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Seminar on Intelligence, Command, and Control

Control and Transformation
Arthur K. Cebrowski

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Control and Transformation

Arthur K. Cebrowski

April 22, 2004

Vice Admiral Arthur K. Cebrowski, USN (Ret.), was appointed as director, force transformation, in the Office of the Secretary of Defense in October 2001. He serves as the advocate, focal point, and catalyst for transformation. He links transformation to strategic functions, evaluates the transformation efforts of the military departments, promotes synergy by recommending steps to integrate ongoing transformation activities, monitors service and joint experimentation programs, and makes policy recommendations to the secretary and deputy secretary of defense. Admiral Cebrowski, a naval aviator, entered the Navy through the Reserve Officers Training Corps in 1964. He has commanded Fighter Squadron 41, Carrier Air Wing 8, the assault ship USS Guam*, the aircraft carrier* USS Midway*, Carrier Group VI, and the* USS America *Battle Group. He has combat experience in Vietnam and Desert Storm. He has served as the director for command, control, communications, and computers (J-6) on the Joint Staff and as director, space and electronic warfare (N-6), on the staff of the chief of naval operations. He retired from the Navy on October 1, 2001, after serving as the president of the Naval War College. He holds a B.S. degree in mathematics from Villanova University and a master's degree in computer systems management from the Naval Postgraduate School, and has attended the Naval War College.*

Oettinger: It's a real pleasure to introduce our speaker for today. I need not go into great detail, because you've all had a chance to look at his biography and a description of his current post. I just want to add that it's a great pleasure to have you here again after a lapse of eight years and many moves and an interesting change of jobs.[1] It's all yours, Admiral.

Cebrowski: Thank you very much, Tony. It's a real pleasure to be here. One of the things I'm sensitive to is your time, as well as your needs and interests. So you're going to have to steer me a little bit to make sure we get to your interests and needs. The graphics are simply a catalyst. We turn into a pumpkin at four o'clock, so that gives us a good bit of time. We should be able to cover quite a lot.

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[1]Admiral Cebrowski addressed the seminar in 1996. See Arthur K. Cebrowski, "Command and Information Systems," in *Seminar on Intelligence, Command, and Control, Guest Presentations, Spring 1996* (Cambridge, Mass: Harvard University Program on Information Resources Policy, I-97-1, January 1997), [On-line]. URL: http://www.pirp.harvard.edu/publications/pdf-blurb.asp?id=343

First of all, I always liked the idea of this course, and I applaud you for selecting yourselves into it. I thought that perhaps we might start at the end, which is questions and answers. I'll start. The name of the course itself is somewhat intriguing: "Intelligence, Command, and Control." Quoting from Martha Maurer's paper here:

> *One of the most striking characteristics of the standard definitions of "command and control," "command," and "command and control system" is the extent to which they evoke the personal nature of command itself, especially being vested in an individual. The importance of the personality of the commander has long been recognized by students of war. The real secret of leadership in battle is the domination of the mass by a single personality. Influence over subordinates is a matter of suggestion.*[2]

That's an interesting comment. That's probably an hour-and-a-half discussion, or maybe a course in itself. I don't know how you're going to cope with the whole paper if this is just a sample, but I guess that's what you do.

I thought what we might do is start not with the issue of command or command and control, but rather with control, and see if we could come to grips with the question "What is the central feature of control?" If we were to make a list of important features of control, what would we put on that list? Any takers?

Student: Extremely high speed, given that a message will travel very fast from one person to another.

Cebrowski: So the speed of information movement is a factor.

Student: Ensuring that the commander's intent is being followed.

Cebrowski: That would be the set of governing rules for behavior.

Student: Control connotes a holding back: restricting subordinates.

Cebrowski: Right: the ability to put the brakes on something. A car without brakes would be a car out of control. What else?

Student: It's also related to a feedback mechanism: to knowing that once the command and control have taken place there's a backward mechanism letting the commander know what's happening. The ability to make changes is also a part of control. So, once the initial command has gone out there's a need to reorganize or reframe for people. I see that as a control process.

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[2]Martha Maurer, *Coalition Command and Control: Key Considerations* (Washington, D.C.: National Defense University, U.S. Government Printing Office, 1994).

Student: Coakley says that command can be considered more strategic, whereas control can often be seen as more tactical or operational.[3] Some people may disagree with that, but it certainly makes sense. Control started appearing more in the literature and becoming more important in the last hundred years as we've seen greater amounts of troops and materiel under a commander. So it's not just about command anymore.

Cebrowski: Gosh! This is a course on control and we're out of subject matter in just five minutes.

Student: Making sure that everyone is speaking the same language, so that what's said by a commander or whomever is taken at that same meaning by the person who is taking the command, and vice versa when the feedback is given back, so there's some understanding between them.

Cebrowski: You have this feedback as your indicator. That's good.

Oettinger: The term came into vogue particularly—or came back into vogue—during the nuclear era, when the question of launching or not launching nuclear weapons was front and center. The notion of things such as "positive control," et cetera, were very high on people's agendas.

Cebrowski: You're right. It's not as though you have your hand on the throat of an enemy.

Oettinger: Whose finger is on the button?

Student: I had my finger on the button for four years, and when you asked about the nature of control the first things that popped into my mind, having grown up for four years in the silo, were assurance and security. In that business you needed to make sure you knew whom you were talking to: that the person who was giving the order was the president of the United States.

Student: We've talked a lot about technology in this class, too. With the advent of technology comes the ability for commanders essentially to control more and more with technology. In other words, when they see specific things going on in the battlefield they have the ability to call out and leap over other commanders and make decisions. It presents opportunities, but also some challenges, so it could maybe cause one to micromanage. I'm interested in that aspect of control too.

Cebrowski: Okay. Let's jump over to a seemingly unrelated question. It's been said that Alexander the Great suffered many wounds in combat. Why do you suppose that was?

Student: His proximity to the battlefield. To command and control his forces, he had to be as close as possible so he could physically interact with his soldiers and tell them what to do.

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[3]Thomas Coakley, *Command and Control for War and Peace* (Washington, D.C.: National Defense University, U.S. Government Printing Office, 1992).

Student: It was much more difficult in terms of command and control of that sort of army to do more than give moral support. It was almost all moral support, and you give better moral support from the front than from the back. So there was very little he could do during the battle that was better than being right there encouraging his troops.

Cebrowski: If you contrast that, for example, with Wellington, he to my knowledge suffered no wounds at Waterloo. He wasn't on point. He was behind the forces. He would sit on his horse on a ridge line and just walk back and forth, and his command and control tools were a pad, a pen, and a constant succession of runners. So there are different techniques, right? Both are highly effective.

Student: Sir, that's true for Army-level command and control on land, but in our reading for today Kenneth Allard talked about how in the Navy the commander is as much at risk as all the other combatants, because he's on the same ship and the shells are coming at him in the same way.[4] So how does that alter the fundamental thought about Navy command and control versus Army command and control?

Cebrowski: I think that maybe what I've done is craft an artificial distinction between Wellington and Alexander, because both of those had something in common with the naval commander. It wasn't the factor of being at risk; it was the seeming coincidence of command and control. They were very tightly coupled in both time and space.

