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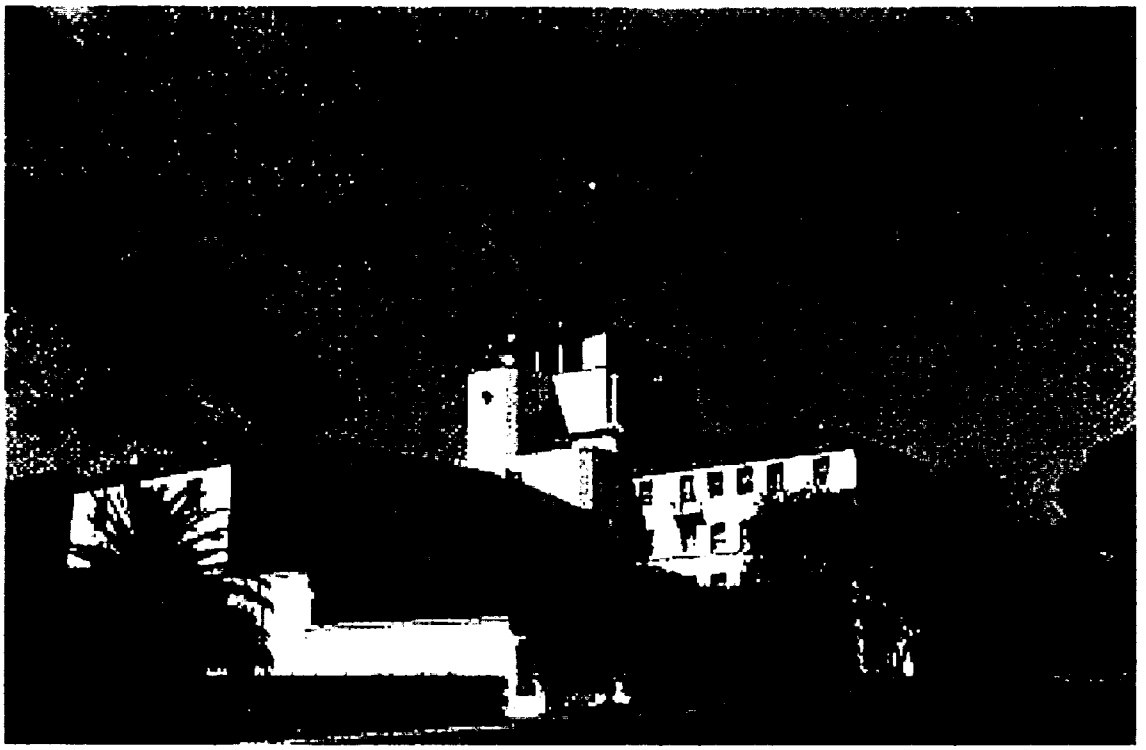
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Professional Military Education

for

The 21st Century Warrior

Conference Proceedings



Reported by Shelly A. Jones and Judy A. Daniel
Compiled by Barbara Honegger
Cover Design by LT Craig Anderson
Edited by CDR Michael D. Palatas

15-16 January 1998

Naval Postgraduate School, Monterey California

Proceedings of the
Naval Postgraduate School
and
Office of Naval Research

Conference on

MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Professional

(1998: Monterey, Calif.)

Edited by
CDR Michael D. Palatas

Coordinated/Compiled by
Barbara Honegger, M.S.

Reported by
Shelly A. Jones and Judy A. Daniel

Cover Design by
LT Craig Anderson

The speaker remarks and presentations contained in this book may be viewed online at: http://web.nps.navy.mil/FutureWarrior/proceedings.html. Copies of this book may be requested from the Conference Director, CDR Mike Palatas, at (408) 656-2503, DSN 878-2503, or by e mail to FutureWarrior@nps.navy.mil.

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IN REPLY REFER TO:

The Naval Postgraduate School and Office of Naval Research were pleased to host the Professional Military Education for the 21st Century Warrior Conference in January 1998. An impressive group of top-ranking legislators, academicians, historians, and military education community leaders came together at the Naval Postgraduate School in Monterey to present and discuss the history, current status, and future of professional military education (PME).

The conference presentations and panel discussions, transcripts of which are included in this proceedings book, raised and proposed solutions to some of the challenges that face those in the military education community. The overall tone of conference participants indicated that, while PME has improved significantly as a result of Goldwater-Nichols legislation and the Skelton Panel recommendations, there is still work to be done.

Those of us in the PME community have a profound responsibility to begin efforts required to refine and focus our current PME system, thus enabling it to produce the educated military professionals that will lead America's fighting forces into the 21st century. For as Congressman Skelton, in the words of Sir William Francis Butler, reminded us:

"The nation that will insist on drawing a broad line of demarcation between the fighting man and the thinking man is liable to have its fighting done by fools and its thinking done by cowards."

JAMES M. BURIN
Captain, USN
Superintendent

DEPARTMENT OF THE NAVY
OFFICE OF NAVAL RESEARCH
800 NORTH QUINCY STREET
ARLINGTON, VA 22217-5660

IN REPLY REFER TO

I was pleased to co-sponsor and participate in the Professional Military Education for the 21st Century Warrior Conference held in January at the Naval Postgraduate School. At the Office of Naval Research, we view investment in the education of our military decision-makers as important an endeavor as the direct investment we make in the science and technology that supports the warrior.

The conference pursued an ambitious agenda with perceptive attendees who represent the driving force in PME. The conference was fast-paced; discussion was lively and represented serious insight and vision on PME issues, challenging those who will shape the educational process of our future military.

The enclosed proceedings reflect the progress in the development and implementation of PME, and the current view of the direction it should take in the future. I was particularly interested in the discussion over keeping our warfighters technically current enough to make sound decisions throughout their careers. The conference and these proceedings provide pause for reflection and further analysis in this most important area. We must continue to challenge ourselves to set new horizons for our future forces.

PAUL G. GAFFNEY, II
Rear Admiral, USN
Chief of Naval Research

ACKNOWLEDGEMENTS

An enterprise of the magnitude of the "Military Education for the 21st Century Warrior" conference is a coordinated team effort amongst sponsors, speakers, session moderators, Conference and Proceedings staff, and attendees. The dedicated efforts of the below listed personnel made the PME conference a success.

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CONFERENCE ON
MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

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Background and Objectives

Military Education for the 21st Century Warrior

A Conference Sponsored by the

Naval Postgraduate School

and the

Office of Naval Research

15 - 16 January 1998
Monterey, California

How did the military educational system evolve to its present state?

How has implementing the recommendations from the Skelton Panel on military education affected the Services?

Within what sort of national security environment will military education perform its function in the future?

What are the overarching issues for military education in the 21st Century?

What kind of officer will we need to dominate the future operating environment?

What are the infrastructure requirements for creating and sustaining a learning organization to support the future force?

What are Congressman Skelton's observations on professional military education a decade after the Skelton Panel Report?

How, when, and where is technology integrated into the continuum of military education?

What are the salient legislative issues associated with military education for the 21st Century warrior?

Where do we go from here?

Thursday, 15 January 1998

Introduction and Orientation

Session 1: Historical Review of the Goldwater-Nichols Legislation and the Skelton Panel Recommendations

Question. How did the military educational system evolve to the present state?

Objective. This session reviews the development of the military education system: its areas of emphasis, its infrastructure, and the underlying philosophical and pedagogical basis of the evolution.

Session 2: Implementing the Skelton Panel's Recommendations and Identifying Dimensions of Importance for the Future of Military Education: Service Insights

Question. How has implementing the recommendations from the Skelton Panel on military education affected the Services?

Objective. This session provides an opportunity for each Service to present issues that

a. arose as they implemented the Goldwater-Nichols legislation and the Skelton Panel recommendations, and

b. the Service deems sufficiently important to warrant inclusion in framing the debate associated with educating the officer of the 21st Century.

Lunch: Human Capital: Joint Operations of the Future

Session 3: The Future Operating Environment

Question. Within what sort of national security environment will military education perform its function in the future?

Objective. This session attempts to establish a framework to bridge the near and far-term national security environment perspectives. The far-term perspective may be driven by prevailing large-scale political, economic, social, technological, and demographic trends, but the near-term perspective will driven by the findings of five recent planning documents. Those documents are:

a. the *National Defense Panel Report*,

b. the *Defense Reform Initiative*,

c. the *Quadrennial Defense Review*,

d. the General Accounting Office Report entitled *Future Years Defense Program: DoD's 1998 Plan Has Substantial Risk in Execution* (GAO/NSIAD-98-26 of October 1997), and

e. the Congressional Budget Office's *Report on the Future Years Defense Plan (1999 - 2003)*.

Session 4: Overarching Issues for Military Education in the Post-Cold War Era.

Question. What has this conference accomplished thus far?

Objective. This introduction will identify the overarching issues that surfaced during the Conference's first day. No particular position will be advocated, but the dimensions of future discourse are articulated. These dimensions may be the

a. relationships among undergraduate education, graduate education, PME, and JPME,
b. relationships between the art of war and the science of war,
c. relationships among Service perspectives regarding military education, and
d. the relative weight given to the study of history, policy, doctrine, strategy, and technology along the continuum of a military education.

Session 5: Human Capital: What kind of officers do we need for the 21st Century, how do we get them, and what kind of organization will best support them?

Question. What kind of officer will we need?

Objective. This session focuses on the desired qualities of mind and character — the "cultivated intelligence" — this nation's military officers will need to dominate the operational environment of the 21st Century. The session begins to identify the nature of an educational process that will produce the intelligence and the propensity to innovate, integrate, and inculcate technological advances in matters of policy, strategy, and doctrine.

Dinner: JPME for the 21st Century

Friday, 16 January 1998

Session 6: Supporting the Growth of Military Human Capital: Infrastructure Requirements for Creating and Sustaining a Learning Organization.

Question. What are the infrastructure requirements for creating and sustaining a learning organization to support the future force?

Objective. Focus on and identify the characteristics of future educational systems needed to deliver professional military education, the role technology will play in those systems, and the resource commitment necessary to create and sustain them.

Session 7: Observations on Professional Military Education a Decade after the Skelton Panel Report

Session 8: Integrating Policy, Strategy, Technology, and Doctrine

Question. How, when, and where is technology integrated into the continuum of military education?

Objective. Identify instances that highlight the need for the military educational system to more adequately prepare officers to integrate emerging technology into evolving strategy, policy, and doctrine.

Lunch: Human Capital: Technology in Systems

Session 9: Congressional Panel

Question: What Professional Military Education issues are important from a legislative perspective?

Objective: Legislators seek to articulate and discuss the salient issues about military education for the 21st Century warrior.

Session 10: The Conference: A Recapitulation

Concluding Remarks: Where do we go from here?

PME for the 21st Century Warrior

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Overall Schedule

PME Conference Session and Speaker Schedule

Thursday, 15 January 1998

0600-0700 Registration and Continental Breakfast at King Hall		
0715 CAPT F. Petho: Call-to-order and announcements. CAPT Petho introduces CAPT James Burin (NPS Superintendent) who makes brief welcoming remarks and introduces RADM Paul Gaffney who does likewise then introduces Rep. Sam Farr (CA). Rep. Farr makes his remarks at the conclusion of which RADM Jerome Smith USN (Ret) introduces Session 1.		
Session 1 0730-0900 1¾ hours	Topic: Historical Review of Professional Military Education, the Goldwater-Nichols Legislation, and the Skelton Panel on Military Education Recommendations	Introduction: RADM Jerome Smith USN (Ret) Topic: Evolution of PME up to GNA Speaker: Dr. Thomas Hone Topic: PME After GNA and the Skelton Panel's Recommendations Speakers: Maj Gen Donald G. Cook USAF Mr. Mark E. Smith III Discussants: Mr. James R. Locher and Mr. Robert Goldich
Break (0900-0930)		
Session 2 0930-1130 2 hours	Topic: Implementing the Skelton Panel's Recommendations and Identifying Dimensions of Importance for the Future of Military Education: Insights	Introduction and Moderator: Mr. James Kitfield Speakers: Hon. Deborah Lee VADM Patricia Tracey USN COL James Beauchamp USA Maj Gen Timothy A. Kinnan USAF BG Robert Blackman USMC Discussant: Hon. Fred Pang and COL Harry Summers USA (Ret)
Lunch 1130-1245 1½ hours	Topic: Human Capital: Joint Operations of the Future	Introduction: RADM Paul Gaffney USN Speaker: Gen John Sheehan USMC (Ret)
Session 3 1300-1445 1¾ hours	Topic: The Future Operating Environment	Introduction and Moderator: Dean Peter Purdue Speakers: MG Robert Scales USA Dr. Gene McCall Dr. Vince Roske Lt Gen Jay Kelley USAF (Ret)

Session 8 1000-1200 2 hours	Topic: Integrating Policy, Strategy, Technology, and Doctrine	Introduction and Moderator: Professor Daniel Moran Speakers: RADM Robert W. Nutwell USN Maj Gen Rodney P. Kelly, USAF Brig Gen Ralph Pasini USAF Point–Counterpoint: RADM Tom Marfiak USN RADM Wayne E. Meyer USN (Ret)
Lunch 1200-1330 1½ hour	Topic: Human Capital: Technology in Systems	Introduction: Provost Richard Elster Speaker: VADM Jerry Tuttle USN (Ret)
Session 9 1345-1515 1½ hour	Congressional Panel	Introduction: Rep. Sam Farr (CA) Moderator: Professor Glen Browder Panel: Rep. Ike Skelton (MO) Sen. Jack Reed (RI) Rep. Sam Farr (CA) Delegate Robert Underwood (Guam)
Break (1515-1530)		
Session 10 1530-1630 1 hour	Topic: Conference Recapitualtion	Speakers: Provost Richard Elster RADM Paul Gaffney USN
1630-1700	Concluding Remarks	Introduction: RADM Paul Gaffney USN Speaker: VADM Dennis Blair USN

Break (1445-1500)		
Session 4 1500-1615 1¼ hour	Topic: Overarching Issues for Military Education in the Post-Cold War Era	Introduction and Moderator: Professor Douglas Porch Speakers: Lt Gen Redden USAF LTG Donald Holder USA (Ret) Professor Williamson Murray
¾ Break (1615-1630)		
Session 5 1630-1745 1½ hours	Topic: Human Capital: What kind of officers do we need for the 21st Century and what kind of education and training infrastructure do we envision to support them?	Introduction and Moderator: Dr. Donald Snider Speakers: Rep. Steve Buyer (R-IN) VADM Dan Oliver USN COL Harry Thie USA (Ret) Professor Richard H. Kohn
Cocktails and Dinner (1845-2145) "JPME for the 21st Century"		Introduction: Captain James Burin USN Speaker: LTG Richard A. Chilcoat USA

Friday, 16 January 1998

0600-0715 Late Registration 0715 CAPT Petho: Call-to-order, announcements		
Session 6 0715-0830 1 ¼ hour	Topic: Supporting the growth of military human capital: Infrastructure Requirements for Creating, and Sustaining a Learning Organization	Introduction: Dr. Peter Purdue Speaker: Dr. Ed Schein Discussant: Dr. Carson Eoyang
Session 7 0830-0930 1 hour	Topic. Observations on Professional Military Education a Decade after the Skelton Panel Report	Introduction: VADM Patricia Tracey USN Speaker: Rep. Ike Skelton (MO)
Break (0930-1000)		

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PME for the 21st Century Warrior

SESSION ONE

Historical Review of Goldwater-Nichols Legislation and the Skelton Panel Recommendations

Question: **How did the military educational system evolve up to the Goldwater - Nichols Act and the Skelton Panel recommendations?**

Objective: **1. Review the development of the military education system up to the Goldwater- Nichols Act and the Skelton Panel's recommendations.**

2. Cover the areas of emphasis, the system's infrastructure, and the underlying philosophical and pedagogical basis of the evolution.

SAM FARR
17TH DISTRICT, CALIFORNIA

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STATEMENT OF CONGRESSMAN SAM FARR
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR
NAVAL POSTGRADUATE SCHOOL
JANUARY 15, 1998

Thank you very much, Admiral Gaffney, and good morning. Happy New Year and welcome to the sunny, beautiful Monterey Peninsula. I welcome you here because this is a very special place in the United States and in the history our country.

The California Constitution was drafted here in Monterey, setting the stage for California to become the 30th state of the Union. In the 148 years since that constitution was adopted, California has grown to become the sixth largest economy in the world. With 32 million people, I think it's the first place on earth where we're really experiencing a multicultural democracy. The challenges that the State of California face are driving forces of the country and of the world. So it's really appropriate that you come not only to California, but to the place where California government began.

I also welcome you because of what you're discussing -- Military Education for the 21st Century Warrior. I can't think of a better place to discuss that topic. Not only because the Naval Postgraduate School is here -- and it's one of the finest educational facilities in the country -- but it is surrounded by many other great educational institutions.

NPS alone offers over 40 different study programs, as you heard from the Superintendent, for over 1600 students. NPS provides advanced instruction in subjects ranging from engineering and oceanography, to logistics and national security studies. The students and faculty conduct leading-edge research in such fields as laser-optics, mine detection, and computer simulation. This school is a key part of our military, doing unique work in advanced research and instruction, much of which is not done anywhere else in the military.

One stand-out example of Naval Postgraduate School work is in its Center for Civil-Military Relations. Many local people don't even know that this program brings officers and civilians to the United States from around the world, teaching

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them how a military should operate in a democratic society. For newly democratic nations, this instruction is absolutely critical. I have to tell you, as a former Peace Corps volunteer who lived in Latin America, I really enjoy the exchange with these officers who are seeing not only how provincial government works in Sacramento, but how our federal government works in Washington.

During the Gulf War, the Naval Postgraduate School provided critical support to our military, giving briefings on military strategy to officers in the field. It analyzed the effects of sand and wind on military equipment, and provided advanced computer technology to foster more efficient logistics.

This school works with other military facilities around the Bay. Not only has the State of California invested in this region, but the federal government has as well, including the military. We located the Defense Language Institute here in Monterey, in 1946. One of the foremost language schools in the country, its faculty teaches 21 languages to over 3,000 students each year. Its over 800 instructors teach language an average of 20 hours a week.

We have the Navy's Fleet Numerical Weather Center here -- DoD's weather prediction, research, and tracking organization. Some of the most advanced weather science in the world is done there, not to mention its significant participation in the international discussion of the effects of El Nino and global warming. The greatest concentration of weather science and application anywhere in the United States outside of the city of Washington D.C. is right here in Monterey.

The Defense Finance and Accounting Service offices located at former Fort Ord are part of the largest finance and accounting system in the world. Its "Operation Mongoose" is a unique program which has successfully tracked and prevented abuse of our military pension system.

But when you're here in Monterey, you're not just at the Naval Postgraduate School. You're here in a region, and this region is leveraging itself by investing in all three segments of higher education: the Community College system, the California state system, and the University of California system. All of those have campuses here. There are about four community colleges in this region.

The Naval Postgraduate School works with all of these institutions, and particularly with the Monterey Institute of International Studies (MIIS) -- a private, for-profit institute located here in Monterey that spun off from Defense Language Institute. It is one of the foremost educational institutions in the world, teaching civilians how to do business in foreign countries, in their own languages. I'm very excited to see that the president of that school, General Bob Gard, is here today. I hope that you'll have a chance to interact with Bob, because MIIS received a lot of federal money to get it where it is today. His Center for Nonproliferation Studies is doing great things here in Monterey.

The federal and state government is well invested in this region. Most of those investments are in education-related concerns. During the next couple of days, I hope we'll discuss how you develop the soldier of the 21st century using *all* the educational resources that are available to the military, including civilian schools.

Not that I agree with the idea that you ought to get the graduate education at some other institution and close the military postgraduate process. I think that would be inappropriate. I think what's appropriate is getting the kind of education that one gets here at the Naval Postgraduate School, and utilizing all the other resources to collaborate in interchange and access.

If you add up all the faculty in Monterey's educational institutions -- all the marine scientists, and we have more marine scientists than any other place in the United States, including Scripps -- we have a faculty equivalency of New York, or Boston, or Los Angeles, or San Francisco, or London, or any of the great educational centers of the world.

In short, the Naval Postgraduate School is a critical part of this area, a critical part of our military education system. I hope that today's conference fosters discussion among some of the great experts in military education, including officers, scholars, analysts and, indeed, members of Congress.

I've served in Congress now for five years. I spent part of my first year on the Armed Services Committee, where I got to be a good friend with Ike Skelton. I was serving on a subcommittee when he chaired it. I'm delighted to see this conference is bringing the greatest concentration of members of Congress that have come here as a group since I've been in Congress. As always, when we need help, we're assisted by Leon Panetta, who's retired and lives here, teaching at California State University of California Monterey Bay.

I look forward to the discussion on the nature of our future soldier, and I hope that we not only learn what kind of education is necessary to win future wars, but that we'd better understand the importance of education for our nation's future security. That requires congressional investment in education, and I think that is your biggest challenge. To lobby for the conclusions you've come to, to deliver them to the Hill and get them funded is going to take teamwork. I stand as a champion of that team. In the end, we must remember that it's not just muscle that wins wars -- it's also brains.

Thank you very much and welcome to Monterey.

THE HONORABLE SAM FARR
17th Congressional District, California

Sam Farr, a Democrat, represents the 17th Congressional District of California, which includes all of Monterey County, San Benito County and a large portion of Santa Cruz County. Agriculture, tourism, education, and commercial fishing form the economic underpinnings of the District.

Congressman Farr serves on two key House committees: Agriculture and Resources. Since taking office, he has made economic revival and the creation of new jobs in the 17th District his top priority. So far, Sam Farr has provided an economic stimulus by obtaining $44 million in defense conversion funds to start a new California State University at Fort Ord and a federal commitment to hire hundreds of employees for a new Defense Department finance center to be located at the base's closed hospital. Congressman Farr also saved 300 jobs by stopping the closure of the Social Security Administration's Salinas Data Operations Center. Sam Farr has been recognized as an "Environmental Hero" by the League of Conservation Voters, garnering a perfect voting record in its 1996 ratings, and has been given perfect voting scores by the Center for Marine Conservation and Children's Defense Fund. He was named 1996 Legislator of the Year by the American Planning Association.

Before coming to the House of Representatives, Sam Farr served 12 and one-half years in the California State Assembly, being re-elected six times with overwhelming majorities. As a member of the Assembly, Sam Farr chaired the Assembly Local Government Committee as well as the Committee on Economic Development and New Technologies and was a member of the standing committees on Education, Natural Resources and Finance and Insurance. He is recognized as a leader in legislative efforts for educational excellence, environmental protection, economic development, and new technologies. His accomplishments include passage of laws to expand and develop the State Park system, to stop offshore oil drilling and hold polluters fully financially responsible for oil spill damages, to give businesses incentives to develop new technologies for environmental cleanup, to place computers in public school classrooms and to study the impacts of defense conversion on the state's economy. Sam Farr has been named Legislator of the Year nine times.

Sam Farr began his career in public service in 1964 with a two-year commitment in the Peace Corps in Colombia, South America. Sam Farr graduated from Willamette University in Salem, Oregon with a Bachelor of Science degree in Biology in 1963 and attended the Monterey Institute of International Studies and the University of Santa Clara. He is fluent in Spanish.

A fifth-generation Californian, Sam Farr was born on the 4th of July, 1941. He is a long-time resident of Carmel, California and is married to Shary Baldwin Farr. The Farrs have one grown daughter, Jessica.

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION AND THE 21st CENTURY WARRIOR

Paper by
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Dr. Hone's conference remarks were delivered from an outline of his paper, which follows this cover page.

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Professionalizing Command, Professional Military Education, and Military Doctrine

by

Dr. Thomas C. Hone

Since the passage of the Department of Defense Reorganization Act of 1986 (Goldwater-Nichols), the Congress of the United States has encouraged (some might say "pressured") the military services to develop joint operational doctrines. At the same time, influential members of Congress have pushed for improvements in the 'professional military education' of officers. These two pressures have sometimes merged. That is, advocates of improved professional military education programs have assumed that better programs would also be more 'joint," and that enrolling officers in those programs would inevitably improve joint doctrine.

This paper questions the latter assumption. It does so by considering the history of the United States Navy's Naval War College since 1911. I believe that a survey of the War College's history shows that the faculty and leaders of the War College have developed four primary models of professional military education since 1911. The first three of these models were largely complementary; that is, the two later ones tended to build on the concepts that underlay the earlier one. The fourth model, created after 1972, was very different, but it has also been judged a success and used as the standard against which to measure progress in the improvement of the Army and Air Force war colleges. But is this model, based on the changes made after 1972, adequate as a tool to promote the development of joint warfighting doctrine? That is, can the Naval War College model, in its latest manifestation, do what some members of Congress want it to do? I believe that, in the case of the Naval War College, the answer to these questions is no, and I will explain why that is so in the paragraphs which follow.

To make this explanation, I need to show that the first three models of professional military education developed at the Naval War College in this century were both complementary and sound. The argument is best made historically; that is, by laying out the progression of models used to guide the curriculum and the purpose of the War College. Then I need to explain why those models lost their utility.

The first model is that of the *professional naval commander.* By this I do not mean the professional naval officer, or the professional sailor. I mean instead someone who is a professional in the practice of commanding naval forces. When this model was adopted at the Naval War College in 1911, it was revolutionary. "Command" was thought to be an art, peculiar to the temperament and intellect of the commander himself. There were many models of successful fleet commanders (such as Britain's Admiral Horatio Nelson), and their careers were the objects of study in institutions such as the United States Naval Academy in Annapolis, Maryland. But to say that the process of commanding squadrons or fleets of ships was, like commanding a ship itself, a profession, and that naval officers needed to be schooled in the command of fleets, was novel.

How was this model taught? First, by instructing officers in a standard means of analyzing combat at sea. With such a common thread of analysis, officers would use the same ideas and the same terms. The goal was to give them the basis for rapid, clear discussion and communication in wartime. Were this goal achieved, then coordination would be easier and achieved faster, and the potential for misunderstandings among officers and between superiors and subordinates would be reduced. The second element of this new curriculum was the use of a standard order form. Again, the goal was to facilitate clear communication to reduce the chance of error. Finally, war games were used to allow officers to practice giving and interpreting orders, and to test the doctrine that was the foundation of fleet actions. These were the three elements of a system of professional naval command called the "applicatory system."

Note the term "system" -- not "art" or "science," but "system." A system is something that you can teach, because it is an ordered process governed by rules. But it is not a bureaucratic routine. It is not a rulebook. Indeed, this "applicatory system" was deliberately designed to prevent senior commanders from giving detailed instructions to subordinates. As historian Ronald Spector noted in his history of the Naval War College, the adoption of the applicatory system "meant acceptance of the principle that subordinates should be granted wide discretion... and make decisions at their level of responsibility with only very general guidance from their superiors."[1] This system meant to replace orders as the link between seniors and subordinates with doctrine, and the doctrine would first be tested in war games.

The adoption of this model had profound implications for the United States Navy. It rested on the assumption that direct, immediate control of large naval forces was impractical. A senior commander could direct the forces under his command, but his control over them would be more a matter of their carrying out doctrine than following his instructions. Instead of the force commander ordering individual ships to steam at specific speeds on specific courses, the commander would say, "Your responsibility is to reach such-and-so position by such-and-such time," or, "Your responsibility is to support the flagship in the engagement without obstructing the fire of friendly ships." Moreover, such orders would not be sent by a fleet or task force commander to an individual ship during an engagement. Instead, *prior to an engagement,* the force commander would exercise his responsibility by explaining his objectives, his plan to achieve those objectives, and his view of the doctrine that would apply. His subordinates would then issue their own orders as part of a coordinated effort to turn his guidance into action.

As historian John Gooch has reminded us, that is the definition of military doctrine: "the bridge between thought and action."[2] The goal of the Naval War College in 1911 was to turn the U.S. Navy's concept of command away from detailed instructions and toward the development of doctrine. It aimed to focus on the "bridge." In this it succeeded, and it did so *despite* the invention of radio. As my

colleague Peter Swartz has observed, radio held out the promise of tighter control by a fleet commander, and even direct control of forces at sea from a command post ashore. But radio was a two-edged sword; it could easily be used too often, and the Navy therefore needed to develop a doctrine for communications before and during battle.

But what was doctrine -- the bridge between thought and action -- to support? What was the proper way of thinking for fleet commanders? Answering that question led to the development of the second model of professional military education for the Naval War College: the senior officer as campaign planner. As Admiral William S. Sims, War College President in the years immediately after World War I, put it, "The War College should be made the principal asset of the Navy." This was an audacious claim -- that the War College, in peacetime, was in fact the heart of the Navy. But Sims was adamant. In his view, the Navy, no matter what its strength, would fail unless it were led by a cadre of officers skilled in campaign planning and in implementing such plans. He went so far as to argue that "no officer not a War College graduate [should] be assigned to any important position, either ashore or afloat."[3] For Sims, doctrine had to be rooted in campaign plans. Such plans had to be anchored, in turn, in strategic thinking, or at least thinking at the theater level. And there was no better way to prepare officers for thinking at the theater or strategic level than through war games.

Sims' emphasis on war games led to a blossoming of simulations and games at the Naval War College in the early 1920's. His emphasis on games provided support to the fledgling Office of the Chief of Naval Operations. The latter developed a war plans division, but this division never had more than ten or twelve officers. Hence it relied on the results of games played on the large, blue-tiled game floors of the War College. The War College games, however, were only one part of a multi-phase process that pioneered many doctrinal and tactical innovations in the U.S. Navy before World War II. Ideas that seemed worthwhile to the war planners were tested in games. The more promising were then forwarded to the staff of the commander-in-chief of the United States Fleet and to subordinate staffs. These staffs were the source of proposals for the annual fleet exercises. In effect, ideas, doctrine, and command procedures that were developed first in War College games were then tested in major exercises. Then the results of these exercises were circulated to the War College faculty and students, the war planners in the Office of the Chief of Naval Operations, and also to the bureaus of the Navy responsible for weapons development and ship design.

This continuous, rolling cycle of planning-to-games-to exercises-to acquisition was instrumental in allowing the U.S. Navy to develop its air arm in the 1920's. In 1924, the Navy had one experimental aircraft carrier, the converted collier *Langley.* This "experiment" operated twelve aircraft at most. In 1925, Captain Joseph M. Reeves, an officer who had watched aviation concepts tested at the War College and also served as a member of the tactics faculty, took command of the fleet's aviation squadrons. Under his leadership, *Langley* stopped being an experiment

and became an operational carrier, with 36 (and eventually 42) operational aircraft. At the same time, the Navy's Bureau of Aeronautics was pressing ahead with the development and procurement of rugged, powerful aircraft for use on carriers. As ideas from fleet exercises flowed back to the War College, they were married with projections from the Bureau of Aeronautics. The result was a systematic study of the strike capability of aircraft carriers.[4] It was precisely this sort of interaction that Sims had hoped for.

The third model adopted at the War College before World War II was that of the war planner. Campaign plans focus on a theater. War plans deal with directing the resources of the whole nation toward victory over another, enemy nation. This was the highest level of professional military education. Officers who were selected for this kind of preparation were judged capable of advising the president of the country in wartime. If campaign games were the tool to prepare officers to serve on the staffs that would wage a Pacific campaign against the forces of Imperial Japan, then the study of strategy was the technique for preparing officers to lead forces fighting modern, total war. It was not clear at the time just what was the best method to study strategy, but the goal of this model was clear: to prepare senior officers (junior officers were not eligible for this instruction) for command at the national (versus theater) level.[5]

Indeed, by the end of the 1930s, the U.S. Navy had developed a "ladder" of education that it hoped would produce officers capable of responding to the different challenges that went with the different levels of naval command. The first rung on the ladder was the Naval Academy, first accredited as an academic institution in 1931. The purpose of the Academy was to produce *educated* officers -- young men who understood what formal education was and who accepted the idea that formal education was essential to their development as officers. The second rung on the ladder was the junior course at the Naval War College, established in 1924. Though the junior course later copied the course offered to more senior officers, it was initially focused on tactics and doctrine. The third rung was the senior course at the Naval War College, which combined lessons in how to command naval forces with experience in mock campaign planning. The fourth rung, the "advanced" course at the Naval War College, was created in 1933. It was an attempt to prepare officers for command at the national level. Through the second, third, and fourth "rungs" of this comprehensive "ladder," there ran one common theme: the need for doctrine to form the basis of the command and coordination of naval forces.

But what was this doctrine? The founders of the Naval War College in the late 19th century would have understood it: gain control of the sea and then use it for some other, larger purpose in war (such as blockading an enemy nation or assaulting it from the sea). For decades, "gain control of the sea" meant "defeating the enemy's main battle force," and so the central idea of the Navy's doctrine spawned other, logically subsidiary doctrines, rather as a large river spreads its muddy tentacles through a delta where it drains into the ocean. Imperial Japan, the

"Great Britain" of the Far East, was particularly vulnerable to these doctrines once they were put into effect.

But the act of putting these doctrines into effect changed the way in which doctrine was created. Before World War II, the staff of the commander-in-chief of the United States Fleet was too small to serve as a source of doctrine. During the war, however, fleet staffs grew larger and gained more and more responsibility. The creation of doctrine became a fleet responsibility, not that of the Naval War College. Moreover, once both Japan and Germany had been defeated, the War College did not regain its role as the primary source of strategic ideas and advances in naval doctrine. World War II had produced a revolution in the Navy's organization. Both the naval staff (the Office of the Chief of Naval Operations, or OPNAV) and the multiple fleet staffs (including the type commanders) had grown in size and sophistication. Just as important for the process of creating doctrine was the shift to a "forward deployed" Navy during the Cold War.

As historian Michael Palmer has shown in his study of what might be called "the first maritime strategy," the Office of the Chief of Naval Operations and the multiple fleet staffs (that is, the staffs for the Atlantic and Pacific fleets *and* for the numbered fleets) were the source of new strategies and doctrine.[6] The War College's role shifted from that of innovator to that of sometime educator of flag officers. Instead of being central to doctrinal, tactical or strategic innovation, the War College slipped to the periphery, and War College programs prepared officers for their more important roles in organizations like OPNAV or the fleet staffs. As Peter Swartz put it, "The center of gravity of the Navy had shifted from those who thought about and practiced what they *would* do to those who prepared for and *did* what had to be done."[7]

This changed somewhat in 1972, when Rear Admiral Stansfield Turner was appointed President of the Naval War College by Chief of Naval Operations Admiral E. R. Zumwalt, Jr. Zumwalt had been influenced strongly by the way the staff of the Secretary of Defense had used techniques such as systems analysis to manage the Defense Department, including the Navy. As Chief of Naval Operations, Zumwalt had created his own systems analysis branch within OPNAV. However, when it came to the Naval War College, he and Rear Admiral Turner chose to emphasize the study of strategy as well as (or even more than) the study of systems analysis techniques.

Why? The answer lay in the need to give naval officers the tools to be successful in the Pentagon, where the management of national defense was increasingly accomplished through techniques and processes that had been borrowed from civilian (especially industrial) life, or created by a small corps of civilian analysts and intellectuals working in "think tanks" like the Rand Corporation. Naval officers needed to be familiar with these techniques and with the ways they were used in the management of national defense. At the same time, military officers needed to demonstrate that they could contribute to the development of

national strategy in a unique and valuable way. President John Kennedy had complained after the Cuban Missile Crisis in 1962, for example, that his senior military advisors had not really demonstrated creative strategic (as opposed to military) thinking. Turner set out to prepare naval officers for roles where they would either (1) work with the leading civilians in the Pentagon in the management of the nation's military resources, or (2) advise the president and the Secretary of Defense on strategy.

Under Turner's leadership, the faculty of the Naval War College developed a fourth model of professional military education for naval officers. One part of this model stressed decision-making in the Pentagon. Another part stressed the roots of strategy -- not just strategic ideas, but the sources of those ideas. As a consequence, the teachers of strategy in the Naval War College became mostly civilian academicians and historians, and the strategy curriculum became an exercise in reading and understanding key episodes in military history.

This was a break with the earlier models, because this new approach did not emphasize doctrine. It assumed that doctrine was something officers learned at other institutions, such as operational fleet staffs, and this assumption was correct. In the 1930's, doctrine had been the thread linking early professional education with preparation for flag rank. By the early 1970's, admirals Zumwalt and Turner were worried less about doctrine than about the loss of influence on the part of senior military officers at the highest organizational levels of national defense. Turner, especially, felt there was a need to ground senior officers in the intellectual roots of strategy. He wanted them to be able to think and speak as national security strategists, not as representatives of separate military services or of unique military communities (such as naval aviation).

Of course, there were reactions to this. One reaction was to focus on the lack of ethics training for senior officers. A later (and still ongoing) critique was that the war colleges (and not just the Naval War College, in particular) did not pay enough attention to the doctrinal implications of joint operations and to the intellectual and organizational keys to the success of joint military operations. A third concern was for innovation and new ideas. Senior admirals feared that the most promising junior officers lacked the time and the place to develop ideas that they could put into practice when they gained the rank of admiral. The Naval War College curriculum and organization were altered after Rear Admiral Turner's presidency to account for these concerns.

But what about doctrine? Doctrine became the concepts that the deployed fleets developed, tested and then implemented. The deployment process itself became a laboratory and a school; officers learned and developed doctrine on fleet staffs and at sea. Because the Navy deployed to regions (especially the Western Pacific and the Mediterranean) where it was likely to fight, deployments assumed the function that the annual pre-World War II "fleet problems" had performed. Preparing for and executing deployments became a mechanism of almost continuous change,

especially in tactics. The fleets prepared and tested concepts such as the Composite Warfare Concept (CWC); *that* was doctrine.

But the Naval War College did not gain great influence over what might be called "strategic doctrine," either. Consider the "Maritime Strategy" of the mid-1980s. Where did it come from? From the Navy staff, infused with the ideas of leaders such as chiefs of naval operations Admiral Thomas Hayward and Admiral James Watkins, and from the energy of an ambitious, aggressive Navy Secretary by the name of John Lehman. Though the "Maritime Strategy" was not doctrine, it was an operational concept with strong doctrinal implications -- similar to the "Orange Plan" of the 1930s, which set the Navy and Marine Corps goal in a future war with Imperial Japan as a trans-Pacific, island-hopping campaign. The Maritime Strategy came along just as all the military services took a renewed interest in doctrine, and the Maritime Strategy met the standard of being a "bridge between thought and action."

And that takes us to the really interesting part of this story. Where should doctrine come from now? The history of the Naval War College in the 20th century suggests an answer to this question. Remember that the model of professional military education put in place at the Naval War College matured as the concept of military command matured. Step 1 was to professionalize the practice of fleet command. Step 2 was to focus the War College on preparing officers for theater-level command. Step 3 was to place in the War College program a section that prepared senior officers for the highest level of command -- at the national level. All these efforts to create a sound program of professional military education paid off in World War II. One of the Navy's most important assets in that war was a cadre of staff officers who could plan and conduct a theater-level campaign. Once they undertook a deliberate offensive against Japan, they and the forces they marshaled and commanded were never stopped.

But the war and its aftermath changed everything -- the technology of naval warfare (to include nuclear weapons), the "enemy," the nature of Navy organization, the organization of national defense (in 1947 and 1949), and the role of the Navy in national defense. Under such circumstances, it is surprising that the Naval War College survived at all. The Navy didn't need the War College as a source of doctrine or as an aid to the Navy staff. The Navy also didn't need the War College as a source of innovative concepts or plans. Admiral Sims' belief that the War College was the intellectual center of the Navy no longer held. But what is just as interesting is that the need for naval doctrine as the unifying intellectual thread of professional military education also seemed to fade away. The evidence that such a fading occurred is the success of Rear Admiral Turner's 1972 changes to the Naval War College curriculum.

My point is that the history of the Naval War College before World War II is the history of both professional military education *and* the process of professionalizing naval command. The two grew up together because the Naval

War College was the place where the process of professionalizing naval command was institutionalized. Professional naval command required doctrine, and so the War College played a key role in the development and propagation of doctrine. The great success of U.S. naval forces in World War II was proof that the process of professionalizing naval command had succeeded. The officers who were the products of that process went on to lead the Navy, and even the Joint Chiefs after the war. They bequeathed to their successors a range of apparently effective institutions (one of which was the Naval War College), a firm concept of professional naval command, and a "military-industrial complex" that could and did pioneer new military technology.

Yet they also bequeathed the practice of deploying fleets prepared for war forward, in waters distant from the United States. Doctrine is now made in these fleets *through* operations and through the work-ups for deployment. The great success of the pre-World War II process created the fleets that displaced the Naval War College as the center of professionalism and doctrine development. So the Naval War College became (after World War II) a place where military officers were introduced to doctrine that was actually made by someone else. In the 1920s and 1930s, the Naval War College had been a problem-solving institution that concentrated on developing both ideas and doctrine. Granted, there were courses "students" had to take just to fill in gaps in their formal education, such as international law. But "students" and faculty were also part of an institution that was engaged in important processes, such as preparing campaign level planning staffs for the likely war with Imperial Japan, and linking tactical- and operational-level doctrines of naval warfare.

All this went away after World War II. The Naval War College was, ironically, a victim of its own success. Both strategy and doctrine were developed increasingly in the fleets, although the War College continued to house officers whose work in fields like logistics and defense economics was valuable to officers manning fleet staffs. Admiral Turner, therefore, did not and could not give the Naval War College back its former mission in 1972. Instead, he gave it a new mission. He did not give it back its pre-World War II functions. He could not. Instead, he gave it functions which suited the times: (1) preparing naval officers to work successfully in the Pentagon, and (2) preparing those same officers to think at the broadest strategic levels. In short, he combined a truncated graduate program in business administration with an abbreviated course in military (not just naval) history. His goal was to produce intellectually sophisticated managers of national defense. Outstanding officers still "slipped by" the Naval War College course, however, because they could pick up critical command and planning skills (and doctrine) through fleet experience.

The "bottom line" is this: professional military education can be graduate level study, *or* preparation for serious staff work at the Pentagon, *or* a process of forming doctrines that facilitate effective military command. It can't be all three at once, certainly not over the time span of ten months. And it's not just a matter of

time. An institution designed to do what the Naval War College does now is not suited to develop doctrine. Navy leaders have a difficult time explaining to members of Congress, or to officers in the other services, that using the Naval War College as a model for the war colleges of the other services is not the way to develop new military doctrine -- especially joint doctrine. The Naval War College is *difftrent* than it was before World War II. Since World War II, the Navy's professional and doctrinal heart has been in the deployed fleets. That situation can't be changed so long as the fleets deploy forward.

The Navy, the Army, and the Air Force have responded to calls to reform their processes of professional military education with what are essentially minor changes to the curricula of their war colleges. These are not useless changes; quite the opposite. They amount to taking, with some variation, Admiral Turner's model for the Naval War College and applying it to the Army and Air Force war colleges. But these changes are also not what some members of Congress have had in mind. These members want to give professional military education a function like it had at the Naval War College after 1911 -- the function of creating a new profession of military command, though now it's not *naval* command but *joint* command. Yet the Naval War College cannot do this. And any institution of professional military education modeled after the Naval War College will not be able to do it, either.

Navy officers do not know quite how to explain this to members of Congress, because they do not want to say that the program and curriculum of the Naval War College have not been successes. *Yet it is critical to distinguish professional military education, which can take many forms, from the process of changing the military profession* -- a process which was, as the history of the Naval War College shows, not at all the same as formal graduate education. A better understanding of the history of the Naval War College -- an understanding which this paper has attempted to provide -- may clear up some of this confusion and facilitate communication among all of those involved in the search for both improved professional military education *and* a changed military.

But missing in this conclusion so far is the answer to my earlier question. What is the *proper* bridge between thought and action? The answer is doctrine. Doctrine is still closely intertwined with the nature of military command, and so efforts to change the latter and make it truly joint must influence the way the former is developed. But this is a fundamental undertaking, not the incidental by-product of improvements to professional military education. Put another way, "fixing" professional military education will not make the services joint, because making the services truly joint calls for fundamental changes in doctrine and in organization, and those changes will not come about when officers are sent through tailored programs of graduate formal education, *especially* in the Navy. Change in doctrine will come through joint exercises in which the deployed fleets participate. This is, in fact, what is happening. I think that it is inevitable, given the history of the Naval War College in the 20th century.

[1] Ronald Spector, *Professors of War* (Newport, RI: Naval War College Press, 1977), p. 119.

[2] John Gooch, "Military Doctrine and Military History," in *The Origins of Contemporary Doctrine,* ed. by John Gooch (Camberley, Surrey, UK: Strategic and Combat Studies Institute, Occasional Paper No. 30, 1997), p. 5.

[3] Michael Vlahos, *The Blue Sword* (Newport, RI: Naval War College Press, 1980), p. 58.

[4] Charles Melhorn, *Two-Block Fox, The Rise of the Aircraft Carrier, 1911-1929* (Annapolis, MD: Naval Institute Press, 1974). Also, Thomas Hone and Mark Mandeles, "Interwar Innovation in Three Navies: U.S. Navy, Royal Navy, Imperial Japanese Navy," *Naval War College Review* (Vol. 40, No. 2, Spring 1987).

[5] Gerald Kennedy, "The United States Naval War College, 1919-1941," Ph.D. Dissertation, University of Minnesota, 1975.

[6] Michael A. Palmer, *Origins of the Maritime Srategy: American Naval Strategy in the First Postwar Decade* (Washington: Naval Historical Center, 1988).

[7] CAPT Peter Swartz, USN (Ret.), now with the Center for Naval Analyses, is engaged in a major study of fleet organization. His research and ideas have strengthened this paper greatly.

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Remarks by
Maj. Gen. Donald G. Cook, USAF
Commander, Twentieth Air Force

The PME panel was formally chartered by Chairman Les Aspin to:

(1) assess the ability of the then current DoD military education system to develop professional military strategists, joint war fighters and tacticians; and

(2) review DoD plans for implementing the JPME requirements of the Goldwater-Nichols Act with a view toward assuring that this education provided the proper linkage between service competent officers and competent joint officers.

A third purpose which was not in the charter but was implicitly included, in our view, was to examine the quality of military education.

With charter in hand, the obvious question was, "Which way to go?" The only way to make any sense of where we were headed was a systemic approach to self-education on PME. After all, none of the military staff members were experts on PME. We were its by-products. Our approach was:

(1) Conduct personal interviews with academic experts and renowned military leaders;

(2) Conduct hearings at each of the schools (ISS/SSS) with panels of expert witnesses;

(3) Conduct our own historical research; and

(4) Review service personnel assignment policies.

We limited our study to service and joint intermediate and senior schools and education for general/flag officers for a specific reason. We believed the first time an officer should receive any substantial exposure to JPME was at the intermediate level. Before this, the officer's focus necessarily should be on his/her own service. We heard time and again, the most effective joint officers ought to bring to the table a solid grounding in their services' capabilities. Many also believed that general/flag officers were not being adequately prepared for joint command and staff

responsibilities. Before Goldwater-Nichols, Capstone was an optional course at NDU established in 1983. The panels' view, shared with Goldwater-Nichols, was that, with few exceptions, Capstone should be mandatory for all newly selected general/flag officers.

I now want to spend time focusing on the three principle areas of the panel's effort: development of strategists, joint specialty officer education, and quality.

A major portion of our effort was directed at assessing how well the current PME system encouraged strategic thinking and the development of strategists. But first, we had to define what we were speaking about when discussing strategy. In other words, what did we expect a strategist to do? What education did we think a strategist needed, and did the current system nurture strategic thinkers? Could they be developed, and if so, how?

Strategy and strategic vision are difficult concepts to grasp. In 1988, Chairman Les Aspin accused the administration's strategy of "be everywhere and do everything" as a prescription for disaster. He felt there needed to be a shift in the emphasis of the debate from the weapons we buy to the strategy we employ to secure our national objectives.

Strategy is the link that translates power into the achievement of objectives; whether it be national security strategy (using all the influences available to the nation), or national military strategy (employing the armed forces to achieve national objectives).

Developing a cadre of officers who could conceptualize and articulate national military strategy to our civilian leadership and/or provide military advice is dependent upon at least three factors:

(1) a comprehensive understanding of operational art (joint doctrine),

(2) appropriate professional and academic education, and

(3) personnel policies which ensure our most able officers are allowed to grow in experience and intellectual capacity.

From a long list of attributes the panel settled on four qualities which were most often mentioned as necessary in an individual destined to become a strategist or strategic thinker. He/she must be:

(1) analytical -- have the ability to move beyond isolated facts or competency in a given subject area to see and develop interrelationships,

(2) pragmatic – able to understand emerging trends and able to react to them, having a keen sense of the art of the possible.

(3) innovative. Strategies should be creative and challenge the status quo. Out of the box thinking, today's cliche, is a requisite.

(4) broadly educated to appreciate trends in political, technological, economic, scientific and social issues, both domestic and international.

The panel recognized a distinction between the theoretical strategist, a seldom found individual who can conceptualize and innovate, and the more common applied strategist, the practical problem solver who can think strategically. Nevertheless, well-educated military officers who can think strategically have an important contribution to make in the development of strategy, and there is an overwhelming need for PME as a whole to reinforce its contribution to strategic thinking.

Where officers possess the talent, intellectual capacity, appropriate experience and relevant education, the PME system must be sufficiently capable of nurturing these individuals. How is this to be accomplished? By first providing an officer a firm grasp of his own service, sister service, and joint commands. Second, by providing a clear understanding of tactics and operational art; and, finally, by providing an understanding of the relationship between the disciplines of history, international relations, political science and economics. The panel believed these were fundamental to developing strategists.

In terms of structure, the panel believed that the entire PME system should be focused to provide an appropriate educational opportunity based upon an officer's time in service, experience and future career potential. The focus and structure would not only enhance the development of strategists, but would provide the correct template for educating officers not only in service-specific competencies, but in joint capabilities as well.

The second focus of my discussion is joint educational requirements outlined in the Goldwater-Nichols Act, and how the panel addressed the issue. Once again, however, the panel was faced with a dilemma. At that time the Joint Staff, in our opinion, had not given a great deal of critical thought to the Goldwater-Nichols mandates. They had not thought through the educational requirements or, for that matter, what constituted a Joint Specialty Officer, and how this officer differed from his/her counterpart in a sister service. Some envisioned the JSO as the precursor to a German-style general staff. Others were adamantly opposed to this notion.

The crux of the issue was whether or not the JSO could ever represent a unique, tangible quality in the planning and/or execution of joint combat operations. Was this expectation realistic? The Congress asserted 'yes', given time, education, experience and opportunity, according to civilian and former senior military advisors

to Congress. The DoD opposed this view, holding that the best joint officer is the expert in his/her own service and that there is not sufficient time or opportunity for a professional soldier, sailor, marine or airman to be both a service and a joint expert. So the panel once again found itself dealing with a conundrum because neither Congress nor the Department of Defense, by design or otherwise, would articulate what the JSO could be -- the prerequisites, assignment policies, selection criteria and career paths.

The joint specialist problem, if you will, appeared to have two parts. Part one was institutional -- the selection, education and qualifications of JSOs. The second part, and more difficult, was intellectual and social, and involved:

(1) changing an officer's mindset from service-orientation to joint, and

(2) creating acceptance that the JSO career path was good for both the service and officer corps.

As you may recall, unless you were very junior or senior, assignments to the joint staff were "career enders" for many. And this was the problem Goldwater-Nichols was going to address by directing the services through various incentives, to assign their future leaders to joint duty. Goldwater-Nichols tied promotions, assignments and education to joint duty.

Goldwater-Nichols directed the services to strengthen the content and focus of joint matters taught at the existing service schools, and directed the Joint Chiefs of Staff to provide specific joint education at a JPME school provided by the National Defense University. The panel made a clear distinction between these two requirements. The first constituted joint education from a service perspective; the latter, joint education from a joint perspective.

