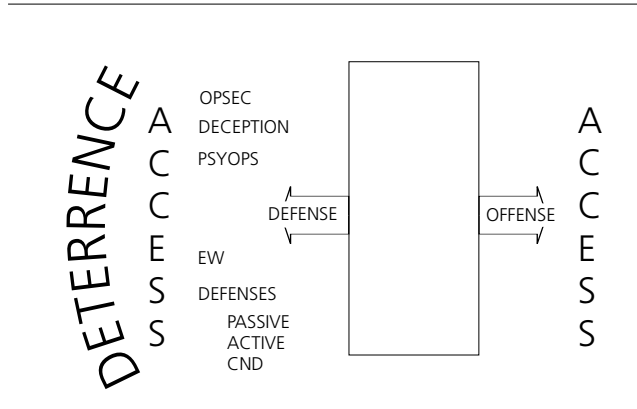
If offensive anti-access methods are ineffective or for some reason cannot be employed, defensive methods to thwart access can be found in operations security, deception, and active and passive defenses. Of these, operations security and deception are comparatively cheap and can be very effective. If the attacker does not know where one’s forces are, or what they are, or if he cannot identify or track them, his odds for a successful attack on them are greatly diminished. Counters—active, passive, and computer network defenses—to such antiaccess measures are difficult and expensive but clearly necessary.

Of interest, deterrence is the last line of defense, and a comparatively weak one. Deterrence comes into effect if access cannot be prevented in other ways. States historically have sought to deter attacks from long-range nuclear-tipped missiles and by terrorists, for example, because other forms of defense against them have great difficulty denying access reliably. Figure 3 illustrates anti-access.

MEANS

Given the ends to be sought and a sense of the ways that might be used to attain them, what means should be developed and devoted to the requisite missions? A

FIGURE 3



OPSEC—operations security
 PSYOPS—psychological operations
 EW—electronic warfare
 CND—computer network defense

key component of new means being developed by the U.S. Navy is that of network-centric warfare. The Chief of Naval Operations in the spring of 1997 asserted, “For us, it’s a fundamental shift from what we call platform-centric warfare to something we call network-centric warfare.”¹⁵ This revealed a fresh appreciation that the Navy had to focus not on the material instruments of the order of battle—what the Navy *is* (ships, aircraft, and weapons)—but on what

the Navy can accomplish. Network-centric warfare draws its strength and its effectiveness from the power of the network, from what naval platforms and a host of other joint and combined contributors can achieve in concert with one another. The power to prevail is grounded in the ability not to hoard but to share information and act on it.

Network-centric warfare pivots on the establishment and maintenance of a common operational picture and on the decentralization of execution. The common operational picture is a function of the networks available to the warfighter. Conceptually, networks link together sensors, a command and control grid, and the ability to engage the adversary. Using the concepts of “smart push” and “warrior pull,” the networks—underlain by a “global information grid”—will provide evaluated, formatted, and analyzed information in the form the commander needs. Information that meets certain parameters (such as high-stress time requirements) is “pushed” to the commander without his asking for it. Other information will be available to commanders on demand, if they “pull” it.

In the future, most data collection, processing, analysis, and storage for network-centric warfare will not be organic to the naval force at sea. It will be accomplished off board. For the inputs that undergird information superiority, at-sea commanders will be, as never before, dependent on capabilities that lie beyond, perhaps well beyond, their direct control. Sensors, for example, might be space-based; they might include AWACS or J-STARS aircraft* under operational control of another commander; or they might be unmanned aerial or underwater vehicles. In such situations, shipboard sensors will be employed

sparingly and, except in unusual occasions, primarily in self-defense. Ships, aircraft, and even ground—Army or Marine—units ashore will act as nodes in the networks. Some will appear on the engagement network, as ordnance deliverers, others on the sensor network, as collectors of data.

The networks are not reserved exclusively to naval forces. They are, and should be, shared by joint or combined forces that contribute to operations. If naval forces are first on the scene, the networks will effect a convenient, smooth, seamless, and comprehensive enlargement of the scale of operations as new units and kinds of forces arrive. Reliance on off-the-shelf civilian “plug-and-play” technologies should ameliorate interoperability problems among joint and combined forces in the future.