"Feedback loop" is an engineering term that has been made an element of the social sciences. It's just an exporting of a metaphor from one discipline to another. It seems to me that the feedback loop is the central feature. With regard to command it's the ability to formulate orders, inspire the troops, and exercise a whole host of leadership functions, but control, it seems to me, is the ability to correct course. If I have the commander's intent, as somebody mentioned, and I see something going in the wrong direction I now have feedback; that is, I can see it and I know that I'm going to have to issue some orders to correct course.

The last time I looked, which was admittedly some time ago (I'd be interested if I can now be proven wrong), the definitions of "command," "command and control," and "control" in the Joint Publications do not include the term "feedback loop" or "feedback mechanism." After all of the various attributes that you mentioned I wonder how it's possible to attain those attributes without a feedback loop.

The reason I raise this is because of the paradox that we see in the transition from warfare in the industrial age to warfare in the information age. The paradox comes in the form of the following question: "But Admiral, how can you possibly control your forces if they have all that information?" That's one of the ten most commonly asked questions about network-centric warfare. What do you think is going on with that? Clearly what's on the mind of the person who's asking the question is "If I give people information or allow them access to information I will lose control of them in that I won't be able to put the brakes on them, or, in the case of a nuclear

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[4]Kenneth C. Allard, *Command, Control, and the Common Defense*, revised edition (Washington, D.C.: National Defense University, U.S. Government Printing Office, 1996).

launch or whatnot, I won't have my hands around the throat of the guy who's got his finger on the button."

Student: I think what's going on there is the disagreement over how much you want the informed network to take initiative, and that debate has figured prominently in warfare in the twentieth century. Certainly in World War II the Germans and the Soviets had a very different style of directing support and control. It's something the Israelis have been lauded for, and some of the U.S. Army also. Network-centric warfare seems to come out in favor of granting authority for taking initiative, while the questioner is wondering whether that authority would indeed help.

Cebrowski: That calls for qualitative judgment on the part of the person who is asking the question as to whether or not that is a good thing.

Student: In my opinion, granting support to initiative is good, but certainly the debate ought to be there.

Oettinger: Underlying the question is a confusion that is one of my pet peeves, and I'd like, if I may, to build on your raising that to make a point that's near and dear to my heart. Borrowing metaphors can sometimes be dangerous, and the dangerous metaphor in this case is "Knowledge is power." That assumes—and I'd be interested whether you agree or disagree with that analysis—that the path of command and control orders and the flow of information are necessarily the same. They have tended to be, and part of your point about Alexander and Wellington being metaphorically in the same boat is that the distinction between flow of command and flow of information was almost irrelevant, because it all happened in their heads and they reasoned from direct observations. It's only with contemporary technology that the distinction becomes important, because if everybody has access to all the information, which is perfectly possible at least in principle and probably in practice, then this question arises that people throw at you: "Is control possible?"

The question comes from the confused notion that if you know something you're also empowered. It goes back to that metaphor, but there's absolutely no logical or technological reason why that should be true. The notion that you know as much as the commander and then, as a matter of policy, doctrine, or whatever you either act autonomously or you act under command, and you may vary between the two, involves completely orthogonal or completely independent decisions if they're not confused in the beholder's mind. If I'm right, it seems to me that there's an important need to keep differentiating between the two. Is that reasonable?

Cebrowski: Yes, I think that's fair. For example, the nineteenth century management model was that the bosses would keep information from workers on the shop floor, which would then keep the workers from being able to unionize. If they unionized, they could perform some activities that were antithetical to the interests of management. That is a case of "information is power," where the managers wanted it and didn't want their subordinates to have it.

The other issue, though, that the discussion raises is the quality of the leadership. If I think they will run out of control, if I think they will launch the missile whether I tell them to or not, if I think they will disagree with my orders or do something antithetical to the commander's intent, what does that say about the discipline of my force? Therefore, what does that say about the

nature of leadership, what constitutes a good leader, and what constitutes good training? What happens in this now-networked, information-rich environment is that the definitions of leadership and of discipline change, so the underlying rule set has shifted. Then, when a person asks the question, what he's really asking is "Do I like the new rule set? Can I in fact live with it, or am I more comfortable with the old rule set?" That, of course, invites a whole series of other questions.

Student: You happened to mention the idea that a leadership strategy for a massive land assault that's going to have very high casualties, for instance, might be a good technique or strategy at a macro level, but at the micro level people might not want to take that risk. People have an instinct for self-preservation. I don't doubt they would obey the orders, but when the individual can make a choice at a personal level it might be very different from the choice you would make for the entire army. The risk of losing 100 men out of 100,000 is small, but if you're one of those 100 men you're not going to want to go through with it. That may be one of the main reasons why people are afraid of too much information going out. They're now able to put their name to the idea of "Why am I the one going into the most dangerous position?"

Cebrowski: That's right. One of the reasons I'm so enamored of this question is that I have commanded forces in combat, and I decided very early on that the discussion I never wanted to have would in somebody's parlor where some mother or father would say to me, "But Admiral, you knew this and my son didn't, and because he didn't know it he died. If he'd known it, he might have been able to take an alternative course of action." If I had been in that situation I wanted to be able to say, "I gave your son or daughter the best possible equipment, the best possible training, the best possible information, and the best possible guidance that I knew how to give." Then I could live with myself. I figured that all of my other rules would have to change so that I didn't have to have that conversation. This is not theoretical. This is very practical. It is very down to earth, and it's very much life or death for the interests of the nation, as well as for a specific individual. So I think it's worth coming to grips with this both intellectually and emotionally.

Student: Can't you say, though, when you're talking about information and everyone having the information, that what makes the commander so special is the means by which he can interpret this information? I don't know how the paradigm of leadership really changes. John Keegan talks about two extremes for a commander: the dictator and the benevolent commander.[5] The best commanders are the ones who can weigh the situation, are flexible, and can move between the two roles so that subordinates don't know exactly where they are in that spectrum: if they're leaning more toward dictatorial control or beneficial delegation to their subordinates. I think the commander is the one who adds the value to what you're talking about. He's the one who adds value to the information and turns it into knowledge. I don't think it's knowledge until the commander adds the value to it, and that's why leadership has a huge impact on control.

Cebrowski: Yes. There's a lot to what you say, because we can share many things, but the troops are not going to know what's inside the commander's mind except insofar as he tells them. Considering the time constants and the circumstances of modern battle, there are a lot of times

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[5]John Keegan, *The Mask of Command* (London: Penguin Books, 1987).

when he's not going to be able to tell them what's in his mind. That calls forth a rather traditional notion of discipline.

Student: I had some experience working with the Spanish air force where service isn't voluntary (they're now transitioning to a voluntary force) and I saw the differences there versus our Air Force in the United States. The media are discussing a lot about "What if the draft comes back?" On the basis of your experience in Vietnam, now that we have this information-rich environment, do you think it should be as information rich if service in the military isn't voluntary? Is there some type of distinction we should make there?

Cebrowski: I'm not sure. First of all, I have a difficult time seeing circumstances where we would go back to the draft. Instead, we're looking at a somewhat different phenomenon that I'll talk about in a few minutes.

Student: Even thirty years down the road?

Cebrowski: Let me give you a couple of anecdotes, and we'll see what we can draw from them. In 1980-something, Admiral Jerry Tuttle commanded a battle force in the Sixth Fleet. He was involved in Lebanon, and as you're aware there were Marines ashore and there was a whole host of activities. He received an order to conduct a strike against surface-to-air missile sites inside the Syrian mountains.[6] He tried mightily to execute those orders—mightily. They were virtually impossible orders to execute. If all the people involved had had the skill of the commander at the time, they probably would have been able to pull it off and do a good job. Anyway, the mission went poorly.