The present PME system could have accommodated the joint educational requirements of Goldwater-Nichols, or so it seemed, until GNA accounting rules were applied to the joint duty assignments list (JDA). The Joint Chiefs of Staff had a production problem because of the inability of the National Defense University to educate all potential JSOs. In response, the JCS, with service cooperation, adopted a joint track to be taught to designated students in each service's intermediate and senior school. The joint track would have a prescribed curriculum, minimum student mix, standards applied consistently in each school, and be accredited by a JCS-designated procedure. But the joint track, in the panel's view created several problems:

(1) Two tracks created two classes of students. Joint track, because of the GNA promotion and assignment rules, was the fast track.

(2) Schools would have to make significant changes to their curricula to teach the prescribed joint block of instruction.

(3) During joint track education, other service students and faculty would be unavailable in the classroom.

(4) Uncertainty existed that the Navy could provide students and faculty of the prescribed quality and operational experience in sufficient numbers to attain the joint education standards at non-Navy schools.

In spite of the joint track concept, the panel could not alter its belief that this was joint education from a service perspective and did not meet the intent of Goldwater-Nichols.

Our solution to the production problem, of course, was to focus upon how Armed Forces Staff College could be restructured to meet the intent of GNA. Here was an institution whose historical root, the Army-Navy Staff College during World War II, had addressed essentially the same issues 40 years prior -- joint education for service-oriented officers enroute to assignment on joint and combined staffs. The AFSC had all the elements. It would:

(1) ensure the mix of faculty and students by service.

(2) ensure equity of job opportunity -- one "class" of student.

(3) provide standard joint education at the intermediate level under the control of CJCS and the President of NDU.

(4) ideally, enable students to attend enroute to their joint assignments.

(5) not preclude more senior officers (colonels/captains) from attending.

(6) allow service schools to continue to focus on joint matters from a service perspective.

The revamped Air Forces Staff College would no longer be an intermediate service school counter for all services, but would be provided for JSO joint education focused on understanding

(1) the combat capability and limitations of units and organizations within other services;

(2) doctrine for employment of other service forces and joint doctrine, to the extent it exists;

(3) service and joint command and control systems;

(4) campaign planning with emphasis on joint task force (JTF) responsibilities.

Having discussed strategies and education for JSO, let me now turn to quality. The panel focused on four segments where we believed quality was necessary to provide the foundations for an effective PME system. These were faculty, commandants and presidents, student bodies, and pedagogy.

Foremost, in the panel's opinion, was the faculty. The importance of a competent, credible and dedicated faculty to both the fabric and reputation of our PME institutions cannot be overstated. Faculty determine the quality and worth of the educational experience.

PME faculties should rightly consist of both military and civilian faculty members. Military faculty should be from three areas: (1) operationally oriented individuals with recent command or staff experience; (2) military specialists, who might be foreign area specialists or intelligence officers; and (3) military educators who are degreed in the requisite subject matter -- perhaps service academy instructors.

Civilian faculty instructors enhance both the academic stature and scholarship of the institutions, particularly if they are renowned in a particular field. General Goodpaster said, "Civilians can add depth to the curriculum and help establish pedagogy." They also add continuity to an institution, particularly a service school where the turnover rate of military faculty can be disruptive. While the panel never stated how many civilians should be on the faculty, we believed that senior service schools should have more than intermediate schools, and that perhaps one-third was a good target.

The panel included PME commandants and presidents in its quality discussion because of the tremendously important role these officers play in their service (or JCS) and the difficulty in identifying these officers. Former Army Chief of Staff, General Meyer, expressed concern that only a few officers possess the characteristics to hold these positions. They must have operational credibility, academic credentials, a superb intellect, and must be seen by the student body as having the highest standard of integrity.

One other former service chief had similar criteria for PME commandants and presidents:

(1) have a strong academic inclination, but not be seen as an 'egg- head';

(2) be a general/flag officer on the way up; not assigned to the positions for faithful service;

(3) be willing to devote three years to the institution;

(4) be seen by his/her peers and student body as having operational knowledge; and

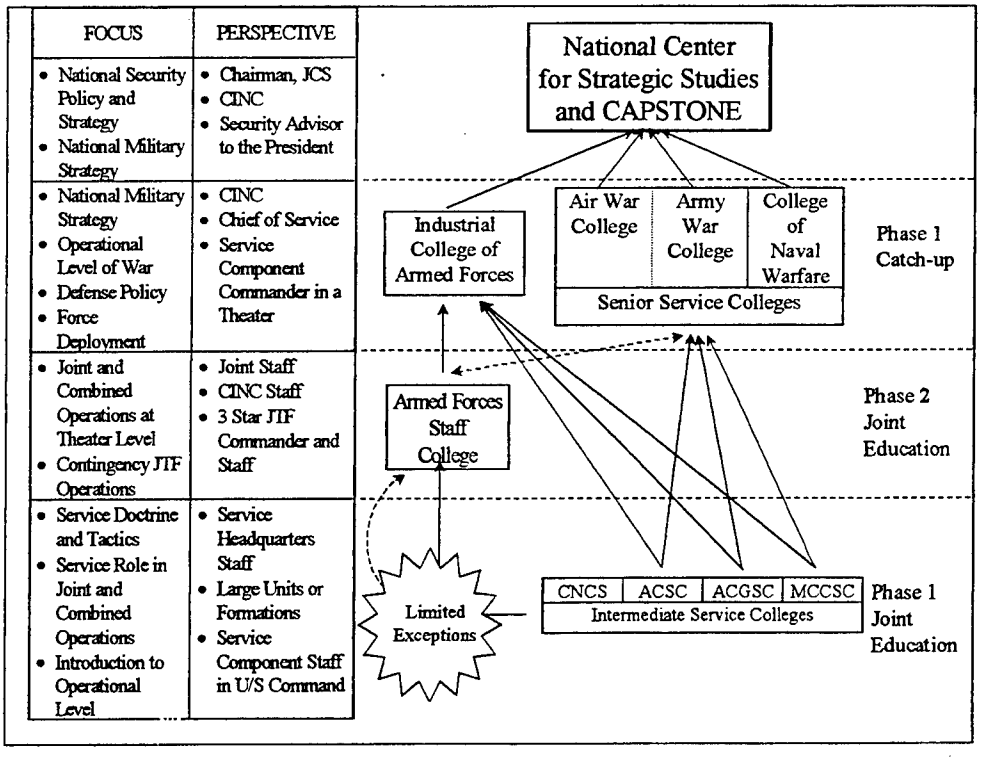
(5) have the ability to establish sound rapport with the student body – i.e.,be a mentor with a high degree of integrity.

Mentorship by the commandant is particularly important. No other single officer in any of the services has such capability to influence -- positively or negatively -- so many of our nation's future military leaders. During a three-year tenure, the commandants of the five senior schools will have direct interaction with approximately 3,000 lieutenant colonels/navy commanders and colonels/navy captains.

Who are these 3,000 military officers who make up the student bodies in the PME system? They are career officers, serious about the military profession, well-educated and capable of serious academic study. The panel reviewed service policies with respect to selection, school designation, follow-on assignments, promotions, and whether or not these policies resulted in selection of those officers who were more able and had the greatest potential. Despite wide variances among the services, by and large, the services select very capable officers for in resident PME.

The pedagogy -- or art, science and profession of teaching -- and the rigor associated with several of the institutions we found to be quite lacking. We heard from numerous educators that the most effective learning takes place in small seminar groups where the student is accountable to the faculty and his peers to make meaningful contributions. Active learning requires self-discipline and diligence, as well as reading and writing. Lt Gen John Pustay, a former president of NDU, provided the panel with three watch words that capture much of the essence of the active learning process: research, relevance and rigor.

Passive learning, on the other hand, is the least effective method and is characterized most commonly by listening to lectures. General David D. Jones, former chairman, JCS, stated, "Passive education is the least productive for the time spent." Occasionally, lectures and symposiums should be used to support a major theme, but they should not be a steady diet for an academically challenging institution. With the exception of the two naval colleges and the Army Command and General Staff College, the panel observed too much passive education.



Before I conclude, let me share with you what I think were the panel's real achievements:

(1) We focused the debate about JPME and JSOS at the right level -- chairman, service chiefs, presidents and commandants, and CINCs;

(2) We held our ground on the joint track issue - that it was not the solution to the JSO production problem;

(3) We brought attention to the quality of education and, by doing so scared the hell out of many students for fear of more writing assignments, DG programs and comprehensive tests - particularly the Air Force;

(4) Armed Forces Staff College became the Phase II JPME institution at the intermediate level, returning to its historical intent;

(5) The School of Advanced Aerospace Studies (SAAS), modeled after SAMS, was founded at Air University; and

(6) For 19 months, we became "they".

What future panels accomplish will be important, too. But we should all remember the words Congressman Ike Skelton uttered in 1987: "Education in the present is the foundation of everything that happens in the future."

MAJOR GENERAL DONALD G. COOK, USAF
Commander, 20th Air Force, Air Force Space Command
Commander, Task Force 214 for U.S. Strategic Command

Major General Donald G. Cook is commander of 20th Air Force, Air Force Space Command; Francis E. Warren Air Force Base, Wyo., and is dual-hatted as commander, Task Force 214 for U.S. Strategic Command. He is responsible for the nation's ICBM force, including three operational missile wings and one missile group with more than 11,500 people.

The general entered the Air Force in 1969 through the Reserve Officer Training Corps program at Michigan State University. He entered undergraduate pilot training at Williams Air Force Base, Ariz. He has commanded a flying training wing, two space wings, served as legislative liaison in the Senate Liaison Office and on the staff of the House Armed Services Committee. Prior to assuming his current position, he was director of operations for Air Force Space Command. A command pilot, he has flown more than 3,300 hours in the B-52D, G and H models, and the T-37B and T-38A aircraft.

General Cook received a Bachelor of Science degree in business administration from Michigan State University, and a Master's degree in business administration from Southern Illinois University. His military education includes the Squadron Officer School, Armed Forces Staff College, and Air War College.

His major awards and decorations include the Legion of Merit with oak leaf cluster, Meritorious Service Medal with two oak leaf clusters, Air Force Commendation Medal with oak leaf cluster, Air Force Outstanding Unit Award, Combat Readiness Medal, and the National Defense Service Medal with bronze service star.

General Cook and his wife, Diane, have two children, Stephanie and Christopher.

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NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

Presentation by
Col. Mark E. Smith, III, USAF (Ret.)

COLONEL MARK E. SMITH, III, USAF (Ret.)

Mr. Smith has served as a consultant to the Director, Organizational and Management Planning, Office of the Director, Administration and Management in the Office of the Secretary of Defense (OMP/DA&M/OSD) since 1986. He is currently working on the implementation of the Defense Reform Initiative (DRI) and a study of the DoD Education Activity (DoDEA), a DoD Field Activity responsible for military dependents education. He has previously worked on reviews of DoD activities that could be relocated out of the National Capital Region, on DoD organization of health care, on the research and development organization for Theater Missile Defense, and as Director of a management study of OSD mandated by the Goldwaters Nichols Act. He was Staff Coordinator for Congressman Ike Skelton's House Armed Services Committee Panel's review of DoD Professional Military Education (PME) system.

Before retiring as a Colonel in 1986, Mr. Smith served in the Air Force for 30 years. He held positions as Operations Officer for the 497th Reconnaissance Technical Squadron; Associate Professor of Political Science at the US Air Force Academy; watch officer in the National Military Command Center; force analyst in the Air Staff's Directorate of Planning; policy analyst for the Secretary of the Air Force; Director of Programs for US Air Forces in Europe; Director of Operations for US NATO in Brussels; Chief of the Strategy Division on the Joint Staff; and Associate Dean of Faculty at the National War College. Mr. Smith is a graduate of the US Military Academy, the University of Chicago with an MA in Political Science, the George Washington University with an MS in Public Administration, the Industrial College of the Armed Forces, and the National War College. His publications include *American Defense Policy*, Johns Hopkins University Press.

SKELTON PANEL JPME RECOMMENDATIONS

Mr. Mark Smith

Office of the Director,
Organizational &
Management Planning,
ODA&M, OSD
15 January 1997

The views expressed in this presentation are solely those of the presenter. These views do not represent the positions of the Department of Defense.

Thank you, Admiral Smith. I'd like to begin by saying that serving the Skelton panel was a great learning experience. The lesson I most learned, or really, learned again, is that it is often a few good people who make things happen.

Amongst the many fine people I worked with on the Professional Military Education panel, the two who stood out the most were Congressman Ike Skelton, the panel Chairman, and Archie Barrett, the House Armed Services Professional Staff Member, who was the study director. Both are men of the highest integrity, and both have always put the good of the nation's military as a top goal.

I'd like to take this opportunity in front of a group who have knowledge and responsibility for military education to recognize Congressman Ike Skelton and Archie Barrett. In the last dozen years, and including PME, Goldwater-Nichols, and other actions, I believe they have done as much to improve the U.S. military as anyone I can think of.

Let me now turn to the Skelton panel and joint PME, upon which I'll focus my comments.

MAJOR WARS TAUGHT
NEED FOR JOINT SCHOOLS

- After Civil War, Army established *School of Application for Infantry and Cavalry* in 1881 and Navy established the *Naval War College* in 1884
- In World War II, JCS created *Army-Navy Staff College*
  - Explicit recognition of need for joint school
- After WWII, JCS created *NWC & ICAF*

One of the most basic conclusions of the panel was that major wars taught the need for joint schools. Thus, the evolution of Joint Professional Military Education (JPME) has it roots in the experiences of the Civil War. It taught that branches of the Army were unlikely to ever fight alone as they had in conquering the western frontier and elsewhere.

The first "joint branch" institution designed to teach officers in one branch of the Army to learn about operating with other branches was the School of Application for Infantry and Cavalry established in 1881 at Ft. Leavenworth, Kansas. The Naval War College followed in 1884 at Newport, Rhode Island.

Similarly, World War II was a major lesson that all future wars are likely to be joint. Even in the middle of that great conflict, our Joint Chiefs of Staff recognized the immediate need to teach jointness and that to fully teach jointness, a joint school was needed. Therefore, George Marshall, Ernest King, and Hap Arnold took the time in the midst of their other concerns to create the Army-Navy Staff College. These war-experienced leaders established the precedent that joint education should be accomplished in joint schools.

After the war, the leaders who had commanded realized that, especially at the senior level, more education in jointness and joint schools were required and they established the National War College and the Industrial College of the Armed Forces.

JPME EVOLUTION

- 1986 Goldwater-Nichols Act established Joint Specialty Officers and called for improving PME focus on joint matters in:
  - National Defense University Schools for JSOs
  - Service PME schools for all
- 1989 Skelton Panel recommendations

More recent **joint PME evolution** includes the following two actions.

In 1986, Congress passed the **Goldwater-Nichols** DoD Reorganization Act. The major impact of that Act was to increase the emphasis on jointness in DoD. As part of that emphasis, Goldwater-Nichols established a new category of officers called Joint Specialty Officers, or JSOs. It also called for improving the PME focus on Joint Matters both in NDU schools for JSOs and in Service PME schools for all students.

Then in 1989, Congressman Ike Skelton led a Panel that reviewed and made recommendations on how best to implement the PME provisions of Goldwater-Nichols. Let's look at these recommendations.

SKELTON PANEL JPME RECOMMENDATIONS

Major:

1. Two-Phase JSO Education
2. Develop Framework relating Warfare Level to PME Level

Other:

1. Establish Director of Military Education
2. Increase Faculty/Student Mixes by Service

This slide summarizes the recommendations of Congressman Skelton's panel. On the two major recommendations:

The Two-phase Joint Specialty Officer, or JSO education was to ensure the JSO got fully joint education. and

The framework relating Warfare Level to a PME Level was to ensure that each school concentrated on a specific subject, and unnecessary overlap was minimized.

Let us discuss these recommendations individually.

TWO-PHASE JSO EDUCATION

Either:

- PHASE I
  -Taught at Intermediate & Senior Level Service Colleges during ten-month course.

  and

- PHASE II
  -Follow-on, three-month course taught at Armed Forces Staff College, Norfolk, VA (900 students per year)

Or:

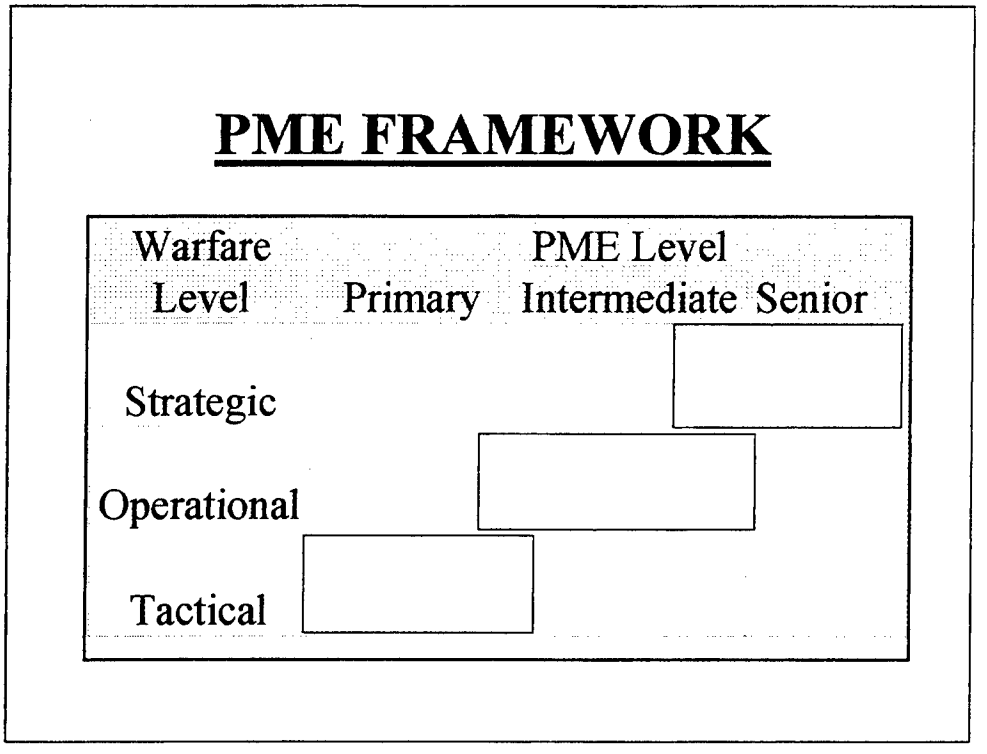
- PHASES I and II
  -Taught at NWCand ICAF during ten-month course

The Two-Phase education for JSOs recommendation recognized the lesson learned in WW II that full joint education required a joint school.

The joint PME curriculum was divided into two phases, the PHASE I of which is taught at Intermediate and Senior Level SERVICE colleges during their ten-month courses. These service schools, as we'll discuss, have had increased numbers of faculty and students from non-host military services, but they still are not a full joint environment.

PHASE II is taught as a follow-on, three-month course at the Armed Forces Staff College at Norfolk, VA. AFSC is under the command of CJCS, has a one-star commandant position whose occupant rotates by Service, the school concentrates solely on a joint curriculum, and it has a 1/3, 1/3, 1/3 mix by Military Department for both faculty and student body. AFSC is a fully joint environment.

An alternative for providing the joint environment is for a student to take both Phases I and II during the ten-month course at one of the two joint senior-level schools, the National War College or the Industrial College of the Armed Forces.



This slide shows the basic framework for PME.

The three warfare levels are shown in the horizontal rows and the middle three PME levels in the vertical columns.

As you can see, the primary PME schools concentrate on the tactical level of warfare, the intermediate or Staff Colleges on the operational, and the senior, or War Colleges, on the Strategic level.

There is some overlap at each school, which is appropriate. The major problem has been the overlap between the intermediate and senior levels, which in some past cases, has been seen as excessive. For example, in the past the Naval War College essentially taught the same course at both the intermediate and senior levels. One reason for this was that it was believed that naval officers could only attend one of the those two levels.

However, now that substantial numbers of students from all services attend each school, it is necessary to have an overall framework to minimize unnecessary overlap.

OTHER DOD JPME ACCOMPLISHMENTS

- Deputy Director Joint Staff for Military Education, J-7
  -One Star who Advises CJCS on Joint PME
- "Officer PME Policy" (CJCSI 1800.01)
  -Framework, Joint Curricula & Standards
  -Faculty & Student Mixes by Service
- Accreditation of Joint PME
  -Every Five Years
  -In Both Service Colleges & NDU

Besides the implementation of the Skelton panels' two major recommendations, DoD has some other accomplishments in JPME.

First, the CJCS has established for the first time the position of Director for Military Education, a one-star on the Joint Staff who advises the CJCS on joint PME both in the Joint and the Service schools. The current Director for Military Education is Brigadier General Ralph Pasini, who will address us tomorrow.

One of the Director of Military Education's first tasks was to develop a "Officer Professional Military Education Policy," (CJCS Instruction 1800.01, and in its first edition called the "Military Education Policy Document."). This document not only codified the framework we just discussed, it also established joint curricula , academic standards, and goals for faculty and student mixes by Service, which we'll address in a minute.

The document also established a process for accreditation every five years of joint PME, both in service colleges and the joint schools of NDU, the National Defense University.

These are significant accomplishments, but the services have had some difficulties accomplishing the Skelton panel recommendations on student and faculty mixes by Service.

MILITARY FACULTY MIX GOALS
(% Each Non-Host Military Department)

College	Congressional Goal	CJCS Goal
National Defense University	33%	33%
Senior Service	25%	10%
Intermediate Service	15%	5%

Here we see the percent of military faculty for each non-host Military Department, first as a goal recommended by the Skelton Congressional Panel, and in the last column as a goal established by CJCS in his "Officer PME Policy."

As a fully joint school, NDU has long had approximately 33% military faculty from each Military Department.

Starting with the Congressional goal column, for the senior service schools, the Congressional goal was 25%. Thus, for example at the Army War College, half the faculty would be of the host military department, the Army; and 25% would from the Air Force and 25% from the Sea Services. The Sea Services designation includes the Navy, the Marine Corps, and the Coast Guard.

The intermediate schools were considered to have more of a requirement for Service unique education and less for joint education than the senior schools. Therefore, the Congressional goal for military faculty of intermediate schools was 15%.

For the CJCS goals, besides the 10% shown for senior service military faculty, there is also a requirement that the combined non-host Military Department total should be no less than 25%. While these goals are above where the Service schools were in the 1980s and they are being met in all essential elements, they are 33-40% of the Congressional goals.

STUDENT MIX GOALS (Students/seminar from Each Non-Host Military Department)

College	Congressional Goal	CJCS Goal
Senior Service	**3 (20% in 96)**	**1**
Intermediate Service	**3**	**1**

Now to look at the **STUDENT MIX** goals. Here we see the numbers of students per seminar from each non-host Military Department.

The Congressional goal for both senior and intermediate levels is three students.

You'll note in parentheses that in the 1996 DoD Appropriations Act (Section 8084), Congress directed that for classes entering the war colleges after 30 September 1996, at least **20%** of the military students be from other Military Departments. This 20% Congressional requirement is being met.

As with the military faculty, the Chairman's goal is 1/3rd of the Congressional goal and is being essentially met. The hardest case is the Army Command and General Staff College, which has almost 1,000 students. These 1,000 students are currently arranged in 64 seminars, so you can see that it takes 64 Air Force and 64 Sea Services students just to meet the CJCS's goal of one student per seminar from each non-host Military Department.

In the panel's view, even the Congressional goal of 3 students per seminar is not as good as the NDU schools having 1/3 of the seminar from each of the non-host Military Departments and so was not sufficient for Phase II JPME. Since the one student from a service in a seminar often had knowledge only of one part of his service, the panel believed a single student did not meet the goal for even Phase I JPME.

PME SUMMARY

- DoD has made *major commitment to PME*
  -In Intermediate & Senior Schools, almost 4,000 students every year
- Kept Service PME and *Added Joint PME*
  -What believe is required

Let me summarize by stating that DoD has made a major commitment to PME with almost 4,000 students attending Intermediate and Senior schools every year (This figure includes international students).

Also DoD has kept the Service-unique PME needed to develop capable Army, Navy, Air Force, and Marine Corps warriors, and added the joint PME required to fight the major wars of the future that will be joint.

However, even with this major commitment to JPME and the significant DoD accomplishments, there still remain two related areas where there is a gap between the Skelton panel recommendations and the current DoD position.

OPEN PANEL ISSUES

- Ways to Increase Faculty/ Student Mixes
- Protect Substantial AFSC Course
  - Work Interrupted Tour TDY Issue
  - (3-month Course, 900 Students, 3/Year)

These are what I've called "open panel issues."

First, as we already discussed, the military faculty and student mixes by Service are below the Congressional goals.

The CJCS faculty/student goals are about 1/3rd of the Congressional goals. The good news is that DoD is essentially meeting the CJCS goals, but many, including those outside Congress, would like to find ways to increase the mixes.

The second jointness issue is the need to protect the most basic JPME lesson of our major wars--that is, that full joint education should be taught in joint schools. The two-phase JPME program using AFSC as the second phase was a good compromise, but some are still trying to undermine AFSC.

Perhaps the major problem with AFSC is the "Interrupted TDY Issue." While the bulk of new assignments to a CINC occur in the spring and early summer, AFSC with three courses each year can only graduate part of its students at that time. There are some advantages to having an officer TDY back to AFSC after 4 or 8 months in a new assignment, because he knows what subjects are important for his job. The disadvantage is that the CINC loses an officer in the middle of his tour. This too is a problem to work--but in any case AFSC should be protected.

CIVILIAN EDUCATION
EFFECT ON PME

- CORM Report (95)
  - Called for "Structured Educational System"
- Management Reform Memo #3 (5/97)
  - Streamline Management of OSD-Sponsored Higher Education
- Defense Reform Initiative (11/97)
  - Chancellor for DoD Civilian Education

While this slide discusses a subject that was not assigned to me for this PME conference, I believe it is important enough to introduce it. The subject is the potential effect on military education of the changes that are being talked about in the education of civilians in DoD. Let me just mention a bit of background.

First, the 1995 Commission on Roles and Missions (CORM) called for establishing a "structured educational system" for DoD civilians. This sounds much like the Skelton panel's call for making explicit the inherent framework for PME.

Second, was last spring's Management Reform Memorandum #3 from the Under Secretary of Defense (Comptroller) that assigned the ASD (Force Management Policy) to summarize inputs from the OSD principals and Directors of Defense Agencies and Field Activities on ways to streamline management of OSD-sponsored higher education organizations and programs.

Finally and most importantly, in November 1997 the Secretary's Defense Reform Initiative, amongst other actions, called for establishing a "Chancellor for Education and Professional Development to develop and administer a coordinated program of civilian professional education and training...."

While the DRI direction is only beginning to be studied under the aegis of the USD (Personnel and Readiness), all of us concerned with military education should be aware of its potential for affecting PME.

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Discussion by
James R. Locher, III
Former Assistant Secretary of Defense for
Special Operations and Low-Intensity Conflict
and
Robert Goldich
Former Head, Manpower and Budgets Section,
Foreign Affairs and National Defense Division,
Congressional Research Service, Library of Congress

Mr. Locher: The political conflict that produced the Goldwater-Nichols Act lasted four years and 241 days -- a period longer than World War II. Those of us who participated in that epic struggle can talk about Goldwater-Nichols for hours without taking a breath. My remarks focus on the influence that Goldwater-Nichols had on Professional Military Education. Admiral Smith, you better keep your gavel close at hand, because I might just get started.

As many of you know, Goldwater-Nichols was a watershed event for PME. In the larger context, as Mark Smith mentioned, Goldwater-Nichols was an effort to balance joint and service interests and perspectives in the Department of Defense. In that context, it put a tremendous amount of emphasis on the management of joint officers, and on the education of officers who would serve in joint assignments or in service assignments where they would be working with joint institutions.

As a matter of fact, one of the eight principal purposes of the Goldwater-Nichols Act, as mentioned in it's preamble, was -- and I quote, "to improve joint officer management policies." The Congress was tremendously troubled by the performance of joint duty in the Department of Defense.

A report by the Senate Armed Services Committee in 1985, as we were working our way up to the Goldwater-Nichols Act, summarized the situation as follows -- and I again quote, "For the most part, military officers do not want to be assigned to joint duty, are pressured or monitored for loyalty by their services while serving on joint assignments, are not prepared by either education or experience to perform their joint duties, and serve for only a relatively short period once they have learned their jobs." This is a very different environment from the one in DoD today. But that was the environment that the Congress saw, and it saw it as an intolerable situation.

To give you some examples, in 1982, only two percent of the officers on the joint staff had previous joint staff experience. Only 13 percent had attended the Armed Forces Staff College. Tour lengths were below 30 months. As a matter of fact, at one time, as we were taking testimony preparing Goldwater-Nichols, one of the witnesses revealed that, for some time, admirals serving on the joint staff had been serving on average 11 months. In 1982, the serving Chairman of the Joint Chiefs of Staff, David Jones, convened a special study group made up of retired admirals and generals and former Assistant Secretary of Defense, Bill Brown.

The study group came to the following conclusions -- and I quote, "The combination of lack of staff experience, lack of practical knowledge of joint activities, and lack of formal education through the joint school system, all coupled with short tours, makes it very difficult for joint staff officers, no matter how capable -- and many are very capable -- to deal effectively with these major staff responsibilities."

Given this situation, the Congress, in Title 4 of Goldwater-Nichols Act, mandated improvements in the performance of officers in joint assignments. Congress had three goals in mind: First, the selection of more talented or more highly qualified officers for joint duty assignments. Second, to increase the joint-experience level of officers in joint assignments. And third -- the subject, in part, of this conference-- to educate officers appropriately in joint matters.

We discussed an important part of the Goldwater-Nichols Act in d[illegible]nating the joint specialty officer -- and General Cook and Mr. Smith have covered that subject very well. So, let me turn and talk for a moment about the various provisions of Goldwater-Nichols that were designed to accomplish these three goals.

First, with respect to the quality goal, the Secretary of Defense was expected to establish qualifications for joint specialty officers. Joint specialty officer promotion rates were not to be less than those for service headquarter staffs. Joint specialty officers and nominees were expected to make up half of the joint duty assignment list; and all general and flag officers were supposed to first serve in a joint duty assignment before they could be promoted to general or flag rank.

Second, with respect to the experience goal established in Goldwater-Nichols, it was expected that, before an officer could be designated a joint speciality officer, he would serve a full joint tour. A thousand of the most critical billets in the joint arena could only be filled by joint specialty officers.

And, lastly, the Congress designated tour length for officers on joint duty -- three years for field officers and two years for general and flag officers. The Congress felt it had to specify this because, every time the services needed an officer back, he would be pulled out of the joint assignment to go into a service position.

As it turns out, another important part of Goldwater-Nichols was to make the JCS Chairman the principal military advisor. This played an important role with respect to Professional Military Education. Even though, shortly after World War II, the JCS had moved out smartly to create joint education institutions, for the most part there had been inattention to this subject from the late '40s through the period just prior to enactment of the Goldwater-Nichols Act. Giving the Chairman the responsibility broke a little bit of the institutional logjam in the Joint Chiefs of Staff, and permitted a more objective perspective on the requirements for Joint Professional Military Education.

The Goldwater-Nichols Act did not go into the education subject in more detail, primarily because of the enormous controversies surrounding the other subjects that were considered in the act.

In the beginning, on the Senate side -- and I suspect over on the House Armed Services Committee as well -- education was one of the subjects the Congress had in mind. But, eventually, we focused on the overarching joint officer personnel policies, and began the shift of emphasis in the education field. But we needed to leave much of that to the work subsequently done by the Skelton Panel.

I think it's important to have an understanding of the context in describing the period leading up to the Goldwater-Nichols Act. It seems like a long, long time ago, but it was only ten years ago. It provides the context for what it is we are now doing with respect to military education.

Mr. Goldich: When I was charged with a discussant role on the subject of Goldwater-Nichols and the Skelton Panel, I read those portions of Goldwater-Nichols that were applicable and I read the Skelton Panel Report, which I had not done for ten years. I had used snippets of them here and there, but I had not had the occasion to look at them on a comprehensive basis.

What struck me about them was, in addition to the enormous amounts of *rigor* -- a term used in the Skelton Panel Report a lot -- that an often abused institution, members of the United States Congress, brought their efforts to bear on a subject that would gain little or no appreciation from their constituents, simply because it was an important thing relevant to the defense of the United States that needed to be done. But I was struck again, even though I had worked in this subject for my entire career, by the relentless emphasis on *jointness* -- how, that is to say, the wording and the discussion of jointness permeated virtually the entire content of the Skelton Panel. If the process issue on the subject of PME that interested the Skelton Panel was rigor, the substance issue that mattered, to the exclusion of just about everything else was *jointness.*

Now this, of course, comes as no surprise. In fact, it was an explicit charge to the panel; and it was, by all accounts not only understandable but very much

warranted. But I confess that after reading the report, I was struck by the extent to which such formidable intellectual guns were brought to bear, on any one target. I felt like somebody saying, "Be careful what you shoot at because you may hit it, and a lot of collateral damage by omission, if not commission, could result."

We have structured, over the past ten years, a great deal of our PME curriculum around jointness, based on a very well-founded concern in the early and mid 1980s about the ability of the services to conduct and win joint military operations in the field.

Now we find that other issues need dealing with as well, and the guns are being brought to bear on them. These include such things as information warfare; operations other than war; the increasing technological sophistication of military hardware, the issue of unmanned vehicles and robotics, and military operations in urban terrain, with all its political and social ramifications -- comparatively new things which have interested people in the last year or so, and for which interest which is growing greatly.

When reading through the report, I was thinking of the predilection that we Americans -- not just those in the Congress or in the government, but Americans in general -- seem to have toward intellectual fads. We are fascinated by new topics; we think "something needs to be done," and we turn to it with unbounded enthusiasm. In some cases, perhaps a little skepticism might be warranted at the same time the enthusiasm is showing. Here I think, in particular, the Congress can help a great deal. The Congress has a tendency, since it comes with a broad and properly political perspective on things, to question fads -- to show some scepticism and to not jump on board with them.

So, based on this initial thrust by Goldwater-Nichols and the Skelton Panel ten years ago on jointness, what did I come away with after the second reading of the subject? One thing is that, perhaps more than anything else, further changes and further evolution in PME should strive for balance. We want to be careful about how the very splendid enthusiasm of the services drives for totality in every way. Perhaps what we need to do is not just develop a PME system proper for the 21st Century, but think more about developing PME criteria that the soldiers of the Republic -- using soldiers in its broad sense -- can use in any century.

Thank you very much.

JAMES R. LOCHER, III

Former Assistant Secretary of Defense for Special Operations and Low-Intensity Conflict

Born in Lancaster, Pennsylvania, in 1946, Mr. Locher has more than twenty-five years of professional experience in both the executive and legislative branches of the Federal Government. He graduated from the U.S. Military Academy in 1968 and received an MBA from the Harvard Graduate School of Business Administration in 1974.

Mr. Locher began his career in Washington as an executive trainee in the Office of Defense. Subsequently, he served in the Executive Office of the President as executive secretary of the White House Working Group on Maritime Policy, which formulated the legislative proposal that resulted in the Merchant Marine Act of 1970.

Returning to the Department of Defense in 1969, Mr. Locher worked in the Office of the Assistant Secretary of Defense for Program Analysis and Evaluation. As an operations research analyst in the Mobility Forces Division, he was responsible for sealift programs. He also served in the Naval Forces Division, with responsibility for amphibious shipping, mine countermeasures, naval gunfire, and maritime and power projection net assessments.

In 1978, Mr. Locher joined the Senate Committee on Armed Services as a professional staff member. Initially, he served as the senior committee advisor on international security affairs, with additional responsibility for force projection programs, including airlift, sealift, amphibious warfare, and rapidly deployable forces. Beginning in 1985, Mr. Locher was assigned responsibility for military strategy, defense organization and management, special operations and low-intensity conflict reforms, and Persian Gulf issues. During this period, he directed the bipartisan staff effort that resulted in the Goldwater-Nichols Department of Defense Reorganization Act of 1986.

President Bush appointed Mr. Locher to the post of assistant secretary of defense for special operations and low-intensity conflict on October 19, 1989. As assistant secretary, Mr. Locher was responsible for the overall supervision of the special operations and low-intensity conflict activities of the Department of Defense. He also performed as the principal civilian adviser to the secretary of defense on these matters. He served as assistant secretary throughout the Bush administration and the first five months of the Clinton administration. During the latter period, Mr. Locher also served as the acting under secretary of defense for policy.

Since leaving government service in June 1993, Mr. Locher has been writing, lecturing, and consulting. He is authoring a book on the history of the Goldwater-Nichols Act, entitled *Victory on the Potomac – The Five-Year War to Unify the Pentagon.* In December 1996, Mr. Locher was appointed as a distinguished visiting fellow at the Institute for National Strategic Studies, National Defense University. Most recently, he served on the secretary of defense's Task Force on Defense Reform.

Mr. Locher and his wife, Norma, have one son and reside in Springfield, Virginia.

ROBERT L. GOLDICH

Robert L. Goldich is a Specialist in National Defense, and former Head of the Manpower and Budgets Section, of the Foreign Affairs and National Defense Division, Congressional Research Service, Library of Congress. His principal areas of expertise are defense manpower and personnel issues, defense organization and management, U.S. Army force structure and doctrine, and military history. Mr. Goldich has written and coordinated CRS analyses of overall current defense policy issues, and is currently working on a major study tentatively entitled The U.S. Marine Corps: Current Issues for Congress. He has also written or co-authored analyses of the DOD service academies, Army reserve component issues, concurrent receipt of military retired pay and veterans' disability compensation, military retirement generally, defense reconstitution, the Army's roundout concept after the Persian Gulf War, the reserve mobilization for Operations Desert Shield/Storm, reserve officer personnel management, U.S. Army combat-to-support ratios, U.S. POWs and MIAs held by Communist countries since World War II, the Goldwater-Nichols DOD Reorganization Act of 1986, and the Military Retirement Reform Act of 1986. He has published articles in various professional journals of military history and defense analysis; is a member and officeholder in the Inter-University Seminar on Armed Forces and Society; and participates in several other organizations concerned with defense policy.

Mr. Goldich received a B.A. in history and political science from Claremont McKenna College in 1971 and an M.A. in international affairs from George Washington University in 1977. He is a graduate of the National War College, Class of 1982. He is married and has one son.

PME for the 21st Century Warrior

SESSION TWO

Implementing the Skelton Panel's Recommendations and Identifying Dimensions of Importance for the Future of Military Education: Insights

Question: **How has implementing the recommendations of the Skelton Panel affected professional military education in the post-Cold War environment?**

Objectives: **1. Present issues that arose as Services implemented the Goldwater - Nichols legislation and the Skelton Panel recommendations, and**

2. Present issues that the Services deem sufficiently important to warrant inclusion in framing the debate associated with educating the officer of the 21st Century.

NAVAL POSTGRADUATE SCHOOL
and
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CONFERENCE ON
MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

Remarks by the Honorable Deborah Roche Lee
Assistant Secretary of Defense for Reserve Affairs

Less than a decade ago, the driver of a company commander's jeep needed to know how to drive the vehicle and operate a simple radio which had a power switch and a dial for changing frequencies. Today, that same driver is in charge of a HUMVEE, a high-tech vehicle equipped with a sophisticated radio and electronic countermeasures, a global positioning system, a secure mobile phone, night vision goggles, and a chemical agent alarm. Astounding advances like these are fueling a revolution in military affairs.

We in the United States have chosen to harness this technology revolution, so that we remain the world's only superpower, and dominate the battlefields of the future from air, land, sea and space. And yet at the same time, we know that technology alone is not enough to keep us strong in the 21st century.

In today's rapidly changing security environment, we must also continue to focus on people, and to adapt the education and training of our future military leaders. We must anticipate new challenges and change to meet them. Today's conference is an important step forward in reaching that goal.

How do we equip our future leaders to face the security environment of the 21st Century? Let me answer this question from my perspective as Secretary Cohen's principal advisor on Reserve Affairs.

The Reserve components have clearly and repeatedly demonstrated their capability to operate effectively in today's strategic environment. Reserve component personnel are being called upon in more cases, and in more places, than ever before. In the Operation Joint Guard theater -- Bosnia, Croatia, Hungary, and backfill in Germany and the United States -- nearly one out of every four American soldiers is a member of the National Guard or Reserves.

On other fronts, Guardsmen and Reservists have fought fires in Indonesia and dropped winter feed to snow-bound cattle in New Mexico. Thousands were recently called up in the Northeast to help relieve the impact of severe winter storms. They are constructing roads and hospitals and infrastructure in South America and the Caribbean. And they are forging bonds of alliance with our new partners in Eastern Europe, helping to build a united Europe that is peaceful, prosperous and free.

In short, they are helping on a daily basis to get the total work of the Total Force accomplished. In fiscal 1996 alone, RC personnel contributed 13.6 million man-days in support of missions and exercises around the world. Just for comparison, that number of

man-days during a year of peace equals about one-third of the Gulf War contributions, when more than 250,000 Reserve component personnel were mobilized.

These are important numbers. They show that the Reserve Components are making the kind of contribution these times demand. They are not just a backup force of last resort, but are needed on a day to day basis in peace. And they show that the Reserve Components are increasingly effective in the post-Cold War world. This is good news.

The other good news is that a decade of increased use has not had a negative impact, at least not yet, on readiness or our ability to meet end strength targets. Attrition figures are stable, and recruiting and employer support remains strong.

These facts and figures aren't just interesting from a theoretical point of view. To the contrary, they directly relate to important policy decisions emanating from the Quadrennial Defense Review - policy decisions that say we will continue to use the Guard and Reserve when possible to help reduce Active component OPTEMPO. And we will continue to use the National Guard and Reserve in the future, not only in war but also in peace.

Let me offer you a few recent examples of how we intend to pursue this philosophy of increased use of the Guard and Reserve.

Efforts are currently underway to provide the National Guard with an enhanced capability to support civilian authorities in responding to terrorist use of a weapon of mass destruction. I anticipate that DoD will soon announce a new plan in this area, which is a national follow on to the Guard's long standing role in disaster response here at home.

We've also received some recent marching orders from Secretary Cohen on the subject of Active/Reserve integration, for it is his belief that maximum integration is key if we are to make our overall strategy work. Congress agrees.

Secretary Cohen has challenged each of the services and the Department of Defense as a whole to identify and tear down any remaining barriers, both cultural and structural, to effective integration between the Active and Reserve components. Toward that end, a number of recent initiatives have been taken.

Last week, Secretary Cohen announced the establishment of two new two-star positions, recently authorized by Congress to be filled by National Guard and Reserve general or flag officers, who will advise the Chairman of the JCS. In November, Secretary Cohen, as part of his Defense Reform Initiative, announced that a National Guard general officer would permanently fill the position of Deputy Director of Military Support (DOMS); and that up to one half of the action officers within DOMS would be drawn from the Reserve components. DOMS is the lead DoD agency in supporting civilian authorities in domestic emergencies, including those involving weapons of mass destruction.

Integration continues on other fronts as well. By October 1999, six Army National Guard enhanced readiness brigades will form the core of two new integrated divisions under Active Army commanders. And Reserve component personnel will soon receive green-color identification cards like their Active component counterparts.

In case you're wondering what increased use and integration of the Reserve components has to do with the subject of this conference -- Professional Military Education, or to use the acronym, PME -- the answer is: a lot. As Congressman Skelton noted nearly a decade ago, high quality PME is vital to our national security and an essential investment in future military leadership.

In today's joint environment, when technology is changing the way we work and think, the need for diverse individual and collective skills among soldiers and leaders remains paramount. Given the inherent complexities of jointness, and with ad hoc alliances and coalitions becoming the norm, Joint PME is now, more than ever, a critical component of military strength. Simply put, the highest educational standards and opportunities must be maintained for officers assigned to joint elements.

Today, Reserve Component officers occupy an increasing number of billets in joint organizations, and they are being called upon more frequently to support joint operations. Yet there is no systematic method for Reserve Component officers to obtain JPME beyond the initial level found at intermediate or senior service schools.

One of my goals in the next year is to move toward putting them on a more equal footing with their Active duty counterparts. Here's how:

First, we're working with the Joint Staff, National Defense University and the Armed Forces Staff College to assess the possibility of having Reserve component officers join the facilities of these institutions. Second, we are working to begin and/or increase attendance of Reserve component officers in establishing JPME courses, like CAPSTONE, in which sixteen spaces were allocated to the Reserve component for FY97. We'll try to do more in the future.

Another example is the Marine Corps University, which has recently begun offering RC officers from all Services an opportunity to attend the two-week Marine Air Ground Task Force. Eight RC officers attended this past summer.

But the availability of billets at JPME courses does not define the issue in its entirety. Even if large numbers of seats were available, civilian commitments of RC personnel prevent attendance at the lengthier residential JPME courses. And in other cases, geographic constraints and money hamper attendance.

So, by July 1999, we hope to implement a new model of JPME for RC officers. Admiral Blair and I have formed a working group to review how best to accomplish this goal, and, although we don't have it completely figured out yet, we believe that the "book end" model holds particularly great promise.

This approach calls for two weeks in residence, followed by a period of distance learning, capped off by another two weeks in residence. Distance learning, as you know, leverages existing technology to bring more learning to more people in more different locations at less cost. It may provide a ready-made solution to the time constraint dilemma faced by RC officers who seek advanced JPME. It may also hold the key to keeping costs down for this program.

With each passing year, we are gaining additional experience and confidence in Distance Learning as an alternative way to train in some -- though not all -- areas. It is increasingly being merged with other technologies, like simulations and embedded training, to facilitate warfighting training.

We are also using Distance Learning to assist in classroom training and education. For example, through distance learning, degree programs are being offered over the Internet and on CD ROM, and virtual seminars are being held on a global basis.

Within the Reserve world, the Army National Guard is at the forefront of distance learning endeavors, helping to create the National Guard Bureau's Distance Learning Network. Using fiber-optic communications, this Network integrates state area commands and links them to state armories and public institutions, such as community colleges and fire and police offices. The goal is to build interactive learning centers across the country, within an hour's drive of Guardsmen's homes. And in Maryland, the Army Guard has teamed up with the General Accounting Office to support telecommuting initiatives.

These examples illustrate how we are effectively moving away from classroom-based training and education in some areas. They also give you an idea of how we hope to harness this technology to help create a versatile, affordable and workable approach to Reserve JPME.

Let me sum up. Where does all of this leave us? I would offer you a number of propositions.

First, technology may be fueling a revolution in military affairs, but war ultimately remains a human endeavor.

Second, all of our people -- Active, Guard and Reserve -- will need a thorough understanding of the challenges ahead and how to face them. Active component officers need an appreciation of what 50 percent of their team -- the Reserve components -- offer; what their capabilities are; how they contribute to the CINCs and Joint Task Force commanders; and how they are activated and deployed.

For their part, Reserve component officers must embrace joint concepts. They must be prepared to augment their Active duty counterparts at the planning and implementation phases of joint operations. They must be flexible and fully prepared to meet the needs of a changing world.

To meet the challenges of the 21st Century, we will need continuous improvements in Professional Military Education, especially as it pertains to the joint environment. We will need to leverage technology and the power of information to educate and train our people. We will need to use all of our manpower assets -- Active, Guard, Reserve and Civilian – to their maximum potential. And the name of the game will need to be integration, integration, integration.

Thank you very much.

THE HONORABLE DEBORAH ROCHE LEE
Assistant Secretary of Defense for Reserve Affairs

Deborah R. Lee was nominated by President Clinton to be Assistant Secretary of Defense for Reserve Affairs on April 5, 1993, and was confirmed by the United States Senate on May 28, 1993. Ms. Lee serves as the principal staff assistant and advisor to the Secretary of Defense on all matters involving the Reserve components of the United States Armed Forces, including the Army National Guard, Air National Guard, Army Reserve, Air Force Reserve, Naval Reserve, Marine Corps Reserve, and Coast Guard Reserve.

Prior to serving in the Department of Defense, Ms. Lee was a professional staff member on the House Armed Services Committee. She is a specialist in military personnel and compensation and National Guard and Reserve issues.

Her most recent assignment was as a senior professional staff member and advisor to former Chairman Les Aspin. In this capacity, Ms. Lee worked directly with Members of Congress -- both on and off the Armed Services Committee -- to help build the coalitions necessary to pass the annual defense authorization bill and other defense-oriented legislation.

Ms. Lee's other responsibilities included: serving as a liaison between the Chairman and other House Members on defense programs and policies related to the defense authorization bill; troubleshooting/problem solving in an "ombudsman" capacity; and serving as one of several staff advisors to the Chairman on political matters related to the House of Representatives.

Ms. Lee holds a Bachelor of Arts degree from Duke University (1979) and a Master of International Affairs degree from Columbia University (1981). Upon graduation from Columbia University, Ms. Lee was chosen to participate in the Presidential Management Intern program -- a prestigious and competitive program that attracts graduate degree candidates nationwide who are interested in public service.

As a Presidential Intern, Ms. Lee accepted a position in the Department of the Army Materiel and Development Command and served as resource and program analyst in the task group of the Deputy Commanding General for Resources and Management. Her work there focused on the planning, development, and preparation of short- and long-range program requirements and studies related to the management of people, dollars, and equipment.

As part of the Presidential Management Internship, she was later detailed to the staff of the National Security Council, Executive Office of the President, where she worked in the Office of Legislative Affairs and Security Assistance.

NAVAL POSTGRADUATE SCHOOL
and
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CONFERENCE ON
MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

Presentation by
VADM Patricia A. Tracey, USN
Chief of Naval Education and Training

VICE ADMIRAL PATRICIA ANN TRACEY, USN
Chief of Naval Education & Training
Director of Naval Training

Vice Admiral Patricia Ann Tracey, a native of The Bronx, New York, completed Women Officers School and was commissioned as an Ensign in 1970, following graduation from the College of New Rochelle with a Bachelor of Arts degree in Mathematics. She also holds a Masters degree, with distinction, in Operations Research from the Naval Postgraduate School.

Her initial assignment was to the Naval Space Surveillance Systems in Dahlgren, Virginia, where she qualified as a Command Center Officer and orbital analyst. Following a tour on the staff of the Commander in Chief of the Pacific Fleet, she served at the Bureau of Naval Personnel as the Placement Officer for graduate education and service college students.

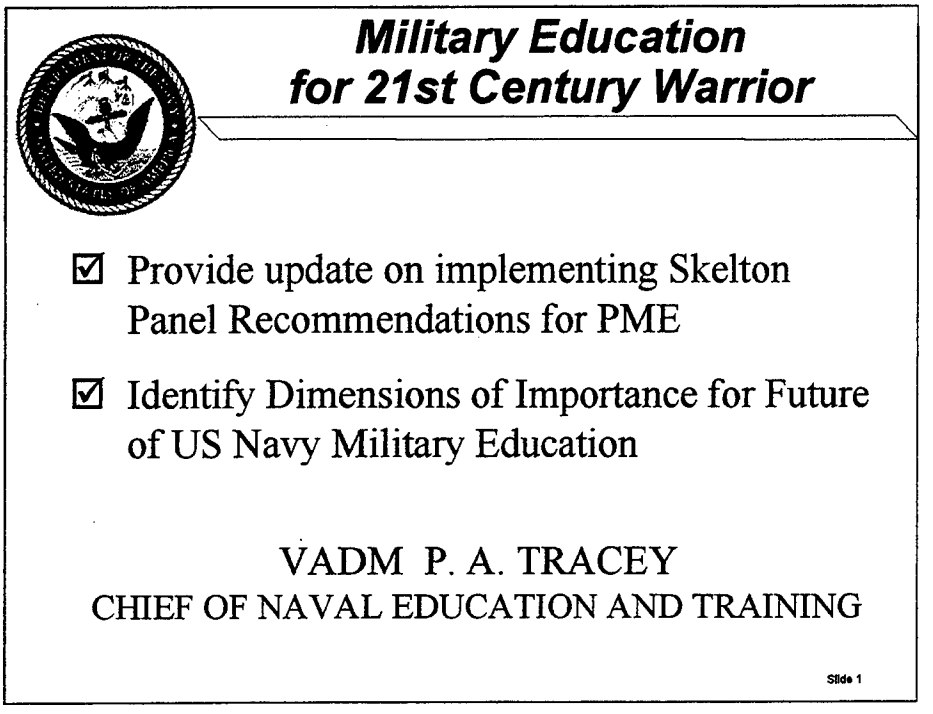
From 1980 to 1982, Vice Admiral Tracey served as an extended planning analyst in the Systems Analysis division on the Chief of Naval Operations staff. She served as Executive Officer of the Naval Recruiting District in Buffalo, New York, until 1984, when she was assigned as a manpower and personnel analyst in the Program Appraisal division of the Chief of Naval Operations staff.

