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## Presidents Forum

Arthur K. Cebrowski

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*On 10 February 1999, at an All Flag Officers Conference convened by the Chief of Naval Operations, the President of the Naval War College, Vice Admiral Arthur K. Cebrowski, delivered a presentation, "The Road Ahead: 21st Century War College, 21st Century Warfare, 21st Century Navy." The CNO requested that it be made available to others concerned with the future of the Navy. On 1 March, Vice Admiral Cebrowski began the process with the faculty of the Naval War College, in an address adapted here.*

## President's Notes

**I**n the summer of 1998, the Chief of Naval Operations, Admiral Jay L. Johnson, sent me here to Newport, along with Rear Admiral Bernard J. Smith (as commander of the new Navy Warfare Development Command) and Rear Admiral Peter A. C. Long (to be Provost of the Naval War College). He did that

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Vice Admiral Cebrowski has commanded Fighter Squadron 41 and Carrier Air Wing Eight, both embarked in USS *Nimitz* (CVN 68). He later commanded the assault ship USS *Guam* (LPH 9) and, during Operation DESERT STORM, the aircraft carrier USS *Midway* (CV 41). Following promotion to flag rank he became Commander, Carrier Group Six, and Commander, USS *America* Battle Group. In addition to combat deployments to Vietnam and the Persian Gulf, he has deployed in support of United Nations operations in Iraq, Somalia, and Bosnia and has served with the U.S. Air Force, the staff of Commander in Chief, Atlantic Fleet, the staff of the Chief of Naval Operations on four occasions, with the Joint Staff (as J6), and as Director, Navy Space, Information Warfare, and Command and Control (N6). Vice Admiral Cebrowski became the forty-seventh President of the Naval War College in July 1998.

for important reasons. One was the sense that the Navy had lost its historic inclination to innovate. This was not surprising: all very successful organizations with long histories of accomplishment, such as the U.S. Navy, have powerful immunologic systems, capable of repelling new ideas and the people who have them. He took certain actions, focused on the Naval War College, to help remedy that situation. The entire College has a part in that effort.

The basic mission of the College is largely the same as it has been: we are responsible for preparing officers for high command and for developing strategic thought, employing the Navy's center for war gaming as a tool for these two tasks. What the CNO added was authorities with regard to directing the Navy's experimentation program and promulgating doctrine.

Some things have changed, however. This year we are running the pilot course for the Navy Operational Planner's Program—which so far looks very successful—as a response to the articulated needs of the unified commanders in chief and the numbered fleet commanders. These graduates are meant to be the best Navy planners, in the joint context, with the skills necessary to provide the best advice about how to employ naval forces in joint and combined operations. We are also working to expand the College's student body, to bolster its Advanced Research Program, to pursue vigorously the concept of network-centric warfare, and to become a center of excellence with regard to the Asia-Pacific and South Asia regions.

The College has maintained a leadership position in war gaming for a long time, but we have come perilously close to losing that lead. This is not so much because the war-gaming center has changed but because warfare is changing. Our war gaming simply must take a more operational, as opposed to just a planning, orientation; the War Gaming Department has already taken that up. In our new war-gaming facility in McCarty Little Hall, now being completed, we will have capabilities mirroring those in the numbered-fleet command ships. We will be able to link fully with them, expanding our capability considerably, and keeping us modern. Also, our war-gaming center must mirror more closely what actually goes on in modern warfare, where there is a high degree of simultaneity. We will meet that requirement as well in McCarty Little Hall.

## Twenty-first Century Warfare

How else is the Naval War College looking to the future? We are pursuing innovation in three areas related to twenty-first-century warfighting: a maritime operational concept (that is, a clear articulation of what the Navy provides the American people), network-centric warfare concepts,\* and strategic relationships.

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\* See Arthur K. Cebrowski [VAdm., USN] and John Garstka, "Network-Centric Warfare: Its Origins and Future," U.S. Naval Institute *Proceedings*, January 1998, pp. 28–35.

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The most important innovation frequently occurs at the intersection of *unarticulated needs* and *nonconsensual change*. In contrast, traditional naval exercises (once known as “fleet maneuvers” or “battle problems”) address fully articulated needs and produce changes the Navy meant to make anyway. The traditional realm allows us to feel very comfortable, but it creates no new knowledge.