A few years later I was a deputy CJTF [combined joint task force] commander in Riyadh, and we had about 110 or 120 Navy and Air Force planes airborne, being tanked, ready to go on a strike. The operations officer from Central Command called from Tampa, Florida, and said, "What we want you to do is just hold your strike package airborne on the tankers, cycle your tankers, until we get a go-ahead from the president, which isn't likely to happen for another two hours." This was night, and there were lots of airplanes involved. At that time General Nelson[7] and I both simultaneously shouted into the phone "No! We aren't going to do that!" because it only took about a nanosecond for us to realize that it was unsafe. We were going to be putting people at risk and we wanted options to develop an alternative. The operations officer came back and said, "This plan has been approved all the way to the White House and that's what the president wants you to do." We said, "Well, go back and tell the president that we don't want to do that!" The operations officer said, "Okay, but there will be hell to pay." Our response went through the Joint Staff and the chairman of the Joint Chiefs of Staff and the secretary of defense and the national security advisor and got over to the president, and then the order came back down all the way and then finally through the phone, and we got the answer from the president, which was "Well, okay, so what *do* you want to do?"

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[6]For an account of this incident, see Tom Cooper and Eric L. Palmer, "Disaster in Lebanon: US and French Operations in 1983," Air Combat Information Group, 26 September 2003, 20:37, [On-line]. URL: http://www.acig.org/artman/publish/article_278.shtml (Last accessed on 28 August 2004.)

[7]At the time, Lt. Gen. Michael A. Nelson was Air Force deputy chief of staff for plans and operations

The difference between our case and Admiral Tuttle's case was that we were really well informed about what was going on in the forces at the time. Tuttle was making the best judgment he could with what he had at the time. As it turns out, the president was happy, and the president of France was also happy, because he was also involved in the decision. The forces that were flying were happy, and we still ended up with an alternative that accomplished the mission.

Collaborative planning and collaborative decision-making are very powerful. If you shut off the information flow, you may get exactly what you want, but you're also foreclosing other options that subsequently you may wish you had kept open, and that's part of the phenomenon.

Student: Where do you think this right or ability to say no should stop down the line of command, as far as getting an order that for whatever reason someone doesn't want or doesn't think is the right thing to do?

Cebrowski: I think there are a couple of logical break points. One is that if you look at the oath of office of an officer, it's different from the oath of office of an enlisted person. The oath of office of an officer does not include the phrase "that I will obey the orders of the president of the United States and the officers appointed over me." That's in the enlisted oath, not in the officer's oath. The reason it's not in the officer's oath comes out of the Civil War: that the allegiance will not be to a person, but to the institution of the Constitution of the United States. It was further reinforced in the Nuremberg trials: that no American officer will ever have as his or her defense "I was following orders." That's one logical break point.

Another one that is very practical from operational experience is the power of the on-scene commander, who may in fact be a quite junior enlisted person. Because he's on scene, he merits the benefit of the doubt to make the call. For example, the most successful operation that Special Operations Command ran during Operation Desert Storm was a platoon-size effort that was led by a Navy second class petty officer. By virtue of the way they do things, he had the authority to make the decisions with regard to executing the mission. That's kind of doctrinal: that the on-scene commander has certain authority.

Once you start getting below those two levels, you start chafing against issues of insubordination, discipline, quality of leadership, and all of those things. The water gets muddy pretty fast, doesn't it? So you say to yourself, "So, doesn't that mean I have to do a better job of training, of developing unit cohesion and alignment?" It raises the value of those attributes of leadership higher than they were before. Before, you had trust based on "I really don't want to do this, but the old man says so, and he must know something that I don't know." That was the fairly common way. Now all of a sudden you get, "I'm doing this because we're in this together. We understand." Can you in fact make that transition? That's a different leadership style; a different level of trust and a different kind of unit cohesion.

Student: With this idea of control, we have all those buzzwords: net-centric control, platform-centric control, all the different controls that are out there. With this idea of increasing communications and the ability to give authority to, as you said, a petty officer second class, or a sergeant or lieutenant in the Army, at what point would the global media perceive that a petty officer second class can take an action in Fallujah right now that could have huge strategic

consequences? At what point do control and the newer system threaten to break down the levels of what is strategic, what is operational, what is tactical, and who controls those arenas?

Cebrowski: This is the phenomenon known as "the strategic corporal." The strategic corporal has always been on the battlefield to some extent, but never more so than he is today, because, among other things, you are looking at the compression of the levels of war.

Oettinger: You could have a complementary tactical commander in chief. If there is a strategic corporal then Lyndon Johnson was a tactical commander in chief.

Cebrowski: Yes. That raises the issue of micromanagement, which of course is nothing new. Union generals used to complain that Lincoln was micromanaging the Union Army, so this is not a new phenomenon. We're compressing the levels of war.

What invited this particular observation you're referring to is the case where a corporal whose unit was part of the success in Iraq picked up the American flag and flew it from a statue of Saddam Hussein. At that point, to the surrounding people it looked as though America was now an occupying force making claims to that territory, which was undoing several months of hard-fought diplomacy in which we tried to convince them that we were not an empire going after territory in general and oil in particular. That's the power of the strategic corporal. The flag didn't stay there for more than a nanosecond when the officer suddenly realized "Whoops! This is a mistake!" The flag came down and there were lots of apologies, but a lot of damage had been done. That then raised the question, "To what extent had the commander's intent been exported and inculcated to the now-strategic corporal?" This is not an issue to be taken lightly. It calls into question such important issues as centering your force on the nineteen-year-old rifleman. Adolescence in America runs to about age twenty-four in general, so it's a small step from the strategic corporal to the strategic adolescent. The demands on leadership and training are profound.

Student: It seems that such robust networking and knowledge of the mission could be helpful in the other direction as well. What I mean is that we talked about commanders and (God forbid this should ever happen) perhaps this knowledge could help buffer a confidence issue. I know this also never happens, but junior officers might creatively exercise their guidance to get their troops to do what they think the general meant to say. It could be very frightening to the people you mentioned who have concerns about that, but if they are well informed and understand things perhaps better than their boss then the system might still be able to perform.

Cebrowski: This is a problem I always have. I used to pride myself on never giving a direct order, because when I give a direct order subordinates stop thinking, so the collaboration about the direction of this enterprise has gone away. The general rule in the Navy is that it's a very foolish captain who ever gives an order to the helmsman, because at that point the rest of the team just stands back and says, "Okay, the captain's got it!" You now have lost all the observation and brainpower of all the other people on the bridge with you.

I ran a couple of tests to see if that actually happens, and it does. In my office, for example, I can give pretty direct orders or I can give these vague orders that kind of bother people because they aren't particularly specific. If I give a specific order then all I get is the answer to that issue.

If I give vague orders I might get something very much better than what I had in mind. But in my office, nobody's life is at stake. We're just burning up money.

I've gotten to the end of phase one, so I'll take one more question, and then we'll go to phase two.

Student: I guess that is true in a bureaucratic sense in an office environment. When I was a commander in Iraq during the invasion the standing order came down "You will not stop for anything as you cross the border," because children would swarm over the vehicle, they'd pull all the supplies off, and then one of the Fedayeen would run up and throw a grenade at it. They didn't care if the children were on it or not. So I had to give all my soldiers a direct order: "You will not stop your truck." If you run somebody over on the road, the natural American instinct (I hope for most of us) is to stop and try to give aid, but it could have led to more death and destruction if we had stopped our vehicles. I don't want to misunderstand you, but there is a place for direct orders. You're saying the best results come out of orders where you have the leeway.