Vice Admiral Tracey commanded the Naval Technical Training Center at Treasure Island from 1986 to 1988. She then headed the Enlisted Plans and Community Management Branch on the Chief of Naval Personnel's staff for two years. She assumed command of Naval Station Long Beach, California, in 1990.

Upon completion of her command tour, Vice Admiral Tracey reported as a Fellow with the Chief of Naval Operations Strategic Studies Group at the Naval War College. Vice Admiral Tracey was assigned as the Director for Manpower and Personnel, J-1, on the Joint Staff from July 1993 to June 1995. From June 1995 to July 1996 she served as Commander, Naval Training Center, Great Lakes. She assumed the duties of Chief of Naval Education and Training and Director of Naval Training for the Chief of Naval Operations, 10 July 1996.

The Admiral's personal decorations include the Defense Distinguished Service Medal, three Legion of Merit awards, and three Meritorious Service Medals.

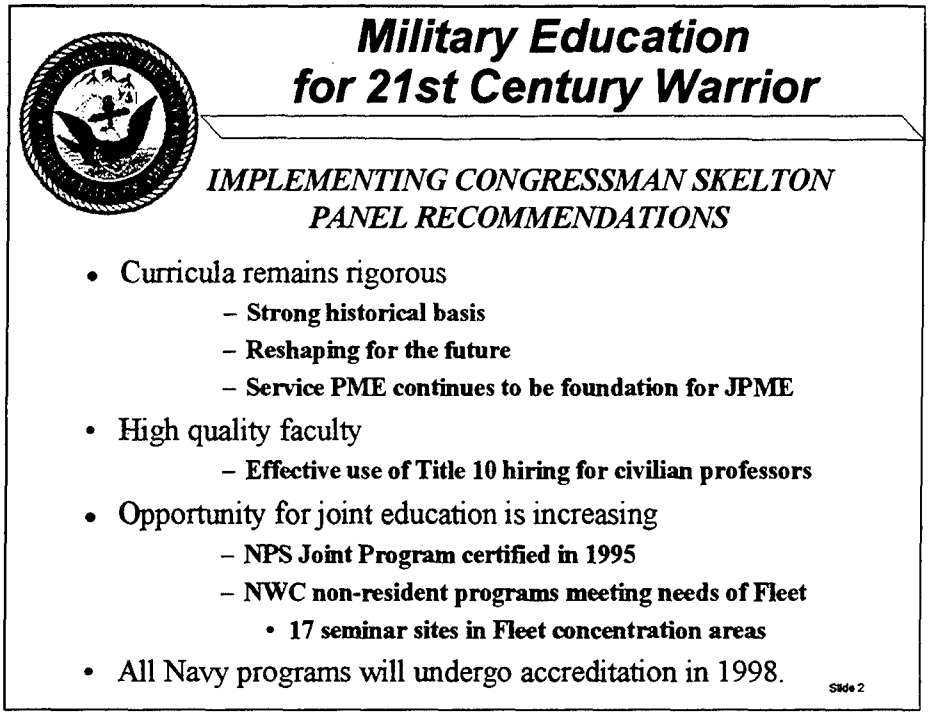
Vice Admiral Tracey's husband, Richard Metzer, is a former naval flight officer from Pengilly, Minnesota.



Thank you and good morning. I am just going to spin through a couple of slides to talk about these two major bullets. It is a particularly good time in our evolution to have this conference, since most people believe that it will be a prolonged period before we engage in a peer-to-peer sort of conflict. During this strategic pause, if you will, it is important to capture the knowledge and experience of our old warriors and apply them to the training of our young warriors, so that they can develop the tactics and procedures required to face that peer competitor.

It happens at the same time that we are operating everyday in an environment that demands the very precise, surgical, and adaptive application of military power, and at the same time as technology is dramatically changing the way that power can be applied. These things demand that our young warriors have a precise and full knowledge of their particular skills and have knowledge of how those skills contribute to the joint environment.

Education plays a critical role in making those two kinds of evolutions happen in a way that keeps us the winning force that we have been since Desert Storm. I would like to talk about where the Navy is going in that regard.



This slide talks to what we have done to implement the Skelton Panel recommendations. We have evolved our curricula at the Naval War College, maintaining the strong historical basis that has always been the foundation of that course. We shape continuously for the future by updating and incorporating changes to doctrine, and incorporating case studies of recent engagements.

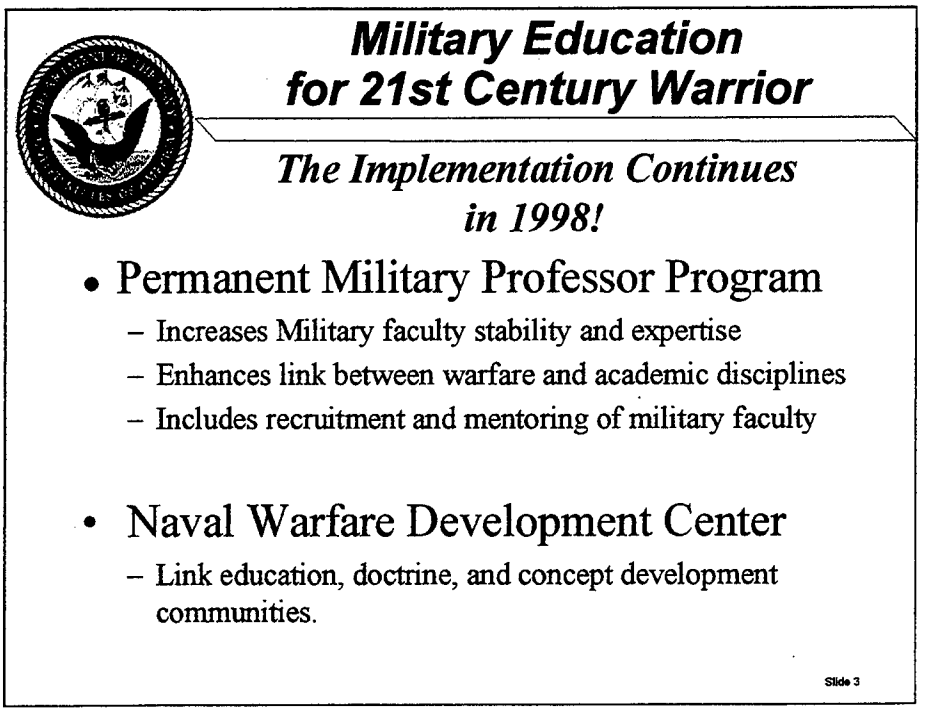
We continue to maintain that service-specific PME must be the foundation of joint PME, so that our naval warrior measurably contributes to the joint enviromnent.

We capitalize on the Title 10 hiring opportunities that were provided as a result of Goldwater-Nichols, and have maintained a very high quality faculty, one-third of which were hired under the Title 10 authority.

We have addressed the requirement to educate more than the people who are on track or JSO in PME and JPME matters by expanding the opportunity for joint education away from the Naval War College.

In 1995, we received certification for the Naval Postgraduate School's joint PME program, and we will go through an accreditation process for that curriculum in about two months.

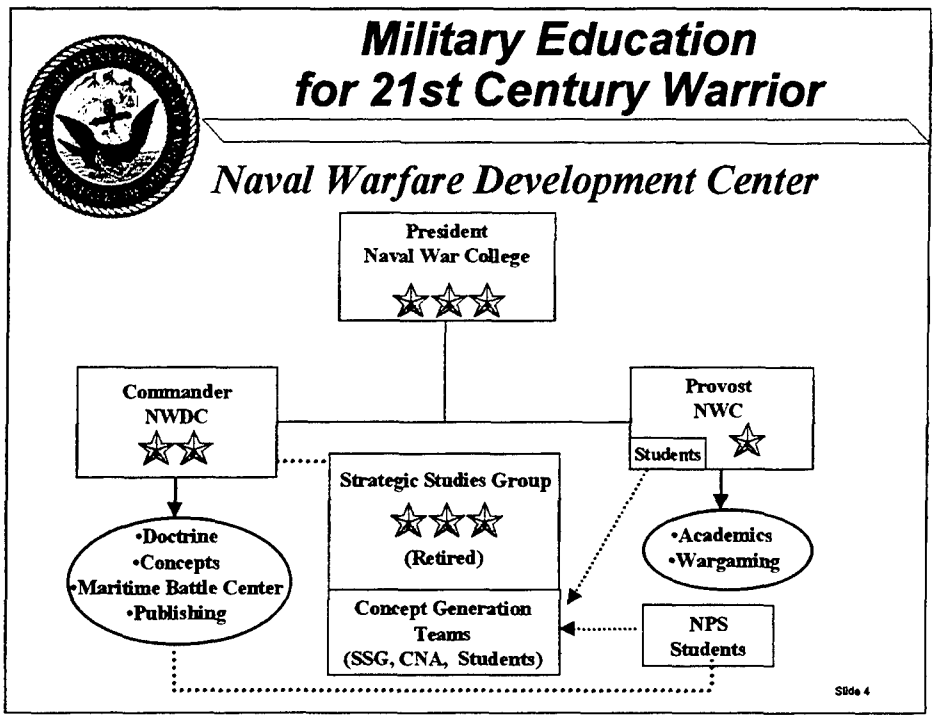
We've also upgraded and enhanced the ability to complete the Naval War College nonresident program, having established about 17 seminar sites in fleet concentration areas so that officers who are still engaged in their afloat assignments have the opportunity to pursue JPME in those kinds of duties. The Naval War College senior course and Naval Postgraduate School courses will undergo joint staff accreditation this year, and intermediate course accreditation next year, ensuring the continued rigor of these curricula.



Additionally, We have just implemented a Permanent Military Professor Program. The first selections for that program will take place this March of this year. This program attempts to establish a more permanent military faculty at the Naval Academy and the Naval Postgraduate School, enhancing the link between academic and warfare skills.

That small cadre of military professors will not be the only military instructors at those institutions. We will continue to draw officers from the operational environment and will cycle them back out to their warfare specialties once their educational tours are completed. One of the goals will be to recruit and mentor those officers who spend only a few tours as instructors while they continue to perform their permanent assignments as military professors.

The second is a larger and more exciting innovation. It is the establishment of a Naval Warfare Center -- an effort to link together and support the educational doctrine and concept development of the Navy.

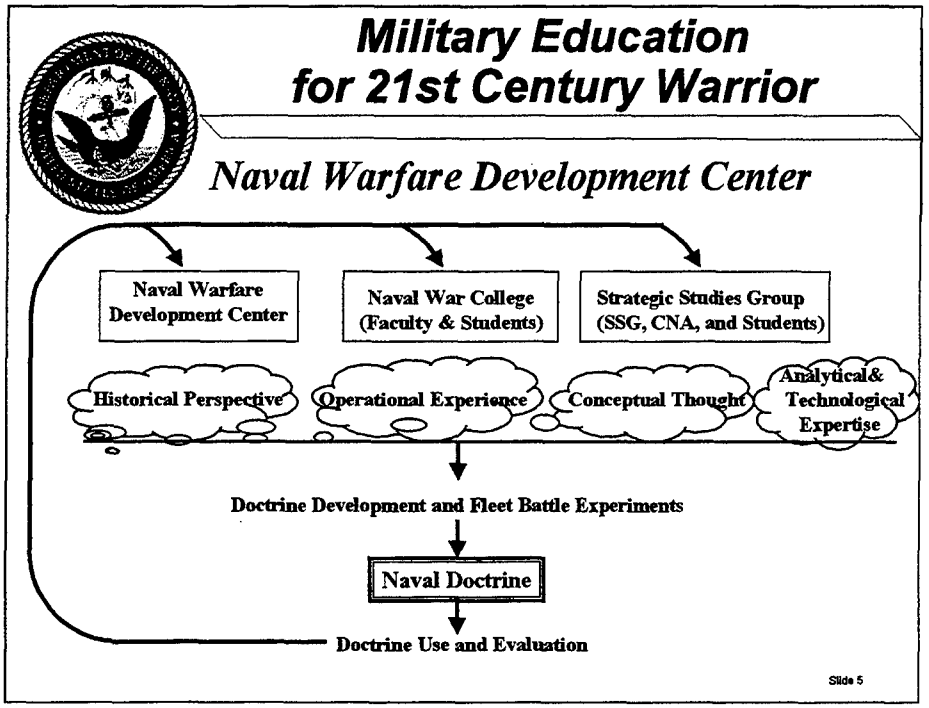


This is a conceptual picture of what that organization will look like. The Naval War College will be organized into three divisions.

The Strategic Studies Group is a small group of captains selected specifically to spend a year studying concepts and developing far-reaching notions as to how to evolve naval strategy. It has been in place for more than 15 years at the Naval War College, and has drawn heavily on the military and civilian faculty at the Naval War College to enhance its output.

Through the seminar structure I recently mentioned, we have strengthened the relationship between Strategic Studies Group fellows and students here at the Naval Postgraduate School, giving the SSG a much more robust view of the technical and analytical aspects important to the development of some far-reaching concepts approved by the CNO.

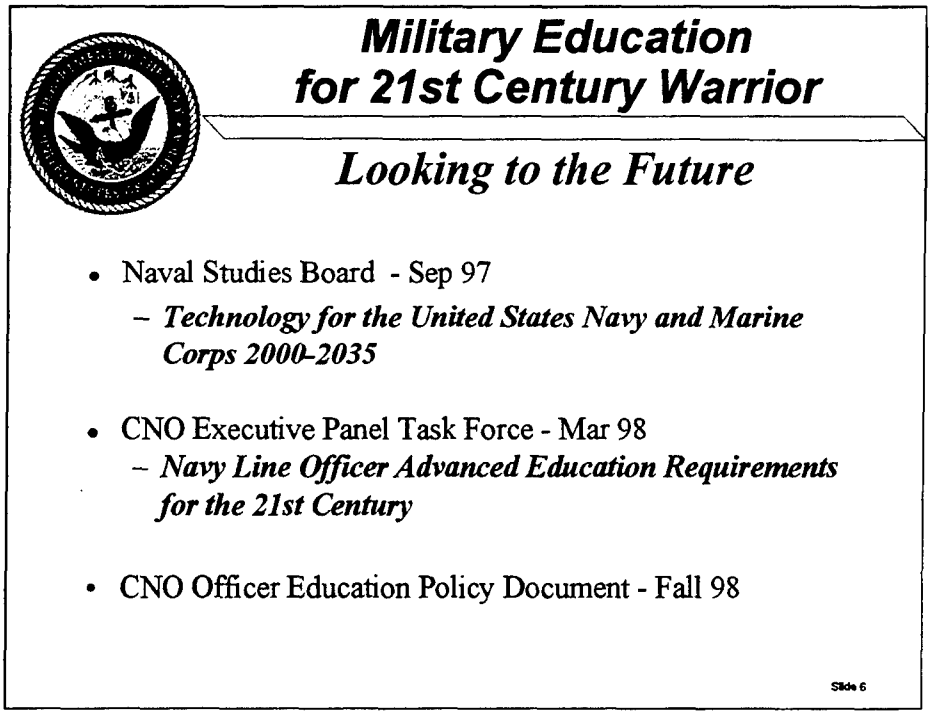
Within the next year, we expect to add a Commander, Naval Warfare Development Center -- a two-star flag billet that will draw together the notions of concept development and testing using the Marine Battle Center and fleet exercises.



The lessons we learn through that process will determine the sorts of doctrinal changes that ought to be incorporated into our educational and training systems to continue an evolutionary process of concept development in the 21st century. It's an exciting development that will capitalize on a couple of things that are important for us during this inter-war period.

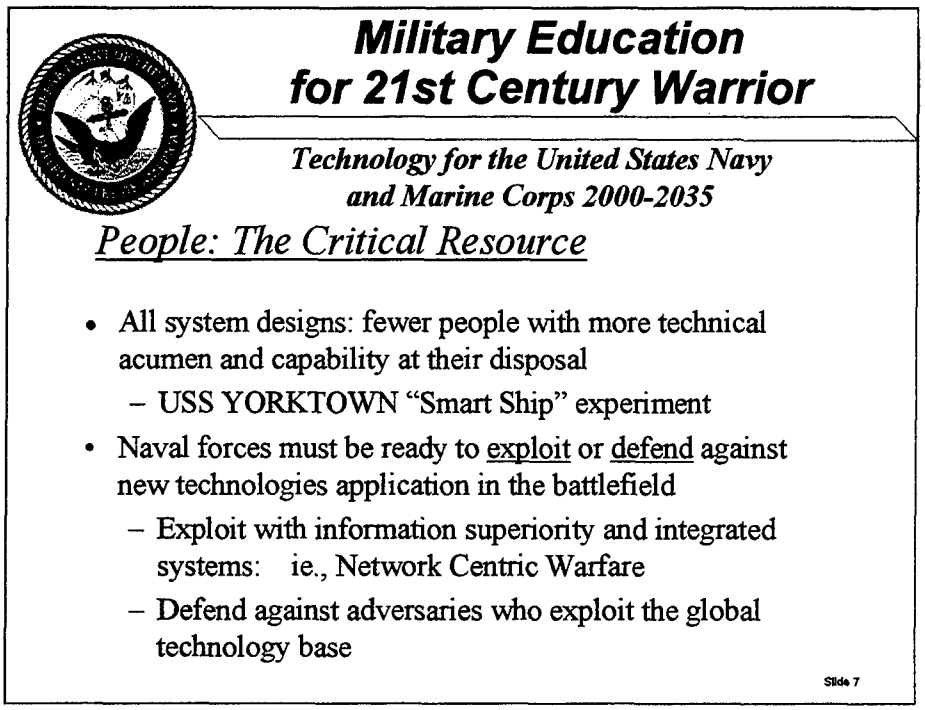
Melding our historical perspective with current operational experience and conceptual thinking about how to apply new technologies and new ways to fight the fight, will enable us to evolve new doctrines, technologies, and procedures that will be incorporated into our training process.

It's an exciting synergy that will include our War College and Postgraduate School students, as well as bringing into the mix people with current warfighting experience, in an effort to further develop our conceptual and innovative ability in this inter-war period.



Where are we going next? There are two key things that have been undertaken in the last six months alone. One is the output of the Naval Studies Board, which reported out in September 1997.

Second is a study by a CNO Executive Panel -- some of the members from that group are here today -- which is looking at the role of advanced application and development of navy line officers, in particular for the 21st century. Their efforts are aimed at the development of an updated CNO policy on officer education. We currently have no such policy.

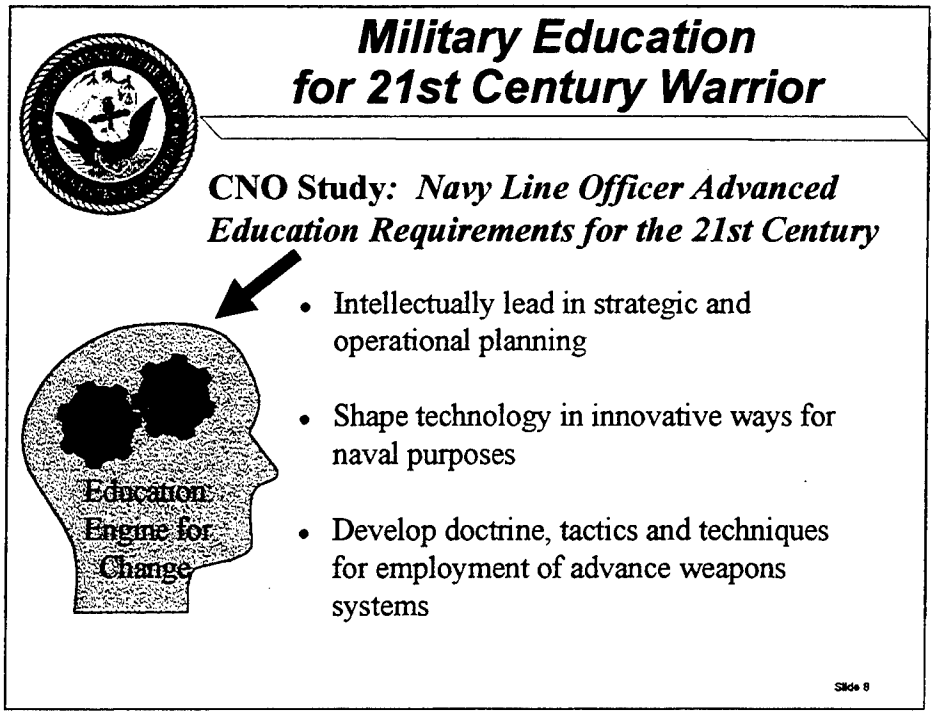


A couple of things came out of the Technology for the Navy and Marine Corps document. It reaffirmed that people are our critical resource. The trend in the procurement of modern systems is to design fewer and fewer people into those systems. The Smart Ship is a successful experiment. One of the fall-outs of that kind of trend is that individual people require broader activity, broader exposure to the technology, broader understanding of the tasks at hand, in order to be able to carry out their functions with a smaller crew.

Secondly, Navy forces must be able to exploit or to defend against new technological applications in the field. RADM Nutwell will be talking about our concept of network-centric vice platform-centric warfare as the way in which warfighting will be organized in the future. It places demands on the career development of officers able to engage in that kind of evolution in technological warfare. Individual warfighters will still demand platform skills, but we must lay on top of that the knowledge of the battlespace that comes from current methods, at much more senior levels than we currently demand.

Thirdly is the requirement to be able to defend against technologies that are proliferating and are much more widely available than they were in the Cold War era. Our previous assumption that only those who could afford large standing militaries could afford those very sophisticated technologies was wrong.

These dimensions demand a level of conceptual thinking, technological comfort, and analytical process, combined with a very deliberate notion of conceptualizing involving tactics, techniques and procedures -- things that are normally acquired from an education system, not just products of a training experience process.



As I mentioned earlier, about two months ago the CNO tasked the CNO Executive Panel to begin a look at Navy line officer advanced education requirements for the 21st century. He requested that the panel report their findings to him by late February to early March. These are the pretty big families of ideas that we are looking for as the general descriptors of what we believe officers need to be able to do for the 21st century -- all of which we think demand a pretty heavy-duty investment in education -- not just at the prescribed times in the life of an officer, but probably a continuing commitment to learning and progressing.

Military Education for 21st Century Warrior

Characteristics would include:

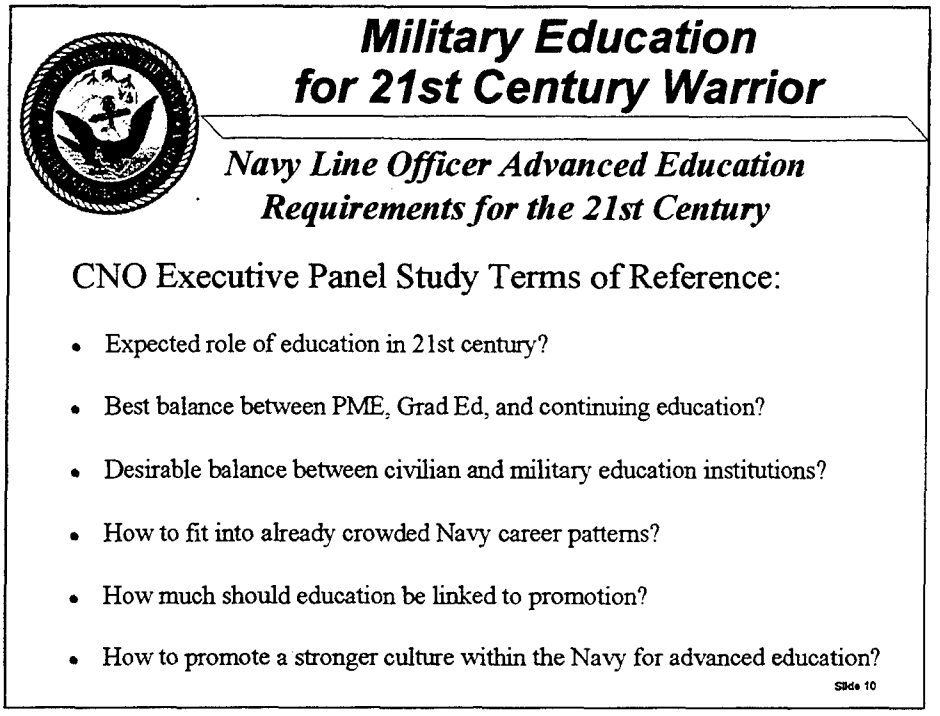


- Well versed in Military History
- Understand Joint/Integrated Force Application
- Comfortable with technology and it's impact on the battlefield
- Able to adapt quickly
- Conceptual thinker, developed analytical skill
- Strong moral and ethical foundation

CNO EXECUTIVE PANEL STUDY
"Navy Line Officer Advanced Education Requirement for the 21st Century"

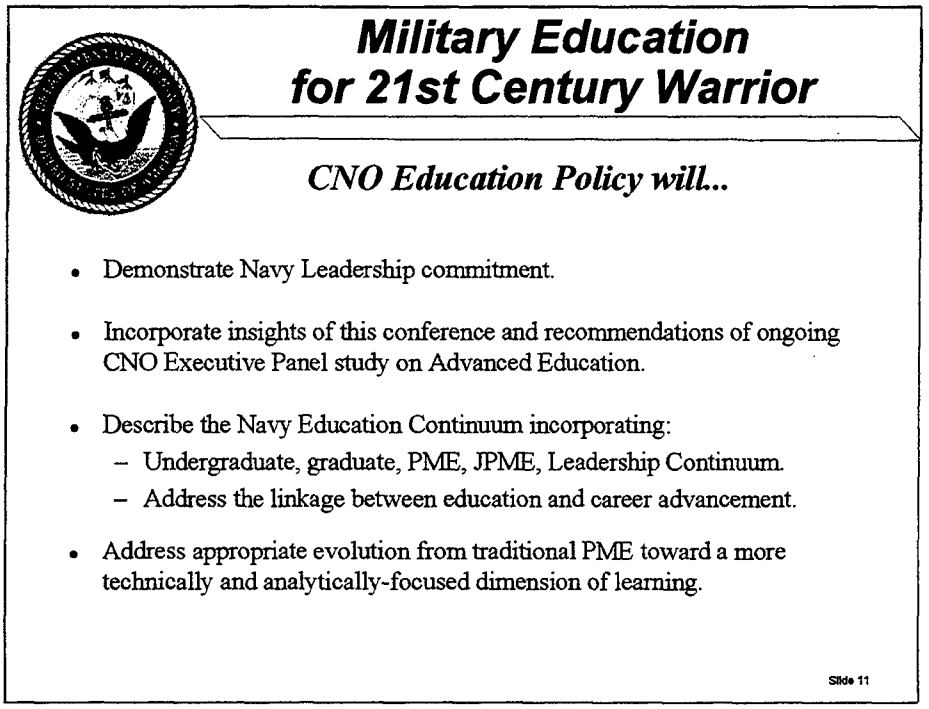
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This a notional descriptor of what we think the basic characteristics of the warrior for the 21st century ought to be -- each of them laying a pretty heavy demand on the education system, and for Navy officers, a particular challenge. The education system must imbue in our officers a knowledge of military history, an understanding of joint and integrated force applications, a level of comfort with technology, not so much to enable warfighters to design those systems, but to enable them to recognize the applicability of emergent technologies to the warfighting arena and to understand what the introduction of those technologies will mean to the way we fight, and the way we command and control the fight. Clearly, the demand for adaptability and for conceptual thinking and analytical skills apply in settings like the Naval Warfare Development Center, where there's time for contemplative effort applying one's operational experience to new ways of thinking and new ways of applying technologies; but equally important, the ability to adapt and conceive and innovate on the run in the heat of battle, a skill that takes comfort in the analytical processes developed probably only in an educational environment, and practiced in the field. And that without question requires strong leadership founded in ethics and values. All of those kinds of skills, added on top of a continued requirement for physical strength, stamina, endurance and agility are best developed, I think, in an educational processes.



Career paths for naval officers have not gotten any easier as we've gotten smaller -- as we've moved from the Cold War into the late 20th and early 21st centuries. So the CEP is confronted with some challenges that are very familiar to people who have worked on officer career path and education issues over the lifetime of most of us in the Navy. Their primary challenge is to determine the balance of requirements for PME and JPME and continuing education. What balance should be struck between the opportunity to study the art and science of war together with one's brothers and sisters in arms, and the exposure of military intellectuals to the thinking of civilians who engage in the other dimensions of the application of U.S. power? What mix do we seek in our exposure inside institutions like the Naval War College and the Naval Postgraduate School, and in our education at civilian institutions? How we fit all the kinds of growth experiences that we suspect young officers need today inside already crowded Navy career paths continues to be a problem for us.

And what kind of link should exist between formal educational experiences and promotion opportunities inside our services? And, lastly, as all of you in dark blue Navy uniforms will admit, we must address the culture of our Navy with regard to formal education and its tie to the development of the warrior ethic.



We expect, as a result of the **CEP**, that sometime in the next year the CNO will issue an updated education policy he hopes will accomplish these kinds of things, and will demonstrate his personal commitment to the educational dimension of warrior development. This personal commitment is evidenced by his support of events such as this conference, with regard to the role of technology and analytical skills in the development of PME and JPME, describing our Navy educational continuum including the link between education and career advancement. We think addressing the evolution of a Navy definition of PME must take in the contributions of technology and analysis in that dimension of learning.

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NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Presentation by
Maj Gen Timothy A. Kinnan, USAF
Commandant, Air War College, Air University
Air Education and Training Command, Maxwell Air Force Base

MAJOR GENERAL TIMOTHY A. KINNAN, USAF
Commandant, Air War College, Air University
Air Education and Training Command, Maxwell Air Force Base, AL

The general was born in Tacoma, Washington. He entered the Air Force in June 1970 as a graduate of the U.S. Air Force Academy. He is a command pilot with more than 3,000 flying hours, primarily in the F-4, F-15 and F-16 aircraft. He has been assigned to numerous operational, command and staff positions, including four tours in NATO. He has commanded a fighter squadron and two wings. While commanding the 347th Wing at Moody Air Force Base, Georgia, he was responsible for the first deployment of America's Air Expeditionary Force.

The general received a Bachelor of Science degree in astronautical and aeronautical engineering from the U.S. Air Force Academy, Colorado Springs, Colorado, and a Master of Science degree in astronautical and aeronautical engineering from Purdue University, West Lafayette, Indiana. He is a Distinguished graduate of Squadron Officer School and National War College.

His most recent duties have included serving as executive officer to the chief of staff, Supreme Headquarters Allied Powers Europe, Mons, Belgium; commander, 401st Fighter Wing, Aviano Air Base, Italy; military assistant to the secretary of the Air Force, Washington, D.C.; commander, 347th Wing, Moody Air Force Base, Georgia. He is currently deputy commander, North Atlantic Treaty Organization's 5th Allied Tactical Air Force, headquartered in Vicenza, Italy.

The general's major awards and decorations include the Defense Superior Service Medal, Legion of Merit with oak leaf cluster, Meritorious Service Medal with four oak leaf clusters, Air Medal, and Air Force Commendation Medal. He was also the first recipient of the Air Force's Robinson Risner Trophy.

General Kinnan and his wife, Sue, of Boothbay Harbor, Maine, have two daughters, Jennifer and Emily.



THE USAF AND PME FOR THE 21ST CENTURY



Major General Tim Kinnan
Air War College

I'm pleased to be here with some very distinguished co- panelists. It's a great honor for me, as a relative newcomer to the world of PME, at least on the delivery side. It is a sure bet that I'm gaining far more from this experience than I could ever hope to contribute. With that, I'm going to do the same things that the previous two speakers have just done, and that is to talk about the results of Goldwater- Nichols and the Skelton Panel efforts, particularly as they impact the United States Air Force and the schools at Air University.

That isn't what I was going to talk about. As a matter of fact, Bob Scales and I got together and cooked up a scheme where we were going to break up the program and do something a little different. We decided, in a spirit of jointness and intellectual curiosity, that we would talk about each other's service. Specifically, he would go through an effort to determine who, in his mind, the most important Air Force officer who has ever lived was and to justify that choice. I, on the other hand, would determine who the most important U.S. Army officer who ever lived was and justify that choice.

We had worked on that about a week, when Bob called me. He was really excited, and said, "I've decided on Curtis LeMay, because he's about development of the strategic deterrent, and because of the role that played in national policy during the Cold War and its ultimate victory."



OVERVIEW

- Where We've Been
- What Was Wrong
- What We've Done Since
- A Modest Proposal

That sounded good to me. And he said, "How are you doing?" I said, "Well, Bob, as a matter of fact, I've got a little bit of a problem. I've narrowed it down to two Army officers, and I can't decide whether I want to talk about Hap Arnold or Billy Mitchell." (laughter). It was at that point that Bob decided, maybe we'd better talk about what we were told to talk about. I said, "Well, okay, we can do that."

The Skelton Panel, of course, made a number of recommendations. What I'd like to address briefly, from the Air Force perspective, is, "Were they good?" and "What have we done with them?"

In addition to that, I have a faculty proposal I'd like to lay on the table -- something we might want to look at through a vehicle such as the MEP.



WHERE WE HAVE BEEN

- 1986--Goldwater-Nichols
- 1987--Panel on Military Education
- 1989--First Report
  - Recommendations for PME institutions
- 1991Air Force Response to Committee Recommendations
  - 29 of 30 at ACSC Implemented
  - 29 of 32 at AWC

I'll start with where we've been. I'm not going to go through a pictorial on that, because most of you know far more about that than I do.

Let me just say that the report from the Skelton Panel, when it was published in 1989, was distributed to the leaders of the Communist nations around the world. They read it, and they realized that, after all these centuries of not thinking in a joint way, suddenly we were going to start thinking in a joint way. It terrified them so much that they closed their shops and left. And you know how the rest came out.

Looking at the recommendations from that Panel, ACS, our intermediate school, has implemented 29 of the 30 recommendations. Our Air War College has implemented 29 of 32 recommendations.

I'd be happy to discuss the three we didn't implement if anybody wants to during the discussion period. Let me just say, they weren't the more substantial recommendations. They were sort of in the margins.

So that there's no suspense regarding what I'm coming to as my "bottom line," let me say that, from the perspective of the Air Force, these initiatives have greatly improved, in my view, the education of military officers.



WHAT WAS WRONG?

- Insufficient Focus on Joint Education
- Faculty Weaknesses
  - Quality and Experience
- AWC had Most Passive Learning (62%)
- Least Rigorous Academic Standards
  - Limited Testing and Grading
- No Clear School Objective or Mission Statement

What was wrong in the Air Force part of this? First of all, we didn't have a focus on joint education in our service schools to the extent that we probably should have, outside of NDU. When we looked at our faculty, we didn't see a lot of jointness there. There was a shortage of quality and experience in those faculty members from our own service. We had ad hoc faculty development, if any; and in many cases, we had none.

The problem, particularly for the Air Force, was passive learning. Sixty- two percent of our curriculum was lectures and videos -- passive experiences. No activity was required of the students. The Air War College was probably the least rigorous at the time -- academic standards, minimal grading, no testing, and not a lot of requirement for concrete evaluated output by the students.

Finally, we really had no clear mission. We couldn't look to a mission statement or description of what we did for a living at the Air War College or Air University, in general at our schools, and say, "This is what we're here for. This is what we do." We didn't have a plan that enabled us to focus on the words in our statement of goals and objectives and understand what was supposed to be going on.



WHAT WE'VE DONE SINCE

- Learning Methods Now 80% Active, vice 38%
- 100% graded . . . Focus on Active Evaluation
  - Essay tests
  - 25 Page Research Papers
- Electives Increased from 80 to 192 Hours
- Air University Initiatives for Educational Continuum and Accredited Degrees

What have we done since then? As a result implementing the Panel's recommendations, we have increased active learning from 38 percent to 80 percent -- in other words, an increase in graded papers, take- home exams, case studies, student presentations, war games, exercises and the like. This is a vast improvement in the way we do business, with a great increase in rigor. A hundred percent of our courses are graded now – both core courses and elective courses. We have instituted a flexible system of electives that supports the core. We call them core electives. We've increased that part of the program from 80 to a 192 hours. These are rigorous electives; there are no courses in basket weaving. The courses are directly related to what our mission objectives are.

There are some other initiatives underway through Air University that I'll touch on just briefly. For example, one of the things the Skelton Panel report showed us was that we needed to think through the continuum in education. What should be studied, when should we worry about national military strategy, when should we worry about operational art, and when should we worry about making better warriors in specific areas of expertise?

We are thinking those things through and developed a scheme by which we're examining the educational continuum across an entire career. What we found is that there are some gaps in there, because of the times in people's careers when they go to the in- residence schools or take correspondence or seminar courses. We're looking at ways to fill those gaps, such as through distance- learning techniques and some other initiatives.

Another thing we're doing - - thanks to those of you who paved the way on this - - is pursuing accredited degrees both for graduates at the Air War College and Air Command Staff College. This is something that, we think, ultimately will make a better institution and a better graduate.



AWC MISSION

- *The mission of the Air War College is to educate senior officers to lead at the strategic level in the employment of air and space forces, including joint operations, in support of national security.*

We have a mission statement. If you look at it, there are words like *strategic*, *lead*, *joint*, *air* and *space*. It's a mission statement that tells us what we're supposed to be doing, and everything that we do in support of our goals and objectives relates back to the mission concept.



JOINTNESS

- AWC was First Senior School Phase I Accredited (1992)
- We Meet OPMEP Standards for Student/Faculty Mix
- Study National Military Strategy, while maintaining focus on Air and Space Power

How are we doing as far as jointness is concerned? A lot better than we used to. We were the first senior school accredited for Phase One Joint PME in 1992. As all you know, that's a five- year process. We have just been reaffirmed by a PAJE Team accreditation, and we were very pleased with the outcome. For those of you who have that coming up, I'll tell you that it was a positive experience. It's a great opportunity for mid- course corrections, and a great opportunity for the educational institutions to think, through the eyes of the PAJE Team, about what they're doing and where they can do things differently to improve.

We've met the OPMEP standards. If you walk into one of our seminars, you'll find Army, Navy and/or Marine Corps, civilians, at least two international officers, International Guard, Air Force Reserve, and Army Reserve representation there. You can walk in on any given day and hear an Army student trying to each others how to say, "Hu-ah," or you could see an Air Force officer trying to teach the other services the fine points of grip, stance and swing. There's a lot of jointness going on.

What's even more impressive than the mix, though, is the quality of the students. I'd like to tip my hat to our sister services. The quality of the students you send to the Air War College is extraordinary. As proof of that, the Army colonel list just came out and our students were a hundred percent, including one below the zone. They are of a very high quality, and that makes the program so much more valuable to everybody who's in it.

Yes, we focus on national military strategy. But, of course, it bears saying that we are still the Air War College, and our focus is on air and space power from the service perspective. And I think we have come to a very good balance in doing both of these things.



FACULTY

- Increase from 6 Civilian Faculty to 30
  - 90%PhDs
- Military Faculty Experience
  - 75% Command Experience
  - 97% Advanced Degrees
  - 90% Senior Service School Grads
- 25% Military are from Other Military Depts

What have we done as far as the faculty is concerned? We've greatly increased the civilian faculty, and the quality is very impressive. They add another dimension to what we do in school. Those of you who have been associated with the quality of civilian faculty at the National War College and at Navy schools in the past, know what that dimension adds. The level at which we are doing this now is fairly new to us.

We continually look at our military faculty to make improvements, and try to make it even better. As far as PAJE requirements for MEP, as I mentioned before--those are laid out in the OPMEP - - I'm very pleased with the quality of the instructors, not only of our services, but those the other services provide as well.

Another thing we've done is to improve the overall ratio of students to faculty. We were in the middle of the pack at the time of the report -- somewhere between 4:1 and 5:1. Today, we're 3.22:1. It doesn't require me to say anything about how that improves the institution.



SMART THINGS TO DO?

- Surveys of Grads' Supervisors
- What Percentage Rated AWC as "excellent" or "outstanding" in accomplishing its mission?
  - 1989 49%
  - 1996 71%

What's the result of all this? We say, "Gee, these things sound great. These are improvements. This is better. We like it." But is there any way to measure that objective? One thing we do - - and I know the other schools do it too - - is to survey the senior people our graduates are working for one to two years after they have graduated. The grades these supervisors, bosses, leaders, and commanders have given our War College graduates have improved our "excellent to outstanding" rating from 49 percent in 1989 to 71 percent in 1996.

I would submit that that is beyond the realm of sampling error. Of course, any time you survey like this, there are so many inputs that it's hard to pin down results. I think, as a result of the PAJE reports and the implementation of the recommendations, that we have a better school program.



WHAT ELSE CAN WE DO?

- Skelton Panel's recommendation sought to improve PME, increase jointness
- We've all done well in moving in this direction with their guidance and assistance
- But there are still things we can do to improve both even further
- We have a joint student body, but not necessarily a joint faculty

Are there other things we can do? Yes, there are. We are at a time now where we've made changes in each of our schools. We've got some things that are working very well. One of the things that happens when you dictate specific rules in an area like this, is unintended consequences. Jim alluded to some of them. We need to go back now and make sure we consolidate the many gains that we have made. We need to examine what the real impact of some of the details of both the Goldwater- Nichols legislation and the other things are. He gave some very good examples.

I'd like to go just a little bit further with just one of his examples - - and this goes back to something Mark Smith alluded to -- Joint PME Phase 2. The way that we now do that is by TDY or TAD attendance. Mr. Smith mentioned that the CINCs are frustrated because they get an outstanding young staff officer up to speed after three to six months, and then suddenly lose the services of this officer for three to four months. Regardless of the value of the school that the officer attends, and the additional capability that officer brings back to that staff, it's still a significant gap on that staff for an extended period of time. The CINC understands that pretty well, because that CINC is a product of the system, knows what went into the legislation and what went into the requirements.

I see (Brig Gen) Ralph Pasini sitting out there. He and I have just completed joint tours laboring in the vineyards of NATO, where he worked for a German three-star general and I worked for an Italian three-star general. I can't tell you how difficult it is to go in to that German or Italian three-star boss -- and he and I both had opportunities to do this -- and explain why the most productive, dynamic young officer on his staff is going to be gone for four months. It's a very difficult thing to do, and it's one of the unintended consequences that we need to do something about.

As we look forward, again I'd like to reemphasize the point that we are much better off now than we were. I would also add that, left to our own devices, we wouldn't have done these things ourselves that have improved us. So I applaud the effort that went into this. Although it was painful at the time, I think we all have to agree that the benefits far outweigh the negatives.

But we have to look ahead, too; and I know that's what a majority of this conference is going to do. General Chilcoat last night talked about the revolution in military education that has to take place to support the revolution in military affairs. When we think about technology, we have to think about jointness and how do we do those things in the future.



CIVILIANS IN PME

- Civilians consititute one third to one half of the faculty at ISS, SSS and academies
- Some may be prior service, most are not.
- Provide continuity for the faculty
- They are not joint trained and educated but are responsible for helping to insure that this happens for their students

I'd like to toss out one proposal, which I recommend become an item of interest to the MEP, and that has to do with civilian faculty -- an area that has been left out a little bit, not so much in numbers, but in who these people are and how they are developed. They have been left out of the PME process, although they are a large and probably growing percentage of our capabilities to teach in our schools. They're super individuals. They add a lot of rigor to the program, but they don't have a lot of first-hand knowledge about the other services because they tend to come from academia. They tend to be associated with one of the schools, and then either stay there or go back to academia.



A MODEST PROPOSAL

- We Exchange Students and Military Faculty between Services . . .
- Why Not Exchange Civilian Faculty between the PME schools of the various services
- Service Academies could take part

Here's our proposal. Why not exchange civilian faculty between schools in a way similar to how we exchange faculty and students on the military side between the services? What would that do for us? We could start out with bilateral trades, and we really don't need to change any of the rules, laws or regulations to do that in a small way. Bob and I could trade a couple of civilian faculty members. If there's a case coming up where he's got a shortfall and he's got an exercise, and he's got something coming up and needs some particular expertise, I could loan him somebody for six months. We could work things like that -- treat it like a sabbatical. It would add benefit when that person returns to our school, because of what they would gain from the other school and from that other service.

What an enabler that would be! Many of you are familiar with the IPA (Intergovernmental Personnel Act) legislation . It allows us to bring in civilian faculty - - from six months to a four- year period - - without a lot of expenditure other than paying salary through the institution that we are borrowing them from and paying some per diem and relocation cost. This is a very valuable piece of legislation, because it allows us to tailor our faculties on a shorter term basis than we would be able to do strictly working within the civil service and Title 10 employees that we have working with us.



SPECIFICALLY . . .

Amend existing IPA legislation to permit intra-governmental as well as inter-governmental exchanges.

What would it require us to do? I would like to see an amendment to the IPA legislation to allow us to exchange civilian faculty between service schools at both intermediate and senior levels, and between the academies. We would use the same rules laid out in the IPA legislation. For example, if any of the other schools send us a professor for a two- year period, we pay that individual's salary through their school. We would also be authorized to pay for relocation cost and the standard per diem as part of the IPA legislation, as it currently exists. This is something that I think would be of tremendous benefit to the faculty. It would be a benefit to exchanged faculty members; it would be a benefit to the gaining school, during the period of that sabbatical period, and the owning school when that individual returns. I think we'd see enhanced academic freedom and frank exchange on different service perspectives.

Most of our civilian faculties, unlike a lot of our military faculties, are very focused and very specialized in areas of particular interest to them. If we could share that between the Services, I think it would be a great benefit to all of us.



THE DETAILS

- Home institution continues to pay salary and benefits--reimbursed by gaining institution
- Maximum of $25 per diem for up to one year also paid ($9,025)
- Period of service for 6 months to four years (as in original legislation)
- No other expenditures involved

But it's not without cost. The civilian faculty is our continuity, just like our civil service friends provide continuity in a lot of our units. We wouldn't want to introduce additional turnover and turmoil. Initially, at least, this would be a small-scale thing. There is also the funding issue -- about $9,000 a year for faculty members -- about what the per diem works out to in the $25 days authorized by the IPA legislation. Then, of course, there's always the fear that the faculty would be captured by the other institution -- find a home and stay. Then they'd lose that person's services for the long term. We can live with that. I think it's worth a look. I would propose this to the MEP as an item for study, and for your consideration.



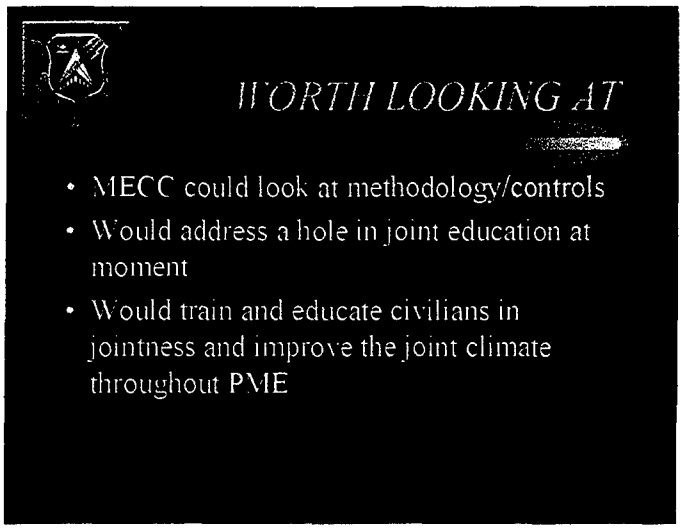
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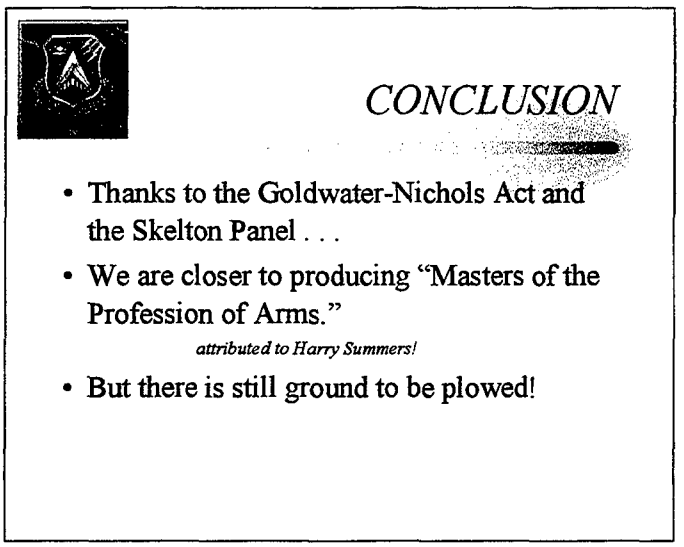
- Share individual expertise for curriculum development, faculty development
- More fully utilize those already familiar with PME environment
- Permit "new blood" without permanent hire
- Joint training and education of PME civilians
- Enhance quality of jointness and PME



DISADVANTAGES

- Additional turnover in faculty at academies and PME institutions
- Additional funding for IPAs to be used for per-diem or relocation (only applies for a maximum of one year)
- May disrupt faculty with some wishing to stay at a different institution





In conclusion, I'd like to say thank you to those who were involved in the Goldwater- Nichols and Skelton Panel processes, because I think they have improved our capability to do the things that we do. Because of them, I think we are closer to producing "Masters of the Profession of Arms." That's the business we should be in. That's what we are doing, and I think, through these enablers, we are doing that better.

But I would also say, let's not slow or stop. Let's consolidate our gains. Let's fix those areas where unattended consequences are detracting from our ability to do what we do, and let's look to the future and figure out how to do them.

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NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21st WARRIOR

Remarks by
BGen Robert R. Blackman, Jr., USMC
President, Marine Corps University

First I'd like to thank the Naval Postgraduate School and the Office of Naval Research for extending an invitation to the Marine Corps University to participate in this conference. This is not going to take very long and, regrettably, there are no new revelations in what I'm going to say. But sometimes there's value in collating and summarizing what we all think we understand.

The Goldwater-Nichols Act and subsequent review of professional military education by the Skelton Panel provided a wake-up call for military educators and leaders. While the services have done well implementing changes to the way we educate officers and by providing enhanced joint education, the real impact of Goldwater-Nichols and the Skelton Panel may very well lie in the future.

Goldwater-Nichols and the Skelton Panel are Cold-War-era legislation and studies. But that doesn't make them a legacy of a time long past. In fact, just the opposite is true.

The greatest value of Goldwater-Nichols and the Skelton Panel is that they helped evolve professional military education and our PME institutions so that we are now poised to enter the next century with the proper and necessary foundation to educate 21st century leaders.

Marine Corps University is a good case in point. During the later part of the 1980s, the Marine Corps determined that our construct for providing PME needed an overhaul. Goldwater-Nichols and the Skelton Panel recommendations provided impetus, direction, and the incentive to help us focus our efforts. The resulting improvements are evident in our facilities, our military and civilian faculty, and our improved curricula. The fact that we have been successful so far in our efforts to accredit our Marine Corps Command and Staff College masters degree program with the Southern Association of Colleges and Schools is another indication of improvement and success brought on by Goldwater-Nichols and the Skelton Panel.

So the reality is that, while Goldwater-Nichols and the Skelton Panel recommendations helped PME institutions correct some noted deficiencies, the real and perhaps more important impact is that our institutions are now prepared for the very real business of dealing with the challenges of providing education for the 21st century warrior.

Never before has the need been greater for educating our officers. Sound leadership, warfighting, and decision-making skills will be a requirement hour by hour and day to day, in peace and in war. The challenges that face us today are the challenges of uncertain and ambiguous threats. The military leader of the 21st century must be as comfortable working in an uncertain environment as our generation of soldiers, sailors, airmen, and marines was when we thought we knew exactly who our enemies were and where we would fight them. It will take a different kind of thinker and leader to be successful in the next century.