The objective of the Fleet Battle Experiment program is to get results that *are* truly innovative. There are several ways to examine partially recognized needs and inchoate changes, but they are perilous. The comptroller might note that you have no mission-needs statement, and of course you do not. If you hypothesize a capability that is not yet under development, the literalist scoffs at your “flight from reality.” We all know how difficult it is to do innovative work, but it is absolutely necessary that we do it, not just at Newport, but throughout the Navy—because innovation is a warfighting skill. History does not reward a commander for slavish adherence to old doctrine but for recognizing an opportunity, seizing it despite the apparent lack of resources, and turning it into victory. That is what we are *supposed* to do.

Indeed, our experiments are exercises in innovation, tailored to the needs, experiences, and environments of the numbered fleet commanders. The experimentation program is meant to be continuous and not discrete. We want this to be a way of life for Navy warfighters, because if an experiment is merely a single event that shows up on the schedule and then is gone, it will have little impact. The technique is to pursue technological, doctrinal, and organizational changes, modifications, and experiments; the aim is to do so continually.

But what is an “operational experiment”? First, if there is no chance of being surprised by what one learns, it is *ipso facto* not an experiment. Next, if all it does is insert technology, it is not an operational experiment; it may be an engineering or scientific experiment, but it is not an operational one. Third, an operational experiment necessarily proposes changes to elements of doctrine or organization. Finally—and contrary to the use of the term in the physical sciences—an operational experiment is not repeatable. The sample size tends to be *one*. This is because when one conducts an operational experiment, the “world” changes: people learn from the event, so the context changes, the people change, and things are revalued. Efforts to reproduce such experiments will be frustrated. So this means you have to ask different kinds of questions, in different ways.

We run two fleet battle experiments, FBEs, per year, rotating among the Second Fleet (homeported in Norfolk, Virginia), the Sixth Fleet (homeported in Italy), the Fifth Fleet (in the Persian Gulf), and the Third and Seventh Fleets (in the Pacific). Each numbered fleet commander gets essentially one opportunity in his tour of duty to conduct an FBE. That certainly is not lavish, but the commanders are finding that their single experiment has a long, useful buildup and generates new creative activity long after the formal stop time.

That is exactly the result we want. First of all, one must know which problems are best dealt with in such a way. Secondly, we want to build an *ethos* of experimentation. Thirdly, commanders have recognized that this is a marvelous leadership tool. Most of the people who are in the military today have seen only a downsizing military; to them it looks like a sunset industry. We should not wonder why we have retention problems. But when the Navy leadership enthusiastically embraces an experimentation program, they are telling the people in their forces, "There is a future; we are crafting it; you can get in at the ground floor."

From a program perspective, the first beneficiaries are command and control and sensor programs. Indeed, the Navy experimentation program, like all the services' experimentation programs, is based on those very factors which we identify as central to network-centric warfare.

### Twenty-first Century Navy

Every senior military leader is confronted with the issue of balancing operational planning for the present with force planning for the future. But balancing is not a useful approach, because one tends to end up with not enough of either. A more fruitful strategy is to develop a *bridging* approach, so that one moves from the present to the future in an organized way. The processes one uses to do that are discovery, innovation, concept formulation, experimentation, testing, analysis, war gaming, and doctrine development. While most of the money is spent on operational planning or force planning, the bridging process is what creates the future.

That is our job, here at the Naval War College. We are not the only people who work in this field, but it is a big part of what we are meant to do. One of the techniques for "getting to the future" is to try to get a sense of what are *constants* and what are *trends*, and to differentiate those from the *shifts*. It is the constants and trends that should drive the four fundamental policy decisions that senior leadership has to deal with: How big should the Navy be? What shape should it be? How should we operate it? How do we change it?