Cebrowski: It's your job to decide whether or not this is the time for direct orders or whether we can do some collaborative decision-making. Part of the fine art of command is to make that judgment. You always have to make the judgment, too, certainly if you're an officer, about the morality of the order.

Student: Fortunately that never happened, so I never had to make that call.

Cebrowski: That's not necessarily an immoral order. The burden on the driver is to avoid hitting someone. You can give that order without necessarily running children over. You find a way to do that. Should you fail in that, we'll find some other way to give aid to a person who's hit by mistake.

Student: So what do I do if I have a sergeant who's in charge of a section of my convoy who then tells his driver, "Stop the vehicle," because he has an assessment of the situation? As you said, someone has an assessment on the ground that "I understand the tactical situation, and we can pull security right here while we render aid to this child." So, do I punish that NCO [noncommissioned officer] when there's a good outcome? Do I say, "You violated the control that I put on you that you will keep going, because that could have resulted in the death and destruction of more people and equipment"?

Cebrowski: I was commanding officer on an aircraft carrier. I'd been in command for eight days. We were at sea, and there were reports of smoke in a certain area of the ship. The fire marshal and the fire party responded. They were on scene. I was talking to the chief engineer at damage control central, listening to the reports that were coming up to the bridge. We had the architectural plates of the ship and the issues plotted, and we were going back and forth. I told the chief engineer at one point, "I don't like this. I want another course of action. Back out the fire party. Get them out of there. Button up the spaces with two levels of protection, and then proceed according to ABC." That order got passed to the fire marshal who was on scene. He came back and said, "We're already here. We believe we have this under control. We're getting rid of the smoke, and we'd like to stay for a few minutes to make sure we have this under control." The chief engineer passed that up to me and approved the course of action by the on-scene

commander. The space blew up, two people were killed, fourteen people were injured, and my original assessment of this problem was right.

What did I do with the on-scene commander? He made the decision. He said, "I'm staying." As it came up the chain of command, I was given the ability to countermand that and tell him to get out, but by that time the space had exploded. Obviously, I wasn't going to take any kind of punitive action, because the guy had all the skin blown off his body and spent about eight months in Brooks Army Hospital. You'd have to be a stone to want to impose punitive action, so that wasn't the point. The point was "What action are you going to take with regard to the policy of the on-scene commander?"

Oettinger: The parallel between that situation and the World Trade Center is striking, because of the heroic actions of both the police and the firemen who continued to go up. It has its civilian counterparts as well.

Cebrowski: This is life. I decided that the principle of the on-scene commander is a powerful, valuable principle and should not be undermined by any action I would take. That was my judgment. Of course, believe me, that judgment was subject to a lot of review, and it was sustained. That's where we are.

The fundamental answer to the first question is "feedback loop." In the presence of a feedback loop, you actually have more control, because you have more information. Until we had a robust feedback loop by virtue of the information age, we actually had less control because we had a lesser feedback loop.

Student: Another point is the speed with which the information was moving between you and the on-scene commander and back to you and so forth. If you had been able to have an immediate real-time conversation with him, he could have said "I think it's under control and I'm going to stay here," and you could have said a nanosecond later, "No, I want you out." At that point, who knows where it would have been?

Cebrowski: Yes, that's a good hypothetical issue. It's something that I had thought about and decided it made my head hurt.

Oettinger: There's another justification for the primacy of that principle, because all the phenomena you describe about the difference between today and Wellington and Alexander the Great placed an enormous amount of reliance on communications technology between hither and yon. The question is ever present: What happens if this fails? One can argue about redundancy and robustness, et cetera, but Murphy's Law is not abrogated, and if the link fails and the on-scene commander has no experience with exercising authority, you have lost the game entirely. That, in and of itself, would argue for adhering to that principle pretty much come hell or high water.

Cebrowski: That was round one. I thought we'd just get to the heart of your course—first principles—and see where that led.

Let's go to a different place. We're shifting gears entirely. This is a whole new discussion. I had this discussion on the other side of the campus earlier this morning.

This is a general case (**Figure 1**); for example, you're running a department store. The red line is transaction rate; the blue line is resource base. You make a lot of sales but you only have one cash register open, because you only have one checkout clerk. So your resource base is very low. Meanwhile, your advertising department is churning out all this stuff about sales and things like that and people are pouring into the store. The sales force, of course, likes that, because their metric is "How many people can I get inside the store and have them walk up to the cash register?" On the other hand, since I'm the boss, my metric is "How often do I hear the cash register jingle?" So I've got a problem, because I want to have a very high transaction rate, but I want to minimize costs. Sales clerks are expensive, so I minimize the number of sales clerks I have, and pretty soon I start losing business. At that point, what do I do? I fire my advertising people, because they're not bringing in enough customers. That's dysfunction.

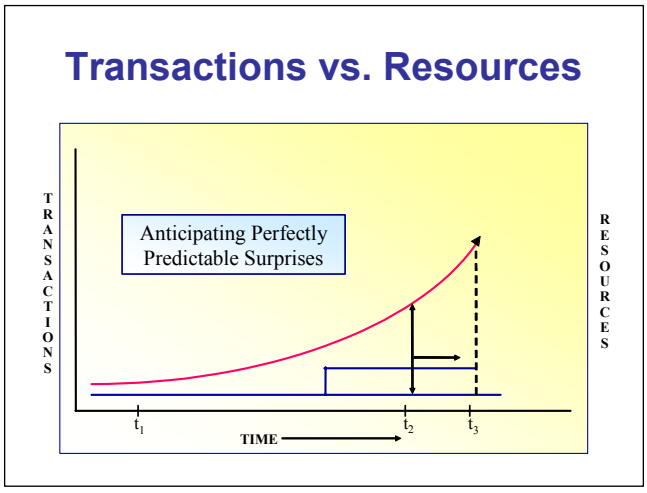

Figure 1

What's the right answer? The right answer is that I increase the number of checkout clerks. I find out, for example, that Safeway and Grand Union and Food Lion are competing not just on the basis of what they supply and how bright and cheerful their store looks, but how quickly they can get you out of it. So they have self-checkout counters in some stores where you scan your purchases and bag them yourself so you don't have to wait for everyone and you don't have to worry about the slow checkout clerk. The people running the stores realize that you value your time and you're really not interested in standing there and reading the C-rated periodicals at the checkout line unless Elvis sightings are a high interest of yours. Your time is more valuable than that. So transaction rate matters a lot, and the relationship between the transaction rate and the resource base to handle the transaction rate is very important too.

You even have this on the battlefield. In general, you like to have a very high transaction rate on the battlefield. One of the reasons you like that is that when your transaction rate is up you're learning more—if you have a feedback loop. Then, because we're all networked, your whole force is learning, so the transaction rate goes up even more, your casualty rate goes down, and you achieve the objective sooner.

Student: What do you mean by "transaction" in the battlefield?

Cebrowski: It could encompass several things. A transaction might be "I give this person a Mark 84 general-purpose bomb, and he gives me his life."

Student: Killing the enemy?