Trying to describe what the 21st century warrior-leader should look like is a difficult task. But some things don't change. Leaders must be physically and morally fit to endure the rigors of combat and the stresses of leadership. At the same time, our future leaders at all levels -- from lieutenant to general officer -- must be more aware, more attuned to change, and more capable of succeeding in ambiguous and uncertain situations. They must be agile thinkers able to identify threats that aren't clearly defined, and to exploit opportunities that are fleeting. 21st century military leaders will have to know how to use information-age technology and systems to best advantage while retaining the ability to lead from th front in combat. Leaders at the very lowest level will have to be confident and savvy enough to take needed actions not necessarily spelled out in their orders; and generals will have to be skilled in articulating guidance and intent, and confident enough in the training and education we've provided young leaders to trust them.

Combat will continue to be what it has always been -- chaotic, vicious, deadly and frightening. Indications are that future asymmetric enemies may use our very culture as weapons against us by perpetrating unthinkable atrocities against combatants and noncombatants alike, hoping to so affect our culturally based sensitivities that we are shocked into inaction. Preparing leaders to operate in an environment like that will be difficult. 21st century leaders will not just have to be technically and tactically proficient. They will need more than ever to understand the moral dimensions of our profession and be well-grounded themselves in the values and virtues necessary to make the right decisions for the right reasons.

As important as what we teach, is who we teach. Every officer must be educated if we are to be as successful in the future as we have been in the past. In the Marine Corps we can only provide resident education to a portion of our officers. Therefore our PME outreach to the majority of officers who will not have the opportunity to attend courses in residence is as important to our future as the product of our resident schoolhouses. Along that same line, we must view PME as a life-long pursuit, not just the two or three years an officer may spend at resident schools. This will require relevant and imaginative programs that will gain and maintain the officer's interest and through which he or she will see the tangible results of their efforts.

Likewise, reserve officers deserve the opportunity to have a high-quality professional military education so that they can successfully prepare their units and themselves for active service alongside their regular counterparts.

Technology favors our efforts to provide this outreach, and we are leveraging advances in interactive courseware, computer simulations, use of the Internet and video-teleteaching. Successful learning organizations, like those that we all represent, are made up of highly educated individuals who understand and embrace change. PME outreach programs will ensure that we have the educated force we need to seize the opportunities that lie before us.

In summary:

- PME is more important than ever because our officers will be called on at every level to make decisions of a magnitude we have never seen before. They will be making those decisions in an environment of unimaginable pressures and demands.

- PME will have to be continuous, not just spikes in an officer's career at career, intermediate, and senior service college levels.

- We will have to provide a quality PME experience for every officer, whether he or she is active or reserve, or enrolled in a resident or non-resident program.

- We will have to employ technology not only to export non-resident education and enhance the resident experience, but we need to push modeling and simulation to the limits to create vicarious opportunities for officers to make complex decisions in the chaos, uncertainty, and terrifying environment of combat.

BRIGADIER GENERAL ROBERT R. BLACKMAN, JR., USMC
President, Marine Corps University

Brigadier General Robert R. Blackman, Jr., currently serves as the President of the Marine Corps University, Marine Corps Combat Development Command, Quantico, VA. General Blackman began his current assignment as the President of the Marine Corps University in August 1996. He was promoted to brigadier general on October 1, 1996.

General Blackman was commissioned upon graduation from Cornell University in June 1970. After completing The Basic School, he served as a platoon commander and company executive officer in 1st Battalion, 4th Marines. In March 1972, he reported to Marine Corps Recruit Depot, San Diego, where he served as a series commander and Director of the Sea School until July 1975.

Following Amphibious Warfare School, General Blackman served as S-3A and a rifle company commander in 3d Battalion, 1st Marines. Assigned to the 3d Marine Division in January 1980, he served as the S-3 for 2d Battalion, 4th Marines. Upon return to the U.S., he served as the Plans Officer in the Officer Assignment Branch at Headquarters Marine Corps. After graduation from the Marine Corps Command and Staff College in June 1985, he was assigned to the Air-Ground Exchange Program with MAG-26 where he served as the S-3A and S-3.

General Blackman reported to the 2d Marine Division in June 1987, and was assigned as the Executive Officer of the 8th Marines. In May 1988, he assumed command of 3d Battalion, 8th Marines. Following the return of BLT 3/8 from a Mediterranean deployment with the 22nd MEU, he was assigned to Top Level School as a Fellow in National Security Affairs at the Kennedy School of Government. In August 1990, General Blackman was assigned to the Operations Division at Headquarters Marine Corps. From there he was assigned as the G-3 Operations Officer for COMMARCENT (Forward) in Southwest Asia. Upon return to CONUS in March 1991, he was reassigned as Head, Current Operations Branch, Headquarters Marine Corps. In July 1991, General Blackman reported to U.S. Central Command for duty as the Commander in Chief's Executive Officer. In August 1993, he assumed command of the 15th MEU. Upon completion of his tour with the MEU, he assumed his last assignment in March 1995 as the Military Assistant to the Secretary of the Navy.

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Presentation by
COL James W. Beauchamp, USA
Director, OPMS XXI Implementation Team

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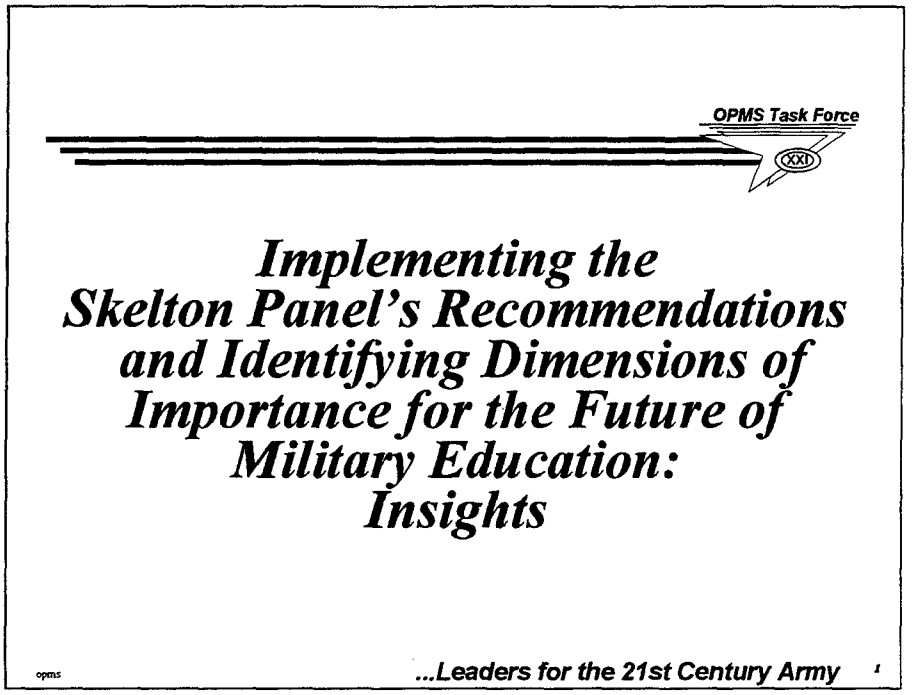
Colonel James W. Beauchamp was selected as the Director of the Officer Personnel Management System (OPMS) XXI Implementation Team on July 1, 1997. Colonel Beauchamp's organization will implement those changes developed by the OPMS XXI Task Force, educate the officer corps on those changes, and coordinate proponency for the new system. Prior to this assignment, he served as the Chief, Leader Development and Training Division on the OPMS XXI Task Force.

Colonel Beauchamp was born December 7, 1947, in Lawton, Oklahoma. Graduating with a Bachelor of Science degree from the Cameron University in 1970, he began his career as an Infantry Officer. He holds a Master of Science degree in Public Administration from Western Kentucky University. He graduated from the Air Command and Staff College in 1981; the National War College in 1990.

His military experience spans more than 27 years of service in various levels of command and staff positions. His commands include Company A, 4th Battalion, 23d Infantry, Fort Richardson, Alaska; Company B, 101st Aviation Battalion, Fort Campbell, Kentucky; 9th Armored Cavalry Squadron at Fort Wainwright, Alaska; and the Aviation Brigade, 7th Infantry Division (Light) at Fort Ord, California. He then served as deputy for readiness and deputy for operations for the Pacific Command, Camp Smith, Hawaii. He served a combat tour in Vietnam and has served in Joint and Department of the Army staff assignments.

Colonel Beauchamp's awards for peacetime and combat service include the Defense Superior Service Medal; the Legion of Merit; the Bronze Star; the Purple Heart; the Defense Meritorious Service Medal; the Meritorious Service Medal (with three oak leaves); the Air Medal; the Joint Service Commendation Medal; and the Combat Infantryman's Badge. He is also authorized to wear the Senior Parachutist Badge, the Senior Aviator Badge, and the Ranger Tab.

Colonel Beauchamp resides in Burke, Virginia, with his wife, the former Jonnie Strickland, and their daughter, Lauren.



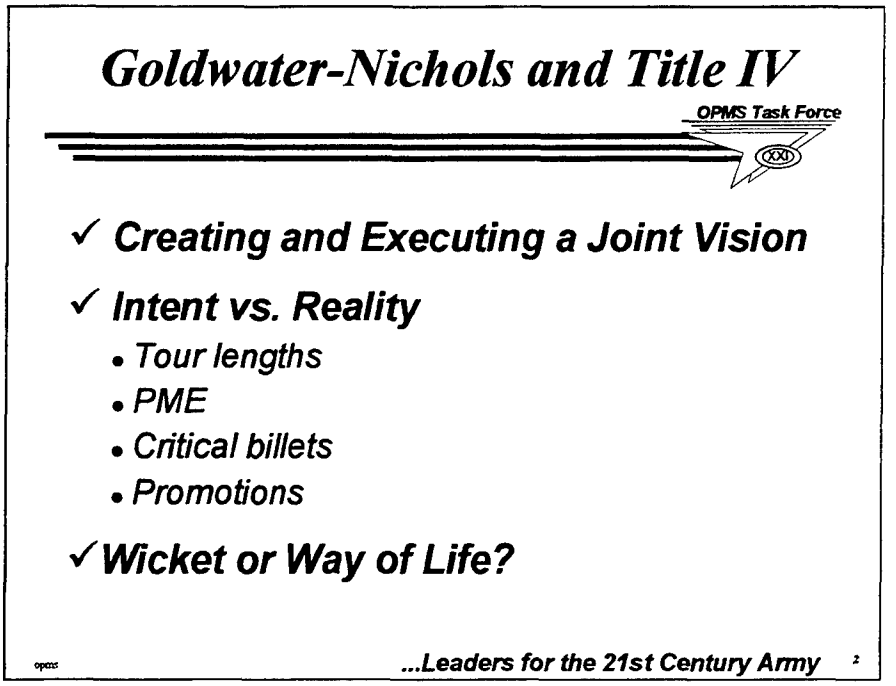
An earlier speaker talked about the great weather service that we have here and all the technology that supports it. That being the case, I wonder why we scheduled the conference this week (it rained .95 inches during the first 36 hours of the conference). Maybe technology is part of the solution; but I think every time we turn to it as the solution, as opposed to the process, we're making a mistake.

Every time I look at a topic like the one I've been given here -- the title would take longer to read than the time I am given talk -- I feel a little intimidated. So what I'm going to do is confine my remarks to my experiences and thoughts on the joint, and where I think the Army is headed. It's not an Army position -- it's my position. I'm also going to apply what I call the 95 percent rule. I think the Army is doing very well in the joint arena. I think we're doing very well across the board, overall. But it's like when my daughter comes home from school and says, "Dad, I got a 95!" I never ask her the 95 things she got right. I also want to take a look at some of the things we may be looking at now that we need to look at a little closer.

You see a lot of emphasis on technology. I will tell you: I think in many cases it is misplaced. There are already dollars available in technology; technology is going to take care of itself in many ways. The greatest thing that we can do for the 21st Century, in my view, is to invest in human capital. The human dimension is the one we need to develop the most. There are programs out there that ought to integrate technology and the person better than we're doing today.

I think the pace of change in the future is going to continue to increase. There is no such thing as "steady state." We looked for it in the Services over the last 25 years as we embarked on our OPMS study and we couldn't find any steady state. It just doesn't exist.

The discussion we had earlier about the relation between tactical, operational and strategic is exactly right, and will continue to be so. And I think the discussion of the military as a system of systems is right - - or, even more accurately, I think it is an ecosystem, where one part of any decision affects the whole.



Goldwater- Nichols raised a couple of questions a few years ago. Was it the right thing to do? I think the Army at that time, and the services as a whole, needed a force from the outside to get it to look more seriously at jointness. I thought then it was right and am still convinced it was right.

I think, though, that creating a vision of where we want to go is the easy part. It is executing the vision that is very difficult. A vision without a detailed plan of execution is a hallucination. We need to make sure we have some way of looking at the programs we want; to make sure that we can do them. And we shouldn't just look at the program level. We need to look at program goals and objectives. It's the matters of performance and measure of effectiveness. How do we know we're getting there? It does no good to make a decision that solves a problem today if we don't know where we are going. We need to look at the future and what we want to develop and reverse-engineer a way to get there.

I want to give you some clear examples of the difference between intent and reality. I'll start with some of the things we have in Goldwater- Nichols, and some in Title 4. We looked at tour lengths. We've tried to develop experience by making a joint tour 36 months. I've done a 36-month joint tour and think it was wonderful. At the same time, I know many officers who steer clear of joint for that very reason. The time compression for that 0-4 or 0-5 is very great. So they think, "Well, if I need to do this, I'll try to do it later," and they will try to steer clear of joint. This is not what we really want for some of our best and brightest.

PME, I think, has come a long way. It is tremendous in many ways. JPME-1 is very good right now -- at each of the institutions. I had a chance to look at some them in the last year and they were very good. JPME-2, I think, needs some work. A lot of the people who come back from JPME-2 tell me that the JPME-1 was so good, they felt like they just got another dish of the same thing at JPME-2. If we're doing that, then we probably ought to add more rigor.

Many of the students also tell me it's a great six-week course crammed into twelve. What I believe is, we ought to look at what we're doing. I think the greatest thing we have at AFSC is the integration of the officers. It works very, very well, but there is room for improvement.

Another problem I see with JPME-2, which we talked about earlier, is assignment pattern. I have seen officers go to a CINC command who did not get JPME before going to their billet. They didn't get it during their three year billet, so they would go to the JPME School at the very end of their joint assignment, just before going back to their service, because it was easier for the CINC to do. I have seen officers, as they got the orders for that, cancel the JPME-2 part of it because, if they got that, they would be a JSO and might have to do another joint tour again. So they decided they weren't going to do that, and we let certain officers get away with that.

I have seen the same thing with joint critical billets. You have a joint critical billet that you want to fill. You get exactly the right officer for the billet, and you find out that the prospective fill is not a JSO, even though they have some of the skills that you really like. What do we do? We move the joint critical designation to another billet. We still have the 50 percent, but we haven't filled it like we thought we would. At CINCPAC, for instance, where I worked several years ago, the chief of JTF training and the chief of the crisis action planning team was not in a JSO billet, but the protocol officer was, because he was a JSO. We simply moved the designation over there. Was that the CINC trying to subvert the system? Absolutely not! That was the CINC trying to perform the mission the best he could, with the people he had available. So don't mandate that we can't do that any more.

You've got to remember that vision is one thing, but management tends to be determined more by rules. So we have to make sure that we check the rules occasionally, and go back and assess them to see that we're really getting what we want out of them. For the most part, these are exceptions. Most people do go to the course, they do learn a lot, and they are very good officers for attending.

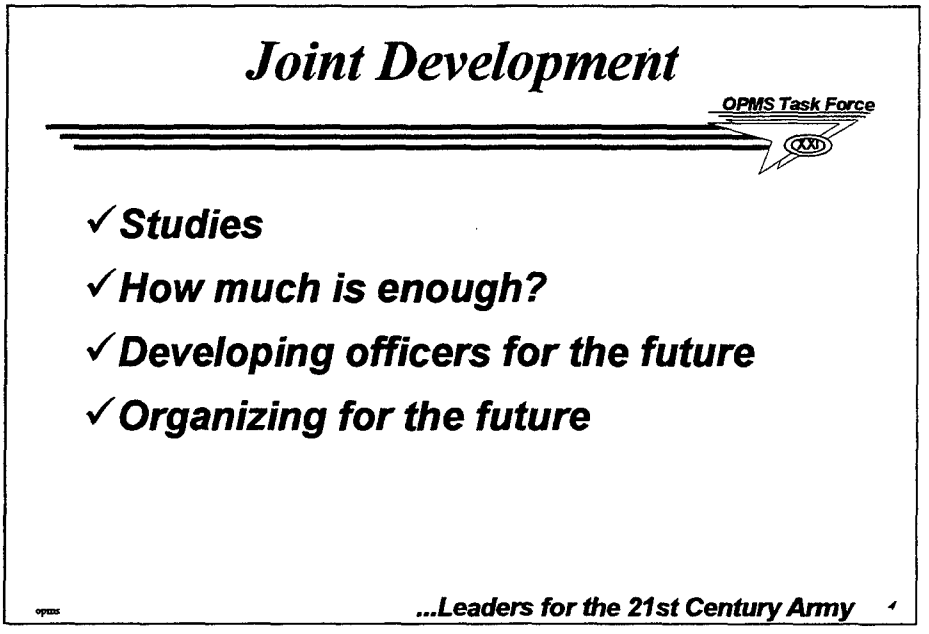
I've seen the same thing in the promotion. Some of the categories we have for joint make great sense for promotion. "Joint other" is one that really bothers me because, if I cannot count you as a "joint other", then maybe I don't want to send you back at all. The same thing goes for JPME at the National War College.

When we first designated officers for joint jobs years ago, before we started the joint business, we just went out and looked at personnel files and said, "These would be great joint officers." A few years later, when many of them were then ready to go to the war college, never having served in joint duty but wanting to go joint, we said, "We would like to send these soldiers to the National War College." The personnel folks said, "You can't do that because he doesn't count against my 50 percent, because he's already been given a 3-Lima, even though he's never worked a day in his life in the joint field."

So maybe sometimes rules don't give us exactly what we want. The same thing happens when we designate someone as a "three ring" when he's been promoted. What, then, is the incentive to send him back, other than to fill the joint critical billet? I was told, leaving a joint assignment this summer, "You don't need to go back to a joint critical billet. You're already a 3-Lima, and we've already counted you in our statistics once." I have about six years in joint billets and I think that's probably where I can help the Army the best.

Well, I eventually got that changed, but sometimes the personnel policies that we intend, and the rules we write to implement them, don't give us the results we want. I guess I still view many things I've looked this last year like we in the Army view joint, as a wicket to be passed through -- as a way of life. Now, the scale is sliding to the right, and rightfully so. But it's still not where we think it ought to be right now. The Army right now is -- still rightfully so -- a doctrine-driven, values-based, performance-oriented organization; and the first thing we ought to bring to the table, as everybody has said, is experience in our service.

If that's the case, then the joint community should say, "Service training *is*, in fact, joint training." I believe that it is. It's like the core of an egg. It's not all of joint, but it's certainly the core of what we want to bring to the table, and it ought to be viewed, then, by the joint community as a part of the joint training program.



I want to talk a couple of minutes about studies. I've seen and read a lot of joint studies over the last several years, and most of them have recommended some kind of increase in joint training or duties. I look at them and ask myself, "If I was on that study, what would I recommend?" I don't have to identify a bill-payer. I don't have to identify the trade-offs. Am I going to recommend an increase in joint? As my 14- year- old is fond of saying, "Duh." I probably am.

I will tell you, we have to not just look at what to increase, but we have to make sure that we drive it in the right direction. Often I'm asked, what is the right balance? How much is enough joint, and how much is enough Army? I will tell you, that's not the right question. We ought to dismiss it every time we hear it. We need to develop an officer corps for the future. We start first by identifying the skills, knowledge, and attributes we expect that officer to possess. Then we reverse engineer to get an answer to what the appropriate amount of joint training and Army training needed is to meet those goals to produce that type of officer. If it means more or less, so be it.

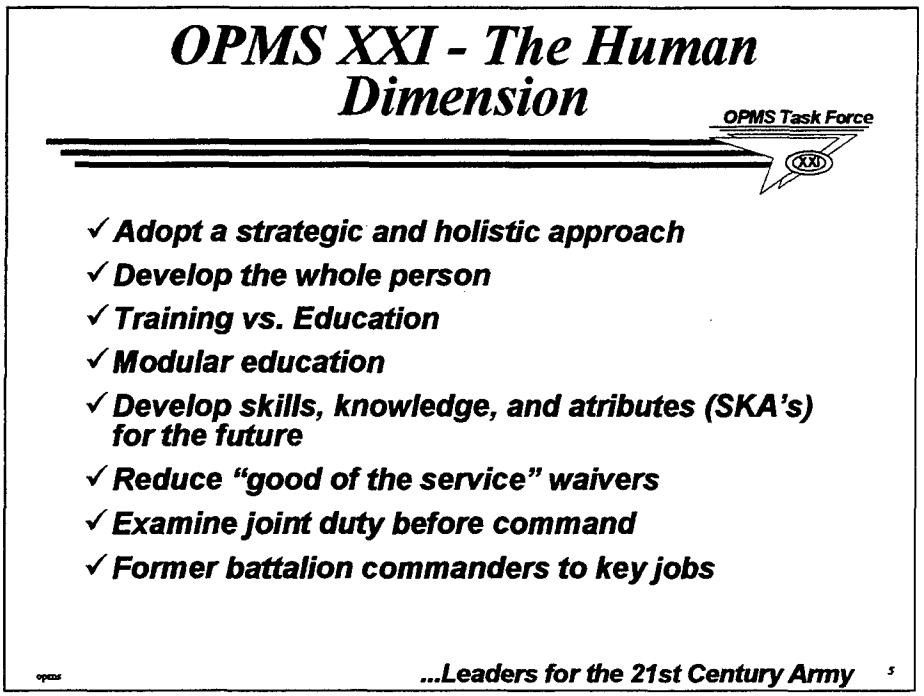
We want to produce a certain set of outcomes, and it's not enough to go from where we are. We have to have a direction we're driving towards. We have to get away from the idea of solving problems for today. How do we know if we've got the right solution if we don't know where we're going? Let's determine what we want the outcome to be, and reverse engineer from there.

The same holds true for organizations. We tend to organize the Army from platoon to corps. All of our training documents are written that way; and yet we tend to fight as combined-arm teams and joint task forces. Now, we teach that to a degree, and I think we've got it about right in many cases. We need to do both.

We also organize our units around our missions. So what we're finding in certain times, like now, is that MPs, signal, civil affairs, and PSYOP folks are being deployed at an inordinate rate. Now, should we increase the size of those in our structure? I'm not sure. But it's something we need to look at.

As we're downsizing, we've also asked the joint staff, on a couple of occasions, and the Army to look at reducing the joint billet numbers. We're asking for about 300 billets. There's going to be another review coming up pretty soon. I would ask the joint staff to take a good hard look at that. I know we've only reduced about one percent the total billets, as we've drawn down the officer corps by about 35 percent. What we ask is that you give it a good hard look and come back and tell us that the answer, 300, is right or wrong, or that it's going to be something different. But do it through analysis, not through arrogance.

Joint is no better than the services. Each has its different place. It's not a hierarchical thing. It is a complementary arrangement, and we all need to think of it in those terms. We need to determine what we want the total force to do, and who does what part of that.



I've been working this last year on the OPMS XXI Task Force. How do we design and develop a system for officers for the 21st Century? Many of the things I've told you about are some of the things we're doing. Let me give you a few examples of what the Chief of Staff of the Army has recently approved. In fact, that hasn't even been tasked out to everyone yet. But they're going to be coming.

We think we need a more holistic approach as to determining where we're going. Many times, in the different areas, we find that we're too concerned with solving problems. Deliberate decision- making serves us very well, but it also tends to work on a finite set of problems at the time. We think that's too problem oriented. We think we need to orient decision making on a goal -- on a vision of where we're going.

We think we need to develop the whole person more than we have in the past -- and not just technically. We need to do it emotionally, physically, and morally, and to make sure that it's an integrated program. These are not separate entities of the whole. The technical, tactical, moral, physical, emotional, and spiritual should be combined to produce the result we want most efficiently.

The same thing is true in training and education. Nothing in warfare tends to fail as much as success. The thing that works today, won't work in the future. So, as much as we teach task condition standards, we have to have minds that adapt to situations that are changing faster than they have in the past.

We think we need to place more emphasis on education, and on how to think. Would we get away from the idea of task condition standards? Absolutely not. But we think it ought to go a little bit more towards applying those in a practical sense, as opposed to learning them and regurgitating them back on exams.

Obviously, the higher up the chain you go, the more you're going to try to develop those particular skills. I also think that we have too many people who are very, very analytical, when what we really need, in many cases, is people who can synthesize -- who can recognize a relationship between this and some totally unrelated view in most people's minds. I think what we need is people who can draw together the different parts of an ecosystem, and realize that this action will have an affect somewhere that you might not think it would, somewhere along the line.

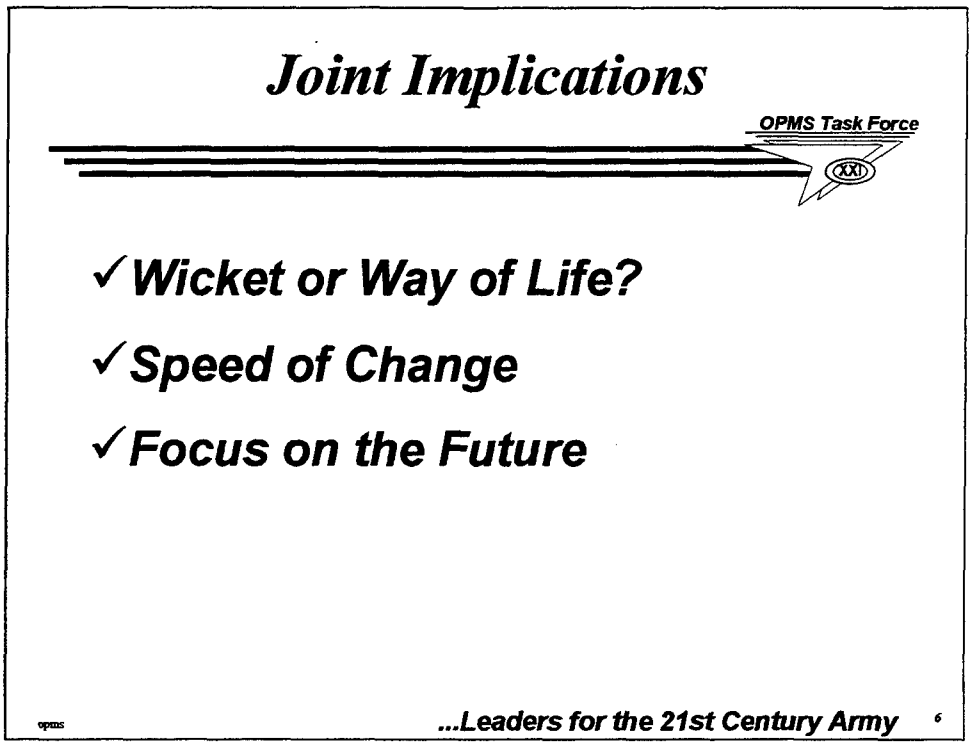
We also have to go more into the idea of modular education. Education is not just the institution. Every time we hear about JPME as only an institution, we're wrong. It's everywhere. It's self-development. It's out in our units, and we need to get that together.

Whoever designed this thing -- three pillars -- I think has got it wrong. It's a lattice work. It's working all three together, consecutively *and* concurrently. Education is no longer going to be progressive and sequential. It's got to be progressive, sequential *and* continuous. But we're not doing that. We can no longer afford to rely on the PME that sends you back to school every eight or 10 years. It won't work.

We think we need to define and develop exact skills, knowledge and attributes and write them down -- make them extant, make them real and visible to everyone -- and say, "These are the things we want you to have." We need to make sure they know up front what these are, so you can combine your self-development with what you're being taught to achieve those goals. And they ought to be reviewed on an annual basis to make sure they haven't changed.

We've also looked at some of the other things the Chief has just approved, that are directly related to joint: going to the service school, for general officers. That's going to be reduced to no more than five percent. We're going to examine the idea of either serving in a joint billet or being joint qualified before battalion or brigade command. Those percentages should be about 25 percent before battalion command, and 50 percent before brigade command. Now, we obviously don't want to do that if we don't provide the opportunity for the officers to do that. And we want to look at the pros and cons of doing that in great detail before we actually implement it. But we think there's great value there.

We also think we need to put former battalion and brigade commanders in more high-level joint jobs. We said, "Chief, the place you need to start is your own desk. What good does it do to say joint is really important when every single four star, the first time we looked at it, had an exec who was not joint qualified." Well, the very next exec he hired was joint qualified. It's starting where it needs to be, I think.



Overall, I will tell you, I think the Army is doing a very good job. I think all the services are. We are getting away from the idea that joint is a wicket, and going to joint as a way of life. The things that we've done in JPME are absolutely the things we should have done to push us in that direction. We're not there yet, but we're getting there.

Sometimes, the speed of change is as important as the change itself. We've got to continue to push in that direction, but we have to be careful that we don't alienate a lot of folks and force them to dig in their heels and retrench. We've got a good thing going. Let's keep it going in that direction.

Lastly, I will tell you, we have to continue to focus on the future. I look at what I want this service, this DoD community, to look like, and I reverse plan to the greatest level of detail to make it work. The job for folks below the flag or general level, most the time, is to operationalize decisions. How do we take your decisions - your visions - and make them real? It's not a program. It isn't complete until it's inculcated into the officer corps. I think that's what we can try in the future. I think that's where we're headed. I'm very encouraged about what we're doing. As to where we ought to be on joint, we're not exactly there; but, overall, I'd give us a B.

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NAVAL POSTGRADUATE SCHOOL
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CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Remarks by
The Honorable Fred Pang
Former Assistant Secretary of Defense for Force Management Policy
and
COL Harry Summers, USA (Ret)
Army War College Distinguished Fellow;
Columnist, *Los Angeles Times*; Editor, *Vietnam* magazine

Fred Pang: Let me first join my collegues in commending Congressman Skelton for giving impetus to this conference. I also commend the Naval Postgraduate School and Dick Elster for putting it on. I believe this is a very timely conference, especially as DoD and the Administration consider and Congress debates the implications of the Quadrennial Defense Review (QDR), the National Defense Panel, and the Defense Reform Initiative for PME. I also want to commend the speakers on this panel for their excellent presentations.

I think it probably would be most useful for me to summarize what I think are the key issues that have emerged in this conference thus far, and then raise some questions that come to mind as I consider these issues.

First of all, there's no question that our national security environment is more complex, and more uncertain than it has ever been, and that it will become more so as we move into the 21st century. I also think there's no question that our military will get even smaller -- you can just look at the base-force size, the Bottom Up Review, and the QDR. The numbers aren't getting larger. They're getting smaller, and because of the resource pressure, I believe they will get even smaller. The downsizing isn't over, in my mind, and there are going to be a lot of pressures on leaders to squeeze more efficiencies out of the system.

I think there's no question that the technology revolution will continue at a rapid pace; and that our leaders need to deal with that and use this revolution to their advantage.

There's also no question that wartime operations and operations other than war will be more joint. Look at the Persian Gulf War, our operations in Bosnia, or read the CSIS report -- the Cheney Report. It's clear we're doing three times more operations other than war than we did before the collapse of the Soviet Union.

There's no question that our military and civilian leaders will be challenged by this very dynamic environment to make wise decisions about the allocation of scarce and competing resources. And there's no question that their decisions in peace and in war will come under greater public scrutiny. Unfortunately, their comportment in their private lives will as well.

There is no question that our PME institutions will be challenged in the vital task of educating our current and future leaders -- equipping them to deal effectively with 21st century challenges to our national security. Frankly, we've known and debated this for a long time. Indeed, the way we have gone about managing and equipping our leaders has evolved over time.

I remember when I was on the staff of the Senate Armed Services Committee, indeed even before that, when I worked on the OSD staff. We were working on DOPMA -- the Defense Office Personnel Management Act. It provided a uniform system for the accession of our officers, and for their professional and career development. It set the tenure points in law so that our services would operate and manage their officer forces in a more uniform way. I believe that was an effective foundation.

The Goldwater-Nichols Act followed, and then the Skelton Panel, which were all part of this evolution as we moved to more and more jointness.

So, how are we doing? We've heard from our panelists that the answer is, "We're doing quite well." We've heard that there are some difficulties with implementation; but, overall, when you look at the evidence -- and the evidence is in the performance of our forces -- I think the answer has to be that it's looking quite good.

What of the current status and future with regard to PME? And of our response to the guidance and recommendations of the Skelton Panel?

Before I came to this conference, I read CJCS Instruction 1800.01 (the OPMEP), which was published in March of 1996. That document clearly spells out the framework and policies for conducting JPME through the entire personnel life cycle. It is quite explicit. It embodies, I believe, the bulk of the Skelton Panel recommendations, and also institutionalizes and evaluates the process that never existed before. So, the framework and guidance are there; but what are the implications of this evolution that we ought to consider?

There are many questions, and we're not going to find the answers to all of them today. But I think it's worth considering, first, whether we need longer careers for some of our officers? Do we need to change DOPMA because of all the very, very difficult matters senior leaders must deal with? Should we get away from this

notion that officers really have two careers: a military career and another one later? Should there be some who have only one career?

Do we need to do a better job of integrating the Reserves? Debbie Lee hit on that, and I agree with her. We cannot mount any kind of significant operation without calling on the Reserves.

Do we need to do a better job integrating our civilians? An earlier speaker pointed that out that DRI has called for a Chancellor of Education and Professional Development to look at the way we develop civilians. That has implications for military PME.

What elements of PME need to be strengthened? For example, should there be a greater emphasis on and continuity in presenting value systems and expectations of personal conduct -- of morality and ethics?

Are we satisfied with NCO JPME, or does it also need attention?

Today, in operations other than war, the forces we have are scattered about in very small groups. A question I think worth asking, is, "Are we satisfied in our programs and the visions that are articulated in Joint Vision 2010, the QDR, and other policy documents regarding our leadership requirements?" Given the critical role of PME, is it adequately programmed and resourced? That's a big question, because, in order to implement the bigger role implied in these documents, it's going to take money and resources.

These are some of the questions that have emerged thus far, and I hope I'll hear responses to these questions. I believe they should guide our debate as to where we've been and where we're headed.

So, thank you again for inviting me, Dick. This has really been an enjoyable experience.

COL Summers: Let me open, as well, with a comment about Congressman Skelton. Many view with alarm the fact that fewer and fewer of our congressmen have served in the military, as if that was a terribly bad thing. But we couldn't have a better friend in the military than Ike Skelton, who's never served a day on active duty. So, maybe we need to look beyond military service as a criterion for our congressional leaders.

Secondly, if you take nothing away from this conference except this -- it is that there is a bottom line to this whole business. And that bottom line is the battlefield, and we're getting farther and farther away from that reality. Fewer and fewer of our people have any firsthand battlefield experience.

Among other things, I am the founding editor and publisher of *Vietnam* Magazine, now in its tenth year. This last year, we had a piece by Major General Guy Meloy who, as some of you may know, as a lieutenant colonel in Vietnam, commanded the 1st and 27th Infantry "Wolfhounds." In November 1966, he got in a very severe fight with a Vietcong regiment. He normally commanded three rifle companies but, in the course of this battle, ended up commanding 11 rifle companies. He was reinforced piecemeal, by eight rifle companies from other battalions, and even beyond his brigade. In the conclusion to his article, he said that his other commanders didn't know him from Adam. They had never met him. They didn't even know his name. All they knew was a call sign over the radio. And all he knew about them was a call sign over the radio. But he ordered them, literally, to their deaths, and he got no argument. All he got was a "Roger" over the radio, as they closed with the enemy. He said, "If you want a testimonial to the military's educational system, you can't get a stronger one than that." They shared the same concepts, the same values, the same notions, the same tactics as he did, and they didn't need to know each other. They didn't need to know any more than a call sign over the radio that said, "Move out and close in on the enemy."

I think that is a lesson that we need to carry away. All of this military education has to focus on this point: when the time comes, does it work on the battlefield?

There was an earlier comment about the professionalism of study at the Army War College. I spent six years on the faculty there. I was in the Army Chief of Staff's office, and I was sent up to the Army War College with a mission directed by the Chief of Staff to inquire about what went wrong in Vietnam and to write a teaching text for the Army War College about it. I got that task because the Army, in particular, was avoiding Vietnam; they didn't want to talk about it, sweeping it under the rug as we had done with the Korean War. As I began my research, I came across a document that was being used at the Naval War College up in Newport. It was an article written in 1915 by Commander Dudley Knox on the role of doctrine and naval warfare. I would commend it to you today, as a matter of fact.

In his conclusion, he said -- and this is in 1915 -- "What we need desperately is a conception of war. Without a conception of war, we are like a ship in the fog -- uncertain of its bearings." As we think about it, that really has great applicability today.

As you think about the post-World War II era, we've had two faulty conceptions of war. First were the atomic purists, who said, "Conventional war is obsolete. Atomic war is the wave of the future and it will govern everything." It almost destroyed the Army and the Marine Corps, and didn't do any favors for the conventional forces of the Navy and Air Force, either.

As Colonel Jack Broughton in the Air Force first said, "When the tactical component of the Air Force first went into Vietnam, it had to relearn, at great cost, all the lessons it had forgotten from the Korean War, because it had been 'SAC-emcised.' It had forgotten about close-air support, it had forgotten about air-to-air combat, and it had to relearn them at a terrible cost."

The other great misconception was the idea of counterinsurgency. As that thinking went, "Conventional, forward war is maintenance; all wars of the future will be guerilla wars, wars of national liberation, and the like." As a recent Marine Corps University pamphlet by Joe Strange pointed out, "The major factor behind our loss in Vietnam was that we seized the wrong center of gravity." This is a basic military concept which, of course, was out of favor.

We owe a great deal to the Navy because these fallacies were destroying us until Stansfield Turner, at the Naval War College said, "Enough of this nonsense. Enough of these civilians, these wizards of Armageddon, if you will, and the social scientists of the counterinsurgency crowd telling us about our profession. We're going to go back to basics. We're going to go back to fundamentals. We're going to go back to Mahan, to Sir Julian Corber, to von Clausewitz." And conventional warfare became again the basis of military education after a hiatus of many years.

We are again in danger of forgetting that lesson, as the National Defense Panel goes on with a new version of counterinsurgency. Conventional wars on the battlefield are 'out.' They say there's going to be terrorism, and this and that and the other -- again moving the focus away from our basic mission in the Armed Forces, which is to win on the battlefield.

Most recently, General Reimer, the Army Chief of Staff, has come down on that thinking and, as General Powell did before him, reminded us that our basic function is to fight and win our nation's wars. "Yes," he said, "we can do other things. We can do peacekeeping and all these other tasks, but never at the expense of our primary mission." In a recent speech, General Reimer reinforced that again.

So, as we talk about military education, we need to talk about military education *for what*? I would submit that the *real* revolution of military affairs took place in 1972, at the Naval War College. As we sloughed off the false doctrines of atomic war and counterinsurgency, we came back to the basic trade that we're in -- conventional war -- and becoming masters of that profession.

Sir Michael Howard, a great strategist, in remarks on the revolution in military affairs given at a recent conference at the Army War College said, "Yes, the information age will bring with it great changes on the battlefield, as the industrial age before it brought great changes on the battlefield." We already see some of these revolutions. In Army field artillery, for example, what used to take

hours to serve a battery, now can be done almost instantaneously with global positioning satellites. There are enormous changes taking place, and they will continue to take place on the battlefield, as digitalization goes apace. But Howard pointed out that while all this was well and good, and while we had to take advantage of it, we needed to remember that we also had to fight not only in the Industrial and Information ages, but also in the Agrarian age. Someone with a sharp stick can still put out your eye.

The task for the military today is to keep one foot in the war of the 21st Century without forgetting the ancient tenets that Julius Caesar knew -- that the spirit of the bayonet is still with us. You forget that at your peril.

The major challenge ahead -- the basic challenge ahead -- which is beyond the purview of the military, is to come up with what Dudley Knox called a conception of war. We *haven't* come up with that yet.

I spent 38 years on active duty -- 10 years as an enlisted man and 20 years as an officer. During that entire time, I knew who the bad guy was. It was the Cold War. But for the first time in 60 years, *we don't know who the enemy is.* And that has enormous ramifications, because you can train for a known enemy, as we did during that period, but you can only *educate* for an *un*known enemy.

This reflects what some of the speakers have said before. Adaptability and flexibility are absolutes, because we don't know who the bad guys are, and we've got to have an officer corps educated to be able to rapidly adapt to a changing situation. That's the great challenge -- to prepare people for the 21st Century while retaining the virtues of past centuries.

As General Solomon, a former Army Chief of Staff, said, "Unless we have young men and women who will sail forward, fly forward, march forward into the face of the enemy, all the rest of the stuff is just junk." That's the lesson we need to remember as we go forth. Thank you very much.

FREDERICK F.Y. PANG
Fred Pang Associates

Mr. Pang is the President and founder of Fred Pang Associates (FPA). FPA is a consulting company providing professional services to government and industry. These services include matters involving the substance and processes of human resource management; the development of legislative and marketing strategies; and the operation and management of healthcare systems.

Prior to his retirement from the Federal government, Mr. Pang served as the Assistant Secretary of Defense for Force Management Policy. As Assistant Secretary he acted on matters pertaining to military and civilian manpower and personnel in the Department of Defense. In this position Mr. Pang had Defense-wide policy responsibility for the recruitment, training, career development, compensation, retention, quality of life, equal opportunity, and readiness of Defense personnel. In addition, Mr. Pang was designated as the Principal Deputy Under Secretary of Defense for Personnel and Readiness.

Previously Mr. Pang served as the Assistant Secretary of the Navy for Manpower and Reserve Affairs where he acted on matters pertaining to manpower and personnel policy within the Department of the Navy.

Mr. Pang served as a professional staff member on the Senate Armed Services Committee. In this key role, he developed and made policy and legislative recommendations on Defense-wide personnel programs.

Before joining the Senate staff Mr. Pang served as a regular officer in the United States Air Force. He attained the grade of colonel before retiring with 27 years of service in 1986.

During his Air Force career, he served in a variety of manpower and personnel assignments including tours of duty in Vietnam, Headquarters United States Air Force, and the Office of the Secretary of Defense. In the Office of the Secretary of Defense, he served as the Director of Officer and Enlisted Personnel Management and as the Director of Compensation before he retired from active duty.

Mr. Pang grew up in Honolulu, Hawaii. He graduated from McKinley High School in 1954, and graduated from the University of Hawaii in 1958 with a Bachelors Degree in Education. He earned a Masters Degree in Business Administration in 1972 from the University of Hawaii under the Air Force Institute of Technology Civilian Institutions Scholarship Program, and completed the National and International Security Program at Harvard University in 1988.

Mr. Pang is married to Brenda W.I Tom of Honolulu, and they reside with their daughter, Susan, in Arlington, Virginia. Their son, Douglas, is a Lieutenant jg in the United States Navy.

HARRY G. SUMMERS, JR.
Columnist, *Los Angeles Times*
Editor, *Vietnam* magazine

An Army War College Distinguished Fellow who formerly held the War College's General Douglas MacArthur Chair, the Marine Corps University's 1993-94 Brigadier General H.L.L. Oppenheimer Chair of Warfighting Strategy and 1994-95 Chair of Military Affairs, and the 1996 Fleet Admiral Chester W. Nimitz Memorial Lectureship at the University of California, Berkeley, Colonel Harry G. Summers, Jr. is now a syndicated columnist for the *Los Angeles Times* and editor of *Vietnam* magazine.

The Honorary Colonel of the 21st Infantry Regiment and honorary member of III Corps' Sergeant Audie Murphy Club, Colonel Summers is a veteran of the Korean and Vietnam wars. Twice decorated for valor and twice wounded in action, his award-winning critique of the Vietnam War, *On Strategy*, is used as a student text by the war and staff colleges and by many civilian universities. His 1985 *Vietnam War Almanac* was voted one of the outstanding source books and his 1990 *Korean War Almanac* and 1995 *Persian Gulf War Almanac* also won critical acclaim. The *New York Times Book Review* called his 1992 *On Strategy II* "the best of any gulf war book to date," and General Colin Powell called his 1995 *The New World Strategy* "must reading." His *Historical Atlas of the Vietnam War* was published in 1996.

Military analyst for NBC News during the Gulf War, Colonel Summers has made more than 250 network television appearances and has been a frequent guest on Voice of America, National Public Radio, and on radio talk shows nationwide. A prolific writer, Colonel Summers won New York University's 1990 Olive Branch Award, the VFW's 1991 News Media Award, the Vietnam Veterans of America's 1993 Excellence in the Arts Award and the 1993 Legion of Honor Bronze Medallion of the Chapel of Four Chaplains.

Formerly *U.S. News & World Report*'s chief military correspondent and contributing editor for the late *Defense and Diplomacy* magazine, his articles and reviews have appeared in numerous periodicals.

A member of the Council on Foreign Relations and the International Institute for Strategic Studies, Colonel Summers has testified before the Congress on strategic military issues and lectured at the White House; State Department; CIA; DIA; National Defense University; Army, Navy, Air and Marine War and Staff Colleges; Armed Forces Staff College; Inter-American Defense College; U.S. Military, Naval and Air Force Academies; Canada's National Defence College and Royal Military College and at such academic institutions as Georgetown, Harvard, Stanford and Vanderbilt.

A graduate of the Army's War College, Colonel Summers was awarded a Bachelor's degree in Military Science by the University of Maryland and a Master of Military Arts and Science by the Army Command & General Staff College.

PME for the 21st Century Warrior

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NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Presentation by
Gen. John J. Sheehan, USMC (Ret.)

GENERAL JOHN J. SHEEHAN, USMC (Ret.)

General John J. Sheehan was born August 23, 1940 in Somerville, Mass. He graduated with a degree in English from Boston College in June 1962. After graduation, he was commissioned a second lieutenant in the U.S. Marine Corps. He holds a master's degree in government from Georgetown University. He has served in various command positions, ranging from company commander to Brigade Commander, in both the Atlantic and Pacific theaters of operations. General Sheehan's U.S. combat tours include duty in Vietnam and the Persian Gulf. He also served in Malaya with the Far East Land Forces of the United Kingdom.

His staff positions include duties as regimental, division, and service headquarters staff officer as well as joint duty with the U.S. Army Special Forces, the office of the Secretary of Defense, the Joint Staff and the U.S. Atlantic Command.

His last assignment was as Supreme Allied Commander, Atlantic and Commander in Chief, U.S. Atlantic Command. Prior to that General Sheehan served as Director for Operations (J-3), Joint Staff, Washington, D.C.

General Sheehan's professional education includes the Amphibious Warfare School, Naval Command and Staff College, and National War College.

His decorations include the Defense Distinguished Service Medal with two oak leaf clusters, Distinguished Service Medal, Silver Star Medal, Defense Superior Service Medal, Bronze Star Medal with Combat "V" and gold star in lieu of a second award, Purple Heart with gold star, the Defense Meritorious Service Medal, Meritorious Service Medal, Army Commendation Medal, Navy Achievement Medal, Combat Action Ribbon, Presidential Unit Citation, Navy Unit Commendation, National Defense Service Medal with one bronze star, Vietnam Service Medal, Southwest Asia Service Medal with two bronze stars, Republic of Vietnam Cross of Gallantry with silver star, Republic of Vietnam Armed Forces Honor (First Class), Kuwait Liberation Medal (Saudi Arabia), and Kuwait Liberation Medal (Kuwait). Other awards: The Ribbon of the Commander of the National Order of Merit of France, the Medal of Merit in Gold (Netherlands), Great Cross of the Royal Norwegian Order of Merit, Great Cross of the Military Merit of Portugal, Defense Intelligence Agency Director's Award, and State of Indiana Distinguished Service Medal.

General Sheehan is married to the former Margaret M. Sullivan of Boston, Mass. They have four children: Kristen Allen, Catherine, Karen and John.

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The Role of the U.S. Military

**"We the People of the United States,
in Order to form a more perfect Union,
establish Justice, insure domestic Tranquility,
provide for the common defence,
promote the general Welfare,
and secure the Blessings of Liberty to ourselves
and Posterity, do ordain and establish this
Constitution for the United States of America."**

The subject that I will talk about today is why America developed a Professional Military Education system. To answer that, I would argue, you first have to address the more fundamental question of why you have a military. Discussing Goldwater-Nichols is a temporary fix.

acom

If you look back at the early military history of the United States, the most fundamental question concerning the military was what kind of Navy we wanted? That debate had everything to do with the mercantile activities of the United States as a nation -- with protecting our coastline and commercial activities from pirates and other navies. Our economic lifeblood was our commercial trade in Europe. Our experience with British occupation was the basis for our land forces. The Congress of the United States made a decision to raise an army, but it did not want a permanent force, because of the legacy Europe had brought to the United States during the early colonial days.

These arguments framed the debate among the elite citizenry of the United States, and were the basis for the formation of, and the nature of, the military we developed. We were, for a long time, an isolationist nation -- known for our ability to fight only when we were either attacked by pirates in the Caribbean, or were invaded by another nation, mostly the U.K.

As we started to grow as a nation, our PME focus was on teaching naval officers, first and foremost, how to be officers and gentlemen. Etiquette and the fundamentals of sailing were covered in depth. As we came to grips with our expansionist internal policies, our ground-side education took on a civil engineering focus. We built forts; we opened the West; we protected wagon trains from Indians. The European ground combat influence was very

much in the colonial mindset -- how we saw the battlefields and how we trained our people. It was a mathematically oriented military education system.

That was our early history. And up to World War I we, as a nation, accepted the European premise that our officers weren't good enough to command -- we weren't sophisticated enough; we weren't smart enough; we didn't have the experience of the legendary European heroes whose armies slaughtered generations of their own people. And so, I argue that our PME institutions are a product of a process in which there wasn't a whole lot of substantive thinking about why we *have* a military.

An exception to this general process was the war period of 1939 to the end of World War II, when there were some bright people in the system who looked at the United States and determined that we couldn't survive as an isolationist nation. We had to do things differently. This group of people hatched most of the military ideas that were executed in World War II. But most of the people in that system were categorized as rebels by the peacetime War Department hierarchy. It was only *after* the early slaughter of World War II that they came to the fore. But most of the ideas executed during World War II were thought through before the war.

Fortunately or unfortunately, at the end of World War II, our military and defense institutions looked at the conflict spectrum they had experienced during the war and focused on a land Army as the basis for their strategic learning. The whole procurement cycle and thought process had everything to do with organizing and training, especially how to deal with the correlation of forces in a force-on-force engagement. We never thought through much more than the principles of mass material, and firepower and their effect on casualties.

Now, all of a sudden, the Soviet Union has collapsed. We now have this large organization called DoD and its many PME institutions. As they search around for a new direction, they must ask themselves the very fundamental question: *Why do we have a military?* What do you want the defense institution to do, and who will decide on a new direction?

Many people, especially those who wear military uniforms, know that the answer is, "Our job is to fight and win wars." That is fair answer because behind it is a platform-incentive thought process.

This slide has an excerpt from the Constitution of the United States. It says that your job is to "provide for the common defence." In the late 1700s, that had everything to do with our capability to protect our shores, to trade across the oceans, to expand our natiion westward and build our civil infrastructure. So we created places like West Point. Now that we no longer have a clear competitor, the question becomes, "What frames the debate about what the U.S. military *does*?" Clearly there is an element of strategic deterrence that doesn't require a whole lot of thought. The consequence of not dealing with it had some consequences. But, increasingly, there is evidence that a sophisticated conventional deterrence has an equal to or in some cases of greater value as a deterrent. The world you currently live in is framed by these kinds of arguments.