Actions will be undertaken in a decentralized fashion. Forces will self-synchronize from the bottom up. In many cases this will be necessary, because the on-scene forces will have both the best tactical picture and the ability to act quickly; speed will be of the essence in such situations.¹⁶ Self-synchronization is enabled by doctrine (supplemented by the commander’s intent and mission orders), by a common situational awareness, and by coordination among the forces involved. Thus, forces must be doctrinally prepared to react to situations they recognize, coordinating (if permitted by the commander’s intent in a particular case) among themselves to accomplish the task at hand with no additional control or guidance from above. At the tactical level, this is but a small extension to the “command by negation” doctrine exercised by naval forces for over two decades. Whether self-synchronization is possible, or even desirable, above the tactical level has yet to be determined.

In brief, superiority in all operating domains will be required for success in future operations; in order to establish that superiority, U.S. military forces must be prepared to fight and win in every realm. One can opt not to operate effectively in a particular domain, but to do so cedes that domain to potential adversaries without a fight and jeopardizes the attainment of security objectives.

What kinds of platforms will be optimal? It seems clear that with most sensing and data-processing functions moved ashore, platforms can be much less complex. If they can be individually simpler, they can be smaller and more sparingly manned. This translates directly into lower operating costs, which means in turn that more numerous forces can be acquired for the same procurement funding.

Aircraft carriers can be very useful to the exercise of naval power. If land bases are far from the scene or unavailable, carriers might well be the only way to bring tactical airpower to bear. Whether or not highly capable conventional-take-

* AWACS—Airborne Warning and Control System; J-STARS—Joint Surveillance and Target Attack Radar System.

off-and-landing aircraft will be required in the future is more questionable, however, especially for carrier operations in defensive roles. If the need for high-performance, dogfighting aircraft subsides, it will be possible for carriers to be smaller—likely much smaller—than they are today.

The value of submarines will lie in power projection operations and will pivot on whether they can perform as fully functioning nodes on the network. If they can maintain connectivity at an acceptable level, a place for them will be easy to justify. They might, for example, provide survivable magazines for a large number of land-attack weapons. If they cannot be integrated into the network-centric framework, however, they will be viewed as an expensive, highly specialized force useful only for a narrow range of tasks such as prearranged strikes, antisubmarine warfare, and covert insertions of special operations forces.

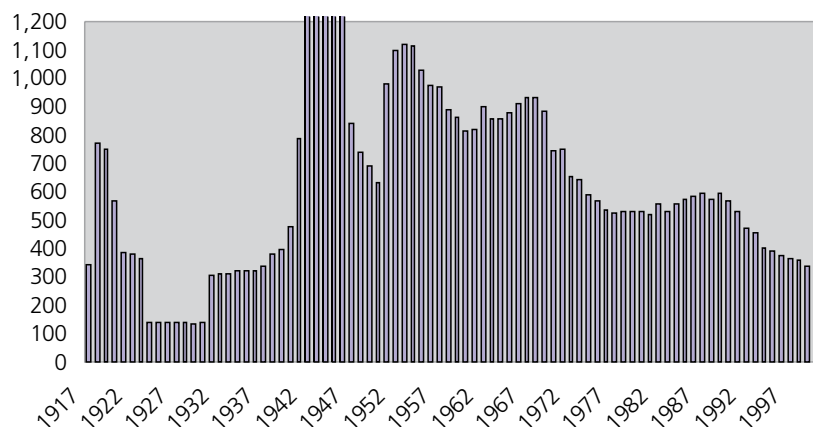
In the future security environment, numbers will be important. Greater numbers allow naval forces to be more places at once without overstretch. Second, they mean shorter average transit times to reach areas that need attention. Third, the power of networks is an exponential function of the number of networked nodes—more ships and aircraft, more nodes, more networked power. Finally, larger inventories of ships and aircraft of less individual value will reduce reluctance to place them at risk.

The inventory of naval ships has been declining steadily over the past decade, the reduction amounting to 46 percent from 1989 to 2000. The combination of increasing personnel and operating expenses, growing ship and aircraft unit costs, and declining budgets has squeezed ship procurement. As a result, ship force levels are approaching historical prewar lows. Figure 4 depicts the situation graphically.

Of consequence, ships have high unit costs and last a long time. Of concern, naval inventories must be maintained in peacetime. Once a conflict begins, it is too late to build a fleet. Henry Kaiser constructed fifty escort carriers in 1943–44, but today neither time nor U.S. industrial capacity would permit anything approximating that feat. “Whether a democratic government will have the foresight, the keen sensitiveness to national position and credit, the willingness to ensure its prosperity by adequate outpouring of money in times of peace, all of which are necessary for military preparation,” warned Alfred Thayer Mahan in 1890, “is yet an open question.”¹⁷ It still is.