A shift, however, is just a "head-fake." It is something that can change within the Navy's capital time-constants. Because military forces have equipment with long service lives and personnel with extensive training requirements, we hear that a particular military is committed to this or that action or way of going to war in the future. In fact, those "commitments" are political choices that can be reversed very easily. An example is the idea that warfare is going to be dominated by an American (or more broadly, a Western) aversion to casualties. But are Americans always averse to casualties? There is scant proof of that. Is that the basis on which we want to size and shape the United States Navy? Another "shift" is the idea that because the United States has no peer military

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competitor, it will have to deal only with the “Somalias” and “Bosnias” of the world and therefore does not have to size, shape, and operate its armed forces to deal with larger threats. Is that really a wise way to go? Historians hold that in the last five hundred years, the period between the devolution of one hegemonic power in Eurasia and the appearance of the next has never been more than twenty years. Is wishful thinking a good basis for sizing and shaping the nation’s military? Clausewitz himself addresses this as a folly, yet we ever-hopeful Americans have a long history of making this mistake, of “taking that head-fake.”

As professionals, the Navy’s leadership must address these issues in ways the American electorate will comprehend, so that it, through its elected representatives, can properly “provide for the common defense.”

What are the trends and constants that our fellow citizens should consider when they evaluate the nation’s military requirements?

One of the most fundamental is in what I call the “domain of victory.” What are the stakes for which the American people would go to war and require success? They would do so when freedom and prosperity are at stake, particularly if moved by moral outrage. There are times the American people appropriately express moral outrage though their freedom and prosperity are not at stake. These are situations from which they can later withdraw if they judge the price too high. Such matters are in the “domain of ambivalence”; they are in the category of shifts. I advise senior leadership not to use the changeable features of this second domain as criteria for sizing, shaping, operating, and changing forces.

The Navy’s “products” are also long-term constants. Any organization should debate from time to time what activity it is really in. The Navy has done that over the years, and we seem always to settle on two functions: providing Americans freedom of the sea, and influencing events through forward-deployed naval combat power.

The domains in which we operate to do these functions are changing somewhat; they are affected by trends. The sea, of course, is a constant; but space and cyberspace are now appearing as well, as very important domains.

One traditional way of looking at the landscape is suggested by Samuel Huntington’s recent forecast of the “clash of civilizations.”\* If one draws rough boundary lines between the civilization blocks he envisions, one senses that there are certain tectonic fault-lines—like those between shifting continental masses—in the civilizational landscape. According to Huntington, the important clashes will occur across those lines. If we plot them, there appears to be some validity to that view. Indeed, it turns out, all of the nations that are

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\* See Samuel P. Huntington, *The Clash of Civilizations and the Remaking of World Order* (New York: Simon and Schuster, 1996).

developing weapons of mass destruction and the means to deliver them lie in a band along such boundaries, extending from the Middle East to Northeast Asia.

A less traditional, but compelling, approach is electronic. If one plots on a blank sheet of paper the location of radio emissions related to commerce, the result is a map of the world, with very prominent zones coinciding with the conflict fault-lines. An analysis of the world's finely tuned network of shipping produces a pattern complementary with the zones of most intense electronic activity. We can fill in the picture of prosperity by adding the movements of oil and the locations of undersea fiber-optic cables. The picture is further refined by the addition of key global financial centers.

All this produces a coherent pattern, one that suggests the U.S. Navy will continue to be forward deployed and that gives a pretty good indication of where those deployments will be. Although there are historical examples of nations that adopted a different strategy—a “deploy-from-home” policy—to my knowledge, all resulted in failure. Deployment-from-home in times of crisis simply does not work for a nation with important and broadly distributed frontier interests. I do not think that the leaders of the U.S. Navy should ever apologize for sending ships and sailors to sea on long deployments. There is an enormous investment here in the freedom and prosperity of America, and to withdraw from it would be perilous. It is a matter of securing *access*, which, since the Republic's founding, has been a major feature of American foreign policy.

### Balance, Shape, and Speed

There are many dimensions to consider beyond large versus small navies or big versus little ships. Principal among these is the concept of *balance*, which includes the issue of multimission versus mission-specific ships. We have ships that are supposed to be “multimission” but really are not—because the crews are not. As a navy focuses on a specific, high-profile mission, training in other important areas atrophies, and along with it the research that would carry it to the next level of capability and performance. To think that you are multimission and then find that you aren't can be a shock.