Geo-Strategic Environment

Industrial World (19-20th Century)	Industrial World (Present and Future)	Developing World (Present and Future)
• Nation-States	• Trans-National Institutions	• Authoritarian Regimes
• Military Power	• Economic Power	• Ethnic Tension
• Economic Nationalism	• Corporate Multinationalism	• Population Growth
• Restricted Borders	• Permeable Borders	• Refugees
• Military and Industrial Technology Focus	• Information and Communication Technology Focus	• Weapons of Mass Destruction Focus
• Gradual Change	• Rapid Change	• Famine, Malnutrition and Disease

The geo-strategic environment of today looks something like this.

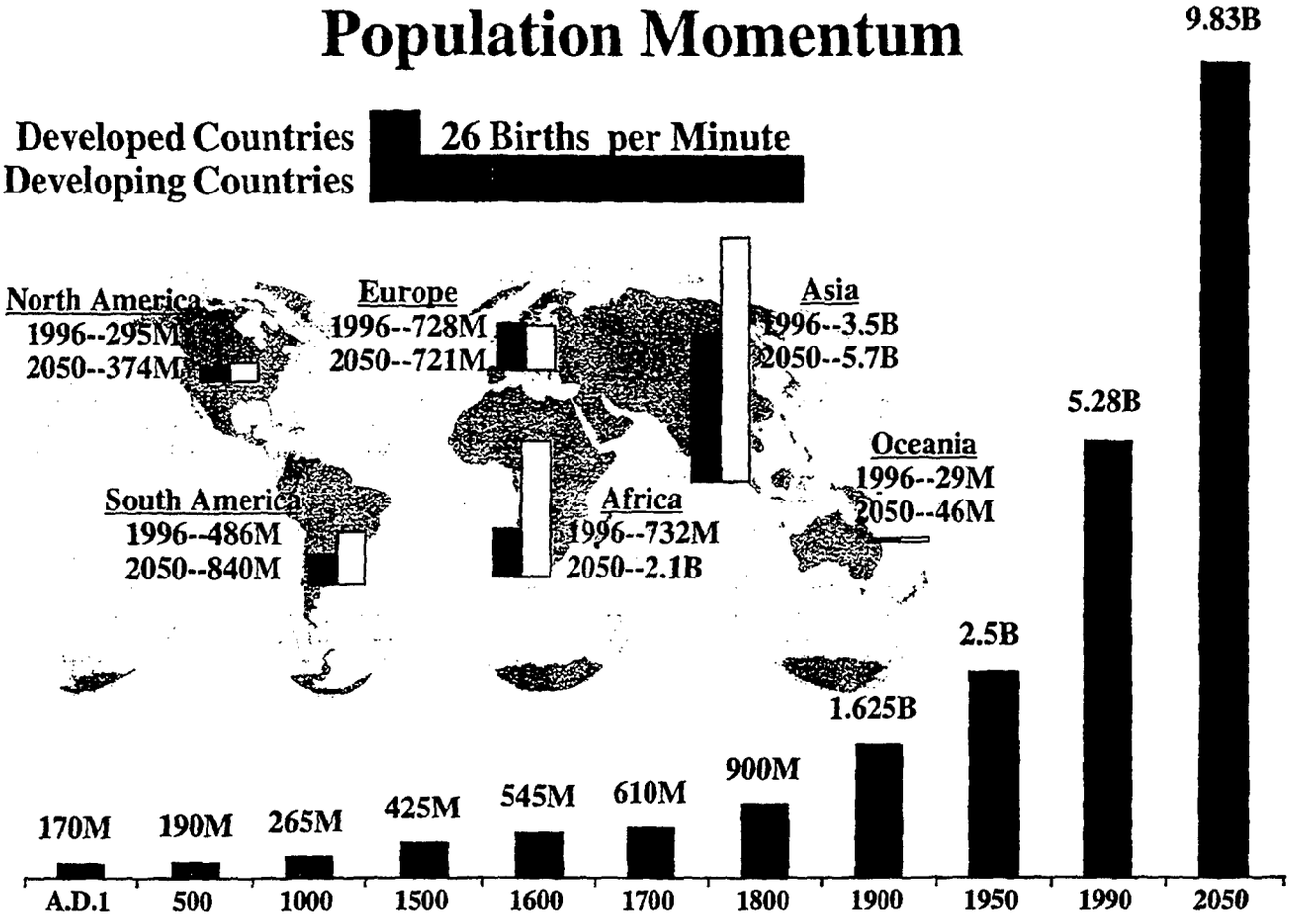
On the left, you have the world that most of us grew up in -- the industrial world. We view the world through an industrial lens. Our structures, our thought processes, our school systems live in this world. Our institutions -- whether DoD, the United Nations, or whatever live there too. We deal with world outside ours by trying to make it fit our current thought processes.

In the middle is the corporate economic world, where there are no borders. That is where the United States is today, whether you recognize it or not. 30 percent of our GNP is derived from exports. In 1970, that number was 13 percent. The United States today has more export trade with Singapore than it does with Italy and France. There are 11.5 million jobs in the United States that require or rely on export trade in order to survive. And most of those are not "Chicken Lickin" jobs. Most are substantive, well-paying jobs -- the economic engine of the United States.

On the right, you've got this developing world. The countries in that world are undergoing transitional political or economic processes. That developing world is trying to figure out how to deal with the already developed world. The United Nations and other large world institutions monitor this process. The World Conference on Population Control was viewed by many of these developing nations as an attempt to impose Western values on their cultures. We are creating friction points with this developing world because, in their cultural assessment, a McDonald's is not always a good deal.

And so, we're asking the military to participate in three different kinds of worlds. And to make matters worse, we've not engaged in any substantive process to understand why we want to use our military forces in the types of roles they get today.

Population Momentum



World Population Explosion

geo-strategic

Let me give you an example of what I'm talking about. I argue that we have not seen the kind of change that the world is currently experiencing since about 1848 or 1850 -- the beginning of the industrial revolution. It took the human race from our beginnings to the year 1800 before the first billion people showed up on Earth. It took slightly less than another 100 years to add the next two billion. You are now looking at adding roughly the equivalent of the population of China (1.2 billion) every 12 years. The population of the United States has doubled in the last 50 years. And there is an interesting phenomenon in these numbers. If you subtract first year mortality rates from population growth numbers, the mortality rates of most nations averages out at about the same age, but that average age has been increasing in almost all nations. That global aging process has tremendous implications, not only for the recruiting force, but from the social welfare perspective. This has tremendous implications for countries, especially countries in Europe like Germany that has a high industrial base requirement but does not have the work force necessary to compete in the global market. Increasingly, those types of countries have to import younger workers in order to survive.

To make the case, when the IMF forced the Mexican government to deal with the peso devaluation, Mexico was forced to shut down 26,000 companies and put almost two million workers out on the street. What happened? They came to the United States, for the most part. It was a natural escape valve, so it didn't create internal problems. Suharto is now talking about restructuring the Indonesian economy. His first solution is to export almost two million workers from Indonesia back to where they came from: Korea, Vietnam, Myanmar, Thailand. Too many workers who become migrants on a global basis cause discontinuities.

Our World

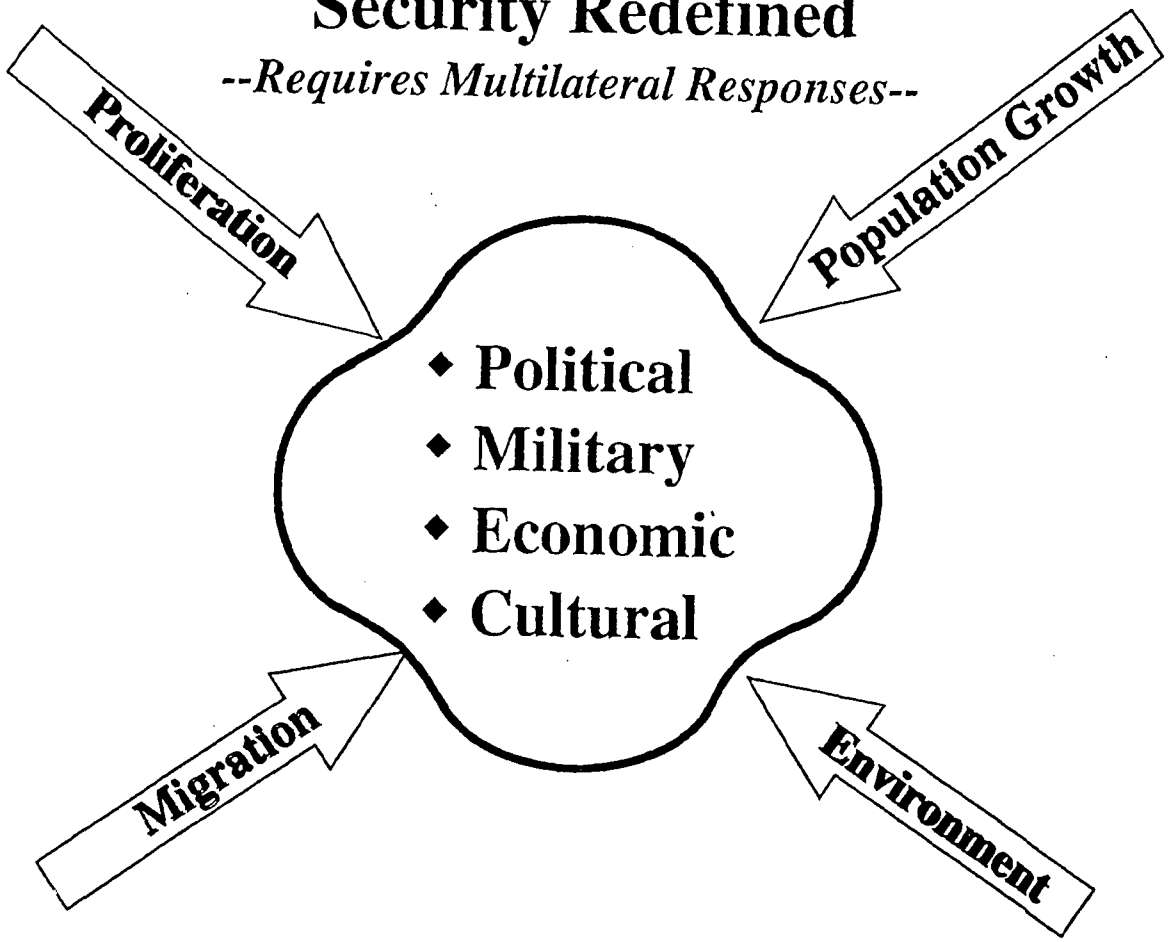
--Reduced to a 100 Person Village--

- **There would be 57 Asians, 21 Europeans, 14 from the Western Hemisphere (North and South America), and 8 Africans**
- **Seventy would be non-white**
- **Seventy would be non-Christian...30 Christians**
- **Fifty percent of the entire world wealth would be in the hands of only 6 people, and all 6 would be from the United States**
- **Seventy would be unable to read**
- **Fifty would suffer from malnutrition**
- **Eighty would live in sub-standard housing**
- **Only one would have a college education**

geo-strategic

The world you live in is not the world that you represent. Look around the room. You are a statistical minority, as a group. If you took the world and shrunk it to a village of 100 people, this slide shows what your world looks like: there are 57 Asians, 21 Europeans, 14 from the Western hemisphere -- North *and* South America, 8 Africans. Seventy are non-whites, 70 are non-Christians. Fifty percent of the entire world's wealth is in the hands of six people, and they're in the United States. Seventy are unable to read. Fifty suffer from malnutrition. Eighty live in substandard housing. Only one has a college education.

At the end of World War I, about seven million people in the world lived homeless, slum type areas. Today there are seven hundred million such people. That type of discontinuity is also occurring here in the United States. So the question that you, as a military, should be asking is where you fit?



I would also make the case that the definition of security is being redefined for you. One of the great tragedies that's occurred over the last couple of years is that we have been unable to define where the United States fits in the world and what instruments it should use to execute its foreign policy. For 50 years, we have defined security purely in military terms. There was a correlation of forces. The German border was the central front. We understood kinetics. We worked at great lengths here at the Naval Postgraduate School figuring F-pulls for air-to-air missiles.

Increasingly, that is not true. Increasingly, it's about economics. And if you don't think that's true, just replay the last six months in the Asian economy. If you don't think it's about culture, go to Bosnia. You could move the entire NATO structure into Bosnia, and you're not going to solve the problem. Bosnia is about culture. Bosnia is about economics. Bosnia is about leadership.

Go to Kyoto, Japan and participate in the environmental conference. What that is really about is a tax transference from the industrial world to the third world -- to somehow or another level the playing field.

Why is it that private security firms in Australia, South Africa, and in the United States spend more money on security than every nation in NATO, save the U.S.? The budget for private security firms is 50 billion dollars a year. France is the closest, with a 46 billion dollar defense budget. Why? Why is it that 23 percent of Americans live in gated communities? Why do assault rifles cost 17 dollars a copy?

You're dealing with a different world, and what happens by default is you end up with somebody saying, "Let's go to Somalia because there are people dying. It's on CNN, so let's go there and stop the dying." It's a legitimate mission. Let's go to Rwanda to stop the dying. Let's go to Haiti to restore democracy. Let's go to Bosnia so we can create a unified state. Those are what I would call fundamentally different missions.

Who do you go with to these battle spaces? People you never thought of. Ninety days ago now, I parachuted into Central Asia. In the aircraft there were 500 guys -- myself and the 82nd Airborne, a Russian company, a Turkish company, and one company from Khazakstan, Uzbekistan, and Kyrgyzstan. The C-17s, as we approached Kahzak air space, were escorted by MiG-29s. Close air support was flown by Russian helicopters called HINDS and HIPS. Now, if that's not a different world, I'm missing something.

The resource base has declined. Those of you who somehow or another think that, because you read in The Washington Post that we have a balanced budget, you're crazy. You do have a balanced budget today and maybe through the rest of the calendar year. But when you look at the out-years of this global aging process that's taking place, especially here in the United States, you had better realize that entitlement programs are going to be a major debate in which DoD is going to pay part of the bill.

That's not just true in the United States, it's also true in Europe. As Europe moves down the road of the EMU process and moves to meet materiel requirements, there's not a nation in Europe that will spend more than two percent on defense. And so the discontinuity you have between the very highly sophisticated force in the United States and what I call a constabulary force in Europe is becoming more and more pronounced.

That has tremendous political implications in terms of how you view the use of force, -- and what it means if you fight a sophisticated force and the front end of that spear is U.S. forces . The political side of that is, you have events like what occurred in Mogadishu, where you get 18 Rangers killed, and the next day you change the policy.

So the asymmetrical nature of what's going on in the world essentially says that, if you want to defeat the United States, don't fight in a force-on-force engagement. Rather, kill as many Americans as quickly as possible early in the conflict, and fight it out on the international media stage.

The center of gravity for the use of military force in the United States today is not the intellectual capital of National Defense University. It lies on the floor of the Congress of the United States. So you'll not get somebody to take you on a force-on-force engagement except to kill people for TV purposes. The great lesson that came out of the Gulf War is, never give the United States six months to get ready.

Today's forces have to fight on arrival. To do that, you've got to win, and win quickly. What you see today is a whole bunch of activity that looks like this.

Military Missions
--In the New Security Environment--

- **Peacekeeping / Peace Enforcement**
- **Humanitarian Support**
- **Drug Interdiction**
- **Support Democracies Abroad**
- **Counter-Terrorism**
- **Counter-Proliferation**
- **Alliance Obligations**
- **Combat Operations**

milchang

It's interesting in the bottom part of this is where Most of the service chiefs will say, "Our job is to do combat operations." If you read the most recent study that the Army produced the soldiers serving in Bosnia, what is going on is the internal deterioration of both morale and leadership because it's a static operation. It's not even a fight. You create activity in lieu of substantive analytical thought that says, "Let me tell you why and where we're going to use force."

There is nothing wrong with stopping the dying in Mogadishu. But taking the next step, to say we're going to rebuild the failed state, is a stupid idea because Mogadishu or Somalia never existed as a state. Before you went to Rwanda, the international community put almost three billion dollars worth of aid into Rwanda, all of which went down the tubes during the massacres.

There are some parts of the world that are just not in our national interest. Understanding what those nations are and what their relevance is, is not something we're capable of doing right now because we don't have an intellectual framework for determining how and why we use force.

Let me give you an example of what the activity quotient looks like.

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Tasks in Rebuilding a Failed State

--Balancing Priorities--

Operational (Stop the Dying)	Structural (Cure the Disease)
• Immediate Tasks • "Enablers" • Treat the Symptoms – Create Cease Fire – Provide Emergency Services	• Long-Term Activities • "Foundations" • Redress Root Causes – Rule of Law – Transitional Institutions – Repatriation of Refugees – Resettlement of Internally Displaced – Integration of Warring Factions into Military or Militia – Rebuild Economy

Everyone thinks it's a great idea to stop the dying. I support that concept a hundred percent. And when you get there to do that, all of a sudden someone says, "Let's also repatriate the refugees. Let's also figure out the displacement processes. Let's also figure out the warring factions."

I built this slide after Haiti. A few days after we arrived in Haiti, the guys from the 10th Mountain Division discovered the Haitian national prison -- a room that's probably one-third of the size of the room that you're in now (100'X300'). In one cell there were seven hundred people. It was clearly an inhumane situation. We took the people out, washed them off, gave them medical treatment, and fed them. Eight months later, our MPs were still running the Haitian prison, because there was no mechanism for the Federal Bureau of Prisons -- the people trained to do that type of thing -- to do it. So we've created this whole subculture in the system, that we have these conferences on operations other than war.

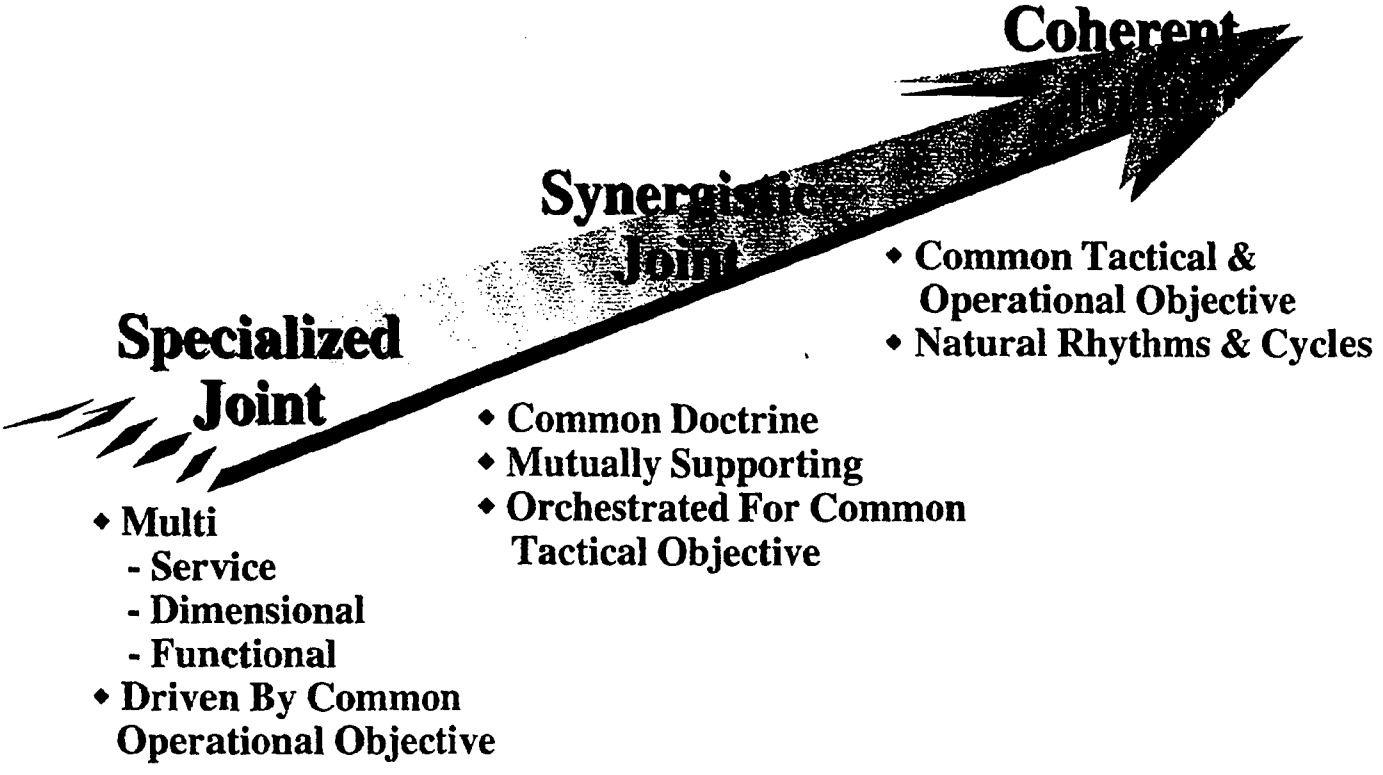
Go to the National Training Center at Fort Polk, Louisiana, and you'll find civilians on the battlefield. The lessons we're teaching the lieutenants and captains is how to deal with them. It's probably necessary because, in today's conflicts, about 60 to 65 percent of the people who get killed are civilians and kids. So you have to figure out how to teach people how to deal with the problem.

What is the real message in our educational institutions for the young lieutenants? Because what's going on -- not only in the United States, but on a global basis -- is that you have restructuring because of the technological revolution.

On the ground side, you can see what's going on. And on the air side, There's an interesting phenomenon going on that somehow or another says that these parts really don't fit. The average cost of a tactical jet today is about $70 million a copy. The roll-out cost of an F-22 is a 150 million dollars for the first couple. At the same time, there's a proliferation of shoulder-fired weapons systems at about 10 thousand dollars a copy. What's the economic exchange rate? Why is it that, when you get an F-16 shot down over in Bosnia, the pilot gets to go to the White House for lunch? What's the unintended signal?

What you see in this world, the military at large, is a leveling process. You have a veneer of technology that's being bought outside of the United States and goes to different parts of the world. It doesn't have the depth and width that exists here in the United States, but there's enough to give the enemy an ability to deal with us on the battlefield. There's enough of a technological edge to give the opposition force the ability to kill "enough" Americans during the first couple days of conflict, to force you to fight on two fronts: one on Second Street and Pennsylvania Avenue and the other on the battlefield itself.

Evolution Of Joint Operations



Now let's talk about where we think we're going. This slide doesn't have any JCS Pub 1 sanctions. This is something we might use to figure out where we are really going. It's interesting that after Goldwater-Nichols was written into a law, we started this joint business But even in the passage of the law, there's what I would call a cooperate and gradu syndrome. There is nothing wrong with the law from an execution perspective. Ther everything wrong with the law in terms of people not being willing to take on service-par interests.

And so what you saw here, in joint specialized operations, was the Gulf War -- mi multidimensional, multifunctional. It was driven by two common objectives. On Iraqi's out of Kuwait, and two, the fear of General Schwartzkopf. As we moved u chain to the synergistic joint operations, we're talking operations like in Haiti. For th we will have cross-decked different parts, different core competencies, to bu battleforce.

The decision to put the 10th Mountain Division and some of the soldiers on an ame caused absolute havoc in the United States Navy and United States Marine Corform a roles and missions fight, instead of an answer to the question, "What sea-threat can provide me with 4.2 acres of helicopter launch space and operate in a n environment?"

Where do you need to go? Clearly, it has to do with joint operations. Each service, in its institutional process of education, teaches a culture. Whether you accept it or not, it happens. It's derived from the educational institution which you represent. It comes from the hardware that you give the people to operate. And it's driven by budget that says protect certain kinds of things.

Let me give you an example: carrier deck cycles. The centerpiece of the U.S. Navy is the aircraft carrier. It runs in a cycle of 17 to 19 hours, depending on which carrier you're talking about. But if you're in the Air Force business and you're true to doctrine, you're in a 76-hour thought process. Clearly, you can change it but, by and large, it's 76 hours. And if you're in the heavy Army business, you advertise you can fight for 24 hours on a sustained basis, but that's not true. It's basically a 20 to 22 hour cycle. If you're a light guy, like the Marine Corps, depending on night vision and tactical capability, it's between 9 and 11 hours.

You come to the battlefield either as a commander or as a staff officer with a predisposed understanding how battlespace is put together. The problem is, the joint force commander has to synchronize the different battle rhythms of different forces. That's the challenge today -- different battles, different battle intelligence cycles, and different thought processes.

Our national intelligence apparatus is not operationally focused. It's focused on the decision cycle within Washington D.C. And you find that the vast majority of the intelligence information goes to Washington staffs -- to people who have no business being in the policy business because they don't understand the difference between management and policy.

If you're a staff officer on a joint staff somewhere, you're also an advocate. You're an advocate for a platform or an advocate for a service. And the question then becomes, where does the advocacy role start and stop, and where does "truth in lending" start and stop? In most cases, we've not been able to figure out what truth in lending really is.

It's the same thing in TRANSCOM. TRANSCOM advertises 98 percent delivery. It's probably true statistically, but between the time the first aircraft lands and the time you close the force, almost 30 percent of the airlift does not arrive where and when you need it.

My point is that, as we build joint operations, there has to be some other way for our educational institution to teach this business about battle rhythms, not from a Service perspective, but to truly understanding what you get when you have a Service platform perform in a joint battle space.

In today's ground combat, you cannot ask an F-16 or F-15 driver to stick his nose into any fight because our systems are not interoperable. If you divert an aircraft into a battlespace, he has a 39 percent chance of getting to the right target with the right bomb at the right time -- he has a 60 percent chance of getting it wrong. What will the system do to him if he is wrong? It'll kill him. He'll be court-martialed. It is because we can't get an agreement between the Army and the Air Force on Link 16 and variable message formats. All the while, we argue bureaucratically back in Washington, D.C. about whether my system is better than your system.

Impediments to Achieving Security

- Cold War Force Structure
- Education
- Legacy C4I System

milchange

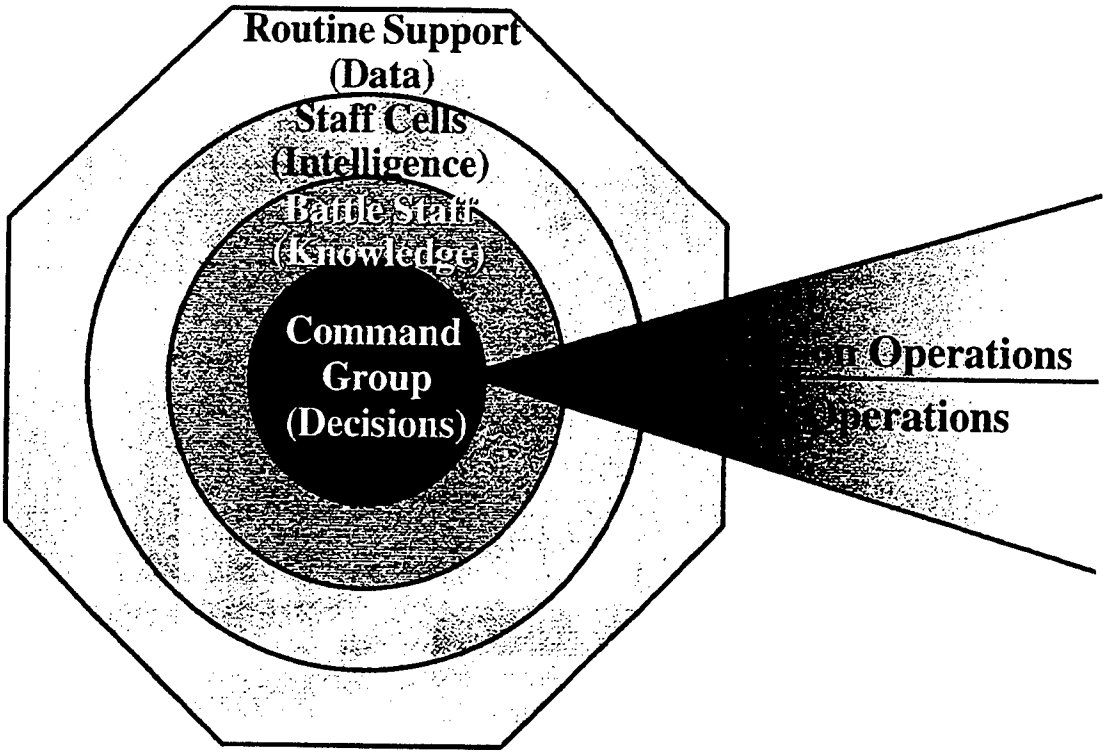
And so what are the impediments of the process? First and foremost is our Cold War structure. Much of what you currently see in overhead is a direct growth out of or a direct transfer from the Cold War. Our whole unified command plan does not make sense. Our whole structure inside of Washington D.C., in terms of the Goldwater-Nichols intent, does not make sense. It does not reinforce civilian control of military.

If you're really going to exercise oversight, how does the Secretary of Defense do it? He does it three ways: through policy, through budget, and through operations. But the Secretary of Defense has zero control over operations. He does not know why it costs $268,000 dollars a year to keep one soldier in Bosnia. That's what it costs. It's now a $2.3 billion bill and John Hamre tears his hair out every day trying to get control of an operation that has been going on for almost three years.

Who do you think controls combat strength -- the front end of the process, the operating forces? No! You are hollowing out your military because of the disproportionate weight you're putting in the staff service.

Functional Vice Napoleonic Structure

Improves Coherency *within* JTF, not outside



milchange

A revolution is going on in the commercial world as the decision process is greatly facilitated by technology. At the same time, we're dealing with a hierarchical system that is not responsive.

When we were doing air strikes in Bosnia a couple years ago, the secretary general of NATO was told that an air strike was going to take place. It took some eight hours before he got his first operational report because it went from the field, where the event was taking place, through 34 echelons of command.

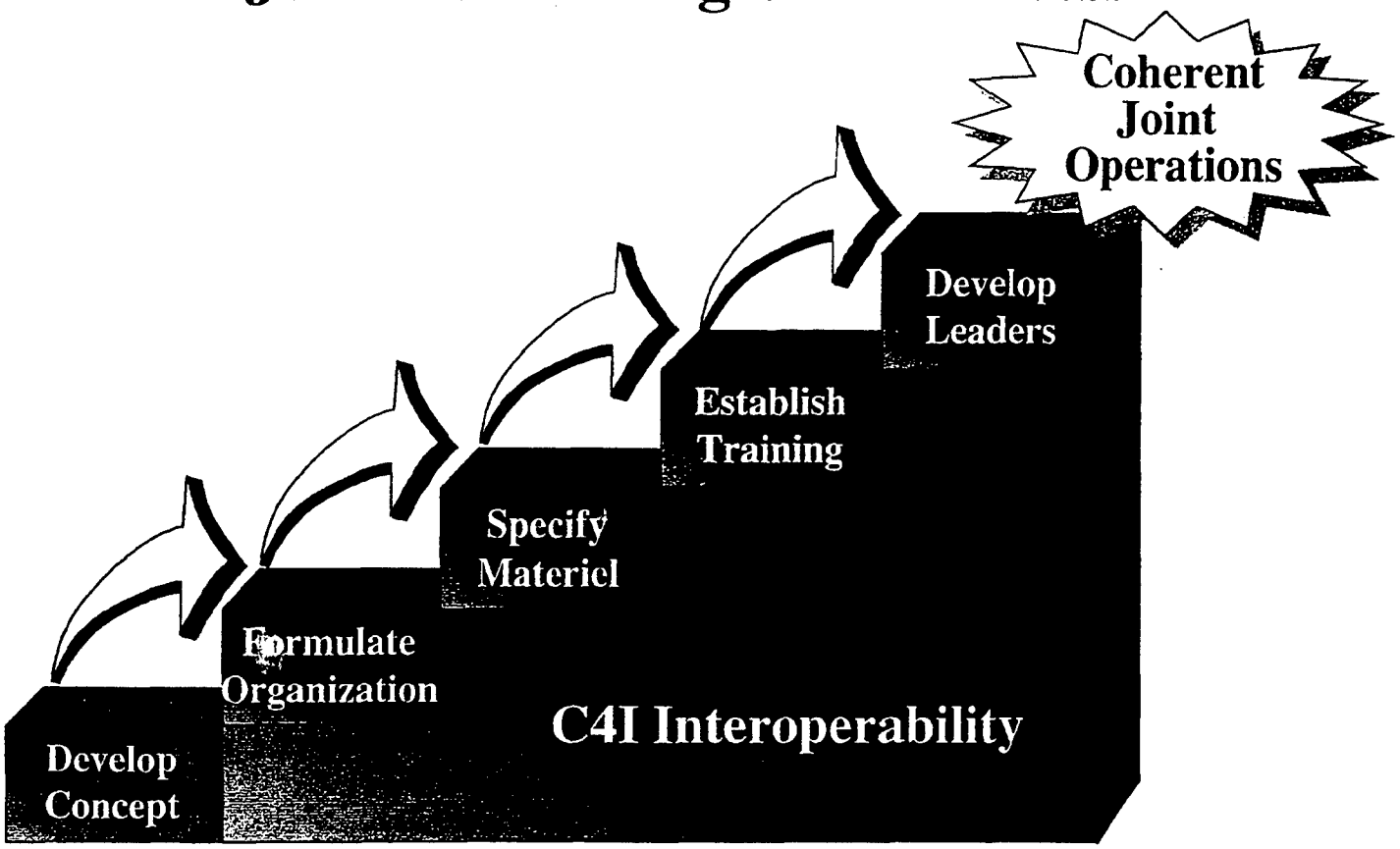
In today's world of instant telecommunications and press access, you have the press on the beach meeting the Marines, or you have 250 reporters standing on the top of Haiti's Montana Hotel who know exactly where the target sets are. You are unable to maintain strategic surprise because of the telecommunications capabilities of the press or even of your own soldier. The average soldier on today's battlefield is carrying a cellular phone and calls his mother with status reports. You can buy a commercial, one-meter resolution satellite imaging system through the Internet for 15 hundred dollars. So strategic surprise simply does not exist anymore.

We are asking our commanders to go into a battlespace, in most cases not prepared for the multidimensional world we're placing him in. The great thing about each of the events that have occurred over the last five years -- whether Rwanda, Haiti, Somalia, or whatever -- is that they've been politically unpopular.

And so, when General Shelton lands at Port-au-Prince Airport, he doesn't meet Jean-Bertrand Aristide or General Cedras. He meets 135 press people who ask him what he thinks. Has something changed between the time he lifted off USS MOUNT WHITNEY and the time he got to Port-au-Prince? When you ask General Shelton what would he do different, he'll tell you he wished he had a CNN television set in the cockpit of his Huey.

Why, during the fall of Srebrenica, when they handcuffed the Dutch soldiers to telephone poles on the bridge, did the Dutch Minister of Defense get called before Parliament and almost fired? Why is it that when the Khobar Towers were blown up, was there a hearing in Congress two days later during which the Secretary of Defense took responsibility? It's because the world that your commanders are living in today is a very different world. You don't have time to make excuses, and if you don't have proper guidance in terms of what the mission is and what the outcomes are, the commander is caught behind the information loop end of political management back in Washington D.C.

Joint Force Integration Process



acom

Now, how did we get here? It's easy to complain. Part of the criticism, I would suggest, is in the third step of this slide -- specifying materiel. We have become a nation that's equipment oriented. We buy things without understanding how they fit into an operational concept. Instead of dealing with the whole business of concept development, organizational theory, buying the equipment, and ultimately establishing training and leader development with an integrated C3I system, we are leaving the system to chance in terms of how we train people.

This is the mechanical process. But there's a bigger issue, I would suggest, in this whole business of training.

Seven Principles of Trust

- *Trust is not blind*
- *Trust needs boundaries*
- *Trust demands learning*
- *Trust is tough*
- *Trust needs bonding*
- *Trust needs touch*
- *Trust requires leaders*

It has to do with trust. You have to ask yourself today some very hard questions: Why are large numbers of very bright, young officers leaving all the services? Why is the resignation rate of tactical jet pilots so high? I know it's got something to do with the airlines hiring, but the kids who fly the same mission over, and over, and over again say, "It is non-threatening, non-substantive, and I don't want to do it." Why is it that 22 Marine Corps captains hand-picked to go to the Amphibious Warfare School resigned just before they got there? Why is it that JOs and deck officers in the Surface Navy are leaving?

Part of the answer is that we in senior leadership positions have failed. If a young officer out there does something because he's genuinely trying and experimenting, but fails, he will not be promoted; he will not be augmented. It has everything to do with our personnel system that says that it is of more value to be a staff officer than it is to be a commander. All of our personnel laws are written to ensure that you go through all the wickets to be Goldwater-Nichols qualified. There is not one law on the books that talks to being a proficient commander. You are, across the board, building a generation of people who don't know their trade.

It has everything to do with the personnel system that forces people in and out very quickly. The numbers that I looked at have everything to do with the amount of time you spend in the foxholes, and cockpits, or aboard ship. If you're an infantry guy on the

groundside, it's about 20 months as a major. Lieutenant colonel command tours are 18 to 24 months. We have colonels today in the groundside, both in the Army and Marine Corps, who have less than 60 months operational experience. They don't know their trade.

You have one opportunity to command either a flying squadron or surface combatant vessel. During that one opportunity, do you think you take that organization or that ship and fight it to the edge of its performance envelope? Or are you careful that you don't do something, because you know down deep the senior leadership will not protect you if you make a mistake?

What you do is build a generation of people who are conservative in their thought process, and if you think or operate outside that norm, the system will kill you. The bright young kids in the system who want to experiment, who want to try new ideas, are not rewarded. If they make a bad decision, you have service secretaries who review the process and guarantee that that officer leaves the service.

There is, in fact, what I will call a crisis of confidence developing in the U.S. military. It's because people like me have failed to stand up and say, "That is not what we are about as an institution." There are certain fundamental things that you ask the American youth to do, not the least of which is to go into harm's way. If he does that, if she does that, you as an institution have an obligation to train them for this new world that you're asking them to operate in. But more important than that, you have an obligation -- senior leadership -- to insure that the guidance you give them is executable. If they do make a mistake, a good and honest mistake, you have an obligation to protect that person, regardless of sex. Or, if you see a debate taking place that says the real purpose of the U.S. military is to become a social experimentation substation, you have to ask yourself, for what?

We did it during the Vietnam War, during the Project One-Hundred Thousand. We brought into the U.S. military 100,000 people who were Category Ivs -- who could not read or write. We almost destroyed the military. The U.S. military has a social responsibility to the nation it's paid to protect. It ought to be reflective of the society at large. But at the end of a day, the responsibility of the U.S. military is to execute those missions assigned to it by the Congress of the United States, not the Executive Branch.

Good luck.

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PME for the 21st Century Warrior

SESSION THREE

The Future Operating Environment

Question: **Within what sort of national security environment will military education perform its function in the future?**

Objective: **Examine the future national security environment from its projected far and near-term characteristics. The far-term perspective may be driven by prevailing large-scale political, economic, social, technological, and demographic trends, but the near-term perspective will driven by five recent planning reports.**

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

Presentation by
MG Robert H. Scales, Jr., USA
Commandant, Army War College

MAJOR GENERAL ROBERT H. SCALES, JR., USA
Commandant, U.S. Army War College, Carlisle Barracks, PA

Born August 3, 1944, General Scales is a native of Gainseville, Florida. He graduated from the U.S. Military Academy and was commissioned in 1966. He subsequently earned a Masters and Ph.D. in History from Duke University in Durham, North Carolina.

General Scales is a graduate of the Ranger Course, Airborne School, the Field Artillery Advanced Course, the Armed Forces Staff College, and the Industrial College of the Armed Forces.

In August 1997, General Scales was assigned as the 44th Commandant, U.S. Army War College, Carlisle Barracks, Pennsylvania.

Initially assigned in Europe, General Scales served two years with the 1-9th Field Artillery commanding two batteries. In Vietnam, General Scales commanded two batteries in the 2-319th FA, 101st Airborne Division. Upon returning to the United States, he served as an instructor at both the U.S. Army Engineer and Infantry Schools. Following a tour as the G-3 (Operations) Plans Officer, 1st Corps Group in Korea, General Scales moved to Fort Bragg, North Carolina. While assigned to the 82nd Airborne Division, he served as a battalion operations officer, battalion executive officer, and the Division Artillery operations officer. In 1981, General Scales was assigned to the Pentagon where he worked as a staff officer in the Strategic Plans and Policy Directorate, Office of the Deputy Chief of Staff on Operations. Returning to Korea in 1982, General Scales commanded the 2-17th FA, 2d Infantry Division. He returned to the Pentagon in 1983 serving as assistant director of the Army Staff. In 1985, he headed the Modern Battlefield Techniques Committee at the Field Artillery School, Fort Sill, Oklahoma. From 1986-1988, he was the Commander, U.S. Army Field Artillery Training Center, and later as Fort Sill's chief of staff. Assigned to the Pentagon in 1991, General Scales was the Director, Desert Storm Special Study Group, ODCSOPS. He is the principal author of *Certain Victory*, the official Army account of the Gulf War. *Firepower in Limited War*, a history of fire support in post-World War II conflicts, is his latest work. General Scales has also served as Assistant Division Commander, 2d Infantry Division, Eighth U.S. Army, Korea, and as Director of Operations, Readiness and Mobilization Headquarters, Department of the Army. Prior to his assignment to the War College Headquarters, General Scales served in the Army's Training & Doctrine Command as the Deputy Chief of Staff for Base Operations and as Deputy Chief of Staff for Doctrine.

His military decorations include the Distinguished Service Medal, Silver Star, Legion of Merit with four Oak Leaf Clusters, Bronze Star Medal, Meritorious Service Medal with four Oak Leaf Clusters, and Air Medal. He wears the Senior Parachutist Badge, the Army Staff Badge, and the Ranger Tab.

Major General Scales is married to the former Diana Weiss. They have two children, Maria and Lieutenant Monica Scales.

PME for the 21st Century Warrior

The Future Operating Environment

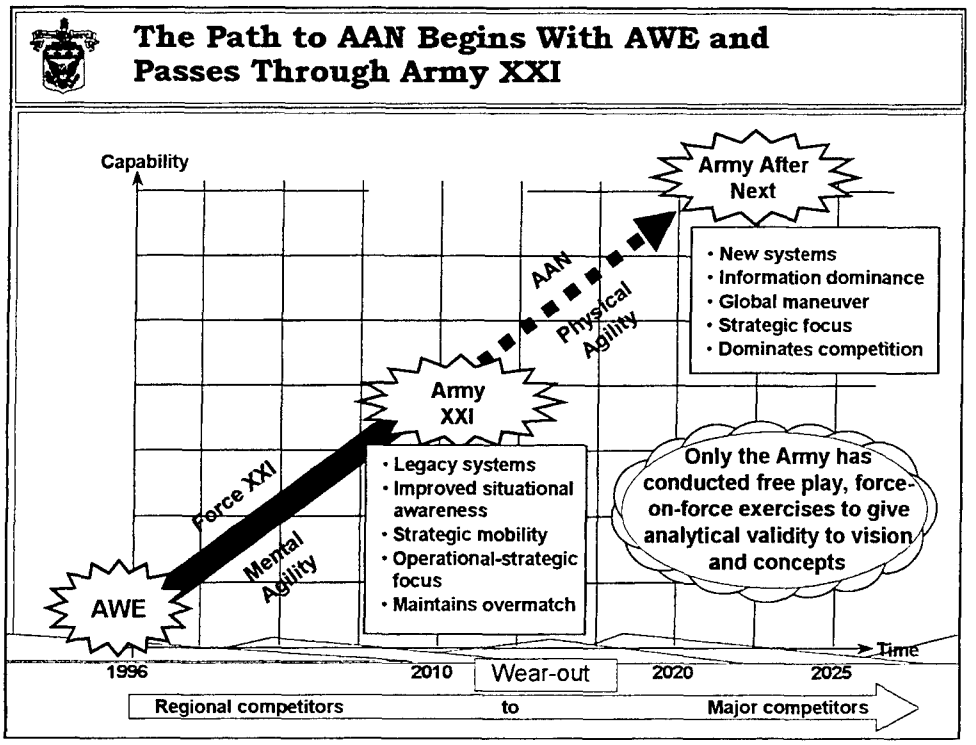


15 January 1998

MG Robert H. Scales, Jr.
Commandant
United States Army War College

Ladies and gentlemen, you're about to be struck with an intellectual blunt instrument. If you'll bear with me, I have 25 minutes to talk about something that's sort of controlled my life for the last two and a half years, and any time you are intimately immersed in any sort of endeavor, you do two things: You generate too many view graphs, and you talk too long.

So, what I'll try and do for the next few moments is spin you through the high points of the Army After Next project, to try and give you some idea of how the Army looks at the future. Then I'll make a couple of specific comments about the future and how it relates to my current job as Commandant at the Army War College, and how it relates to the issue of PME.

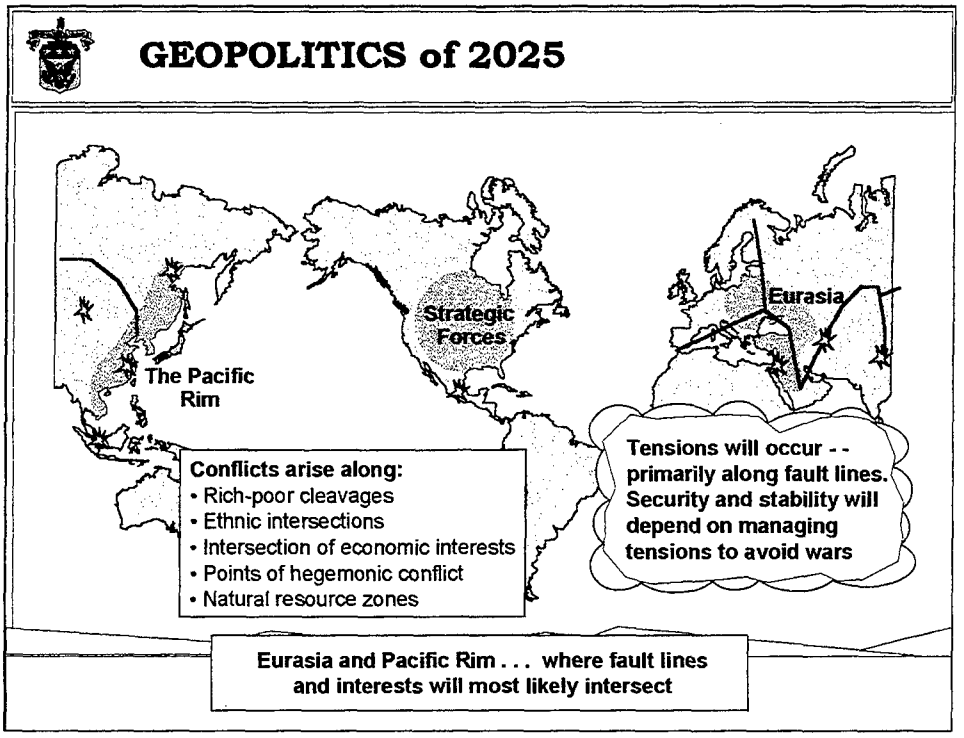


The Army After Next project was started by the Chief of Staff of the Army two and a half years ago to look at the future of the Army beyond the year 2010. Why? Because JV 2010, Army 21 -- whatever you want to call them -- are nothing more than programs to improve systems in today's operational environment -- to do the best we can with what we have now. There isn't a whole lot we can do between now and 2010, quite frankly, and in the opinion of our group, there is not a whole lot that you really need to do.

The problem comes beyond that period, when we will face what we believe to be a couple of historic events which will change the international security environment. We operated a great deal differently than the Air Force and the Navy did in conceiving their future groups. We took a very holistic view of the future. We looked at four general categories: geostrategy, the art of war, technology and its symbiotic relationship with the art of war; and probably most interesting of all, human behavior -- organizational and human behavior.

One of the great frustrations that General Sheehan mentioned just a few moments ago is this creature called the human animal. We find that when we have wonderful ideas, we run into three roadblocks: Kepler, Newton and the human being. Each one of them keeps drawing us back into the realm of reality.

Let me walk through each of those four areas and talk a little bit about them, and then speak to the human and organizational impacts, as we see them, beyond the year 2020 or 2025. I'll then talk about technology very briefly.

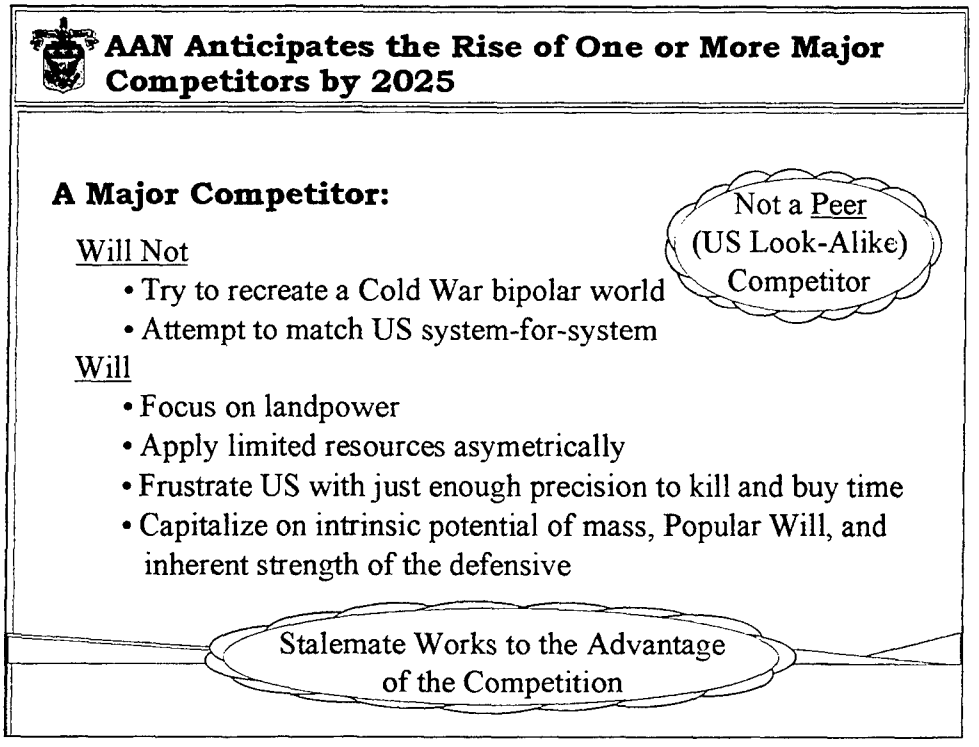


Our view of the future nature of conflict is very similar to what General Sheehan described just a few minutes ago, with a few modifications and subtleties that we think are important.

First of all, wars and conflicts will be caused by those factors that cause wars and conflicts today. And, as in the immediate past, they will be exacerbated by many of the factors that General Sheehan spoke about at lunchtime.

However, wars for national survival -- or, better yet, conflicts fought for America's vital interest in the years ahead -- will occur where wars have occurred for the last five millennium, along those sort of tectonic fault lines that define conflict. It's where those fault lines intersect with America's national interest that, we believe, America will fight for its vital interests.

That's not to say that South America and Africa and Central Asia aren't important. They certainly are. Will they involve national security assets? They certainly will. But the issue, as far as we're concerned, is just as Harry Summers said this morning: "We're interested in where major conflicts fought for our or vital interest will occur. That is, as best we can tell, in the Pacific Rim and Eurasia."



A moment, if you will, about the nature of a future enemy. We reject out of hand the term "peer competitor." It is inconceivable to our minds, after studying this for the last two and a half years, that any major power will be able to develop the expendable income and garner the technologies necessary to match us ship- for- ship, plane- for- plane, tank- for- tank. It won't happen, even though it would almost be best for America's national interest if it did. Instead -- again back to General Sheehan -- we see, after the year 2010, the rise of what we have called, euphemistically, a "major competitor."

We presume that we will be the intervening power. We presume that a major power that we face in the future will use -- to use a hackneyed and overused phrase that we coined a few years ago -- an asymmetric approach to warfare. As Harry said, "An future enemy does not have to defeat us in the field in order to win. He merely will need to avoid defeat." -- like George Washington after Long Island.