Cebrowski: Yes. It's a very antiseptic expression. Or it might be that, by virtue of my expending *this* amount of energy, I gather *that* intelligence, and the fact that I got that intelligence back means I screw him up, or I have effective military control over a patch of terrain for a particular period of time. It's not just killing a person, it's an exchange of things of value. I exchange my resources for what I get in return.

Student: How do you resolve the problem if your transaction rates gets very high, which our technology can give us? How do you filter the information coming in so you know what's important and what's not in terms of the transaction rate? You also said that if your transaction rate is up and your organization is linked, then your whole organization is learning, but different people in your organization (you being the admiral and commander in chief) see things differently. How is Captain Joe Schmo down there at one level, or Private Snuffy at another, supposed to put what you see in context and learn from it?

Cebrowski: Different people are going to learn different things. Let's do an aside on that question right now, because I think this bears some exploration and I don't have a very good answer to it. If you look at, say, air-to-air combat, and I'm in the cockpit of the airplane and I have data link displays, that information is of value to me in the cockpit. It's also of value to the air wing commander and to the air operations center. You can have the same symbology that's displayed, and it's of value up and down. That is because this type of information is scale free. It doesn't matter at what level you are, and that's a characteristic, generally, of information for air warfare. It is also a characteristic for some elements of naval warfare.

For land warfare and some other elements of naval warfare it's categorically not true: the information that's of value at a very low level is of virtually no value or limited value at higher levels, and vice versa. So for land warfare, the phenomenon that we seem to see is that information is scale dependent.

What that then calls into question is, "Can I have one information system that is good for all forms of combat?" It tends to imply that the answer is no. That doesn't mean you can't communicate between the various systems, but the information is going to have different value for different people. Even if it's all available to everybody, you'll find that certain users will only access some, because the rest simply has no value to them.

Student: It may require computers to process it. If you've got lots of high-resolution information about terrain coming in from individual squads, it can be aggregated by a computer really quickly to give the commander better information.

Cebrowski: Sure. But then you have different information by virtue of the aggregation. You leap over the scale issue to the other side when you've used the technique to aggregate information.

Student: On that slide (Fig. 1) it seems you have a linear assumption about the amount of resources you've put in versus resources going out. In complex, nonlinear systems often you can't make that assumption. You might have a huge amount of resources going in and bringing a small return, or small resources bringing huge returns. The feedback loops are much more complex; they're not "Just see what comes in."

Cebrowski: Yes. That's true. It's not the case I'm talking about. In this particular case, the manager sees that he has a gap at this time between his transaction rate and his ability to address that transaction rate, so he institutes some management efficiencies. He puts people on overtime, he cuts out extraneous work, does efficiency engineering, whatever. As time goes on, however, he comes to realize that those were inadequate: what he really needs is a higher resource base. So he goes after the higher resource base. This is government, so you never really get what you need, and you're somewhat short. In any case, all you've really done is move to a higher plateau somewhere else. Particularly in government, the demands on the resource base lag the growing transaction rate.

But notice the phenomenon that's happening. The red line has a second derivative; the subsidiary blue one doesn't. Over time, the rate at which these lines are opening is greater, so you have a looming cataclysm, where all of a sudden you're going to have a gross dysfunction. People are going to stop going to your grocery store and go to another one because you passed some threshold where people decide, "I'm not going to stand in line here anymore," and your store goes under or you get fired.

Although the management actions taken here for efficiency were well intended, they were actually the opposite of what you needed, because all they did was postpone the problem to a worse time, when the rate of opening is increasing and therefore it's harder to cope with the problem. You have consumed valuable time in doing this.

What's an analogue or an example of this? I think it was in about 1920 or so that all telephone calls were operator assisted. AT&T said, "My gosh, at this rate of growth of transactions in telephone calls, by the time we hit 1960 everyone in America is going to have to be a telephone operator!" Sure enough, that's what happened, but in order for that to happen policy had to change. The policy was that the telephone operators were no longer going to be AT&T employees. Instead, that function was now going to shift to the customer base, so you had the popularization of telephone poles. Then, with the advent of the little plastic clip that goes on the end of the wire, we all became telephone installers.

My master's degree is in computer systems management. It is an absolutely worthless degree, or the name is worthless, because we don't do that anymore. We've all become computer systems managers, and furthermore we've all become computer systems installers. If your Dell computer fails, you dial the 1-800 number and you get the guy in India who talks you through how to fix your computer, so you're now a computer repairperson. It's the popularization of these functions, because the transaction rate of these functions vastly exceeds the resource base to satisfy them. The trick—indeed, the burden for you—is to try to identify this phenomenon while the curves are still pretty flat and then make the judgments as to what you can do.

For example, AT&T says, "I'm back here at the beginning of the blue line. What I'm going to have to do is increase my ability to do switching," so they start doing switching faster. Then they've got to automate switching, and they say, "Why am I doing the switching?" They make a decision that they'll progressively bring this on board. They bring on the necessary technologies and then they start to educate the customer base, and then you start to have the shift in this thing. It's a perfectly predictable surprise. This is a very pronounced characteristic of the information age now, because of the way the transaction rate developed, and now it's so fast.

Student: On the rate of increase on your transactions, what do you do when that monotonic increase gets to the point where you cannot handle it anymore? You read about information overload, and it's too much.

Cebrowski: You make a policy change. This is the number of intelligence collections by the National Security Agency, and it is log scale on the vertical axis (**Figure 2**). This curve goes up to the roof if it's on a linear scale. The x-axis is the resource base of analysts. What's happening is that we're seeing a policy change. These are the three main policy choices. You can just disregard some of it—just chuck it, or you can do automatic processing, or you can all become intelligence analysts. Actually, we're in the process of doing all three of those things.

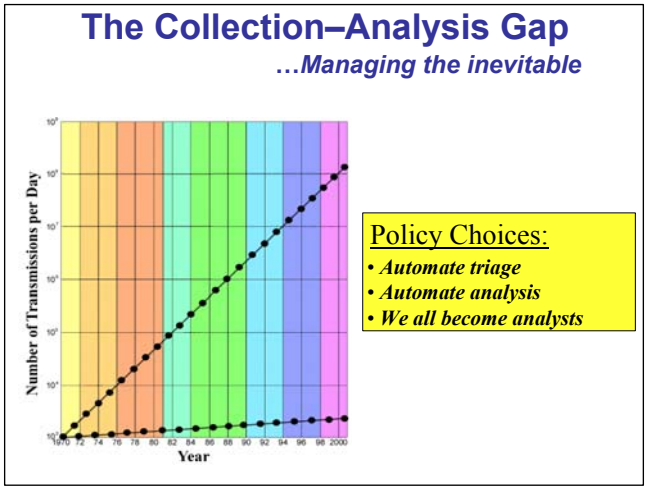

Figure 2

The dominant one is that we all become intelligence officers, because every day we deal with information overload. You craft your own information domain. You don't let Peter Jennings tell you what you need to know; you decide what you need to know. What comes from Peter Jennings is fine, but if you can pull it off some other Web site that's fine too. It's up to you. If you look at what Army officers do in tactical operations centers these days, or what fighter pilots do in the ready room, ten or fifteen years ago only intelligence officers would have been doing that.

Student: It sounds more feasible when you have intelligence coming from a very small number of sources. If it's all going to be imagery, and you happen to have a skill set that enables you to look at satellite reconnaissance and pick out the radar installations or whatever, you can plot out your own flight plan that evades the radar detection. But when the intelligence is coming from a

ton of sources, it requires all-source intelligence fusion to get a picture. Now information security becomes an issue as well as simply getting all the information.