In the early 1960s, fighter-versus-fighter training was allowed to atrophy. Then came the Vietnam War, and sure enough, there was fighter-versus-fighter combat. Such skills are highly volatile. As a result, fighter exchange rates early in the war were nowhere close to what we had hoped for. The Navy made a strenuous effort to turn that around so as to finish the war, as it did, with a far better exchange rate. Are we in the same position now with antisubmarine warfare?

Other issues of balance include the mixing of highly capable and more austere (and cheaper) units, and also precision versus volume. If one wanted a smaller navy, I defy him or her simply to have “less of the same” without grossly

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unbalancing the force with respect to the kinds of operations we have always been asked to conduct. An alternative is to accept a more focused navy. But history has shown that this requires predicting the future with great accuracy, certainly not within prudent risk for our nation.

Another shaping strategy is to focus on combat rather than combat support capabilities. This seems an attractive approach to some who are tempted to consider combat support essentially a “housekeeping” function that can be “outsourced.” This is a perilous approach, and our track record is mixed.

More fundamentally, we are out of balance too in the relationship among sensors, command and control, the weapons, and the platforms that fire them. Much of the debate today about how to shape the Navy to get the right kind of balance focuses on defense versus offense—which I recast as mobility versus “shooters,” or stealth versus sensors. Many analysts are saying that long range is the important thing, that the battlefield will become much less densely populated. Is that true? After we have invested in long-range weapons, and we have, what do potential enemies do? Will they simply accept that we have an advantage? No. Around the world nations are increasing their investments in stealth, mobility, camouflage, cover, and deception. They may have no way to control the reach, or “envelope,” of our weapons, but they can affect the reach of our sensors—and it is the capability of the total system that counts. So we are finding that potential enemies adopt such “envelope management” to counter our great advantage in depth of battlespace. They pose a battle of stealth and mobility versus engagement range. We are building superb hunting rifles, so our adversaries are devising ways to force us into wrestling contests.

Fighting at long range in a battlespace of great depth (that is, in which we can see and shoot a long way and threats come toward us comparatively slowly, producing comfortable amounts of reaction time) permits the “shoot, look, shoot” approach—one can shoot once, see what happened, and then if necessary shoot again. Time, then, counts for much. If an enemy can prevent us from assessing results before we must shoot again, we will empty our magazines at prohibitive rates. Numbers of weapons are important, but not nearly so important as the ability to see, assess, and quickly shoot again. Incidentally, even dramatic improvements in single-weapons kill probability do not fundamentally lessen the expenditure-rate problem; the speed with which one can assess and reattack remains the critical feature of the problem.

With regard to strike and fire support against moving targets, there are only three things one can shorten to achieve such speed: sensor time, decision time, or weapon fly-out time. While these factors overlap, command-and-control delay (decision time) tends to dominate, because of target motion. Yet today we are spending a great deal of money increasing *weapon* speed. The big payoff is in reducing command-and-control delay.



The point here simply is that ultimately we must be network-centric, *content*-centric, and fast. We must have the network, but the information the sensors deliver to it must be timely, accurate, and relevant. Awareness is important. *Shared* awareness is even more powerful. We are not going to achieve the self-synchronization we need without shared awareness and the ability to act on it quickly.

How is the Navy doing? In terms of target types, the picture is mixed. With fixed targets, where one needs updates after days or many hours, we do very well; every service does this very well. Where targets are movable, it gets quite a bit harder. Still, against those that move really fast, things are not too bad; we do quite well with air targets, and as for space, we are generating some good intellectualization and research. The tough problems are the moving targets on land, on the sea surface, and under water. Nobody handles these well, but if we mean to influence events, we will have to. For any service, moving targets are important. Potential enemies are adjusting. They are shrinking the fixed target set, because of our success in targeting such "nodes"; presumably they are converting fixed assets to moving, or at least moveable, ones. The Navy needs sensors for this critical tactical target set.

### Sizing the Force

What benchmarks would help us decide how big the U.S. Navy should be? The British once had the "two-power rule": the Royal Navy should be as big as or bigger than the two next-largest naval powers combined. That does not seem appropriate now. For much of this century, the United States adopted the notion of a "balanced fleet second to none"; that does not seem a good way to do things either. For instance, compare the United States and the Western European Union, or WEU, formed in the mid-1950s for the mutual defense of its member nations. The WEU has more ships (by about a hundred, not counting a large number of minesweepers), a larger population than the United States, and a somewhat higher gross domestic product. Its area of regard, however, is smaller by orders of magnitude.