I have taken eleven or so jaunts around the world to visit many of the armies and militaries of emerging or transitional states. In doing that, I discovered a few things.

First of all, as a rule, the 21st Century warfare has already started in many ways. These countries have just about got us figured out. They understand that they don't have to defeat us in the field to win. They understand that they need to buy just enough technology, either precision or counter-precision, to provide just enough of a deterrence and just enough killing power to buy time, because time is the our future enemy's friend, and it's our enemy.

You see evidence of it today as you look around here. We are eight years into the 21st Century. You look around at what foreign militaries are doing and what they're buying. They're shedding their Cold War impedimenta. Their heavy equipment is going into the junk heap. They're buying cheap weapons of mass destruction, cruise missiles, and cheap ballistic missiles, distributed air defense, dismounted infantry weapons, sea and land mines, et cetera, et cetera, et cetera.

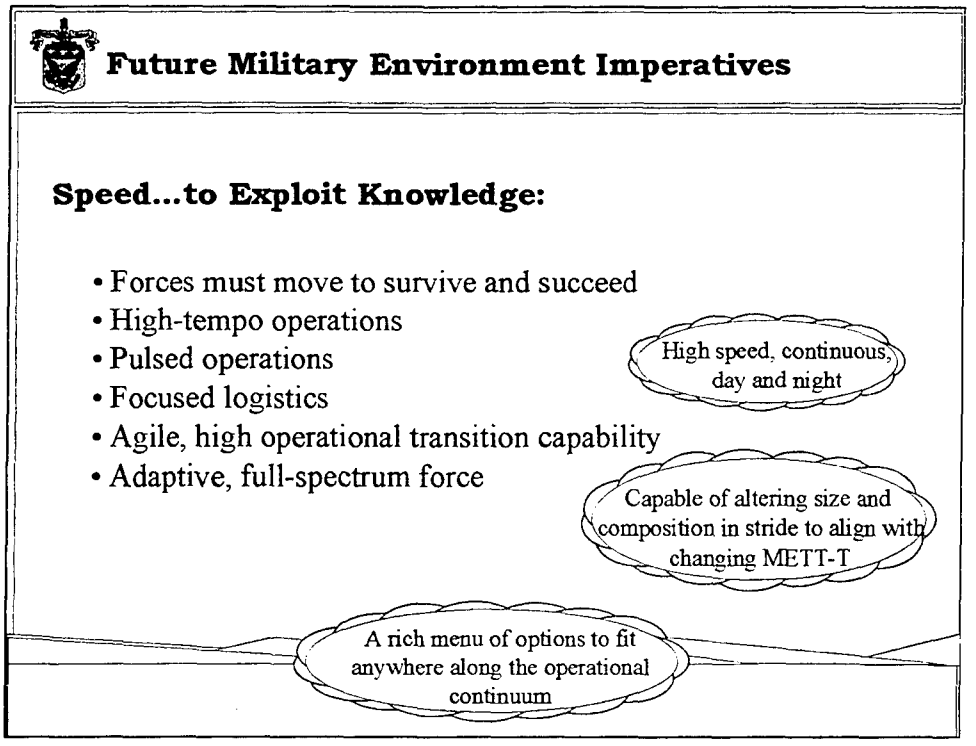
What I saw in the eyes of these potential enemies, as I went around the world, is the sense that they've got it. As a defending power facing down the world's only global superpower with the means to intervene, they have the impulse to garner their own inherent strengths, which are, to borrow from Harry Summers, "a will to win"; second, to leverage their advantage in mass; and, third, to leverage the inherent value of the defensive. They don't have to win openly in the field; they merely have to avoid defeat.

To exacerbate the problem after the year 2010, we face this interesting symbiotic effect of military technology and military art. All too often we look at technology in the future and we treat it as a "Toys R Us" exercise. You break into a toy store, pick those technologies off the shelf that you think are neat, and buy and apply them to platforms and weapon systems. It's a bad approach. Why? Because we have to take a look, and we have taken a look, at how technology affects the art of war.

Recall what happened with the first precision revolution -- with the introduction of the muzzle-loading rifle, the small bull rifle, the quick-firing artillery piece, railroad, telegraph, and so forth. A hundred years ago, with the appearance of the machine age, technology took the killing zone or battlespace and moved it from a distance of about 150 meters to a thousand meters or more at Antietam. It had moved out to about 14,000 meters by Verdun.

Not only had the battlespace become more expansive, but, with the perfection of muzzle-loading and repeating arms, it became tremendously more lethal. But the pace of movement of military forces through and across the killing zone was the same in 1917 as it was at the battle of Marathon -- two and a half miles an hour. It was that exposure to the lethality of the first precision revolution that removed the ability of military forces to strike to operational distances; capture, seize, and hold the enemy's operational center of gravity; and break his will to resist -- the essence of victory in any war in the future, or present, or for the past five thousand years.

Fast forward to the second precision revolution. The same lethality rules apply. In 1944, it took an average of 14 rounds at an average range of 800 meters in the European Theater of operation to kill a German tank. In Desert Storm, it took 1.2 rounds at an average range of 2,400 meters. A P-47 glide attack against a German tank had a .005 probability of kill. In Desert Storm, it was .4 or .5 against an Iraqi tank -- an enormously more lethal battlefield and tremendously more expansive. The thousand-meter killing zone of the Civil War grew to about 36,000 meters for a corps in World War II. In Desert Storm, the 7th Corps had a front that was 140 miles wide and 240 miles deep -- an enormously more lethal and an enormously larger killing zone, or battlespace. And what's the pace of movement today? It is exactly the same as it was in 1939. It's 11 miles a day or 20 kilometers per hour. It hasn't changed.



Some would say, "Not a problem. Make the battlefield more transparent. Continue to make it larger and more lethal, and eventually you'll win." We argue that's simply not so. A firepower attrition war - - a view of future war -- is no more relevant in 2025 than it was in the spring offensive against the Northern provinces of 1971. It won't work.

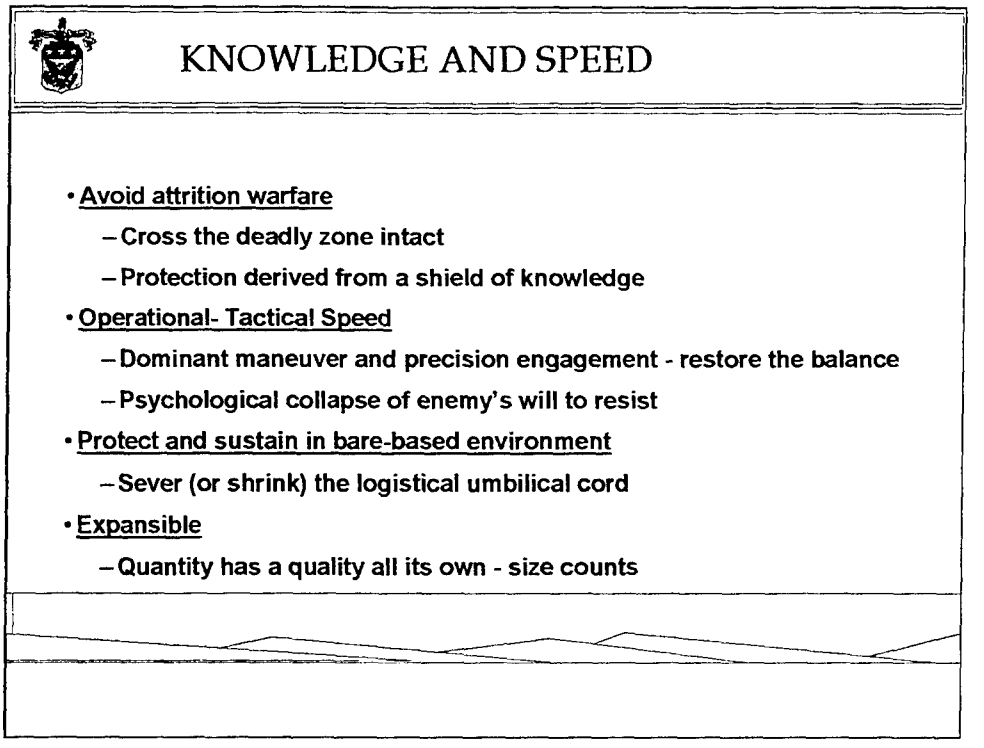
In the battle of 2025, just as Harry (Summers) said, you need a balanced military force that has the inherent capability to attack an enemy -- to reduce his advantage in time, and to collapse his will to resist -- just as the Panzer forces did in 1940. The question is how.

The answer is speed -- speed enough to cross the killing zone intact, speed enough to garner the advantage of time and apply it to our side. We must have forces that are able, in the next millennium, to exploit speed to survive. And not only speed in terms of velocity, but speed in terms of agility. We have to build forces that have the ability to operate at a very high momentum.

I disagree with, I think it was General Sheehan, who said the operational tempo for ground forces is 24 hours. It's really 72 hours per unit. But that's still not long enough, because units in the field follow that traditional pulse- and- pause scheme that again gives the advantage of time and initiative to the enemy.

The critical element in what I am going to talk to you about in restoring speed to the battlefield is logistics. The secret of blitzkreig wasn't tanks, airplanes, or Army personnel carriers at all. It was the ability of the German army to break free from the tyranny of the railhead, to break their operational maneuver force free form the railhead, and accelerate it by an order of magnitude to destroy the enemy's will to resist.

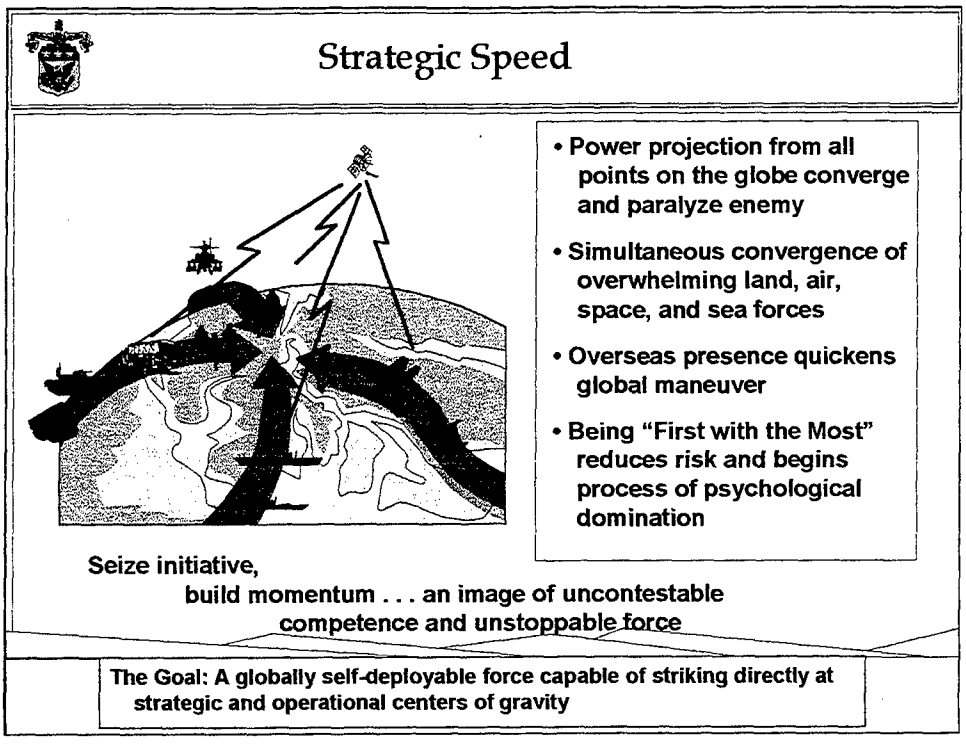
It's no different in 2025. The only difference is, instead of the tyranny of the railhead, we face this enormous logistical umbilical cord that restricts our operational pace of movement, and our strategic pace of movement. So, how do you do it?



First, cross the killing zone intact. Secondly, restore operational and tactical speed. Third, use the inherent advantage of the information revolution to lighten your force, to reduce your need for self- protection -- to reduce this terrible proclivity that the American military has to oversize, safesize, and to overstaff an operation because of fear of failure or a lack of information about the nature of the enemy force. And, finally, to borrow from Lenin, understand that quantity has a quality all of its own.

Battlespace in the Napoleonic era was 30 soldiers per square kilometer; today, it's about 16. And in the battle I'm about to describe to you, it may be five or six. But the bottom line is that technology no longer drives the size and density of soldiers on the battlefield. Psychology does -- the fear of violent death, the ability to bond with leaders, confidence in your leadership -- trust, to borrow a phrase from General Sheehan. All of that has to be built into small units before they can be broken out and dispersed to the degree that I'm about to show you here in a moment.

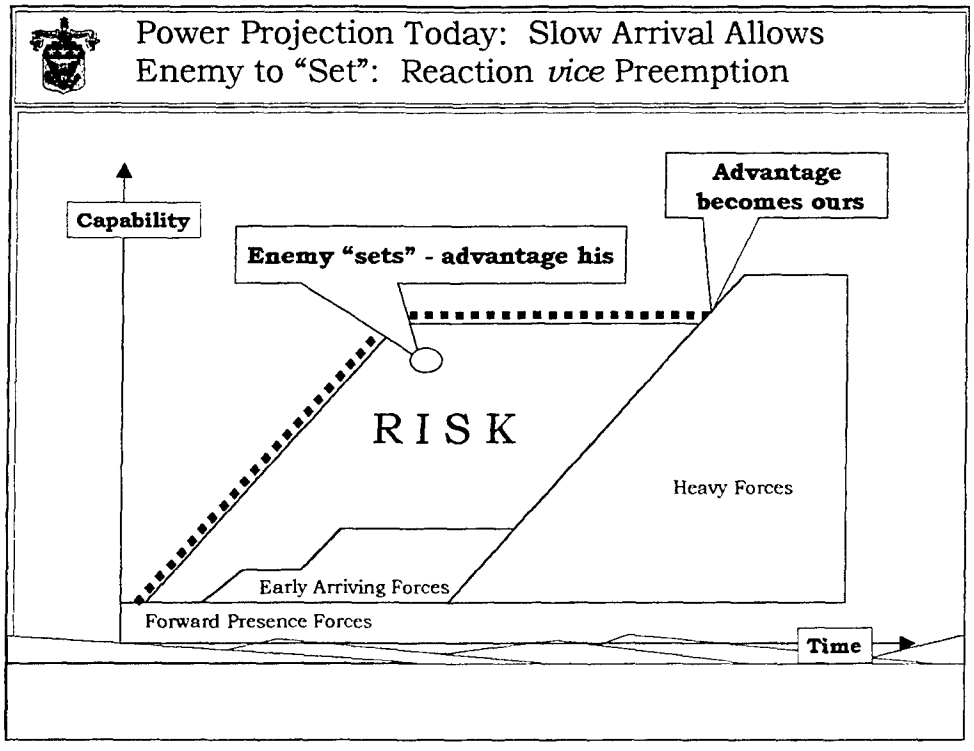
So, let me walk you through speed as it applies to the three different levels of warfare.



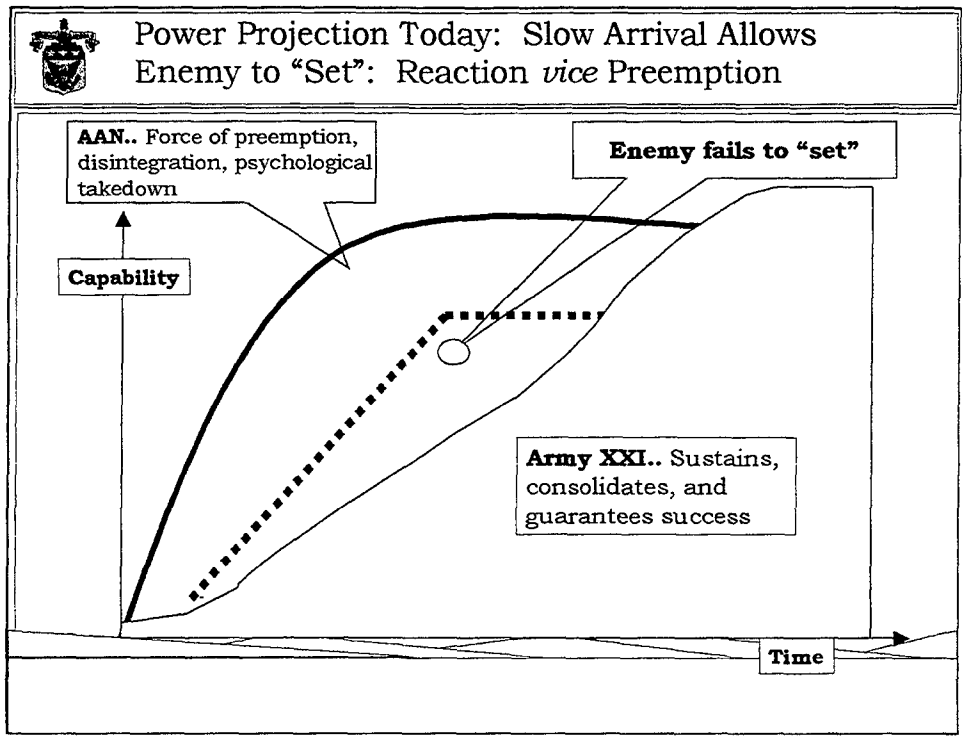
The information age is on us. The information age to the commercial sector will give us a knowledge- based army and information dominance. But to know is not enough. If you have a knowledge- based army without the ability to *act* on that knowledge when warfare comes, you simply die smarter.

Strategic speed. The act of strategic projection is a means by which the process of psychological intimidation and domination begins. When I did my study on Desert Storm, we interviewed senior Iraqi officers. And much to my chagrin, I realized that Peter Arnett was, in fact, our friend. The Iraqis, particularly those who had been stationed at a corps level and above around Basrah, who had a down link for CNN, told me that when they saw this enormous projection of forces from Beaumont and from Bayonne and other ports in the United States, they quickly appreciated the concept of a global power converging from all points of the compass by air, land, sea, and space. It planted in their minds the conviction that they would be defeated. The only question was when, and what cost?

As a nation, however, we face a problem after 2010.



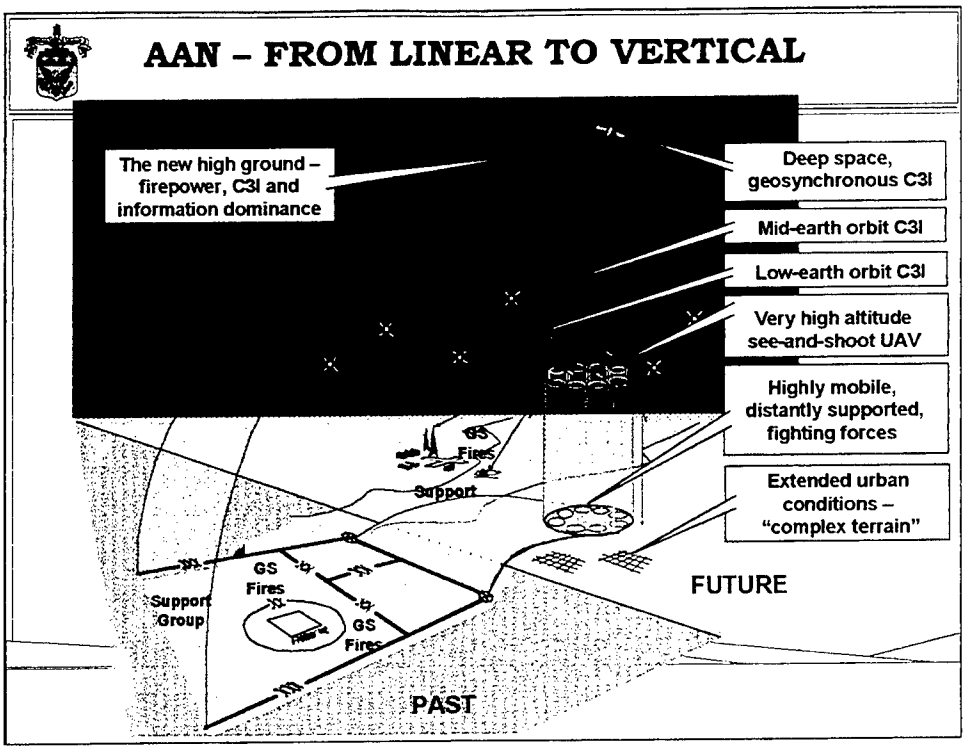
The way we do it now, and the way we've done it since the end of the Second World War, is through forward presence forces, pre-positioned to provide early warning -- the global scout function. Unfortunately, our forces face an enemy who is already set in-theater, closer to his operational objectives. The military challenge for strategic projection forces is to restore the balance -- to counterattack, using Air Force terms. This means that you have to send early- arriving forces that can place a line in the sand. But those projection forces don't have the ability to conduct offensive maneuver and, sometime in the future, they count on the calvary arriving in the form of heavy air and land forces.



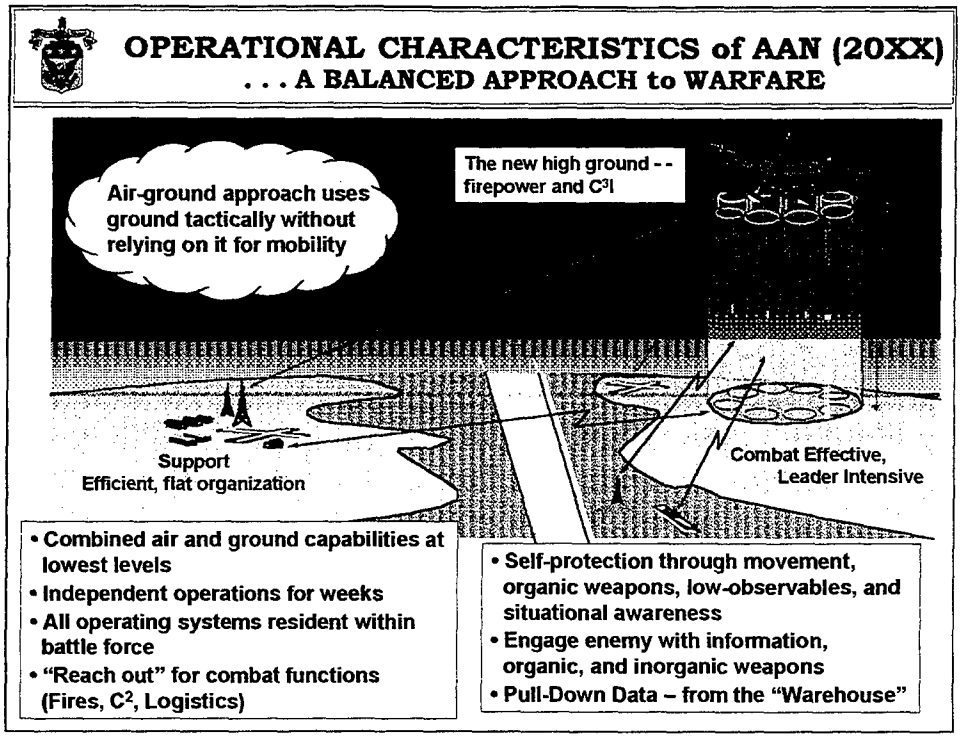
What we want to do in the future is to be able to build an early arriving force able to achieve an act of strategic preemption -- a strategic coup de main, if you will. They will arrive in a theater of operation so quickly that the enemy is unable to capture and hold his operational objectives.

What happens if we could have put three brigades into Kuwait before Saddam crossed the border? What happens if we'd have put three brigades across the three Rhine River bridges to prevent the German army from marching into the Rhineland in 1935? Those would have been acts of strategic preemption.

I get in trouble with the press at this line here (pointing to the line immediately above the Army XXI block). If you're not careful, and if we don't reform the Army XXI, and form it to fit with our early- arriving strategic preemption forces, then we have a situation where we may be a continent too far away. So, the active reform of ground forces is one that melds and alters the composition of our strategic projection capability, parallel with existing forces and new forces that might come along. How do you do that?

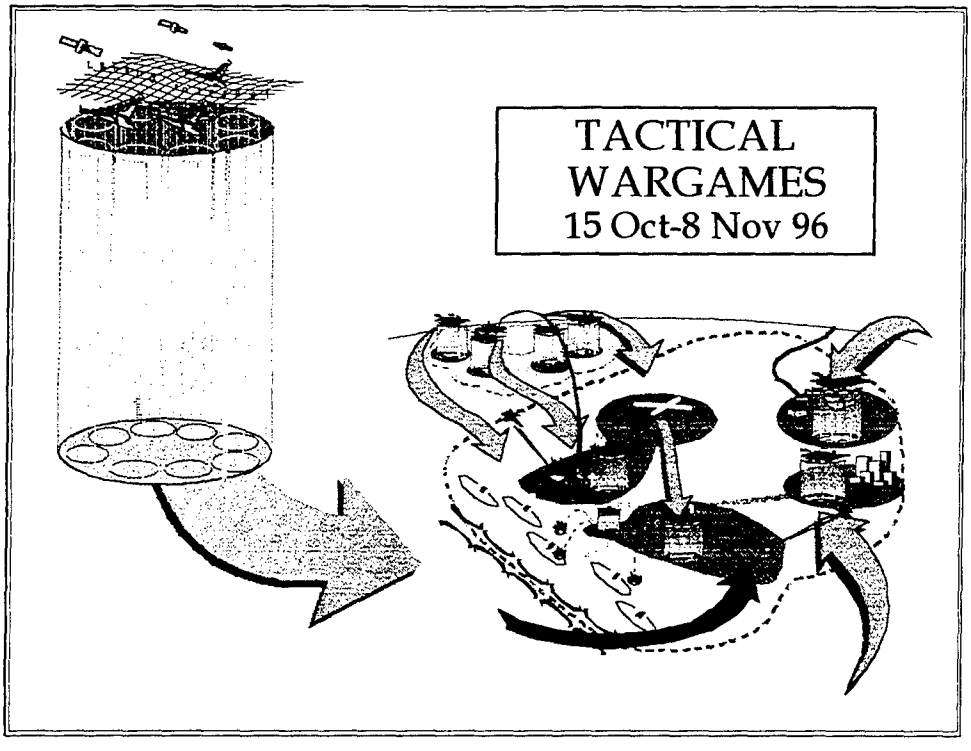


The only way to do it is to accelerate the pace of operational movement on the battlefield by an order of magnitude. We can no more achieve what I've just shown you at the theater level of war with a 20 kilometer per hour Army than we could with a two- and- a- half mile per hour Army in August 1914. We must be able to accelerate the pace of movement. And the only way to do that for operational forces is to transform ourselves from a two- dimensional into a three- dimensional force.

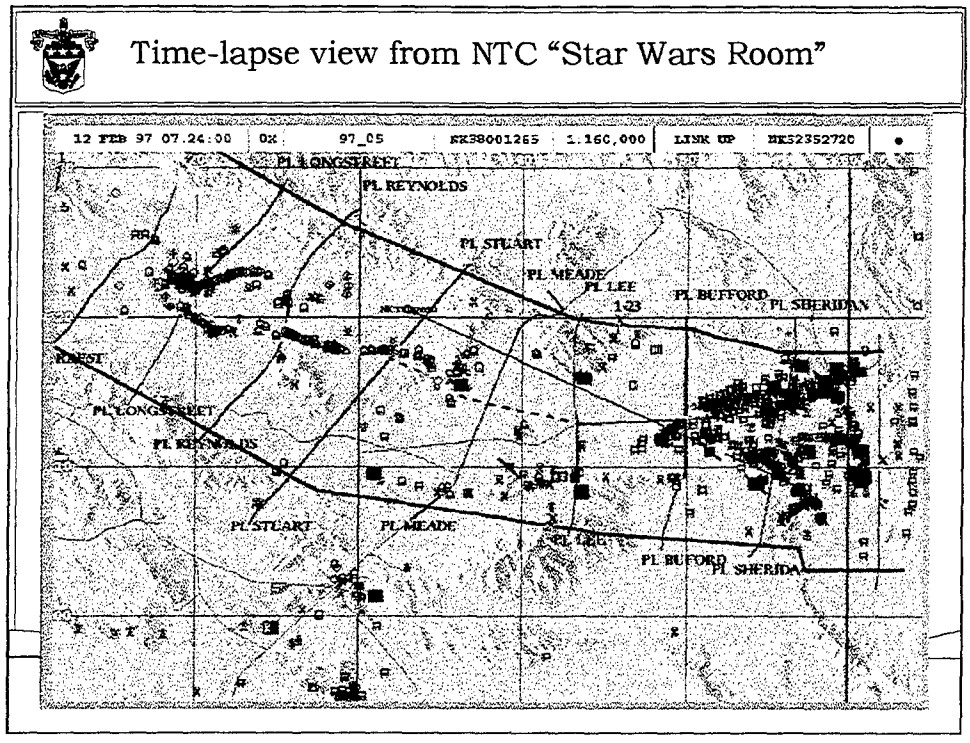


How do you do that? Something like this: first, remove from the immediate confines of the closed combat area everything that isn't needed to perform four essential functions: movement, sensing, fusion and killing. That means that -- thanks again to the information revolution -- we should be able to remove whole categories of combat functions away from the close-confines combat area, to include, helo- communications, logistics, intelligence, and most fire support. Just pick them up and move them somewhere else.

Where else? Somewhere out of the close confines to an area with some form of sanctuary outside the range of crude weapons of mass destruction. What you see at the right is a force that's able to move at a single bound about 600 kilometers, consisting of somewhere around 7,000 soldiers, that has inherent in its battlespace sphere, or battlespace cylinder, all of the seven inherent combat functions. That cylinder represents what my war-gamers call the "surface- to- space continuum" -- that is, the ability to form a continuous connection between surface forces and low- altitude, medium- altitude and high- altitude devices connected up into space, so that many of those functions can be removed elsewhere.

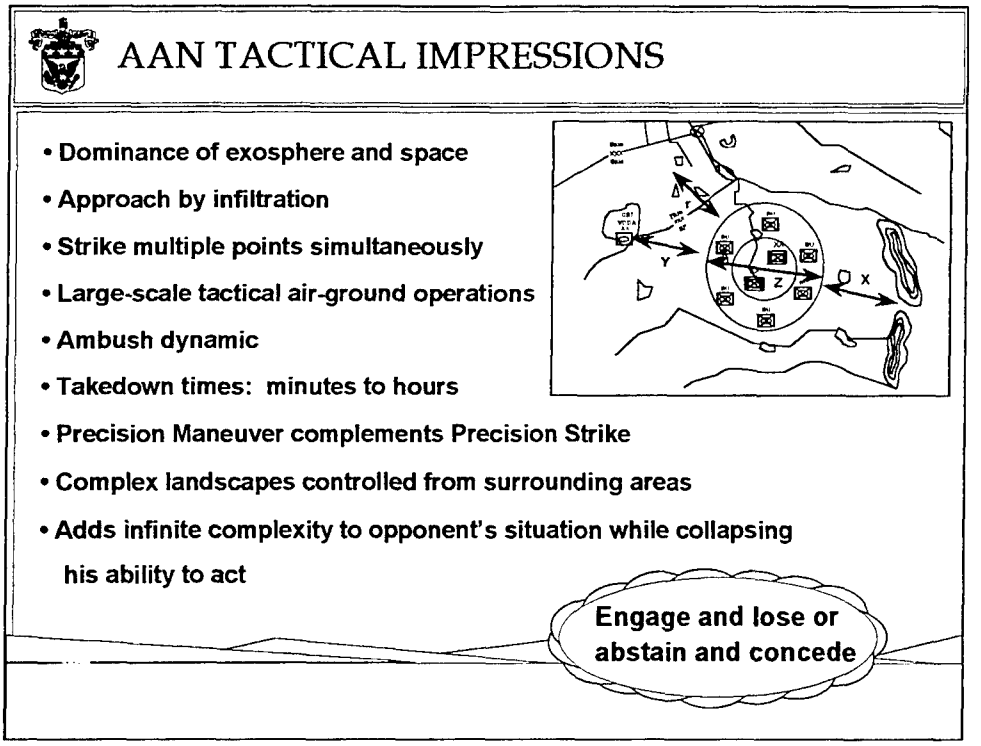


Last fall we conducted a series of tactical war games. We built a series of "Army After Next" battleforces and experimented with them in a sophisticated tactical war game that exploited, or was able to measure, information dominance versus just the single force- on- force measurement from traditional war games. And we came up with some very interesting insights.



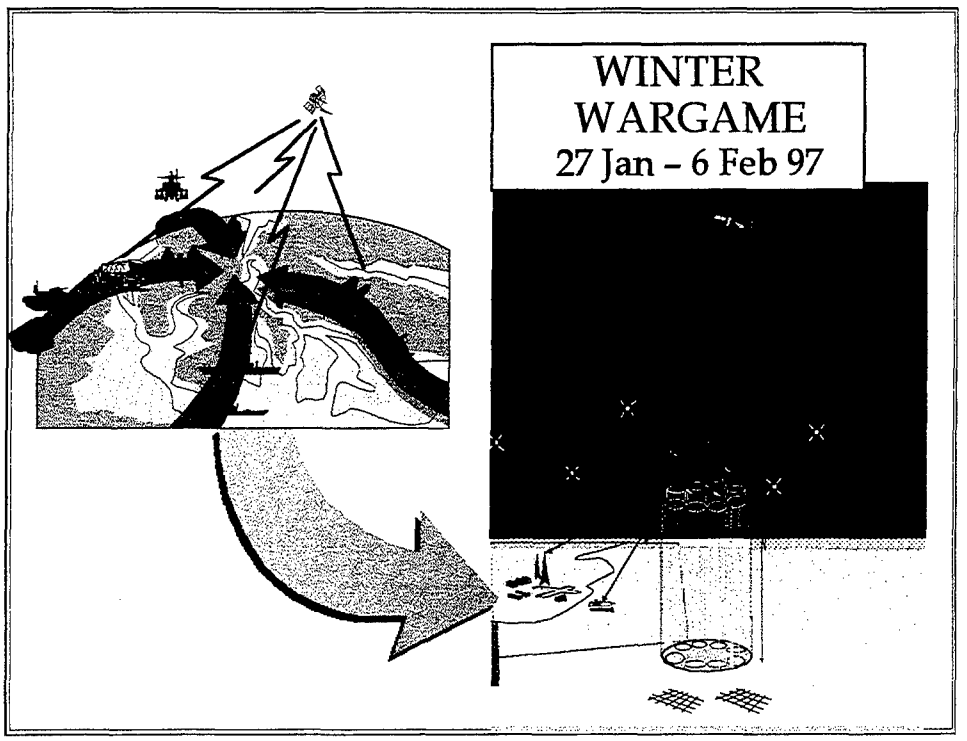
We built a series of information tiers and metered information to the red and the blue sides. By the way, if you don't conduct war games that are free-play, force- on- force, you're just telling each other bedtime stories. We did that out at Fort Leavenworth, with two forces, red and blue. We metered information to create an information flow ratio of about 3- to-1. We continued to meter the information flow, and when we reached a dominance on one side of about 9-to-1, the cycle, pattern of movement, maneuver, and fire on the battlefield changed fundamentally.

There are some caveats here. First of all, if you don't control space in the exosphere, none of this works. Secondly, if the enemy possesses even primitive weapons of mass destruction, even at the tactical level, you must approach the battlefield in a dispersed fashion. Third, because of our dominance of information and our ability to control many disparate parts of the battlefield, we were able to take, first, the application of precision, followed by the application of a force, and were able to gain positional advantage over the enemy. We turned a three- week campaign into a two- hour campaign.

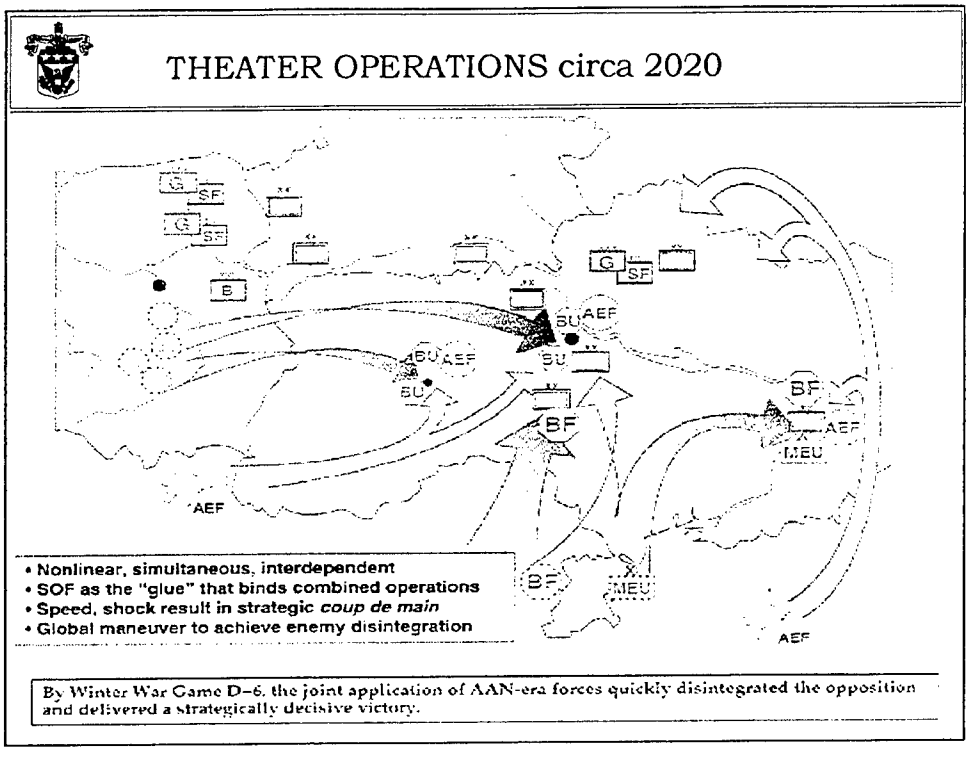


Why? In the limited time I have available, let me just give you a gross analogy. Picture seeing an open field, a meadow maybe the size of this auditorium, with thousands of fires burning in the meadow. Picture the ability to drop two large wet blankets on top of those fires and snuff them out. If you're looking for an historical analogy, forget about Desert Storm for a moment and think more about the operational takedown in Panama in 1989. We did seven iterations. Of the seven, we won five; the enemy won two. How? They went straight for the cities. And by going to the cities, the takedown time went from hours to days, and, in one case, several weeks.

This is a difficult problem. I'll be more than happy to talk about some ideas about urban warfare, separate and distinct from (General) Paul Van Riper's ideas about urban warfare, to tell you how we did that.

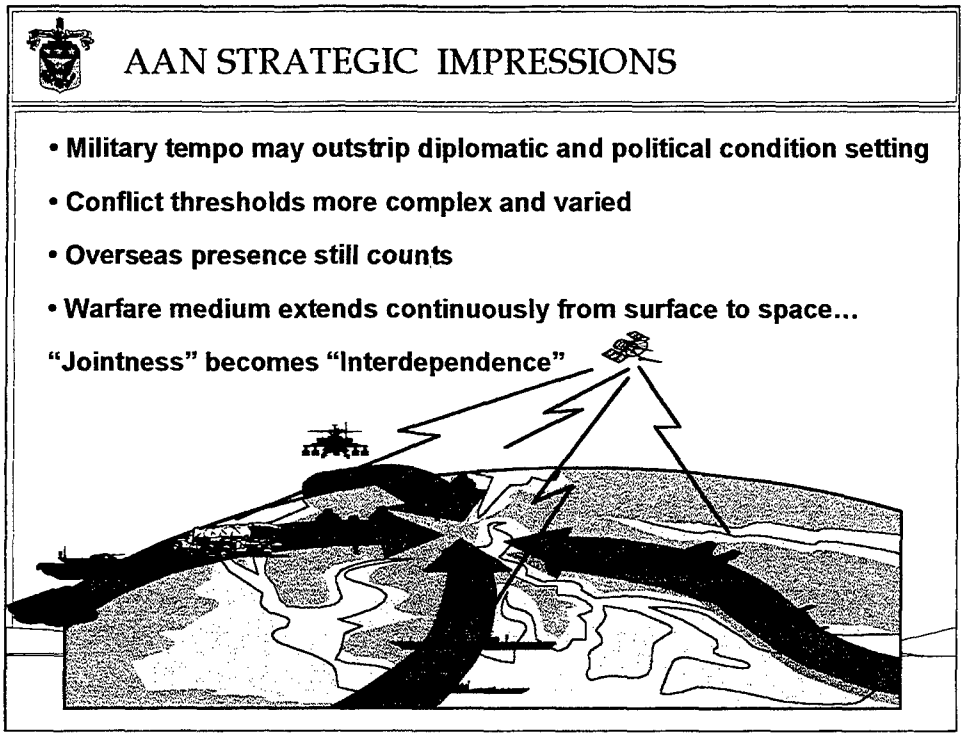


Then we did a series of winter war games -- the largest strategic future war game the Army has conducted in its history.



For those of you who are geographically challenged, we fought the battle in the Ukraine, over a 12-hour period. It essentially was a strategic takedown that took three "Army After Next" battle forces, juxtaposed them with Air Force AEFs and Marine MEFs, and managed to collapse an entire Red Force in a period of 12 hours.

We used strategic preemption – approaching from four or five different directions by air, land, sea, and space. The enemy was kept out of his operational objectives, and destroyed in the open. We dodged a bullet in not having to fight in the streets of Kiev.



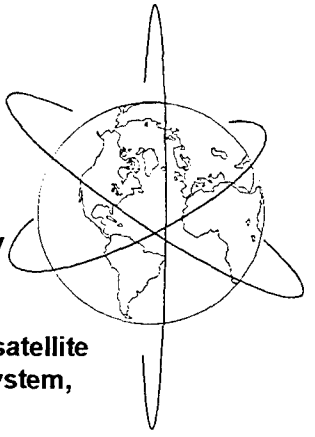
Here are some of the insights we had, and this caught us by surprise. Suddenly it was August 1914. If you tell the President of the United States that it used to take us 30 days to deploy to a theater, and it now it takes you three days, what does the President say? "You've given me 27 days, thank you very much."

And that's what happened here, particularly as the Red Force began slowly to erode our dominance in space. Space became a Pearl Harbor in slow motion. And it very greatly complicated the process of strategic projection. Because, for instance, our ability to project forces to Europe was measured at thirty-two hours. The process of cobbling together a coalition and doing the diplomatic and political condition setting was more, not less complicated, and it made the strategic problem the most difficult problem.

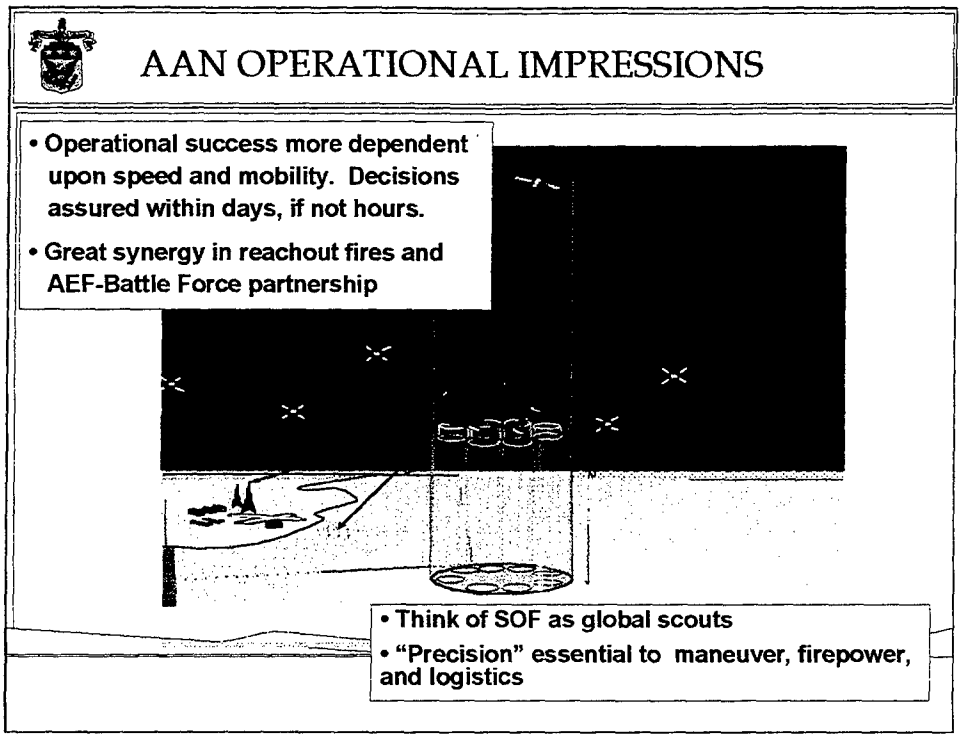
Also, if you can project a force like this in 32 hours, conventional warfare, to an enemy at least, begins to take on the image of warfare with weapons of mass destruction, doesn't it? Because it's that overwhelming.

SPACE and INFORMATION IMPRESSIONS

- **Immediate impact from space attack**
- **Space-to-ground continuum essential to information dominance**
- **Information operations contribute immediately to operational and strategic campaigns**
- **Dependence on GPS demands either a rapid satellite reconstitution capability, a surrogate (UAV) system, or greater redundancies**
- **Army must broaden its traditional focus on delivery of space products to warfighters.**



Space was the Achilles heel. The immediate impact of space, as I said, was such that the President wasn't sure if America had been attacked, because no American boys were dying and no American territory had been seized. The enemy's surprise was that, by 2025, the constellation of orbiting bodies was so thick and so robust, and so interconnected with those of other countries, that, until he attacked military- specific satellites, he had little or no effect.

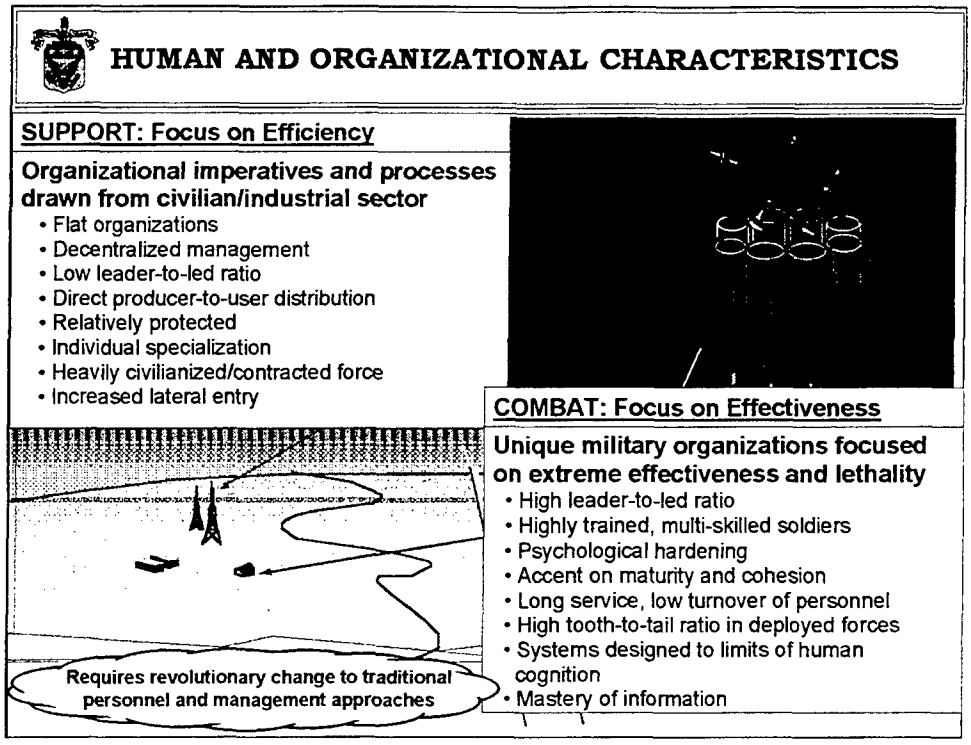


Operationally, there is an enormous synergy between the ability to apply massive precision on the one hand, and the ability to apply precise maneuver in a near- simultaneous fashion on the other.

My key point is that the biggest impediment to exercise success was joint operations. Jointness was the best friend the enemy had in this particular exercise. The American joint operational system, which demands a sequential, linear, pedantic, carefully coordinated, planned application of combat power gave the enemy time to react.

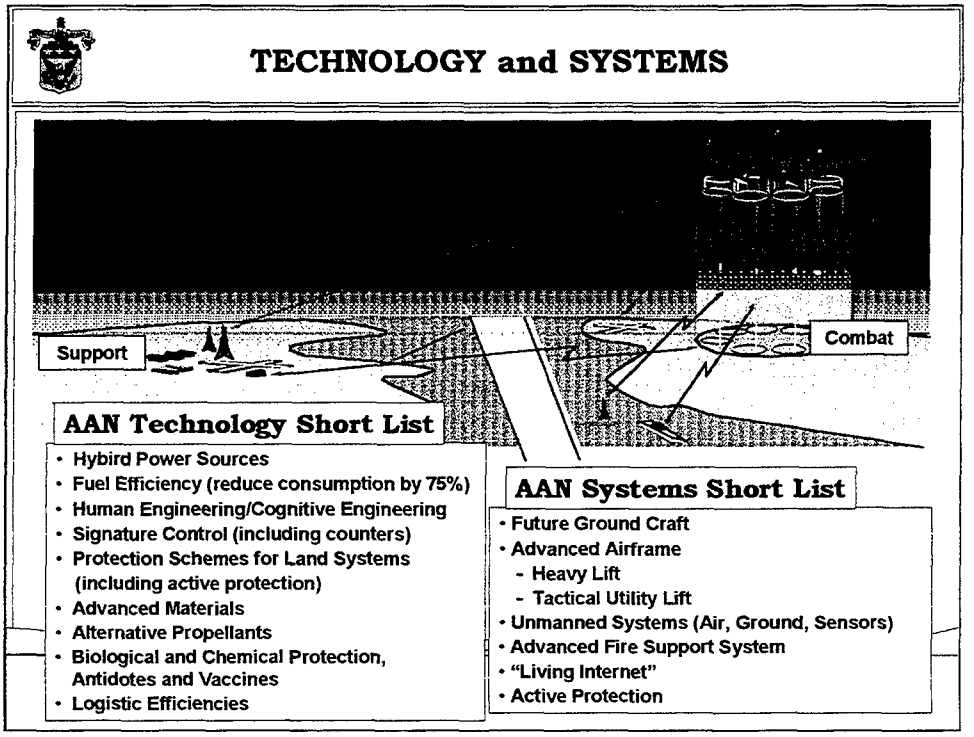
What we need in the future is something *beyond* jointness, which in our book we call interdependence -- the ability to push aside the bureaucracy associated with the application of fire and maneuver, and get beyond it -- much like General Sheehan talked about this morning.

The use of SOF as global scouts is important. Because we did not have the ability to set the diplomatic and political conditions for victory, SOF became our most effective means of gaining time and using economy of force. By SOF, I don't mean just special operating forces. I mean soldiers embedded in theaters of war for a decade, who establish that special trust and confidence with potential coalition partners. An alliance is a marriage; a coalition is sleeping together. And if you don't have confidence in your partner, it's very difficult to come together for just a one- night stand.



To build an organization like this requires a fundamental change in the way armies recruit, train, and retain people. The force on the left would warm the cockles of Frank Fukuyama's heart. It's industrially efficient, has a high density of reserve components, contracted personnel, host- nation support, and like any good industry, a leader-to-led ratio of 1:12 or 1:13.