Cebrowski: Note that the bottom line on the chart doesn't go to zero. What happens is that this line focuses on what only they can do and you can't.

There are a couple of other things that happen with this policy. First of all, we're witnessing an increase in the value of social intelligence, because for national security purposes the frontiers are no longer national borders, they're the fault lines within societies. That means we have to look and operate deeply within societies. That's social intelligence. The vast majority of social intelligence is unclassified. It's not valued by the analysts.

Oettinger: You've given me a fresh perspective on something that I've used as an illustration, but sort of unconsciously. Let me test whether it's an illustration of the same principle. If you go back to World War II, getting weather information for a convoy or for antisubmarine warfare in the North Atlantic or ultimately for D-Day was a major intelligence undertaking. It was very expensive in money and lives, and you got lousy coverage anyway because the techniques were very crude. If you fast-forward to 2004, global weather coverage has become a universal activity that involves the widest variety of things, including some of that bottom-line-type stuff like government satellites, kids in back yards, people with big hair on television stations, and so on. So it's gone completely that route of everybody becoming a weather analyst.

Cebrowski: That's certainly happening, so you see the emergence of a whole collection of things. First of all, there's a set of technologies that are going to have to spring up to support social intelligence and that we only have in a prototype stage. It's one of the things that my office is monkeying around with, so we know that such technologies are within reach. That makes it technically possible for you to do this. The fact that it's unclassified information tends to make it organizationally possible for you to do it.

You still have the possibility that the technology will not be adequate to keep you from being overwhelmed. What might actually be introduced is a new layer of people who are called intermediaries, which is a phenomenon that already exists. You use them all the time.

Student: We're not always satisfied with what the newspaper journalists or whoever else give us.

Cebrowski: Yes, but there are other ones. For example, I want to buy a vacuum cleaner. A salesperson is one source of information, but I'm not always satisfied with that. There's a low level of trust. I can look on the Web for all the vacuum cleaner manufacturers and I can rack and stack all of them, or I can go to the master vacuum cleaner Web site where they've done a comparison, or I can go to Consumer Union. Those are infomediaries. They have a higher level of trust.

Student: There is one source that you have to place your trust in. You decide ahead of time "I think they're unbiased. I like their methods of analysis or whatever." It seems to me that's what intelligence analysts right now should be.

Cebrowski: That's right, except they can't do it. The reason they can't do it is the distance between the end points on those two lines.

Student: So it's a matter of providing more people with those skills.

Oettinger: There are vision statements in the intelligence community that say, without cracking a smile, "We've got to know something about everything." That's the most idiotic statement ever made when you look at this situation.

Cebrowski: The resource base for intelligence analysts is essentially fixed, so what you do is popularize it. Because of the difference between classified and unclassified you're actually given an opportunity to deal with social intelligence. You can move social intelligence to an unclassified format, create technologies to support it, and then you can all do it. We already do it in the case of weather.

Student: The bottom line seems to be that in an extreme sense you send all your officers to graduate school so that they all learn how to be social analysts. They get a liberal arts degree.

Oettinger: You sound like General Gray![8]

Student: Either that or make it like the telephone: we all became telephone operators. Then we all became telephone installers because of the little plastic clip. You didn't need to be some kind of engineer who knew how to wire something; they developed a tool that allowed the average person to do that.

Student: Sir, having an intelligence background, what I would suggest is what the community has done to some extent: "Don't simply assume that all your analysts are within Langley. Go out to the universities." Going out may be as simple as writing an email message. They don't have all the classified information, but they have the unclassified information and the quality of knowledge that gives them the credibility. By the way, I learned a long time ago that information doesn't have to be good to be classified, and doesn't have to be classified to be good.

Cebrowski: That's another approach to popularization. You're dealing with the disparity between transaction rates and resource base. This slide (Fig. 2) is essentially the national security transaction rate, by decade, and we know where it's projected to go. The resource base is relatively flat. The Department of Defense is not going to get very much bigger than it already is, barring some kind of cataclysm. There are going to be policy choices.

Here is a list of some policy choices (**Figure 3**). The engagement policy could change, which is a way of saying "I'm going to do something to suppress the transaction rate."

[8]General Alfred M. Gray, twenty-ninth commandant of the Marine Corps, placed a strong emphasis on continuing professional education.

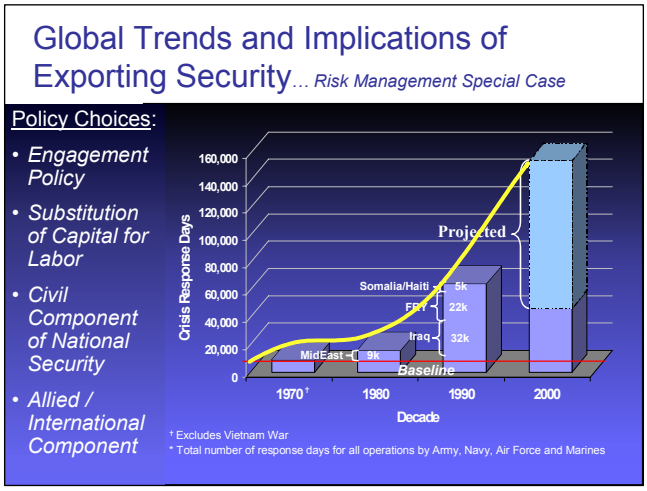

Figure 3

Oettinger: All those private security guards in Iraq now are in the civil component.

Cebrowski: That's right. The "civilianization" of defense is going on now in a very big way. It's also happening at home. There are record handgun sales in the world. The good news is that most of them are in the United States, so that's the popularization of security.

Student: Going back to part one, though, when we talk about a lot of civilian contractors in Iraq, at what point are you effectively losing control of these folks? I saw a picture the other day on the front page of *The New York Times* that showed a Blackwater Security minibird helicopter that's only flown by the special operations community of the U.S. Army and other services, and they looked for all intents and purposes like part of the 160th Special Operations Aviation Regiment. (I think the Blackwater Security Firm or some civilian contractor in North Carolina is the one to which the four gentlemen who were killed in Fallujah belonged.) I thought to myself, "What kind of control do we have over these guys? What do they provide us, and how do they limit us?" I'm concerned that it's almost as though we're paying mercenaries to go and do things for us.

Cebrowski: It sort of reminds you of the Hessians. These policy choices are observations. They don't make a value judgment about their goodness. What you're watching is the popularization and internationalization of defense.

Oettinger: Just to go back to the intelligence, there are negative sides to that as well. If you get everybody to be a snitch, your civil liberties go to hell in a handbasket. So my fanaticism over balancing acts applies here as well as anywhere else. You don't have the time to do the complete balancing list for every one of them.

Cebrowski: What you and I have to decide is what we're going to do about the eventuality of one or more of these policy changes. There's a downside to every single one of these. There's also a powerful upside to them. You have to work your way through them. The point is that you can make these policy decisions now, in the first part of this decade (actually, it's getting to be the middle of the decade), when you're under heavy pressure, or you can wait until the end of the

decade to make them, when you're under extraordinarily painful pressure, the change has become drastic, and you haven't had time to think it through.

Student: I don't know if I believe the trend you're showing or not. For one thing, there's that little note on the bottom that it excludes the Vietnam war, which changes the trajectory of that graph pretty dramatically. It turns it into a U. The graph is really an exponential and I don't think there's enough data to say the number of crisis response days is growing exponentially. I can see it going down, I can see it going up, and I'm not sure you want to have radical policy changes until you have an idea which way it's going.