Naval forces are routinely deployed forward, assigned to the Sixth Fleet (Mediterranean), Seventh Fleet (western Pacific), and Fifth Fleet (Persian Gulf). There are barely three hundred ships in the deploying force; that means fewer than one hundred will be on deployment across the three fleet areas at any one time. Some ships will probably be near where a crisis erupts, but at most they

FIGURE 4
SHIP FORCE LEVELS, U.S. NAVY



will have to steam on the order of a thousand miles. At a speed of advance of sixteen knots, that will take almost three days. It is of serious concern, therefore, when projections by the Secretary of the Navy result in a ship total of 286 by the year 2007.¹⁸

Speed matters as well. Arguably, the potential for adversaries to act very quickly and present the United States with *faits accomplis* has increased and will probably become more acute over time. For a forward-deployed naval force the numbers of ships and aircraft is intimately related to speed. Smaller fleets result in less geographic coverage and longer response times.

A greatly increased role in homeland defense or defense of friends and allies from ballistic missiles, should that come to pass, will be met by ambivalence in the Navy. On the one hand, it constitutes a high-profile strategic mission for the Navy and will probably justify construction of more Aegis-equipped ships. On the other hand, it does not resonate well in U.S. Navy culture, for the positioning of the ships would be essentially fixed, depriving them of their most vital survival asset, mobility. Coastal defense of landward targets from the sea has not historically been in favor in the Navy; the tasks will be wholly defensive; and the mission is one essentially of garrisoning rather than of expeditionary operations.

RISKS

Like the selection of ends, ways, and means, the assumption of risks is necessary in combat operations, for “there is no zero-risk situation in war. The willingness to run a calculated risk and to absorb some damage is essential. In sum, heroes run risks. Smart heroes calculate the risks and take steps to shift the odds more in their favor. Those who avoid risks stay home.”¹⁹

Risks are one measure of the fit between ends, ways, and means. If one believes that desired ends cannot be attained, operations assume high risk. In the abstract it is not possible to foretell where the fault lies. It might be that the ends are too ambitious, that the ways are insufficient, or that the means cannot produce the desired effects. It might be that the ends do not justify the risks. That was the reason for the U.S. withdrawal in 1993–94 from Somalia—there was insufficient U.S. interest to justify the loss of eighteen service members. This episode has often been cited as reflecting a U.S. unwillingness to take casualties, which some strategists argue will be a determining factor: “The prospect of high casualties, which can rapidly undermine domestic support for any military operation, is the key political constraint when decisions must be made on which forces to deploy in a crisis, and at what levels.”²⁰ Official U.S. Army doctrine states, “The American people expect decisive victory and abhor unnecessary casualties.”²¹ The degree of reluctance prompted by casualty estimates, however, is not absolute. It is closely correlated to a perceived necessity to undertake a particular operation. If the operation is deemed vital or necessary to U.S. security, tolerance of casualties will be commensurately high; to the extent the operation is considered discretionary, that tolerance will be low.

Risk determination is related closely to damage assessment. In determining whether attacks on a radar site have been effective, one asks, does the fact that it is no longer radiating indicate that it has been so damaged that it cannot radiate? If a tank company has been attacked, how does one determine its residual combat power? Such appraisals tend to be difficult to make. The advent of weapons that are more precise but carry less destructive power, and of information operations (in particular, computer network attack), renders damage assessment even more problematic.

In future operations, especially information operations, however, the desired effect of military action should be *neutralization*: rendering enemies’ actions ineffective, negating their hostile intentions, thwarting their objectives. Similarly, an analyst of the future battlespace writes:

All of this also will require discerning new and different “measures of effectiveness” for the application of force, that go beyond traditional “battle damage assessment.” . . . This implies an “effect-based attack” designed to *manipulate* the enemy, rather than a “target-based attack” designed to destroy. In turn, this could enable commanders to distinguish—at their will—between inflicting lethality and achieving effectiveness.²²

If this is an accurate rendering, assessing neutralization should be simpler and less ambiguous than the more doctrinal measures such as *destroy*, *neutralize*, *suppress*, *eliminate*, *disable*, *degrade*, *render ineffective*, *delay*, or *attrite*.²³

In any event, risks tend to be difficult to assess accurately. One must be specific about the risks being discussed and as to what underlying factors determine risks. One must also appreciate that it is in the adversary's interest to make risk assessment as difficult as possible. Saddam Hussein made obvious attempts at this several times prior to and during DESERT STORM, and he has done so since.