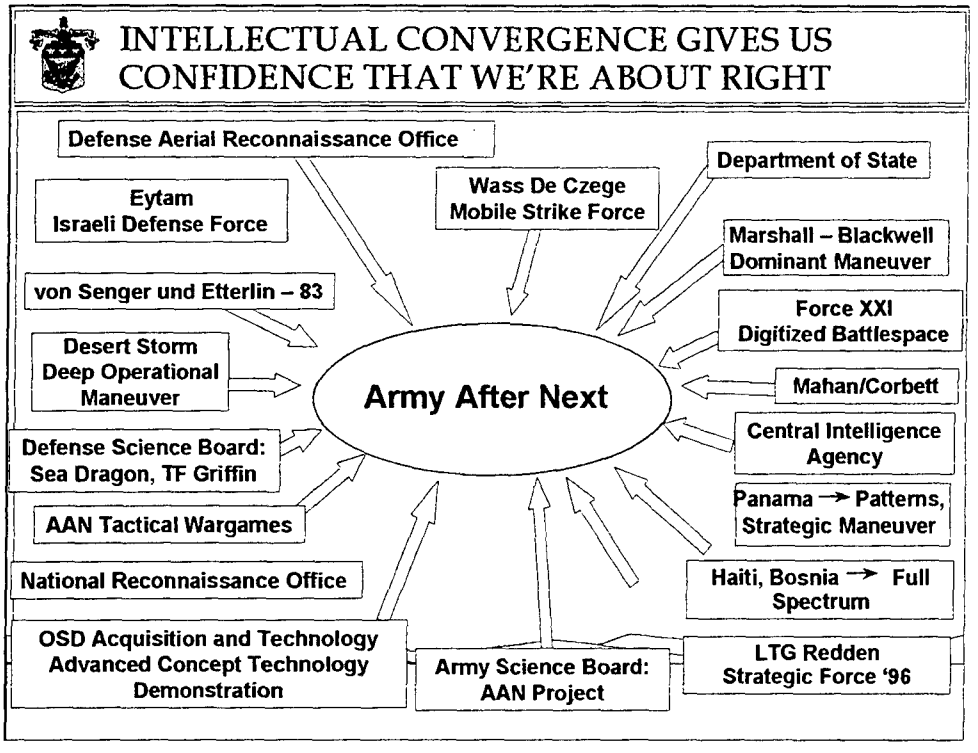
On the right is an entirely different force -- with a very high leader- to- led ratio, perhaps 1- to-2, and bonded to a degree unprecedented in our military history. Think of platoons that are together for decades, rather than months, with a leader- to- led ratio, as I said, of 1- to- 2; with an apprenticeship and a selection process that takes years, if not decades, to be fully qualified to be part of that organization; with the ability to operate under the enemy's precision in an environment threatened with weapons of mass destruction, isolated, hundreds of kilometers away from friendly forces for periods stretching into weeks, if not months.



It's too expensive? No, it's not too expensive. Heinz Guderian didn't invent machine warfare. Society invented machine warfare. The internal combustion engine, the vacuum tube and metal roads dictated a change in the nature of warfare, whether Guderian would have shown up in 1933, or not.

The same applies for the information age. It will fundamentally change the way we build and project forces. Exploitation of the private sector market and the thickening of our telecommunications pipes in the years ahead will give us the means to do most of what we seek to do, if in our own silly way, we don't allow our acquisition process to get in the way of progress.

Think of a craft that's able to lift hundreds of tons with a single lift. Now think of an AT&T "craft", where small numbers of people are hired out to provide the level of strategic telecommunications we need to do just what I've just said. Our future R&D efforts can then be focused on the things that the civilian industry can't give us -- distributed precision, hypervelocity missiles, UAVs, and protection against weapons of mass destruction.



One of the things I've learned in this two and a half years of study of how militaries change is simply this: if you don't get the ideas and the visions right, just as General Sheehan said -- if your view of the future isn't clear and if you don't have the ability to follow the intellectual glide path from the line of departure today out a generation ahead – then you will throw money and resources at bad ideas. That only makes bad ideas worse.

The greatest technological innovation in the 20s and 30s was the Maginot line. It was terrific. The eleven mechanized, motorized divisions the Germans put into France in May 1940 were essentially derivative technologies taken off their ships.

Which side won? The side that got the ideas and the vision right, and then managed to leverage commercial technologies to build an operational method that dominated during the invasion of Flanders in 1940.

Thank you.

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Presentation by
Dr. Gene H. McCall
Los Alamos National Laboratory, University of California

GENE H. MCCALL

Los Alamos National Laboratory of the University of California

Dr. McCall is a Laboratory Fellow of the Los Alamos National Laboratory of the University of California and is Past Chairman of the United States Air Force Scientific Advisory Board. At Los Alamos he was one of the founders of the Inertial Fusion Program, and participated in laser and plasma physics research. He and a small group of collaborators designed and built the first high power Nd:Glass laser to be used for fusion research at Los Alamos. From 1972 to 1976, he was leader of the group responsible for the development, design and performance of diagnostic instrumentation for laser-driven fusion experiments, for the fabrication of targets for fusion experiments, and for the development of new technologies in these areas. He holds patents in both the diagnostic and target fabrication areas. He was responsible for the discovery of and the explanation of the high-energy electrons and large electrical currents produced by the interaction of high intensity laser light with matter. He was Leader of the Laser Division from 1980 until he became a Laboratory Fellow in 1982.

In addition to his activities as a senior advisor to Laboratory, Department of Energy, and Air Force managers and workers, he continues to be active in hands-on scientific and applied science work. His research as a Lab Fellow has been in the areas of lasers, hypervelocity particle production, plasma physics, and nuclear weapon related science. He invented techniques for the shockless acceleration of matter to high velocities, developed a large program to explore those techniques, and served as the Chief Scientist of that program from 1986 until 1992. He has contributed to the development of large computer codes for modeling nuclear and conventional weapons and has developed algorithms for describing detonations. He also developed new experimental techniques for investigating shock waves in matter using microwaves.

He worked abroad in the United Kingdom as a Visiting Professor and a Visiting Fellow in the Physics Department of Imperial College (London) and a Visiting Staff Member at the Atomic Weapon Establishment, Aldermaston. He has collaborated with workers at the Rutherford-Appleton Laboratory and at the University of Essex in the UK on laser-produced plasma and laser-driven shockwave experiments. At the United Kingdom Atomic Weapon Establishment he participated in nuclear weapon technology and design projects of joint interest to the United States and the United Kingdom. He was a Visiting Researcher at the Institute of Laser Engineering at Osaka University, Japan.

Dr. McCall was awarded the prestigious E.O. Lawrence Award by the U.S. Department of Energy in 1988 for contributions to National Security. He has also received Distinguished Performance Awards from the Department of Energy and from the Los Alamos National Laboratory. In 1995 Dr. McCall directed the *New World Vistas* study and received the 1996 Theodore von Karman Award in recognition. In 1997, the Secretary of Defense awarded Dr. McCall the Department of Defense Medal for Distinguished Public Service.

Dr. McCall is married to the former Leslie Summerford of Albany, GA, and they have one son, Stuart, who is an officer in the United States Army.

The 21st Century Military Environment

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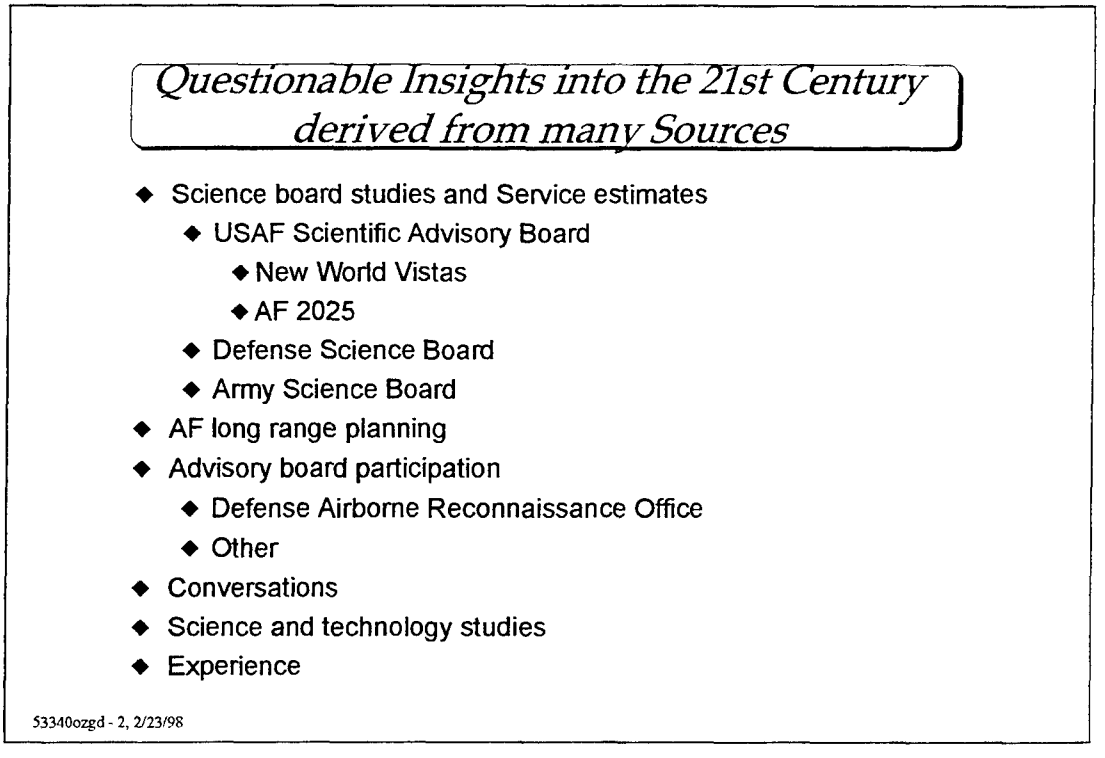
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

15-16 JANUARY 1998

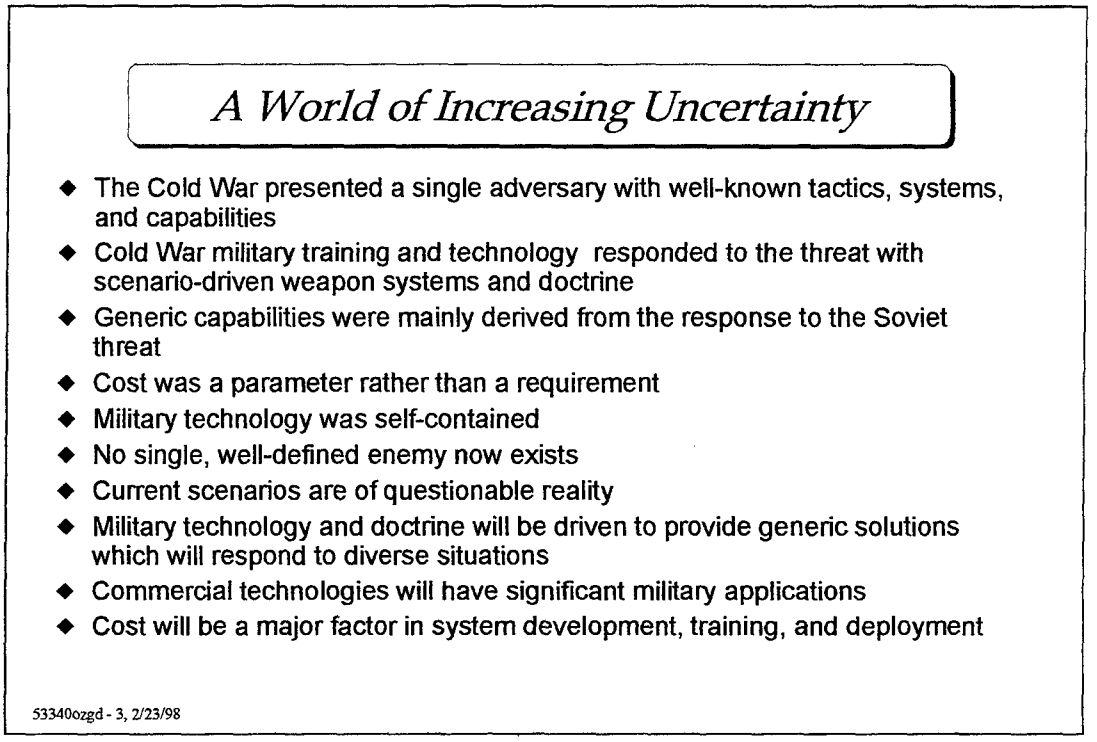
Gene H. McCall
Los Alamos National Laboratory

It's appropriate that General Sheehan set that strategic context for our discussion of the operational environment of the 21st Century. And I think what General Scales said concerning the imperatives of the battlespace and the structure of forces for the future Army applies equally well to the other services.

What I would like to talk about is certainly more technology- oriented. Let me caution you not to interpret my discussion of technologies as technologies which enable platforms or things; I'll discuss technologies which enable capabilities. So, I will discuss the future of military technology in terms of the capabilities which are enabled by them.



When I see hear someone talk about the future, I always wonder where they get this stuff? So I decided to make a slide that would give you an idea of where some of my stuff comes from. Some of it is Air Force oriented because of my background, some is from the New World Vista Study of the Scientific Advisory Board, some of it is from the Summers report, some from Air Force 2025, which I think Jay Kelley will talk about, some is from Defense Science Board Studies, and so on. I noticed I've left out the Naval Studies Board, but it did have an effect here, as did Joint Vision 2010. In the end, what we're really talking about is experience and conversations with others, and forming an idea based on your own experience and those of others in the future.



I call this chart "Questionable Insights Into the 21st Century" because, any time one talks about the future, you should certainly question that person. Questioning is going to be a significant characteristic of the military officer of the future. I think that, in any case, we are going to have to question our own opinions; we are going to have question our own scenarios; and we are to going to have to question our doctrine. We're just going to have to keep questioning until we think we have it right, and then we are going to have to proceed.

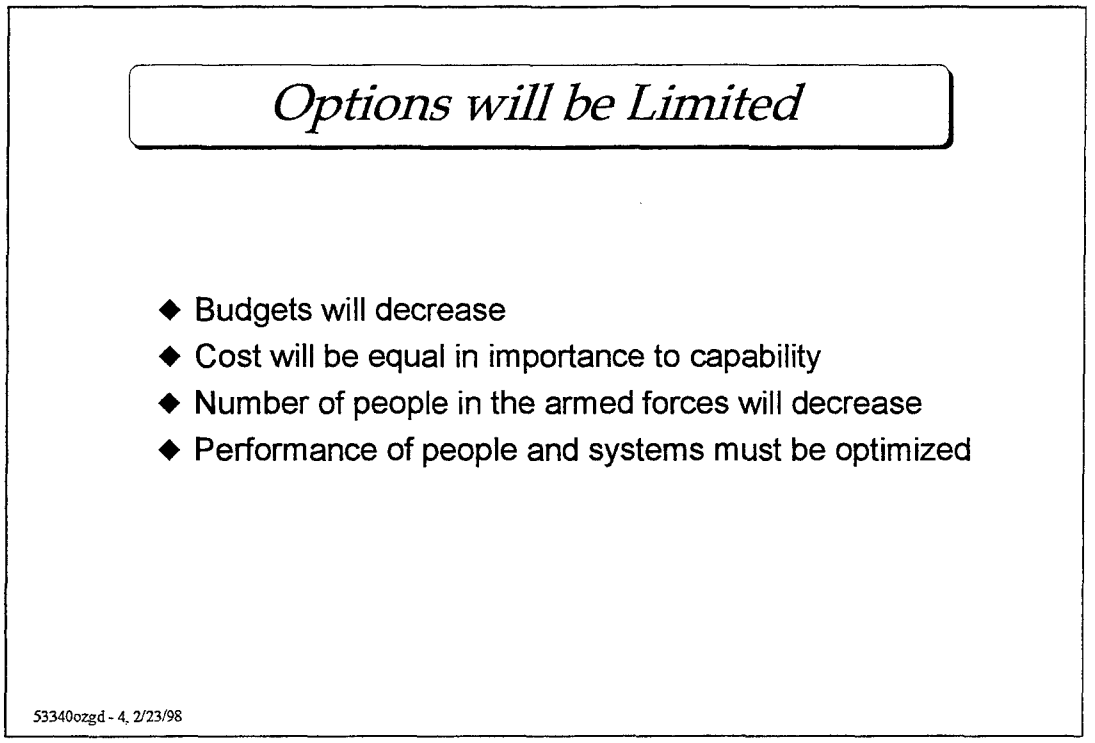
The world is one of increasing uncertainty. During the period of the Cold War, we tended to proceed on the basis of scenarios. We constructed scenarios which we really believed had basis in fact. Those scenarios led us to think of ways of countering the Soviet Union. We generally would come up with an idea for a new system to counter something that, we believed, was happening in the Soviet Union, and I think we did pretty well at that. The Cold War military training and technology paradigm responded to this threat with what I call a scenario- driven, weapon- system approach.

We generated a number of generic capabilities as a result of that. In fact, we fought with those generic capabilities generated during the Cold War and Desert Storm, and did very well. But that was not the purpose of generating them in the first place.

Cost was certainly a parameter in everything we did, because, we usually found that our first idea of the system was unaffordable. But cost was not a major parameter going into studies of ways to proceed against our enemy.

What is the situation now? As we've heard many times, there is no single, well-defined enemy. The scenarios we've built, the study aids, have questionable basis in reality. Military technology and doctrine must now respond to generic problems. We don't know what those specific problems are, and so we have to address the generic if we want to be able to fight a specific war in the future.

Commercial technologies are certainly becoming far more applicable to military problems than they ever were in the past, partly because of the proliferation of information technologies around the world. But, as we all know, anyone who has tried to start, or pursue, a program in the past few years understands that cost is a major issue. It will be a major factor in the development of everything we do, certainly for the next decade.



What about our options, given all this may be true? Budgets are going to go down. I don't think we've seen the bottom of that yet. We're going to find that cost is equal in importance to capability. Now, that's a rather frightening prospect, but I'm afraid it's the world we live in. The number of people in the Armed Forces will decrease, and we must optimize the performance of those who remain in the services. We'll try to do that through technology.

Sometimes it's said that we must do more with less. That's not what I mean. Don't say that, because it's really rather insulting to the people who are trying to do the best they can and who are overtaxed in performing their jobs right now. I say we must generate systems. We must generate technologies that optimize the performance of the people we have in the Armed Forces.

Maintaining Technical and Operational Superiority Difficult and Important in the 21st Century

- Commercial capabilities are developing in militarily important fields
  - Space communications and surveillance
  - Information processing
- New technologies will be available to all purchasers
- Military systems will be pressed to respond to commercial developments
- Foreign arms sales will become more competitive
  - New vendors may enter
  - Low observable cruise missiles
  - Highly effective SAM's, anti-ship missiles, anti-armor munitions
- Reduced procurement budgets will demand that many new capabilities must result from technology insertion

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We all know about what is happening in the communications field today. We've heard of Iridium, Teledesic and Bill Gates putting up hundreds of satellites. But we don't hear as much about surveillance. We've heard it mentioned once today, but you hear it only in a few limited arenas. Commercial organizations, a lot of them multinational, are launching satellites that will certainly have one meter ground resolution. Some are hyperspectral, which means you can't hide from them with camouflage. They will be available to the highest bidder, and the cost of pictures, now available for a thousand dollars, is probably going to come down to a hundred dollars, or ten dollars, depending upon the turnaround time you want.

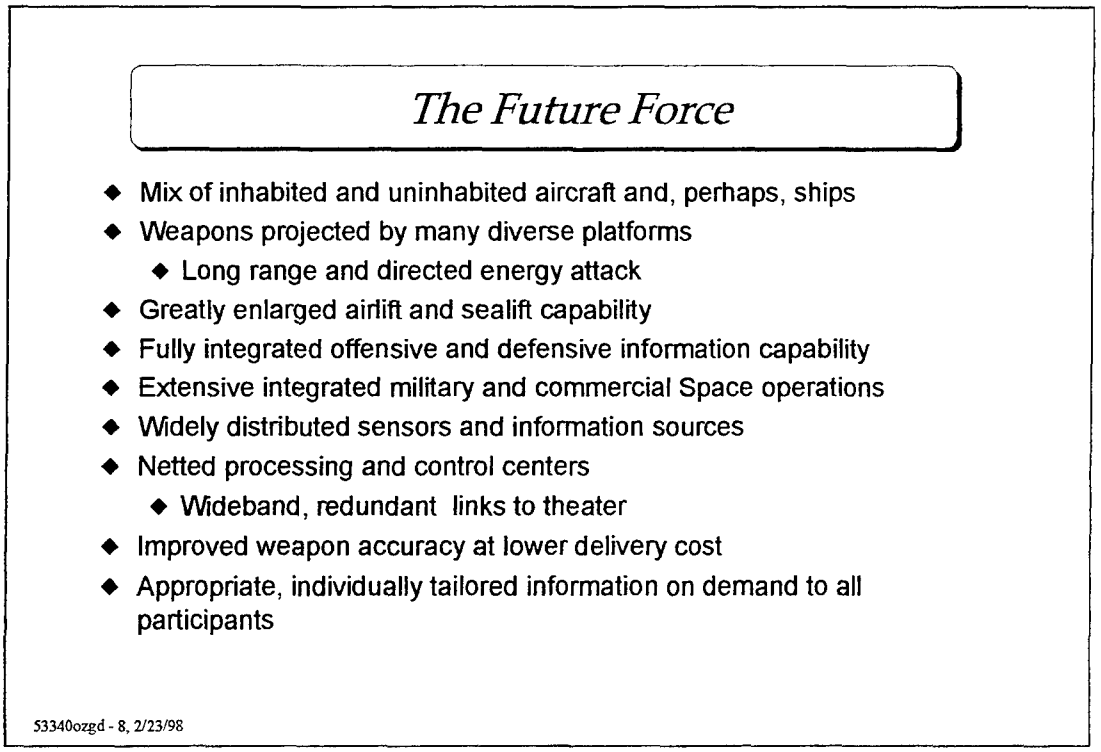
The day will come when our men and women of the Armed Forces are going to be targeted and die because of commercial multinational space observation capabilities. Frankly, I think we have to do something about that situation. These new technologies are available to all purchasers.

Military communication systems will be so intertwined with those of our own commercial world, and those of our allies, that we will simply not be able to turn them all off. In fact, we may not be even able to find our enemy's communications in this tremendous battle which will occur around the world once there are hundreds or thousands of satellites in orbit, all carrying gigabits of data per second, most of it encrypted, whether military or commercial.

Foreign sales are becoming more competitive. New vendors are entering the market and bringing in new technology, such as high-power microwave and laser technology, new information technologies, and low-observable cruise missiles that we won't be able to find very easily with the systems we have today. And if we find them, it's hard to destroy them before they reach their target.

More highly effective surface-to-air missiles, anti-ship missiles, and armor munitions are going to appear over the next few years because, with the information and control systems that are developing and processors now available, they're easy to make; and they're cheap.

Look at the dichotomy. In working recently on anti-personnel land mine replacement issues, I've heard people say, "Well, land mines are really cheap." Ah ha! Land mines are cheap because a Third World country can go out and pay three bucks a piece for them. We pay $250 apiece for about the cheapest mines we employ, and building a mine field will typically cost you a quarter of a million dollars, right from the outset. That's not cheap for us -- it's cheap for the enemy. And the same thing is happening with information systems in the commercial world.



What is this future force going look like? If we take advantage of all the capabilities and commercial technologies we can generate, what are we going to have on both sides? We're going to have a mix of aircraft, some which have people in them and some which don't -- aircraft I like to call "uninhabited aircraft," to get away from the issue of what "pilot" really means. The idea of uninhabited ships, I think, is one that the Navy will eventually consider, just as the Air Force of the day is considering the idea of uninhabited combat aircraft, for jobs where it makes sense.

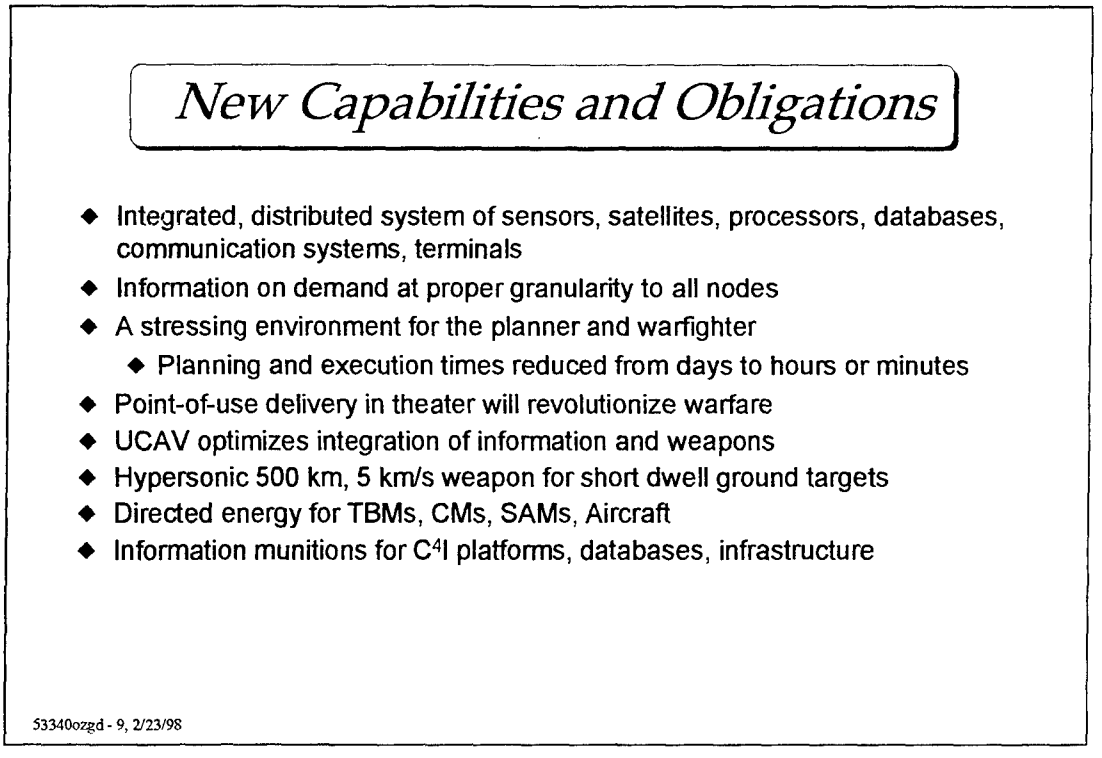
We are going to have weapons projected by many diverse platforms -- some delivered by air, some by sea, and some from the ground; and you really can't distinguish weapons based on their range, or based on their accuracy, in terms of the platform which delivers them.

Information is a rather special subject that we hear a lot about. We hear a lot about the information world. So where does defense information stand, in general?

Fifteen or twenty years ago, the Department of Defense purchased 60 percent of the information products produced in the United States. Today, the Department of Defense purchases less than 2 percent of the information products produced in the United States. That means that there is no one who, in the long term, is going to address our problems with the same intensity, or the same interest, with which they address

the problems of commercial information technologies. So, we *are* going to use those commercial technologies. But that means we're going to use them smarter than our enemy, because they can buy them, too, and they are becoming cheaper all the time.

We're going to have netted-processing. We're going to be able to network information and, eventually be able -- and so will our adversaries -- to distribute individually-tailored information to all the participants in the battle space. This means, in principle, that the private can know as much as the general about what's going on. Distribution of information should never be a question of equipment; it should only be a question of doctrine and security. And that is certain to lead to a number of cultural changes in the services.



What about these new capabilities and new obligations that will be incurred by the military officer of the future? I mentioned integrated and distributed systems. We're going to have satellites that work together. Nowadays, we tend to put up a satellite, and the satellite does its thing – it sends messages or pictures down, or whatever. In the future, satellites that communicate with the each other are going to perform integrated tasks, which means we, and our adversaries, will be able to view a part of the world 24 hours a day, at whatever revisit rate we like. It's not going to be cheap. It's just going to be possible.

This is a very stressing environment for the planner in particular, because planning must occur on a much more rapid basis and at a much more rapid rate than we've been accustomed to in the past. Planning will require great flexibility, great innovation, and a capability for pursuing new approaches when the old ones no longer make sense – in periods that may be only days or, perhaps, weeks.

When I think of flexibility in pursuing new approaches, I'm reminded of a woman who was called for jury duty in a civil case. She told the judge that she couldn't serve because she was opposed to capital punishment. She had seen the O.J. trial and the Oklahoma bombing trials. The judge said, "Well, that really doesn't apply in this case, because this is a civil case in which the husband took all of the money out of their joint bank account and spent it on liquor and women and gambling." And the woman said, "Oh well, in *that* case, I guess I *can* serve; After all, I may be wrong about capital punishment." We must be flexible.

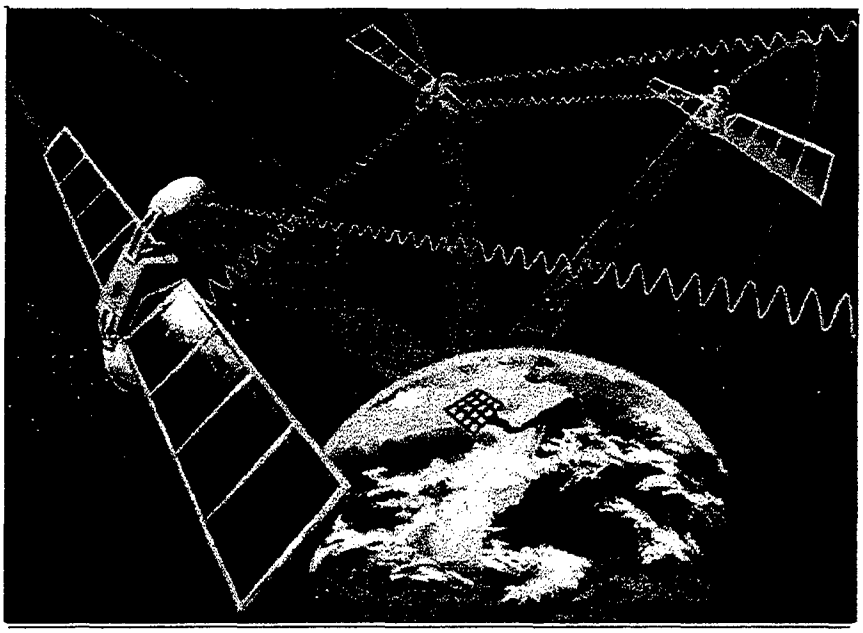
Uninhabited combat air vehicles certainly optimize the integration of information and weapons. They are information machines which carry weapons. They're not just airplanes that fly to a target and drop a bomb.

Directed energy for theater missile defense, and cruise missile defense for defending against surface-to-air missiles, will also become more important.

I use the term information munitions because we hear the term information warfare so much, but it's not well-defined. I think it has its possibilities, but we must define information and information use in the way we define the use of a 2,000-pound bomb, a precision-guided munition, or an artillery round. Until we do that, it's not going to be accepted in the force, because it's not going to be understood -- in the same way that space, and space capabilities, have not been understood in the past, and have not been used to their maximum capability.



Airplanes may look more like this than the airplanes we're familiar with now. This is no airplane without a pilot -- there's no place for a pilot in this airplane. This particular design, you notice, is very smooth on one side, and has the engine/weapon delivery pods on the other. It takes off, flips upside down, flies to its target in a low- observable configuration, then flips itself up to deliver its weapons. It's a little uncomfortable for pilots to do that, although some of us believe you can teach a pilot to do anything.



Satellites, as I mentioned, will, be cooperative. They will know where each other are to an accuracy, certainly, on the order of millimeters; and, perhaps, on the order of a few wavelengths of light. We must take a rational, but creative, approach to all this.

A Rational but Innovative Approach to new Capabilities is Essential

- The relationship between revolutionary and evolutionary concepts is complex and complementary
- Revolutionary ideas sometimes point the way to later applications
- Identification and development of revolutionary concepts require intuition, innovation, acceptance of substantial risk
- At least half of good ideas fail to produce useful results
- Most revolutionary ideas will be opposed by a majority of decision makers
- We must remember that Science and Science Fiction are related only superficially
- The educated warrior is an essential part of decision making

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We hear about "revolutionary ideas" in technology. But the relationship between revolutionary and evolutionary is very complex and certainly complementary. It's not that one's good and one's bad, because revolutionary ideas point the way to later applications.

In some ways stealth was a revolutionary idea. The F- 22 is an evolutionary advance, as was the Stealth Fighter, which is far more competent than anything ever envisioned by early stealth designers.

To identify and develop these revolutionary ideas requires great insight and the acceptance of a substantial amount of risk. We're going to have to be willing to fail -- maybe half the time. And we're going to have to believe that failure will teach us something. We're going to have to believe that the half we get out of all our experiments is worth having.

We talk so much about risk reduction, and we heard General Sheehan talking about risk reduction in careers today. My only other story here is about the risk reduction expert who's walking down a country road, and hears a voice which says, "Help! Help!" He walks over and realizes that this voice is coming from a frog, which is sitting next to a pond on this country road. He picks up the frog and looks at it, and the frog says, "Oh, kind Sir. I'm a fairy princess who has been bewitched and turned into a frog. But if you will kiss me, I will turn back into a fairy princess. I will grant your very wish. You will be rich. You will be famous. You will live forever." And the risk reduction expert looks at the frog, puts it in his pocket, and says, "No, thanks. I think I'd rather have a talking frog."

Most revolutionary ideas will be opposed by a majority of decision makers. I caution people not to use that definition as a way of identifying revolutionary ideas, but you better be prepared for it.

The educated warrior is an essential part of decision-making. After all is said about technologies, people will be the enduring factor in our 21st Century forces. We simply must have more efficient and broader training to respond to a much broader set of threats and capabilities in the enemy, and a broader set of capabilities in our own forces.

People are the enduring Factor in the 21st Century Forces

- More efficient and broader training and education are essential to support a smaller, more effective Force
- Detailed physical and psychological models of people included in weapon system design
- Real-time distributed simulation of human against human
  - Commercial involvement
- High bandwidth, Human-Machine interaction
  - Artificial intelligence, expert systems & software agents
  - Brain controlled computers
- Safe, effective chemical intervention

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We are going to have to develop more rapid ways of producing results from simulations, especially people oriented simulations -- simulations that are as unpredictable as people are but have many of the same characteristics. This kind of effort should have the involvement of the commercial sector.

Finally, we are going to have to interact with computers much more efficiently and effectively than we have in the past. It's becoming a machine- oriented world, in many cases.

People will remain the limiting and enduring factor, but they're also the factor which enables all of this. Technology is done by *people*. There is no such thing as buying technology off the shelf. You buy it from people's brains.

When the "mouse" came out, we all thought it was wonderful because we could now move this thing around the screen and -- click -- we didn't have to type. For those of us who didn't know how to type, that was really great. But it's too slow; it's too confined, and it's going to be replaced by something -- I don't know what, but we need to work this problem. Does that mean brain- controlled computers? I don't know -- perhaps. One other item I think is worth mentioning is related to the way drugs interact with the brain. That's another subject, but we're learning more about that at the same time.

The Future will be Exciting and Stressing

One should not doubt that the 21st century forces which will be enabled and, indeed, demanded by new capabilities and responsibilities will hardly be similar to those of today. The changes will be as profound as those experienced by the Army in moving from horse to tank or by the Navy in converting from sail to steam.

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In closing, I'd just like to say that the future is always uncertain, but it's always exciting. In the past, there have been a couple of turning points in military history. I think for the Army, in particular, it was when the Army finally transitioned from the horse to the tank. For the Navy, it was the sail to steam transition. I think we're facing issues, problems and questions that are at least as significant as those, and there are going to be some very lively discussions about all of this in the future.

NAVAL POSTGRADUATE SCHOOL
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CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Presentation by
Vincent P. Roske, Jr.
Deputy Director for Wargaming, Simulation and Analysis;
Force Structure, Resources, and Assessment Directorate (J-8);
Executive Director, Joint C4ISR Battle Center

VINCENT P. ROSKE, JR.

Deputy Director (Wargaming, Simulation and Analysis); Force Structure, Resources, and Assessment Directorate (J-8); Executive Director of the Joint C4ISR Battle Center

Mr. Vincent P. Roske, Jr. serves the Chairman of the Joint Chiefs of Staff as the Deputy Director (Wargaming, Simulation and Analysis); Force Structure, Resources, and Assessment Directorate (J-8), The Joint Staff and as Executive Director of the Joint C4ISR Battle Center. Mr. Roske was appointed to the Senior Executive Service in 1986. In 1995, in recognition of his significant contributions to the National Security, the President conferred upon Mr. Roske the honorary rank of Presidential Distinguished Executive.

Mr. Roske was born in Cleveland, Ohio in 1945. He holds a B.S. in Civil Engineering, a Master of Engineering in Mechanical Engineering, and an M.S. in Operations Research. He has also completed postgraduate studies in Operations Research and Statistics at George Washington University and American University in Washington, D.C. He is a graduate of the Federal Executive Institute, Oak Ridge, Tennessee, and the Federal Executive Development Program, Denver, Colorado.

Mr. Roske's military service included assignments to White Sands Missile Range, New Mexico, and to the Air Force Flight Test Center, Edwards AFB, California as a development engineer and flight test program manager for the AIM-9L and AIM-7F air-to-air missile systems and for numerous special unmanned, reconnaissance, electronic warfare, and defense suppression weapon systems. He served as an ASTRA staff officer (1975-76) for the Assistant Chief of Staff, Research and Development, Headquarters United States Air Force, in the Pentagon and from 1976-78 as operations officer, Space Operations, for the Special Projects Office; Office of the Secretary of the Air Force in Los Angeles, California.

In 1978, Mr. Roske was selected as Test Director for the Secretary of Defense's Cruise Missile Survivability Flight Test Program. In 1981 he was assigned as Director for Systems Analysis, Joint Cruise Missile Project Office where he was responsible for testing and analyses supporting the tactical employment, product improvement, and advanced development of Air Force and Navy cruise missiles. Mr. Roske joined the Joint Staff in 1983 as Senior Operations Research Analyst for the then Studies, Analysis, and Gaming Agency. He became Chief of the Technical Support Division, Joint Analysis Directorate, in 1984 and has served the Joint Staff in a variety of increasingly responsible positions since.

Mr. Roske is responsible for joint analysis of national security policy, joint military capability, strategic and general-purpose force structure design, operations plans, and C4ISR assessment. He is also responsible for development and application of methods, tools and simulations supporting joint analysis and training. He provides wargaming and analysis support to the Chairman of the Joint Chiefs of Staff, the Directorates of the Joint Staff, and to Commanders-in-Chief of the unified combatant commands world wide.

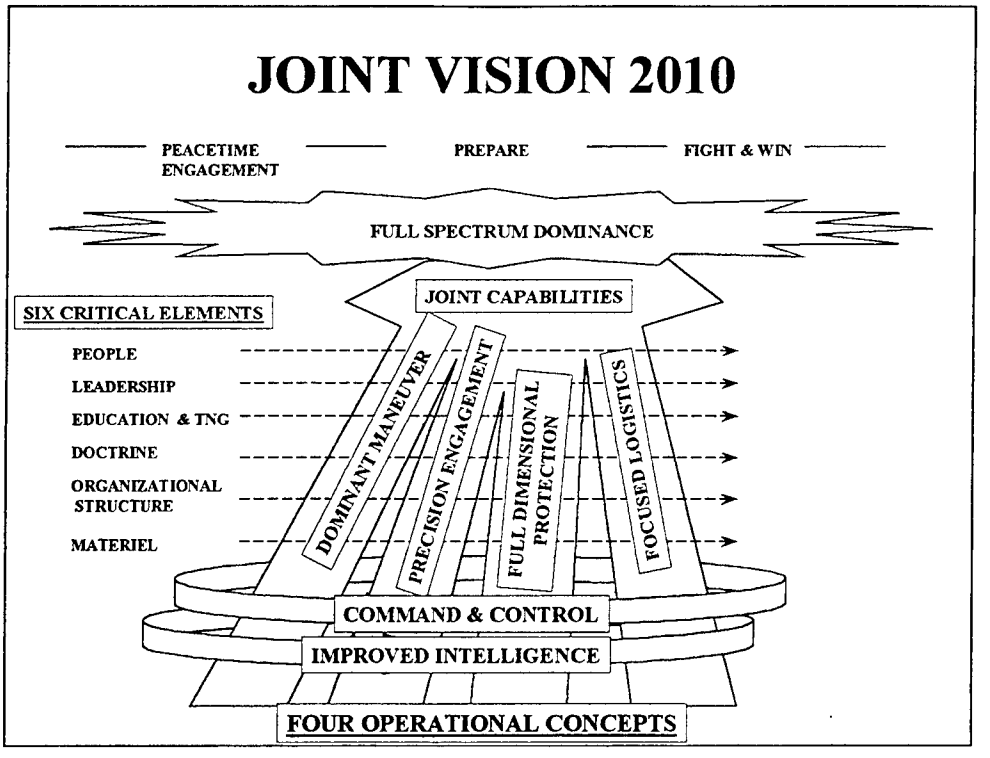
MILITARY EDUCATION
FOR THE
21ST CENTURY WARRIOR

THE FUTURE OPERATING ENVIRONMENT

Mr. VINCE ROSKE
DEPUTY DIRECTOR
JOINT STAFF/J8

NPS
15 JANUARY 1998

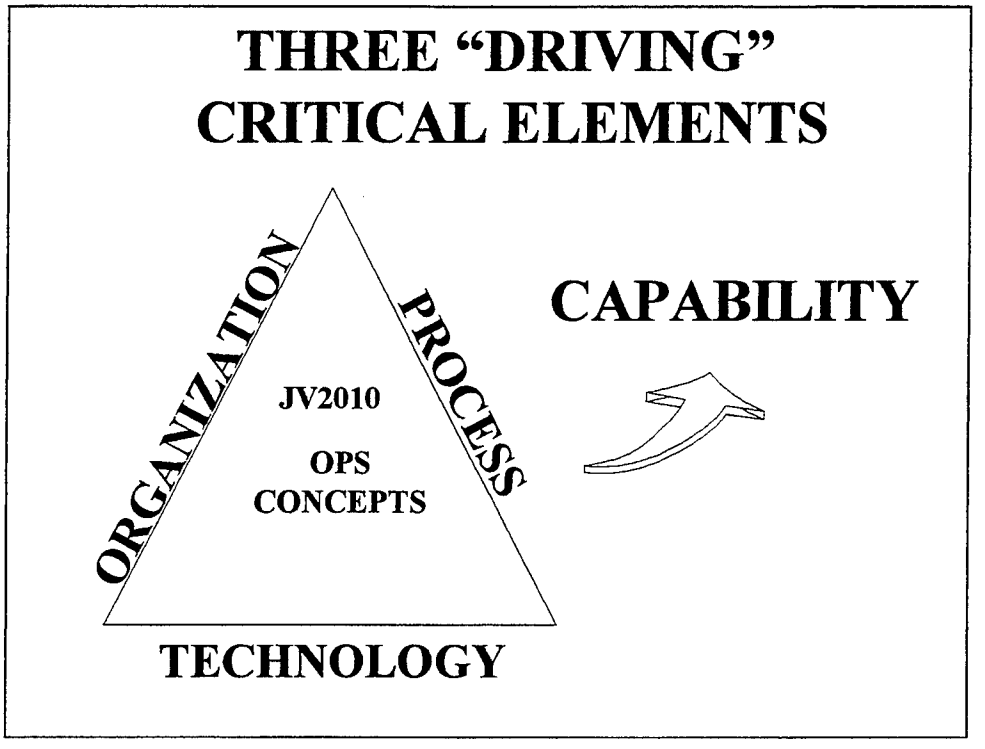
My comments today will be from a JV 2010 perspective, and also from my perspective as one who has the pleasure of working on the Joint Staff, helping to motivate, assess, and prime the intellectual pump up there to make things like this happen. I'm not coming to you as an advocate, but as an observer. I'm going to share with you some of the things I've seen, and some of the conclusions I'm beginning to draw, particularly as they relate to our PME challenge.



This is a graphical depiction of JV 2010 out of the JV 2010 booklet -- I'm sure all of you have seen it. It shows the four major operational concepts -- dominant maneuver, precision engagement, full dimension protection, and focused logistics. There are the six critical elements and these are the enabling dimensions. Nothing happens in these operational concepts unless you do something in these six critical elements. Of those six critical elements, I believe the bottom three -- materiel, organizational structure and doctrine -- are the drivers. They are the ones that are the independent variables.

JV 2010 is aimed at fighting and winning the next big one. In a comment during the concluding days of his tour as CJCS, General Shalikashvili said, "You know, it is a challenge to discuss these operational concepts during peacetime engagement. The term peacetime engagement is probably not a good one, because I'm not so sure it's peacetime anymore."

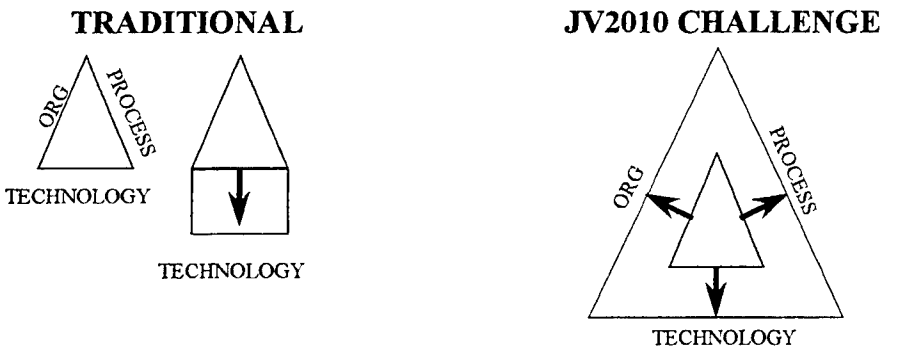
What do things like dominant maneuver, and so many of the other activities the military does outside combat, mean -- things like force protection and precision engagement? We don't know. And from what I can see, we are not expending a lot of intellectual effort right now to figure it out. Yet, we spend most of our time concerned with JV 2010. So, we are just not thinking out there very much. And we need to.



Those bottom three critical elements – doctrine, organization, and materiel -- are the things which, in the aggregate, provide us with capability. They are the heart and soul of the operational concepts of JV 2010. I'll tell you, we have kind of skipped over the operational concepts in JV 2010, in an effort to try to understand them.

We have the four bumper stickers, but I do not see us spending much time sitting around the table or discussing, among ourselves, what we think those really mean -- what the vision of warfare looks like when we think about these functional concepts. We leap past them quickly into desired operational capabilities – "DOCs" we're calling them -- which, for the most part, are descriptions of the technology systems we think we want. There is a problem there.

EVOLVING NEW CAPABILITIES



IN JV2010, OUR BIGGEST ROAD BLOCKS ARE:
-DON'T UNDERSTAND THE TECHNOLOGY.
-CANNOT ENVISION TECHNOLOGIES' POTENTIAL BEYOND THE CURRENT ORGANIZATIONAL AND PROCESS PARADIGMS.

Traditionally, this is what we're running up against, and I see it over and over again. Within the Joint Staff, we're using the Joint War Fighting Capability Assessment Teams – JWFCATs -- as the work groups to come up with these desired operational capabilities. What I repeatedly see in their work is the concept that organization and process are fairly fixed -- the potential of C4ISR technology out there in the future, the command that it offers, the weapons' technology, that sort of thing. So often They are looking at these things through a lenses of how we're organized today and the processes that we practice today. When they think about what we're going to be doing in the future, it's just an extrapolation in one dimension.

What will future technology accomplish I keep the organization and the procedures fixed in relationship to each other? The technology, by the way, fits into JV 2010 in the materiel dimension of the critical elements.

So what needs to happen? What isn't happening very well is an appreciation of technology in the military context and what it means, not just in weapons, but in what we fundamentally do. How we organize to do that?

Let me give you some vignettes. They have the anecdotal property of being just points. Drawing a line through them may not be valid, but I'll give them to you anyway.

Two weeks ago Wednesday, we had a 6:30 a.m. morning meeting on JV 2010. How are we doing? The fellows from the dominant maneuver, OPS concept bunch, JWIC, got up to pitch their desired operational capabilities. Poor fellows, they got up there, and what we got was, "We're going to have to hold them; we're going to have to move quickly to the theater, and we're going to have to build a force and then counterattack." It was a tragic display of "yester-think.

The general idea, though, was we're going to do it better in the future. It was the same old trick with a bigger dog -- no real thinking about what dominant maneuver is. From an Army perspective, you have a sense of units moving. But what does it mean if you are the bad guy? What does dominant maneuver do to you? You know. It conveys that you're going to get hit, and you don't know when or where, and you can't make a move without getting smacked. You're frustrated by the fact that you can't hit back, because you don't know where to hit.

There is virtually no thought going on about how you start doing that immediately? And what's the role, eventually, of the Army, the Air Force, and the Navy, and the capabilities they contribute to doing that? We're just reinventing the old processes there. There's no thought about process and organization, and what the technology offers to accomplish those same ends.

I'll give you another example -- integrated air defense. We ran an informal roundtable discussion to try to stir the imaginative juices in the Integrated Air Defense bunch, which works common air picture understanding. They're wrestling with concepts like air-radars on aerostats, and the idea that one service could potentially provide a missile that would be guided by another service's acquisition or tracking systems, and all that.

As we began to talk about the potential of a completely interoperable military, where anybody's weapon could be guided against anybody else's by a third service; where the end game could be accomplished by someone other than the launcher; and where you could get maximum efficiency out of what you had to shoot, I observed their eyeballs roll into the back of their heads. They were unprepared to leave the concept that each service's weapon system enables you to kill from acquisition to end game; or to entertain that there might be a benefit in one service providing resources to another to do a job more efficiently.

And beyond that, there was no thought at all concerning how you would manage technical interoperability on the battlefield? We worked around to the idea of a defense coordinator, someone who could look at the integrated air picture and determine that a certain threat needed to be engaged. It had been detected, say, by an AWACS. There were potentially F-22s in the area without munitions that could take a missile off a ship in mid-course and guide it to the end game. Who would make those calls to a defense coordinator? They couldn't touch that because the implication was, if you had a defense coordinator, then you might have an offense coordinator.

Rather than air, land, and sea component commanders actually fighting a war, they became more like football team managers. You had some coaches for offense, defense, and special teams. The whole structure of JTF and war fighting began to change in their minds, and they backed away from those concepts very quickly. The possibility of technology ran up against fixed constraints of how we organize, and what we do.

I also ran into another problem, which it still has me thinking. I'm not sure what to do about this one, or how one wrestles with it. Just last week, I went down to the Joint Battle Center in El Paso with JTF-6. Their mission is to introduce technology to the JTF commanders, not as science fair kind of stuff, but to really help them get their mission done. They work with technology that's available now, and get stuff out to them quickly to solve command and control issues.

They offered the JTF-6 commander a thing called Compass. Now, Compass is just a current version of a distributed collaborative planning system for operations, so you can get different organizations together and come up with an operations plan in one system, bringing everybody together. It put the one system, the JTF-6, in the distributed collaborative process. Like the sound of one hand clapping, it doesn't do much good unless you get a second system out there so you can bang the two together and see what you've got.

So they asked the JTF commander, "Where would you like the second system?" And he said, "Well, let's put it in the El Paso Intelligence Center, because that's where we do most of our planning. Those are the people we provide a great deal of support to." So the action officer from the battle center did that. Then, after noon, he took our work station over and put it there, loaded the software, showed them how to use it, and left it in the hands of the JTF-6 folks to assess.