Cebrowski: We did this for a couple of reasons. One is that almost all the decisions about the forces that were deployed in the 1970s were made in the 1960s. So to a certain extent that's at the start of the x-axis, and what you saw between 1970 and 1973 is the tail of it. In any case, the point is there was a policy change, and I guess one of the questions we can kick around the table is "Can you think of some examples?" It would be a worthwhile exercise to get a few folks together tonight over a couple of beers and ask, "Can you think of some things like this, and what might the set of policy changes look like?"

For example, health care is growing at a rate five times that of the national market basket inflationary rate. It's currently 16 percent of GDP [gross domestic product]. This is a huge disparity, and because we are talking about rates this is a phenomenal opening factor. So there is going to be a policy change with regard to health care. That's a perfectly predictable surprise. The question is: What's the policy change going to be? That is the political and the moral question. For example, we could have rationed health care and we could kill all the old people. People are capable of making that choice, but it's immoral, so it's not necessarily what you want. If you take that choice off the table, what are some other choices that could be made?

Student: There are two that come to my mind. One is that you can turn more people into preventive health experts through education, so that everybody kind of watches out for everyone else's well being. It's a particularly popular notion in the Third World: trying to get preventive medicine out and get people to avoid disease, and that brings down mortality rates.

Cebrowski: Americans do have the capacity to do it.

Student: Over at the Health Policy Institute here at Harvard I believe they say that 70 percent of all the health care costs in America is spent in the last ten days of the Herculean efforts to keep someone alive on life support. So at what point do you say, "Okay, we're at ten days; cut the life support"? Who's going to allow you to do that? How are you going to have that choice?

Cebrowski: Actually, there are moral positions for that, and if those moral rules are followed then this might be quite justifiable. But we may find that the actual application of those rules doesn't really home in on that 70 percent. The number of cases that come under those rules may be very small, but that's not clear. So you can approach it through a moral lens and do the hard research to figure that out, or you can just say that what we'll do is essentially the moral equivalent of rationing health care.

Oettinger: Or you can privatize it or popularize it by passing legislation that authorizes assisted suicide, because in many instances the phenomenon you've described is not the will of the patient.

Cebrowski: The trouble with that is that you hit up against the moral issues again. But there's another way of popularizing it, which Clay Christensen points out.[9] We can change the rules so that we handle certain rules-based illnesses essentially with a nurse at a health care kiosk at Wal-Mart. Mom can show up there with a kid who has a strep throat or a urinary tract infection and have that condition diagnosed by rule set. There's a set of medications prescribed for that condition. Mom authorizes the nurse to do it. They're doing that right now in Michigan. You show up at that kiosk, you get the diagnosis, you get the treatment, you pay thirty-five dollars, and you're out of there.

Student: It seems the military would have a lot of data on that kind of thing.

Cebrowski: That's right. It's one of the things we're trying to get the military to look at right now, because on a military reservation you don't have a lot of the state laws concerning tort.

Student: A Navy medical corpsman does lots of diagnosis and treatment. It's not like everybody gets to see the staff surgeon on board the aircraft carrier.

Cebrowski: Yes. You don't have one on a submarine, for example. You depend on the corpsman, who does everything, including surgery if necessary. But this notion of popularization is a big thing. Now, the likelihood of your getting to the point where you actually kill old people is pretty slim, because old people vote, so there's a moral reason and there's a practical political reason not to go there. But two of the reasons health care costs are so high are that we don't do the prevention and we don't have grandma at home. So what we'll do is change the technology of medicine to allow a surrogate grandma to be at home, and that allows the highly trained surgeon to focus on what only highly trained surgeons can do.

Student: A lot of times popularizing things helps, when there's too much government regulation and it's causing the market to perform suboptimally. At other times there's a genuine tension between the market and people's individual incentives for how to act, and in that case rules actually help. It's the government keeping people in place so they're not acting on their own incentives but in a way that's cooperative. I certainly haven't studied health care, and I'm sure there are a lot of people who have and are looking at this problem, but I think you first have to prove that the market is performing suboptimally and that by popularizing you can make it perform better before you can justify making these kinds of changes.

Cebrowski: My point is simply that there's going to be policy change. There's a certain inevitability behind that. The job of leaders is to try to figure out when that's likely to happen and what the set of policy choices is, and then to get upstream influence for the best possible set of policy choices.

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[9]Clayton M. Christensen, a professor at the Harvard Business School, is the author of *The Innovator's Dilemma* and *The Innovator's Solution*.

What you might do is start thinking about what the choices might look like in the information realm. For example, if you've got enough people doing file downloads, what starts happening to the policies? They start changing. Choices start to be made about which laws are invoked and which ones aren't. Then you have some countries that undermine that and they decide not to enforce that law, and that has to be reconciled. So you've got a big churn going on right now concerning the laws protecting intellectual property. The transaction rates have outstripped the ability of the old rules to cope with them, so there's going to be a policy change of some kind. I'm not saying what it's going to be, because I don't know.

Oettinger: You've put another thing in perspective for me. This is a beautiful model. It accounts for so many things that were incomprehensible. I served for many years on the advisory board for the National Library of Medicine. When we first proposed to the director that the library alter its mission from being totally in the hands of the medical profession and provide medical information to the general public it was greeted as madness. Take a look at Medline today, and the consumer-oriented information it contains. As the Congress started dealing with the disparity that Admiral Cebrowski is talking about, the appropriations to the National Library of Medicine to undertake the popularization program of their holdings for the benefit of the general public started taking off.

Cebrowski: At a time when the transaction rate in pharmaceuticals was low, the doctor gave you a prescription, you went and got it at the drug store, and that was fine. Now the transaction rate is very high, and every morning you have five or six little brown bottles lined up on your table at breakfast time (not today, but there will come a time in your life). So what you're going to do is go to some Web site and punch in all those pharmaceuticals. You're going to find out the interactions among all of those medicines and the contraindications for various interactions and print out a schedule as to how you organize the little bottles on the kitchen table so you take the right ones before you eat versus the ones after you eat, and all of that kind of stuff. You're going to go to Doctor A for this one, Doctor B for these other two, and Nurse C for the other one. They're going to be specialists in widely different areas, maybe even in different parts of the world. Who's going to coordinate this?

Student: I hope that by the time that happens they'll have reinstated the law that didn't allow advertisements for prescription medications on TV, because I imagine that's another simple policy that's caused insurance rates to skyrocket.

Cebrowski: Sure. There are all kinds of things. But my own experience is that this is very real. It's real in information technology realms, it's real in national security realms, it's real in medicine, it's real in business practices. Look at the trades that are going on in business. I remember when a hot day on Wall Street was 160 million shares. Now you never have a day in less than the billions. The number of Wall Street traders has not gone up. This is a phenomenon that's happening all over, so that's what we go to college for. Education is making a deal with the unknown. This is simply one of maybe a gazillion techniques to help deal with theses issues.

Oettinger: I can't resist. Your description is of good education, but a colleague of mine brought me a paraphrase: that education frees the mind to run in accepted channels.

Cebrowski: This was the big piece that I wanted to talk about in the second half. Can you think of anything in the slides that you'd like to discuss? I have a lot of graphics for you, but I won't go through them. They'll be on the Web site one way or another.

Oettinger: It's one of the best insights into the strategic phenomenon that I've seen.