Recently, an analytical tool has been promulgated to assist commanders in assessing and managing risks. "Operational risk management" requires staffs to set forth methodically all recognized hazards of an operation and then translate those hazards into risks by analyzing the severity of the consequences of each hazard in light of its probability. Once the high risks have been identified—those with severe potential consequences and high probability—measures are considered to mitigate, or manage, them. While qualitative and often difficult, this method does offer the commander a more structured and systematic tool than mere guesswork.²⁴

TO REMAIN AND PERSEVERE

Sinking an enemy fleet, conducting blockades and embargoes, and threatening sea-based attacks are all to no avail if they fail to alter adversaries' actions or intentions. Historically, navies have been able to influence events on land indirectly, because only with great difficulty or after prolonged periods of time could they place an opponent's sanctuary in jeopardy. Now, however, with the free use of the sea, the air over the sea, space, and cyberspace; with the power of information superiority enabled by networking; with long-range precision weapons; with the development of abundant and affordable new sensors; and with the techniques of information warfare, navies are becoming able, as never before, to penetrate adversary sanctuaries and influence events ashore rapidly, directly, and decisively.

The "Maritime Strategy" of the 1980s began a naval realignment process that continues today. It emphasized that the objective of seapower was no longer to defeat opposing fleets but to affect opponents' actions on land, where political processes transpire. The Maritime Strategy called for defending allied transoceanic shipping as far forward as possible and for applying power to the flanks of the Soviet Union in order to relieve pressure on the continental center, the inter-German border. In the 1990s, with the demise of the Soviet Union and the Warsaw Treaty Organization, the threat to U.S. forces in deep waters subsided, and a new naval strategic vision, set forth in the white paper "... From the Sea," steered attention to the littorals, the green waters of the world. The 1990s also witnessed the shrinking of the U.S. military and a concomitant reduction in the size of the fleet.

Over time, the battlespace in military operations has become more and more nonlinear with respect to time, space, and intensity. Having been accustomed for centuries to battlespaces that are nonlinear and three-dimensional, and in which all targets are moving, naval forces are particularly well suited to understand and thrive in this environment. The key to future operations is *access*—because once access can be reliably secured, enemy sanctuaries can be compromised and objectives can be attained.

Unquestionably, naval forces will be required concurrently to deal with antiaccess efforts of adversaries. Because the fundamental challenge—for both sides—is to find the right target, operations security and deception will have greater leverage in the future, alongside active and passive defenses. Because information superiority must underwrite targeting efforts, information warfare in all its manifestations will become more and more important.

Naval ships should become smaller, and inventories of them should increase if the U.S. Navy is to continue to be highly effective. Most sensing and information processing functions will be accomplished off board, allowing platforms to be less complex and more numerous for a given procurement expenditure.

Questions remain regarding whether the right targets to vitiate adversary sanctuaries can be identified, whether they can be attacked effectively once they are identified, whether the effectiveness of attacks can be confidently assessed, whether decision makers are willing to assume the risks that might be necessary to approach a hostile shore or to engage adversary forces on the high seas, and whether self-imposed constraints will so reduce the degrees of freedom of U.S. forces as to render them powerless. The central contribution of naval forces is to be there to open the door, quickly and effectively, once these difficult questions have been resolved, and to remain and persevere for as long as it takes to secure national objectives.

NOTES

1. This is what distinguishes *maneuver* from *movement*. Maneuver is undertaken relative to adversaries in order to place at risk their centers of gravity or critical weaknesses, or to strengthen one's own defenses vis-à-vis enemy capability.
2. "Maritime power projection—Power projection in and from the maritime environment, including a broad spectrum of offensive military operations to destroy enemy forces or logistic support or to prevent enemy forces from approaching within enemy weapons' range of friendly forces. Maritime power projection may be accomplished by amphibious assault operations, attack of targets ashore, or support of sea control operations." *Department of Defense Dictionary of Military and Associated Terms*, Joint Publication 1-02 (Washington, D.C.: Joint Staff, 23 March 1994, amended through 15 April 1998).
3. One of the themes of Colin S. Gray, *The Leverage of Sea Power: The Strategic Advantage of Navies in War* (New York: Free Press, 1992).