If the "second to none" analysis, then, does not tell us how big our force should be, it certainly tells us that we do not have *too many* ships. How many surface combatants do we have? We have 116. The Japanese have about half of what we have, for an area of regard orders of magnitude smaller than ours. It is plainly not true that we have too many ships.

Moreover, numbers count. Since the First World War, the number of big ships in the U.S. Navy has been roughly constant. We are at twenty-eight right now, and it is important that we keep the number of big ships at about that level. Big ships are valuable because they are enormously flexible and reconfigurable. These are the ships that carry us through periods of great change, in

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threat and in technology. Smaller ships, on the other hand, tend to be “point”—more finely tuned—designs. Consequently, they normally do not survive transition periods quite so well, though they are easier to obtain. As a general rule, navies never have enough small ships at the start of a war. They can well perform the specific mission for which they were designed, and that is not likely to change in the midst of war. The times of peace, however, are times of transition, change, the abandonment of old tasks, and the imposition of new.

### Implications for the Future

I see the Navy evolving into two broad kinds of forces, both dedicated to securing, maintaining, and exploiting access. One will fight at range, relying principally on total systems reach. That will considerably lessen design pressure in certain areas; those reductions should be leveraged for other capabilities. Secondly, there will be a requirement to fight in close, for which the need for numbers will go up. In-close fighting will call for some mix of stealth, speed, and toughness. That indicates the direction for at least one class of surface ship.

The big reward will come from command and control improvement. The Surface Warfare Division of the Navy Staff has done some major work with the Johns Hopkins Applied Physics Laboratory in a program called Area Air Defense Commander. It has produced a very high-quality product in displays, collaborative planning, and modeling. However, it is all meant to be located inside a cruiser. No doubt, that kind of command and control would be valuable so closely coupled, in the same hull, with the weapon; but it is a capability that needs as a first priority to be put in numbered-fleet command ships.

We need very much to move into the realm of netted sensors. Probably they will be fitted in unmanned airborne vehicles, but they absolutely must be under the tactical control of the on-scene commander. We must never outsource the sights on our rifles.

Submarines are access-acquiring ships!

There are several opportunities in the realm of weapons. Research in energetics may considerably reduce design pressure as well as logistics “tail.”

The realm of navigation has great promise. We should move away from the Global Positioning System as soon as we possibly can, into a more decentralized capability.

The number of big ships is, as I said earlier, about right, but it will be important to adopt a strategy, focusing on their changeability, for their evolution.

The last and perhaps most important point is that we have to take serious steps to keep our intellectual capital from walking out the door. One of the places where we are at risk of losing intellectual capital is among those who are skilled in information technology and in how to apply it. If the ability to translate information into actionable knowledge is a prerequisite for the control of


forces, then it seems to me that we should stop populating our command centers with ad hoc teams and find a way to staff them with teams that are well trained in using technology for controlling forces, and who are brought up in a logical career progression to do exactly that.

There are many more challenges each of us could cite as we think about the future of the Navy, of warfare, and of this institution. The Naval War College exists for the future; that is what we are essentially concerned with in all that we study, research, and teach. What I, as President of the College, am expected above all to do is to identify, examine, and explore the kind of future the Navy, the nation, and indeed the world should welcome. No person can do that alone, so I earnestly invite your collaboration.

As our old teacher Thucydides reminds us:

The great wish of some is to avenge themselves on some particular enemy, the great wish of others to save their own pocket. Slow in assembling, they devote a very small fraction of the time to the consideration of any public object, most of it to the prosecution of their own objects. Meanwhile each fancies that no harm will come of his neglect, that it is the business of somebody else to look after this or that for him; and so, by the same notion being entertained by all separately, the common cause imperceptibly decays.\*

We must be our fellow citizens' "somebody else," looking after the common cause, the future. Much depends on how well we do.



ARTHUR K. CEBROWSKI  
Vice Admiral, U.S. Navy  
President, Naval War College

\* *The Peloponnesian War*, Book 1, Section 141.