Cebrowski: Here's another technique. This is a technique for you to consider too: look for contradictions. Society can only live with contradictions for so long, and then it must reconcile them. When it does that, there's a policy change. Examples and development are left to the student.

One of the very big things that's going on in national security today is shown on this graphic (**Figure 4**). To a certain extent, it amounts to a transformation of transformation itself. The whole focus of transformation is now essentially subordinate to these items. We've already discussed the last bullet in considerable detail. It used to be, when the focus was on surviving nuclear war with the Soviet Union, that you could largely reduce national security to defense for many purposes. You can't do that anymore. You couldn't do it then, but you can do it even less now. That is an ever-growing awareness in the Department of Defense, and the government at large.

Figure 4

Militaries have always prided themselves on being very responsive, which means they tend to be punitive. The president decided in his national security statement that that's not good enough. What we need to be is preventive, because the consequences of not being preventive are indeed grave, and because of the following bullet: It's not good enough just to stop something that's going on that you don't like; the larger national security responsibility is keeping the world system up and running. What that automatically means is that it's not just "the big one," but it's a whole host of military and security competition that goes on.

Homeland security is not something to be left to the homeland. It's a defense-in-depth problem. It's sufficiently large and complex that it involves all agencies, private citizens, at home

and abroad, and a networking structure with other governments and agencies that we have never had before.

Oettinger: If you put that statement in the context of what you've read in Zegart's *Flawed by Design*[10] you get a sense of the gap that needs filling in that particular slide.

Cebrowski: If you want to know where transformation is heading, this is the big direction.

Student: In the context of internationalization of defense, where currently are the incentives for other countries to pick up more of the burden? To create those incentives doesn't necessarily mean that we'll have to sort of withdraw and not pick up so much of this stuff.

Cebrowski: The incentives come from filling the gap on this slide (**Figure 5**). We've looked at this issue and at the void in policy after the fall of the Soviet Union. One of the things we did is look at where we had military events from 1990 to 2002. Over 95 percent are inside this red zone, which we labeled as the "non-integrating gap of globalization." These together are the world's most disconnected societies. They are the societies that are unable or unwilling to accept the rules and contents of globalization. This is the Petri dish of grief and disease in the world.

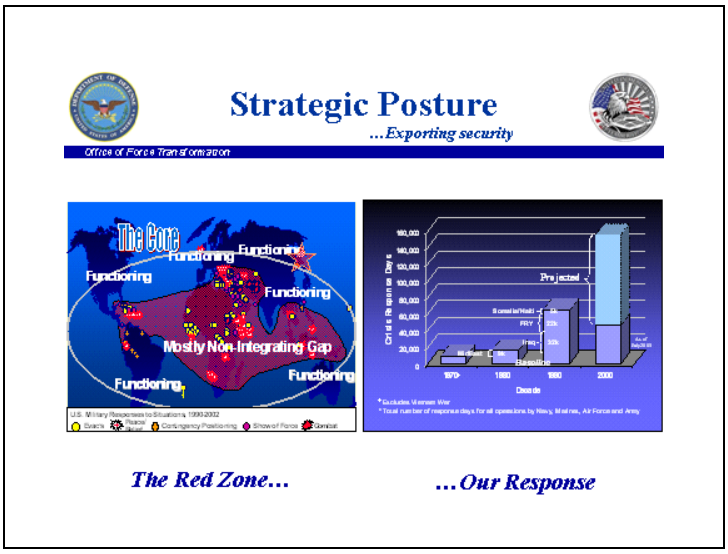


Figure 5

What emerges as a policy is not just to firewall ourselves from the gap, but to shrink the gap. What that means is that we need to be able to make common cause with all of the nations that are in the functioning core of globalization. Most of South America, North America, much of Eurasia, and Australia are members of the functioning core of globalization. These are people who either are our friends or could be our friends and make common cause against the problems in the non-integrating gap, which is really what the war in Iraq is all about. It's a great strategic

[10]Amy Zegart, *Flawed by Design: The Evolution of the CIA, JCS, and NSC* (Stanford, Calif.: Stanford University Press, 1999).

thrust into the heart of the dysfunctional core in terms of the functional gap of globalization. Right now, nothing good comes out of that gap.

Student: The viability of that thrust into Iraq brings into mind the question of how we believe a free and democratic Iraq is going to cause some of those central African countries that are on there, like Rwanda or some of the others that have had a lot of ethnic problems, to clean up their act and to integrate globally.

Cebrowski: We do have an interesting example of that: the case of Libya. Iraq doesn't necessarily constitute the one single domino that makes everything fall. However, it's likely to substantially change strategic relationships in the Persian Gulf region, which is a fairly large area. It's a great strategic gamble, and we have to hope for the best on the world scale. The stakes and the risks are high; the risks of not taking the gamble are higher. So the incentive for people to work with this is part of working against the great source of grief and disease. You're not going to firewall it. It's a certain, nearly immutable thrust that is going on here.

There are four great movements going on in the world. One is the movement of people, primarily from the non-integrating gap to the core. Two is the movement of energy from the heart of the non-integrating gap to East Asia. Three is the movement of foreign direct investment from the United States and Europe into East Asia and South Asia. Four is the flow of security from the United States and NATO [North Atlantic Treaty Organization] Europe into the gap. We think those four main thrusts are likely to continue for some time: a long enough period of time that we have to craft policy to deal with them.

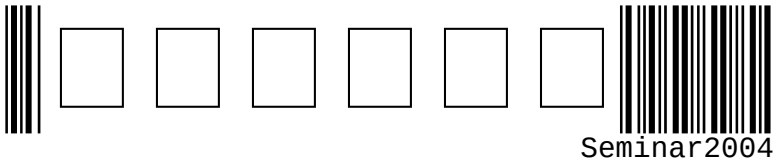
Oettinger: I hate to break into this marvelous conversation you've engaged us in, but we're nearing the end of our time. Are there a couple of last words before we finish? That last statement leaves me with an awful lot of food for thought.

Cebrowski: We're living in a time of extraordinary opportunity. We're also living in a time of peril that I'm not sure we fully understand. Your future is not going to look like your past. The rules are going to change. So much of what we see going on in the world is on an asymptote and we know the rules are going to change. We don't necessarily understand how for each particular asymptote, and we don't know how those are going to change as they interact to reinforce or mitigate each other.

For my generation, the defining conflict was Vietnam. For your generation, the defining conflict is likely to be the global war on terror. It's going to touch you personally the same way that Vietnam touched my generation. The issue before you is whether you're going to be a victim of it and have it all just happen around you and carry you away with the flow, or whether you are going to be an active participant and try to have upstream influence on it in whatever dimension you're capable of having that influence. That's the burden of the age, and you're going to live it. My generation is going to be moving into retirement and will give you salty old advice that is going to be inadequate. I hope it will be helpful, but you're going to have to sort this out.

Oettinger: Sir, thank you! We have a small token of our large appreciation for you.

Cebrowski: Thank you! That's very nice. Good luck to you all.



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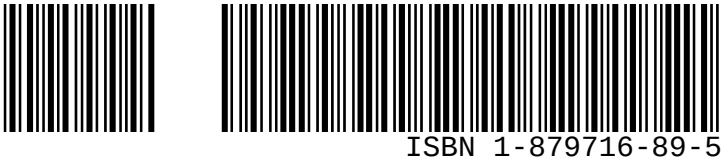

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