4. See, for example, David S. Alberts, and Thomas J. Czerwinski, eds., *Complexity, Global Politics, and National Security* (Washington, D.C.: National Defense Univ. Press, 1997); Barry D. Watts, *Clausewitzian Friction and Future War*, McNair Paper 52 (Washington, D.C.: Institute for National Strategic Studies, October 1996), pp. 106–7; and Harlan K. Ullman and James P. Wade, *Shock and Awe: Achieving Rapid Dominance* (Washington, D.C.: National Defense Univ. Press, 1996).
5. Alan Beyerchen, “Clausewitz, Nonlinearity and the Unpredictability of War,” *International Security*, Winter 1992, pp. 59–90.
6. See Wayne P. Hughes, “Naval Maneuver Warfare,” *Naval War College Review*, Summer 1997, pp. 25–49.
7. “Selection” of targets lies at the intersection of intelligence and policy. Selection, in this sense, distinguishes what is a target and what is not, and which targets can produce the desired effects if successfully attacked or threatened. Selection will rely heavily on the ability to collect, process, evaluate, and disseminate large quantities of information—on information superiority. While the great difficulty of selecting the “right” target should not be underestimated, it is not pivotal to this analysis.
8. The contemporary image of information operations is that it comprises computer network attack and defense. In fact, however, it is much larger, encompassing not only those subjects but deception, psychological operations, electronic warfare, operational deception, operational security, some types of physical destruction, and even, on occasion, public affairs.
9. Colin S. Gray, “Sea Power for Containment,” in *Navies and Global Defense: Theories and Strategy*, ed. Keith Neilson and Elizabeth Jane Errington (Westport, Conn.: Praeger, 1995), p. 204. [Emphasis supplied.]
10. The “high seas” denotes those areas that are beyond the agreed twelve-mile “territorial seas” and other controlled areas (such as archipelagic seas) provided for in the United Nations Convention on the Law of the Sea.
11. Steven Strasser, with David C. Martin, James Doyle, Mary Lord, and John J. Lindsay, “Are Big Warships Doomed?” *Newsweek*, 17 May 1982, “News/Alnews,” LexisNexis (accessed 27 March 1998)
12. Erbil Serter, “Warship Designs for the 21st Century,” *International Defense Review*, Quarterly Report (Jane’s Information Group, 1 December 1997), p. 3, LexisNexis (accessed 9 February 1998).
13. U.S. Air Force, *Global Engagement: A Vision for the 21st Century Air Force*, 1996, on the World Wide Web, <http://www.af-future.hq.af.mil/21/index.htm>, 2 December 1998.
14. Winston Churchill, *The Gathering Storm* (Boston: Houghton Mifflin, 1948), p. 601.
15. Remarks delivered by Admiral Jay L. Johnson, USN, Chief of Naval Operations, to the U.S. Naval Institute, Annapolis, Maryland, 23 April 1997.
16. “Most images of war are linked to destroying an enemy, controlling resources, maintaining sovereignty, and rearranging territory. Yet wars are won or lost, begun and ended, and conducted in time as well as space, with time normally the more important factor.” Grant T. Hammond, *Joint Force Quarterly*, Spring 1994, p. 9.
17. Alfred Thayer Mahan, *The Influence of Sea Power upon History: 1660–1783* (New York: Hill and Wang, 1957), p. 58.
18. As reported in “Navy Gives Rumsfeld FY-03 Budget to Buy ‘Only’ Five Ships, 81 Aircraft,” *Inside the Navy*, 3 December 2001, p. 1.
19. H. Dwight Lyons, Jr., Eleanor A. Baker, Sabrina R. Edlow, and David A. Perin, *The Mine Threat: Show Stoppers or Speed Bumps?* (Alexandria, Va.: Center for Naval Analyses, 1993), p. 19.
20. Edward N. Luttwak, “A Post-Heroic Military Policy,” *Foreign Affairs*, July–August 1996, p. 36.
21. U.S. Defense Dept., *Operations*, Field Manual 100-5 (Washington, D.C.: Dept. of the Army, June 1993), pp. 1–3.
22. Douglas H. Dearth, “Imperatives of Information Operations and Information Warfare,” in *Cyberwar 2.0: Myths, Mysteries, and Reality*, ed. Alan D. Campen and Douglas H. Dearth (Fairfax, Va.: AFCEA International Press, 1998), p. 396.
23. Rudy T. Veit, *Joint Targeting: Improving the Playbook, Communications, and Teamwork*,

Strategy Research Project (Carlisle Barracks, Pa.: U.S. Army War College, 1996), p. 26.

24. For the U.S. Navy and Marine Corps, the governing instruction for the process of

operational risk management is Opnav [Navy Staff] Instruction 3500.39 / Marine Corps Order 3500.27, 3 April 1997.