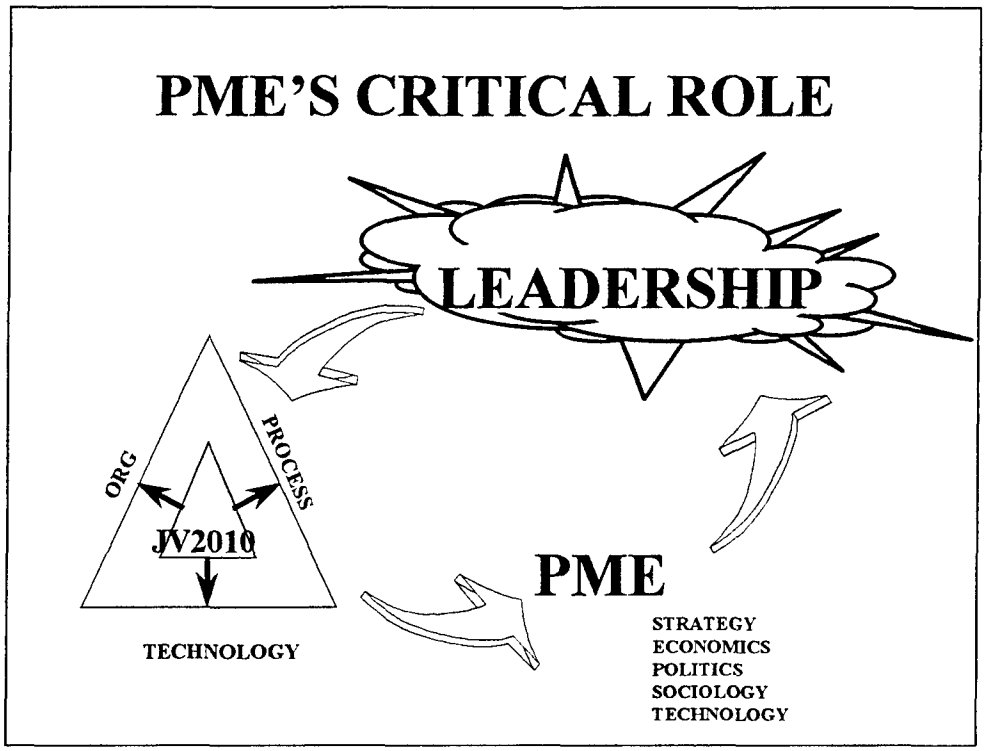
The young officer got on an airplane, and by the time he had flown back to the Joint Battle Center, he had a pack of legal-beagles on him. They were all sniffing at his drawers something fierce -- posse commitatus. So, how much can the military give to the law enforcement folks? And do we even want to do that?

Once again we have run into a constraint of old think, rather than thinking about what needs to be done and how can we go about doing it? Were people more afraid of making mistakes there?

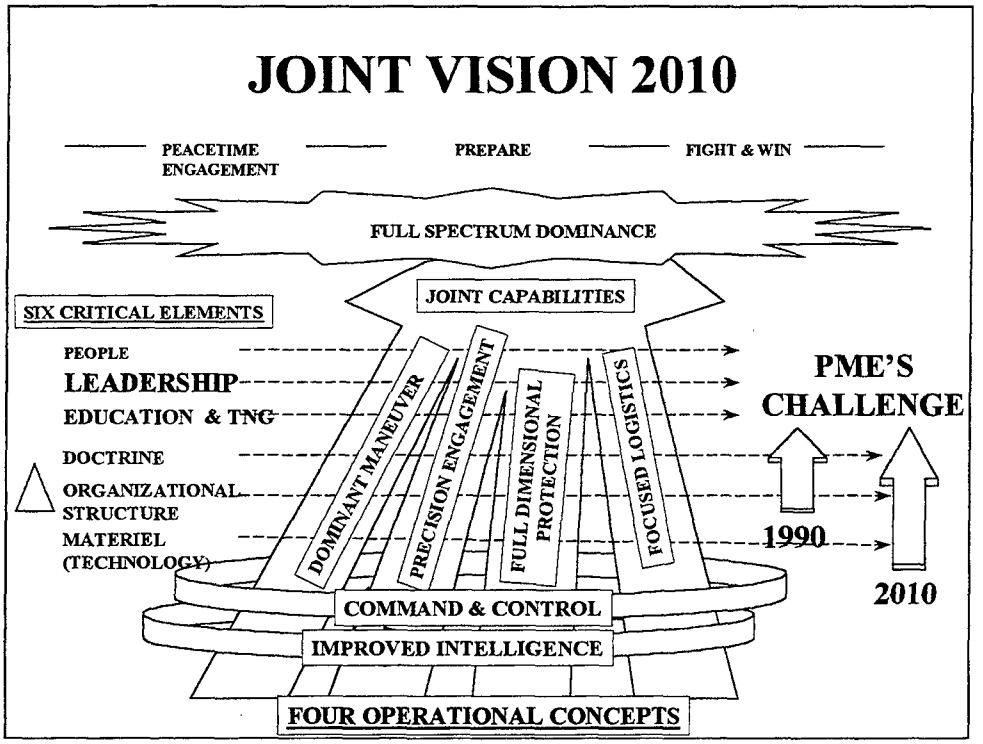
Luckily, we've got some forward-thinking people in the legal staff and the joint staff, and they've decided to turn that into something of a precedent-setting activity. Rather than ordering that this stuff be taken out of the El Paso Intelligence Center, they're now working the legal decisions to allow it to stay there, so that we can work interagency.

I'm left wondering when and where we really think about the impact that technology has, not only on our organizations and on our doctrine, but on the whole

structure of what our military allows itself to do -- including the legal dimensions as well? Out of that thinking, we need to decide how far we can go in terms of structuring campaigns to push those boundaries out a little bit to give us the maneuver room we need. Because we're still -- as we've talked earlier with regard to Goldwater-Nichols -- very much constrained by the letter of the law in what we're able to do. We have to think out farther and beyond that.



What's the role of PME in all of this? In my opinion, it is consensus -- fold the technology in with the history and political science and economics and everything else. It's within this context that the military challenge lies. As we go about doing that, these new technologies have to be appreciated, because out of the PME system comes the leadership that's going to manage this expansion of our capability, in terms of organization, process and technology -- and ultimately, legally, too.



Very simply, the challenge for PME lies primarily in those bottom three critical elements. The match between technology, organization, and culture, or doctrine, or process -- what the military does -- it has to be appreciated in unity. From what I've seen in our efforts in JV 2010 to implement it and to move joint warfare forward, I don't see that we've been doing very well so far.

I think that's it. I hope I hit it on the head for you. Thank you.

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Remarks by
Lt Gen Jay W. Kelley, USAF (Ret)
Executive Vice President, System Technology Associates, Inc.

Thanks, Dean. I reckon my job is to bat cleanup for the best after-lunch speakers you're ever going to forget. I don't have any slides, so I am going to sit tight. I had the honor, in my last few years active duty to run a couple of future studies for the Air Force: One was SPACECAST 2020; the other was Air Force 2025. Those studies identified some significant capabilities the Air Force needed to engage -- serious capabilities in technologies that it needed to embrace and grasp. Most important throughout all that, the thing that struck me was that our capabilities are far out in front of our thinking. So, in my opinion, it's not the future of PME that's important; it's the PME in the future. One would imply plotting evolutionary change, and the other says to "get with it, and get on with it."

I would assert that the PME we have today comes from the time when mass production was booming in America, when mass production drove American life styles and drove that thing called mass education. I would submit to you that PME today is mass education. Everybody gets pretty much the same stuff in their service's PME school -- a little difference service-to-service, and there's some exceptions to this -- But by and large, that's how I see it.

I also see things are changing in terms of the folks who are engaging PME, and the environment in which that Professional Military Education is occurring. We're well into the time when folks aren't content to have the same thing the other guy has -- be that their buddy or their neighbor. We don't all want black Fords, and we don't all want black telephones. We might prefer a red convertible, thank you very much. We'd like to have telephones with no wires because it's all about mobility. It's all about, "I want it when I want it, the way I can use it, and that's the way I see it, okay? It's the way I've got to have it."

Technology is doing great things -- providing me choices I never dreamed of. You, too. But we're not doing such a good job at preparing people to deal with these choices. You can see it very clearly in your kids today. You know, they've got more choices and opportunities than you and I ever dreamed of. You can also see some of the challenges that confront these kids -- and you, too -- trying to pick among those choices and opportunities. You and I have choice and opportunity more than we ever expected,as well. My other bosses -- with my other hat on -- are Al and Heidi Toffler. Al and Heidi would describe all this as *over*choice.

The importance of these critical decisions is mounting by the day, and our preparation for making them is going up even more rapidly. We want to think for ourselves. We want to find out answers. We want to question and challenge, as was made clear to us this morning.

We know there's more than one way to do almost anything. What we want to do is explore the ways, and see the ones that fit us best. We want to keep on learning. We want to learn continuously -- not episodically, like we do in PME today. We know things are rarely going to be clear, so we're becoming comfortable with ambiguity. But we want to understand the shapes in the fog.

Some of you probably read the most recent issue -- the special edition -- of Newsweek (on U.S. military readiness) on your way to this meeting. If you got to the section in the back that says, "How We Fight," you found that the old quote is still in there, but there's a twist at the end. The old quote is, "Generals are always preparing to fight the last war -- the one they know how to fight." The twist is, "The best minds in the business are trying to prepare for a war no one has ever fought."

Now, I would submit that nearly everybody in this room comes from a time, when you talked about hardware, you were talking about a hammer and saw. Software wasn't even a word. You all remember slide rules? Try to explain how a slide rule works to your kid, and why it was important, and then convince him you know where to put the decimal point. Now, there's a challenge for you!

Some of us remember when we were asked, "What does an Air Force do?" and "Why does America need an Air Force?" that the answer was "to fly and fight." But today, if you look at all of the services -- not just the Air Force -- and look at what they're actually doing, you'll find more food, blankets and medicine than bombs, rockets and bullets -- just like General Sheehan said.

I don't know about you, but when I retired just a little over a year ago, the day I retired I'd never been in an Air Force so small. America had never had an Air Force that small. And as you all know, today it's even smaller still. And when I was promoted to general in the mid-eighties, I was issued a handgun. When generals -- at least in the Air Force -- get promoted today, they get issued a laptop computer. The handgun's "optional." I don't know if that's still the policy, but it was at about the time I checked out.

Some of us remember dumb simulators and training devices, too -- cardboard replicas of the real thing. But go down to Tyndall Air Force base today. You can fly a 2 Ship of F-15s, look over there and wingman's right where he's supposed to be. You can go 2-V-2 with F-16s from Luke (AFB) and never leave the ground. These are exquisite, extraordinary training systems. Same thing for the Army, with M1A2 systems, firing systems. Same thing for the Navy submarine -- full-motion simulators. It's great.

Then there's PME. Only a very few get to go -- the top 10 or 20 percent, I suppose. Those who aren't selected get a stack of books that's shrink-wrapped with an errata sheet. There are very few Guard, Reserve slots., and fewer still civilian slots. It's hard to build a team that doesn't get the same preparation.

Those selected to go get to stop whatever they're doing for their service; pack up family, too, probably; and travel cross country, to Quantico, Newport, Carlisle, Leavenworth, Maxwell, McNair. They join up with ten or twelve other folks, sit around a table with a talking head at the other end, a black or a white board, and an overhead projector. Some now have TVs and VCRs. They're going to read a lesson the night before, they're going to go to a lecture on it the next morning, and then they're going to go back to the room and sit around that table and talk about it. And they are going to do that for ten months, with little or no exception.

Along the way, they're going to hear a couple of good comments: "You're lucky. You get a chance to get reacquainted with your family and play a little golf." The other comment that comes out -- and you heard it here today, by the way -- is: "You're going to learn more from your classmates than you will the course work."

My friend, John Warden, once said, "Socrates would be comfortable in our classrooms." I think he's right, but give us a break. America's never had forces so small. Technology is providing us with exquisite weapon systems. Capabilities are improving at a fantastic rate -- Gene ( )talked about some of that. And we've still got the top troops sitting around a table in an old building, studying history and management.

In a time of smaller forces, smarter weapon systems, and uncertain futures, we need to prepare brilliant warriors. And by brilliant, I don't mean with IQs of 140. I mean smart, savvy, agile through *ambiguous* situations, with a desire to survive and succeed in whatever future presents itself -- to be confident in finding a way knowing there's more than one way. I'm talking about life-long, career-long learners, thinkers and risk-takers.

My good friend Brigadier General John Brooks, when he was a commandant of SOS, started each class with this: "Space systems, airplanes, ships, and forces that can strike beyond the horizon are of little value without minds that can think beyond the horizon" -- the killing zone.

In the midst of World War I, some of our best were trying to solve a very, very knotty problem: how to design gas masks for horses. Now, I'm sure they thought it was important at the time, but it seems a little bit short of the horizon.

What about PME in the future? You've got to understand the environment you're dealing with, and, in the case of the military, the only natural predator of PME is training. It seems that there is this inner desire, a belief by some, that education "ain't really important," but that training is. So they're more than willing

to waive PME in lieu of improved training. Moreover, you and I know that we can directly measure the value of training. We also know how very, very hard it is to directly measure the value of education. I think Jimmy Doolittle had it right back in the '40s, when he said, "If we should have to fight, we should prepare from the neck up." We just didn't see it come to pass. Instead, the natural predator won out. So you see services with a function that says, "organize, train, and equip."

I know it's important to learn how to learn, and to learn how to fly an airplane or drive a tank or drive a ship. But I would submit -- and I'll bet you'd agree -- that it's more important to learn *what to do* with the airplane, tank and ship. Bob talked about that. In other words, it's not the doodad or the gadget; it's what you do with it that PME ought to be concerned about.

So now the challenge of PME is from it's only natural predator, and it ranks right up there with some of the great challenges of life. I got out my book and tried to look up what some of those challenges were, and I said, "Well, okay. Everybody knows what the speed of light is. What's the speed of *dark*?" I've got another one -- we've all said, "That's the best thing since sliced bread." But what was the best thing *before* sliced bread? But the real big one is, "How in the hell do you know when your bagpipes need tuning?"

So, how are we going to do PME in the future? I would submit to you that this Asian had it right when he said, "If you show me, I'll see. If you tell me, I'll hear. If I *experience* it, I'll *learn*." Now, we've all said that, you and I, but we've said it a little differently. We've said, "Experience is the best teacher." We've got T- shirts that say, "Been there, done that." We wear them proudly.

We treasure experience in this profession. It's most respected -- combat experience -- deeply respected. Few really have it. It means a lot, because some things are learned that thus far can't be learned any other way than through experience.

But why not try to provide experience-based learning to many, instead of just a few? Education is supposed to be about making connections. So, let's make them smarter. Let's smartly identify those courses, or portions of courses, that can be done by distance learning. That would prevent the enlisted folks, the officers, the civilians, the Guard, the Active Reserve from having to stop what they're doing, pack up their bags and go get it done somewhere else.

Let's identify what can only be learned, or best learned, through experience, and ask technology and industry to provide the capability and ability to do that across a range of alternative futures. Because nobody knows what *the* future is going to be.

Let's also go back and let get some of the historical things we believe are important -- let's do that, too. Let's make technology give us that historical

experience. I've got a benchmark. Is that virtual reality, or is it Holodeck 3 (the simulation room on The Next Generation Star Trek's USS Enterprise (NCC-1701-E))? I don't know. But we haven't asked for it, either. As educators, let's put some requirements on industry and technology to serve us. I'm not sure we've done that.

PME ought to be used to leverage the most important and most powerful factor in any war-fighting equation -- the human mind. It's all about learning whatever we do *not* know, but envisioning what we *must* know in order to survive and succeed. The ultimate test of PME will be success in environments and futures that were *not* anticipated. Businesses that don't get that right lose market share. Militaries that don't get that right lose nations.

PME should study the future more than the past. It will be technology-rich, not poor like today. It should be the crucible for learning experiences. It should be career-long, continuous, on demand of the individual, and structured to provide and enable the "right stuff" at the right phase of the career -- a custom-tailored learning experience. And because you won't do it like she did, there's more than one way.

Distance learning will set the stage and bridge the gap between resident experiences -- which, by the way, will be greater in number and shorter in duration. That should also help the Guard and Reserves, because we know one of the problems that they have is finding the ability and the time to get away from their other jobs so they can go in residence.

This Guard, the Reserve, the civilian matter is important. We've got to solve it, because going into this future environment knowing how *your* part works, or how to make *your* part work, won't be good enough. You've got to be able to know how all the other parts work, too. The faculty of such educational operations will consist of mostly visiting scholars, visiting warriors and visiting mentors. Few, if any, will be permanent.

In summary, I'll say that PME should have a more experientially-based curriculum that bears on conflict, human relations, and leadership; and ambiguous, uncertain futures.

Thank you.

LIEUTENANT GENERAL JAY W. KELLEY, USAF (Ret.)
Executive Vice President, System Technology Associates, Inc.

Jay W. Kelley was named Executive Vice President of System Technology Associates, Inc. in May 1997. He is responsible for directing and overseeing the activity of the corporate staff and field operations consistent with the policies, goals and objectives approved by the President/CEO, STA, headquartered in Colorado Springs, CO. He performs requirements analysis, system design analysis, simulation and modeling, detailed design, system development, software design and coding, s m integration, testing and training development programs, integrated logistics suppo , and program management.

Mr. Kelley enlisted in the Air Force Reserve in 1959, and was selected to attend the A Force Academy in 1960, graduating and receiving his commission in June 1964.

He retired with 37 years of career military service to the United States Air Force at the rank of Lieutenant General and had worked developing and orchestrating "futurist" business with major communications companies and government organizations befor coming to System Technology Associates, Inc.

He has served as a base commander and a strategic missile wing commander, has been assigned to the Organization of the Joint Chiefs of Staff, was the vice commander of the Air Force Space Command, and director of public affairs, Office of the Secretary of the Air Force.

Lieutenant General Kelley served as the commander, Air University, Maxwell Air Force Base, AL, and director of education, Air Education and Training Command. As such, he ensured that Air Force needs in the areas of enlisted and officer professional military education, professional continuing education, and graduate education are met, as well as officer commissioning through Officer Training School, and the Reserve Officer Training Corps.

His educational background includes a Bachelor of Science degree from the U.S. Air Force Academy, and a Master of Science degree in political science, Auburn University, Montgomery, AL. Additional education includes Squadron Officer School, Maxwell AFB, AL; Air Command and Staff College, Maxwell AFB, AL; Research associate, International Institute for Strategic Studies, London; National War College, Ft. Leslie J. McNair, DC; Program for Senior Executives in National and International Security, John F. Kennedy School of Government, Harvard University and Massachusetts Institute of Technology Program on Foreign Politics and National Interest.

PME for the 21st Century Warrior

SESSION FOUR

Overarching Issues for Military Education in the Post-Cold War Era

Question: **What are the overarching issues for military education in the 21st century?**

Objective: **Address the overarching issues which are likely to confront post-Cold War military education and articulate dimensions of future discourse.**

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Remarks by
Lt Gen Joseph J. Redden, USAF
Commander, Air University

First, I would like very much to express our thanks to the Naval Postgraduate School and to the Office of Naval Research for hosting this conference. Obviously, great thanks is also due Congressmen Skelton and the other distinguished members of Congress who helped us arrive at this point. I also have to thank the conference organizers, particularly, who got General Don Holder and I up here just when the oxygen deficiency is about to reach the maximum point inside this auditorium. We'll do our best not to suck the rest of it out of here.

I would also make an editorial comment, having been the gentleman who followed Jay Kelley at the Air University. If Jay had felt so strongly about those issues and fixed them all, my golf game would be a heck of a lot better today than it's going to be during my tenure there.

This conference has been rich in the views that have been expressed. The problem that any of us have when we come to this podium is not what we will say, but what we eliminate from what is there to say. Certain things have been said about where we might go to the future, and there are three of these areas I'd like to focus on with you today.

The first of those is the agility the system will require to handle the challenges of the future. I would certainly agree with previous panel members and distinguished individuals who have been on this stage that we are not prepared, and are not doing a good enough job in preparing, our officers to meet the challenges of the future.

The second is the challenge we face in our coalition operations, and the importance of our allies and friends around the world within our Professional Military Education and training system.

The third -- and one that's equally important to us -- is our PME system for noncommissioned officers, which has been mentioned by some of the speakers already.

I kid my old friend and classmate, Jay Kelley, about fixing some of those PME problems, but we have a tremendous challenge. General Sheehan eloquently addressed it, not only during his time as the ACOM commander, but in many of his

speeches I've had the opportunity to hear. Intellectually, we are not looking enough to the future. I was very frustrated, during the training time I spent at the Joint Warfighting Center, in attempts to stress the envelope a little bit. We'd look at some of the key strategic mobility areas, and at questions we might have about the environment and about trying to fight while disadvantaged. Because, as has already been expressed very clearly by many people far more experienced than I, we are not going to repeat our Gulf War experience. We will not be allowed to repeat that experience. If we are not preparing our military leaders to deal with future conflicts, then we are failing in our responsibilities as educators and as trainers.

We have to find a more agile system that is willing to accept some degree of failure in the effort; some degree of failure in the exercise; and some degree of failure, if you will, in the seminar. From that failure, they will learn.

We find ourselves in a training environment that repeats the lessons and the scenarios that came from the Gulf War. Despite my frustration with that, I've become reconciled with it, because I really understood: 1) that we had limited joint-training dollars, and 2) that commanders like General Sheehan were faced with a tremendous training problem. They had a large group of people -- deep echelons of people, in which to train on the basics of Joint Force operation. You have to have a structure to do that; and, in limited time, with limited money, you have to focus on that problem.

Now I'm in an environment where I see that we do have the opportunity to address these issues, and that is in our educational system. It is exactly that part of the problem we should be addressing in our educational system. One of the things we clearly have to fix is to make the schools agile enough to respond to all the changes that are going on.

As we look at the evolution of the Sea Dragon experiments in the Marine Corps, at the formation of a Naval Warfare Development Center, at the Battle Labs and Force XXI in the Army, and at the evolving Battle Lab Structure in the Air Force, we are grappling with establishing the appropriate links to make sure we're tied to those battle labs and the concepts emerging from them. When we do that, our educational system can, in fact, contribute to the development of the operational concepts that will help further refine those products coming out of the labs and the experiments. It can also help define and refine the operational concepts that will support the technologies that come from those labs.

I don't know what the other services' experiences are, but I will tell you mine, both as a recipient of input and as one who has provided input at various staff levels. When we did PME system research, we would canvass a major command, commanders, and those serving on CINC staffs for inputs. Inevitably, our tasker would fall -- as it did when I was that junior staff officer -- to some harried junior staff officer who didn't have much time, who put it at the bottom of the pile, and who

work it at the last minute. He'd end up coming up with a bunch of vanilla recommendations for research projects that were then forwarded to the schools, most of which just simply provided a vehicle to allow someone to complete their graduation requirements. We very clearly need to re-energize that.

At Air University, we have restructured our research effort. We have named a director of research, and have relieved him of educational responsibilities. We're trying to forge a link with our sister services, with our own battle labs and, more importantly, with the field and the CINCs, to determine the emerging concepts and those questions they are most concerned about. We're taking the intellectual capital resident in our student body and our faculty and turning that toward addressing the very kinds of problems that Vince Roske raised during our last session.

We have failed to do that adequately, in my mind from where I sit, in our institution, and we need to fix that problem. We need to clearly make the year more challenging, certainly as an intellectual exercise, as to how we employ force across the spectrum of challenges we will be faced with in the future.

I couldn't agree more with Colonel Summers -- we need to stick to one level in making sure people understand basic blocking and tackling. But the challenge of the future will be much more sophisticated than that. We will need to have people who have thought in advance about the range of challenges they'll have to face, because they'll be put into difficult environments with inadequate force and asked to respond. Often the airlift won't get there on time, or maybe it won't show up at the right place. They might have to fight for a period of time at a disadvantage. They might have to use those things we inherently have within our armed services to the best advantage, and be able to hold it to a stalemate until they get the appropriate force, so that, with conditions appropriately in their favor, they can win.

Yet, every time we sit down and talk about an exercise, even within the schools, we assume we have a balance of force. We start with a fully-flowed TPFDD, and assume there are no challenges. We don't think them through.

We had a minor breakthrough in the global engagement game we ran for the Chief of Staff this last fall, because we ended up having three game teams playing a future scenario where they started at a disadvantage. All three teams were very capable people -- CINC staffs, led by retired senior officers. They fell into attrition warfare and, at the end of the game, the enemy Red Force won its limited objective.

We all failed to catch what that limited objective was: to bog down U.S. forces; to create a stalemate; to drain U.S. power; to create a unfavorable attitude and environment at home so that we would give way to rather limited goals and then leave the scene very quietly.

We were aided by the fact that we were supported by our leadership, which allowed us to have a very aggressive enemy Red Force which had a lot freer play than we normally allow in games. They were very aggressive, did some very, very interesting things, and they ended up being a real challenge. Most of the people on the Blue Force felt like they had their hands full. Blue Force members repeatedly asked the controllers, "Why are you letting these guys do this to us?" The controllers would respond, "Who's going to stop them in real life?" These are the real kinds of challenges we're going to be faced with in the future.

We need to get more integrative in our approach. One of the things we're doing this spring is trying to integrate our games between command and staff and the War College. We have great resources at both the operational level and strategic level of education, yet run separate war games for them in the spring. We are trying to combine the games this year; play staff against staff. I know this is a goal of General Chilcoat at NDU, and I know General Scales has the same desire -- to learn from some of these efforts and get to the point where we're playing together at the schools. This will foster play at the appropriate level of warfare, and engage the war colleges. We hoped to be able to move forward on that front also, and do some things that are more innovative.

One of the things we have to turn around in our service, as a culture, is the very point raised from this stage about rewarding the risk-taker and honoring the question-asker. I'm afraid a very, very bad mindset sometimes creeps into the service mentality, that says: "If you're not playing my game, you're not on my team." Where, in fact, I think all professional officers *ought* to be asking questions. They ought to be trying to look for alternative answers and alternative solutions. If, of course, when the time comes to saddle up and move forward with the decision your commander has made, you continue to carp or grouse when the posse has ridden off to the south and you're heading north -- that's disloyalty. But, up to that time, I hope we would honor the intellectual freedom that would encourage a lot of people to think about all sides of a problem, and talk about some of the innovative solutions that might help us better find our way to the future.

Somehow, we have to instill within our schools the kinds of challenges and thinking we hope people will have. Part of that comes from the challenges we have put on our faculty -- one of the things that has been addressed here, in part. I think we need to leave this conference very cognizant of the fact that we're going to have to make some accommodations in the future. We are limited in manpower and we're not going to get all the people we need with the right skills to do the things we need to do within the schools.

I'll give you an example of this in our War Gaming Institute today. We've reached the point in our operational expertise, due to a shortage of pilots -- that we can't man our War Gaming Institute to the level we need to. So we are making a military-to-civilian conversion this year that will save us about three and a half

million dollars. We're converting those positions to contract positions, contracting those functions out for an estimated cost of about two million dollars. I think we're going to end up with a net savings of a million dollars or so -- not small change to the educational system. More importantly, this will provide us with the level of expertise and continuity we need in that very, very important aspect of our work force. And finding outside help is just one of the challenges we're facing, trying to look at all the other things we're having to move to. Because we do not have the manpower to do it internally.

Another real challenge all the schools have as we move to the future is, what we will do about and how we will address the question of distance learning? I'm a fan of distance learning, but it is neither a panacea nor a cure for all ills. I think we need to be very, very careful about distance learning and how we employ it. It does offer us the great opportunity to get what we might, in the past, have seen as traditional learning out of the way -- to bring everyone to a school at a much higher level than they might start now. But we'll still need that experiential effort and, I think, we'll still need the interface of the human element.

I would harken back to my own time at the Army War College. I was very fortunate to be in a very distinguished company with my Army classmates -- people like General John Tilelli, General Jay Garner, General Gene Blackwell, former OPS DEP, General Dick Larson, and General Dan Christman, now the superintendent at West Point. I kept running into those gentlemen on the Joint Staff and at other assignments, and it was a great, great experience to get to know them better in the environment of the Army War College. It paid great benefits in terms of understanding and being able to deal with them on a variety of issues throughout the years. I hope we don't lose that in the schools.

Very clearly, we need to be able to reduce the time, save money, and be more efficient. And very clearly, as we move to the future, distance learning is very, very important to our Reserve Forces. We are blessed because we're been able to integrate our Reserve Forces and our faculties. In fact, we probably couldn't do our Officer Training School and all the courses and electives we have in the Command and Staff College and the War College without help from Reserve Force faculty members. We're getting a great help from them, but we have problems in the educational processes we're using to reach them. Part of our problem, amazingly enough, as we have gone to CD-ROM technology -- and General Drennan and his people did a great job of making that happen -- is that some people don't have that CD-ROM technology available to them.

Interestingly enough, the feedback from the field was: "We don't like reading from the computer screen. Can you change the course and still give us required readings in hand-out form, so we can use them and make notes? And make the print-outs small enough to stick in a fatigue pocket, or flight suit pocket, or someplace to store when we go on deployment." So, we made that modification.

But distance learning raises another big issue for us. Our distance learning is basically CD-ROM based, though we're also doing a lot with television and outreach. But in the near future, CD-ROM technology will be obsolescent, if not obsolete, and we do not have the money to move forward and chase new technologies. I can invest 15 million dollars tomorrow and still have to go back to the Air Force in two years and ask for 15 million dollars more -- or more than that -- just to keep abreast of the technologies.

So, it's really important that we seek the right industry partners who can help us move forward in those key areas to all the services. The challenge is that this requires a degree of commonalty within our own service that we have not achieved to date. We can't even get our information systems common enough within the Air Force to all talk to each other with any great ease, much less achieve the degree of commonalty we would like to have with our sister services to make sure we have a truly joint educational environment. That's the real challenge for all of us as we move forward in this area.

I think the way ahead is bright. We are blessed by some very, very bright, articulate people. I think the challenge we have ahead of us is to challenge them as much as we can and, hopefully, we will be able to do that.

We're moving forward on another front. (General) Tim Kinnan briefly mentioned a continuum of education, which was among the proposals and broad scope of issues Mr. Skelton addressed. We have gone back and really done a ground-up review of where we are going with Professional Military Education, and it has revealed gaps. This review has led us to develop a new in-residence course for our brand new officers that we will test this summer. It's patterned after the concept of the Marine Corps basic course, the Air and Space basic course.

If it is successful, we will implement it in the following year. We have also developed three new distance learning courses that involve a great deal of mentoring -- one for company grade officers, one for field grade officers, and one for senior field grade officers. It will require involvement from our leadership at various levels to make those courses work. They are intended, very clearly, to prepare officers for the education that they will need to handle the specific responsibilities they will have at transition points in their careers. So, there's a lot of work being done in that area.

Internally, we will review a lot of things -- commonality in our faculty, for example. I don't think we're yet at the point of going to one common faculty at Air University; although we've had the advantage of having all of our schools there on one campus. We certainly have to do more sharing between the faculty.

We found a shortfall in the pace of accreditation in the joint presence at Air Command and Staff College. We simply could not, because of the rank structure of the officers we had instructing that course, get a lot of joint experience. They

weren't at that point yet in their careers to have it, or to have command experience; and, when we looked to the next higher rank, we couldn't bump it up another rank, because we simply couldn't find the people to fill the billets. Our solution is going to be to use those officers who are at other schools and who have that experience. We can use them to help teach in the joint arena -- to augment General Drennan's staff in Joint PME, in specific cases and instances, at the Command and Staff College.

As we look toward the importance of coalitions, we see an increasing pressure and request for presence in our classes, particularly with the dissolution of the former Soviet empire. We have an awful lot of queries and a lot of international presence in our courses. I think that's very, very important for us. (General) Rusty Blackman, in his earlier comments, indicated, "It's not going to be the Gulf again. It will be fast and it will be violent." Someone will try and grab the advantage. We are going to have to get organized on the run. And it's going to help if we go there and meet with coalition partners, friends, and allies whom we've been to school with, whom we've trained with, and whom we've exercised with. That will be ever more important for us.

I would hope -- particularly from those members of Congress who might attend, and certainly for those former members of Congress who are here -- that we evolve away from the carrot-and-stick mentality we've used toward our military training programs in the past. I would specifically reference my experience in Asia, when I was serving on the PACAF staff over there. In the smoke of history, many people may have lost the fact that, when Indonesia had difficulty in East Timor and members of their armed forces fired on the Portuguese minority in East Timor, the officer who went in and fixed that situation was put in charge of the district. In fact, he went in and rectified many of the ills that had occurred and was responsible for several senior officers retiring as a result of their actions -- something unheard of in that Armed Force to that point in time. The officer who did that had been educated in U.S. schools. Yet repeatedly, during my time in the Pacific, because we were concerned about our relationship with Indonesia, we would cut the 1.2 million dollars in military education training funds used by their officers to attend Marine Corps University, the Naval War College, Air War College, and the National Defense University. That was the first thing we would cut. Yet there were many, many millions of dollars in aid programs that the State Department controlled that never got cut.

I would always ask the ambassador's staff there, "Why don't you guys cut some of that agricultural fund stuff, or something else?" You can cut several million dollars and make them really feel the pain. But we always went for the military training program. I would argue that, for the small dollars we spend, it results in some of the greatest benefits we reap. We should never forget that as a point of emphasis, a point of focus.

A military member of one of our allies made an interesting comment to me at

an International Doctrine Conference that Bob Scales and I attended at Fort Leavenworth while I was at Fort Monroe. He said, "As you move forward technologically, you run the risk of leaving us behind. If you do, you will fight your future battles alone because of the technology that only you use -- if you're not very careful about that." Somehow we have to work our way through that. We is only through our educational process, through cooperative agreements, and through close-training efforts that we will be able to stay away from that, and form the kinds of coalitions we will need for the future.

When we think about where we're going in the future in terms of our noncommissioned officers, I think all the services see us very clearly relying more on a well-educated force of NCOs. One of the great benefits we've seen in the all-volunteer force, with the GI Bill and the other things that have structured us better, is that we have recruited far better young men and women into the service of their nation. Across all the services, that has resulted in a high-quality, highly educated force.

From our perspective, we think the structure is in place to do extremely well. Right now, our Senior NCO Academy is a joint and international venture. We have members of the Navy and the Army serving permanently on the staff there as instructors. We have a member of the German Air Force serving as an instructor on an exchange tour. Representatives from other services regularly attend that school, and from the international community.

We're fortunate to have Colonel Hank Yancey, the commandant of our College of Enlisted Professional Military Education, with us here today. He is responsible for curriculum development at all of our schools -- Airman Leadership School, NCO academies, and Senior NCO Academy. So, given central structure and central control, we have the vehicle we need to ensure we insert the right things, at the right time, into the system. The system exists. We have to be careful about what we are going to teach.

When we talk about Joint Vision 2010 and the agility we expect to have in future battlefields, much of that is based on information dominance and information superiority. The people who are responsible for those systems, in large part, for the Air Force are our noncommissioned officers, both junior and senior. Many of you in this room are old enough to remember the days when we struggled with ASAS -- the All Source Analysis System -- back in the '80s, trying to acquire that system and keep it alive. It was going to filter and direct inputs from all the many sensors we had in the battlefield -- even the limited battlefield of the '80s. This required a degree of artificial intelligence we had not yet acquired, as my good friend Bob Scales will readily tell you. As an aside, he told me one time during a conversation on our front porch, that all the services acquired a degree of artificial intelligence they developed military aviators.

For the foreseeable future, though, we are still going to have people in the

loop; and a large number of those people are going to be our young noncommissioned officers. Their understanding of the environment in which they will operate; their ability to understand the broad scheme of what a Joint Force commander's intent might be; and what their service's role or their component's role within that scheme is going to be, is important to them in making the kinds of decisions that will give us the informational agility we will need to succeed on a future battlefield. Fred Pang referenced this in his comments, and I think it's very insightful. We need to think about that. We find, in all the services, that we have put great pride and a lot of effort into the Professional Military Education of our noncommissioned officers. The structure exists. We don't want to miss out on what we need to do to ensure that they continue to make the great contribution that they are making today.

In closing, it's only appropriate, being a guest here at the Naval Postgraduate School, to quote the CNO. We were very fortunate, those of us who came from Air University. The day we left, Admiral Jay Johnson came to speak to a combined ACSC and War College audience. In his closing remarks, he assured everyone that "The Navy was being guided on its way to the future -- not by its following wake, but by the stars ahead of it."

That was wise counsel, I think, because he was speaking very clearly to the service having its eyes on the future -- trying to look forward over far horizons to the challenges they might face, and the requirements they have to prepare their people for those challenges. That's wise counsel for all of us involved in Professional Military Education, because our real challenge is to ensure that we are looking far enough ahead to provide the institutional and organizational agility needed to respond to a changing future and to support the outstanding individuals we have going through our schools. Thank you very much.

LIEUTENANT GENERAL JOSEPH J. REDDEN, USAF
Commander, Air University, Maxwell Air Force Base, Alabama

Lieutenant General Joseph J. Redden is commander, Air University, Maxwell Air Force Base, Ala., and director of education, Air Education and Training Command, headquartered at Randolph Air Force Base, Texas. As such, he ensures that Air Force needs in the areas of enlisted and officer professional military education, professional continuing education and graduate education are met, as well as officer commissioning through Officer Training School and the Reserve Officer Training Corps.

General Redden was born Feb. 16, 1943, in Council Bluffs, Iowa, and graduated from East High School, Denver, Colo., in 1960. Commissioned on graduation from the U.S. Air Force Academy in 1964, the general is a command pilot with more than 4,900 flying hours in several types of aircraft, including 607 combat missions for 1,323 combat hours. Throughout his career, he has served in a variety of flying, operations and command positions at the squadron, wing, major command and air staff levels. Prior to assuming command of Air University, General Redden commanded the Department of Defense's Joint Warfighting Center at Fort Monroe, VA.

General Redden holds a Bachelor of Science degree from the U.S. Air Force Academy, and a Master's degree in political science from Auburn University, Montgomery, AL. He is a graduate of Squadron Officer School, Air Command and Staff College, and Army War College.

His major awards and decorations include the Defense Distinguished Service Medal, Distinguished Service Medal, Legion of Merit with bronze oak leaf cluster, Distinguished Flying Cross with bronze oak leaf cluster, Meritorious Service Medal with bronze oak leaf cluster, Air Medal with five silver oak leaf clusters and three bronze oak leaf clusters, Air Force Commendation Medal, Presidential Unit Citation with two bronze oak leaf clusters, Air Force Outstanding Unit Award with "V" device and bronze oak leaf cluster, Combat Readiness Medal, National Defense Service Medal with bronze service star, Armed Forces Expeditionary Medal with bronze service star, Vietnam Service Medal with silver service star and two bronze service stars, Republic of Vietnam Gallantry Cross with Palm, and Republic of Vietnam Campaign Medal.

General Redden is married to the former Shirley Ann Woodroof of Nashville, Tenn. They have two children, Ashlee and Brett.

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MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

Remarks by
LTG Don Holder, USA (Ret)
Texas A&M University

The Inter-war Opportunity

General Binford Peay, former CINCCENT, classified the present time an "inter-war" period. I like that because it draws the right parallel between today and the other periods that have preceded large national defense efforts. In the past, the military establishment's use of the time between wars has had decisive effects and many of these have involved substantial contributions by the military school systems.

The Prussian preparations between 1852 and 1864, and the varying quality of inter-war education in the western armies before the Second World War are often cited as examples of how professional education affects performance in war. More and more frequently, commentators mention the U.S. military's recovery from the nadir of Vietnam as a similar case.

Couple that with the changes described by the "futures" panel, and the coming years promise to be similarly important. Retrospectively, this decade may well be seen as an opportunity and a formative period, a decisive preparatory interval for whatever follows.

The quality of the preparation we make now is therefore vitally important. And, while we must develop every part of the national defense establishment intelligently, nothing exceeds the importance of getting the professional education of the soldiers, airmen, sailors and marines right. Today we are educating the leaders who will devise and carry out the campaigns of the future.

Military people today serve in an environment different -- very different -- from that of the last period of substantial change. In the post-Vietnam period, the armed forces faced substantial challenges and made great progress in education, doctrine, training, material development and organization. The services are called on to do the same things today, but, while the post-Vietnam generation toiled in obscurity as semi-pariahs, this generation's military stays very busy.

You all know the chief features of this environment. Forces are smaller. Deployments are almost continuous. People rotate through assignments rapidly. Technology is presenting great new opportunities, and liabilities. The machinery procured

in the 1980's is wearing out at a time when the service budgets cannot support much in the way of procurement. And fighting doctrine is changing as national strategy and the international situation evolve. With all that going on, more time in resident schools doesn't seem likely for today's officer corps.

The "Overarching Issues for Professional Military Education" these days seem to me very simple. I believe that there are really *only two* fundamental issues. First is that of transforming PME into a more flexible and comprehensive system. That means changing its present emphasis on progressive, periodic and modestly individualized resident courses to a system of comprehensive, life-long learning that will address the specific needs of the force. The object of this change would be to impart the professional basics of doctrine and practice to the leadership as a whole, while providing more rigorous, accountable education and training to a smaller group of key leaders and staff officers.

The second and tougher task will be to raise the quality of the PME system from today's mediocre levels to real excellence. In view of the complexity of today's world, the operational environment we anticipate, and the complex transition that lies between the two, we can accept nothing less than that. But cultivating genuine seriousness about PME will amount to a cultural change that the services will generally resist.

I'll spend the rest of my time elaborating on those two points.

First the business of completing the transformation of PME and converting present systems to continuous learning programs. We have a good base to build on.

- We possess a system that is the envy of business and industry;
- We have an experienced and competent officer corps (a by-product of high OPTEMPO);
- We've made great progress in joint education; and
- Our school commandants are exceptional people.

So reform of the PME system wouldn't start from zero.

The Schools are dealing with a changed environment, though. The forces they support are operating at a very high operating tempo while simultaneously re-organizing and re-orienting themselves. We should not expect this to change and, therefore, with the forces as small and busy as they are, we should assume that there will be no more time available for resident education in an officer's career profile than there is now.

To contribute effectively, then, the schools will have to adapt to existing conditions. Instead of being chiefly residential programs, they will have to provide continuous, individualized, accountable education to leaders throughout their service. Instead of spending their time in basic instruction about quantities and qualities, they will have to devote more effort than ever before to teaching their students *not* what to think, but *how* to think. Everyone has a favorite scheme of changing the concept of PME. Here's mine:

All career officers would be expected to learn continuously throughout their service and would be responsible for demonstrating progress on professional examinations. The mode of learning would be less important than the fact that the learning took place. Therefore, officers would meet professional education requirements established by their services and the joint staff through a mixture of resident and non-resident training. All officers would attend basic courses designed to teach doctrinal and procedural standards. All would be eligible for special courses designed to prepare them for particular assignments. A smaller number would attend staff and war colleges.

In this effort:

- All officers would receive basic specialty and service education through the ranks of 0-3, in courses long enough to thoroughly teach them service and branch doctrine and staff techniques and procedures. For most officers this would be the only extended resident course they would attend.

- As senior 0-3s, all officers would enter a program of mandatory and elective studies that would continue throughout their careers. While in staff and line assignments, their commanders follow their progress and assist them, while the services maintain central records of their course work. This in-service training obviously cannot distract officers from their principal duties, but it would fit easily in a tiered readiness arrangement in which the unit emphasizes refitting and basic training.

- In addition to teaching resident courses, the staff and war colleges would write and administer these continuing education courses in doctrinal and technical fundamentals for non-resident students.

- The services and joint schools would also provide special preparatory courses for unique or sensitive assignment -- things like treaty verification duty, attache duty, military support to civilian authorities, humanitarian relief and the like. These would either be short resident courses or courses taught through any of the existent non-resident means. (Some courses of this kind exist now.)

- Resident attendance at the major schools -- by which I mean the staff and war colleges -- would be limited to a smaller number of promising core specialty officers. A few professional specialty officers attend these courses, but most doctors, dentists, lawyers, administrators and chaplains go to joint senior specialist courses in lieu of the combat-centered courses.

Testing would complement the system, allowing course work to be focused on the learning needs of the student and permitting full or partial course credit for individual learning. At critical developmental points, officers should take certification examinations just as other professionals do. If I were organizing that program, I'd require senior 0-3s to demonstrate their basic understanding of their specialties before promotion to 0-4, and all 0-5s to re-certify at a higher level before being promoted to 0-6. Freer use of testing would

allow officers who have learned in active field service to "test out" of all or parts of resident courses, or to receive credit for short courses in the joint or service catalogue.

This approach would preserve a strong level of general education in the force, make leaders principally responsible for their own development, and, by reducing the size of classes, support better instruction in the staff and war colleges. Such a program should allow officers to follow their own interests to some degree, but would also assure that they all read and studied their professions even when they were not enrolled in schools.

There's a clear part for every participant in this arrangement.

Role of the officer. In such a system, the individual leader bears most of the responsibility for his learning. With the assistance of self testing, branch guidance and counseling from his bosses, officers should be expected to improve their strengths, remedy their weaknesses and prepare themselves for the next level of employment. Professional reading lists and correspondence courses all have a part to play. As a former division and regimental commander, I understand the "busy-ness" of officers in the line, but I know from my own unstructured "in-service" study that reading the profession while doing it is possible. Units, in fact, derive advantages from having their leaders study while they are involved in troop leading.

Role of the line. To pitch formal schooling at the proper level, the services and joint educators would need to administer developmental programs for their leaders between their school assignments. Those programs would roughly resemble the old "school of the soldier" that used to teach young leaders in the units in the 19th Century, but would be supported with the best available non-resident materials. Taught in coordination with a unit's training cycle, professional development would become a full- time activity, and most educational needs would be met in the field or the fleet.

Role of the Schools. The role of schools in this arrangement would be to assure consistent basic doctrinal instruction to the leadership at large through resident and non-resident courses. Technical and basic courses wouldn't change much. Schools would write and evaluate all course work. The resident courses would remain the most important means of educating future leaders. But they would begin their instruction on a higher plane than at present because students would arrive better prepared. Curricula and faculties would then be

able to use the time in school to stretch their students' horizons by forcing them to solve problems several echelons above their actual ranks, and to think hard about the full spectrum of operations.

Even if operational tempo remains high, there is every reason to support such an approach. As peacekeeping operations settle into long-term, routine activities or operating elements are positioned for deterrence, leaders will have the opportunity to work toward their required development objectives through distance learning and electronic

correspondence courses. Doing so in field conditions offers the advantages of immediate application of some of the learning and constant comparison of theory with reality.

Improved teaching tool -- interactive self-development programs, low-overhead simulations, digitized references, computer-assisted instruction, collaborative distributed work stations and the like -- now add great efficiency to every aspect of learning. They can also improve faculty understanding of student progress, strengths and weaknesses, and pace student learning to the individual's progress.

Service leadership and the Joint Staff would design the system and prescribe its requirements.

The second problem is that of improving the quality of American PME -- of assuring that the services get full value for the investment that PME represents. This is important whether or not you accept my first advice about re-forming the education system. And it comes down to improving the quality of students, faculties, and facilities, but most importantly it depends on the unqualified support of the senior leadership of the services. As I said in the introduction, this is a counter-cultural idea.

The services presently use selection boards to choose officers for resident PME. Graduation from a course is less meaningful to the officer than being chosen to attend. Service schools are distressingly disinclined to insist on high academic standards. The "gentleman's 'B'" predominates and comes almost automatically to those who participate. The schools also suffer from outmoded instructional tools and fall short of accomplishing what they should as a result.

A number of things might be done to improve quality:

Changing the method of student selection from simple review of files to a mixed system of applications and boards would prove instantly beneficial. To be considered for the next resident course, prospective students should have to show progress since their previous academic experience. Requiring them to qualify for attendance at the staff and war colleges would first shock the officer corps and then stimulate a lot of healthy activity.

Prospective students should take the initiative in their middle and high-level schooling. First, officers meeting course prerequisites (experiential and completion of non-residential requirements) would take the initiative in applying for admission. Second, applicants would qualify for admission by passing an entrance examination. Selection boards' tasks would be simpler, since they would only consider for admission those officers who had performed to an agreed-on standard on a test. *This simple change would induce a substantial change in officer behavior and in the quality of professional education. Instead of relying solely on assignment patterns, reputation and fitness reports for selection, the system would compel officers to study their professions to assure their ability to qualify for schooling.*

A second important change would be to record academic performances in greater detail, and base assignments in part on school performance. This has greater applicability at the war college level than in the staff colleges. We would do very well, however, to emulate the policy of the British Higher Command and Staff Course in using course performance as a basis for assignments. In our application, we might make the most sought-after assignments contingent upon strong performances in relevant courses.

Involving commanders and staff supervisors in monitoring the non-resident progress of officers in the line would be part of the system. This would settle in on top of scheduled performance counseling as a natural accompaniment and would add a new dimension to the overall evaluation of a subordinate's performance.

Faculty. Staffing the schools with expert faculty is no less important than selecting the strongest possible students. The best civilian schools exert enormous effort and devote considerable amounts of money to build strong faculties. Teaching is only one reason that they do this, but it's generally agreed that an all-star faculty is essential for academic excellence.

At present, only the special advanced studies programs (SAMS, SAAS, SAW) and, to an extent, the Marine Corps take this approach. Requirements for highly qualified officers in operational billets, at training centers, on joint and service staffs, and in directed assignments (reserve components, recruiting, ROTC) all take precedence over faculty positions. As a result of the priority placed on other assignments and the tendency of promotion and command selection boards to ignore or even penalize teaching experience, few officers seek assignment to service school faculties. To a promotion board member, a classroom teaching assignment is at best a skip-over line on an officer's record.

For instance, the Army requires its staff college faculty to be graduates of the staff college course but cannot detail enough experienced people to fill the billets. It therefore assigns a number of each year's Leavenworth class directly to the faculty. The service also initiated its Combined Arms and Services Staff School (CAS3) with the intention of using former battalion commanders as teachers for captains. In practice, the number of command-experienced lieutenant colonels has dwindled and, because of other priorities, the former commanders the School does get are predominately those who fail in selection for war college.

This institutional indifference toward teaching doesn't deter some very good people from working on the faculties, but it doesn't reward them either. Teaching at a service school therefore gets little priority from assignments officers and tends to attract officers who either prefer teaching to field work or have missed selection for a more prestigious post.

Goldwater-Nichols strictures force a specified number of joint staff officers (JSO) and joint-experienced officers into the schools to teach joint subjects. The services would benefit from some similar forcing factor that would put outstanding instructors on the platform. **At the very least, the status of their faculties should be reported in**

readiness reports that inform public officials and senior leaders of the condition of the teaching base.

Other possibilities include policies that link faculty duty with first line operations jobs. That would earmark a fraction of the 0-4s in primary staff positions with line units for subsequent assignment to the college faculties. First assignments for a defined number of line officers at the 0-5 level might be to teaching or training positions.

More ambitiously, faculty for the staff colleges and war colleges could be selected by boards or "by name" based on their professional reputations. Some of the best foreign schools do this. The Fuehrungsakadamie and the Higher Command and Staff Course choose their faculties with great care. In the case of the German staff college, assignment as a syndicate leader is a high prestige position that usually presages promotion to flag rank.

Two other European practices bear examination. Both would selectively counteract the loss of talent that comes with the American twenty-year retirement system and thirty-year service cap. The German Army permits longer service in the first place, but it also encourages its most talented colonels who are will not advance to flag rank with special status. These "colonels deluxe" get additional pay and the status that goes with being singled out as the best on service. While the Bundeswehr does not put these officers into its schools as a rule, we might very well employ a few distinguished colonels and captains in that way to add stability and experience to the college staffs.

Similarly, a few older general officers might be retained on duty for extended assignments to the leadership of service schools or as distinguished faculty. This works well for the Russians and complements their younger faculty very effectively.

Where joint education is concerned, there is room to build on the strong base established by the provisions of the Goldwater-Nichols Act. Specifically, the Joint Staff and unified commands should take a more active part in joint education.

Instituting CINC chairs or teaching positions at the major colleges would pay off in the quality of instruction and in preparation of students for duty with the joint commands. The CINCs could also assist in teaching by participating in the staff and war college course-end exercises, which in every case involve joint operations. The potential here ranges from simple staff participation – AOR briefings, advisory assistance to student planners, product review and comment – to exercise design and administration. In the most ambitious application, a simple rotation would pair the unified commands with a different institution every year, giving the CINCs responsibility for exercise design. This would solidify the connection between the schools and the field, and add realism to coursework.

Facilities. Today, the service colleges are falling behind in a period of high-tech teaching aids and increasingly automated operations. They neither possess the best in instructional aids nor the command and control tools that fighting organizations use. As a result, they are not as effective in teaching as they might be, and they are increasingly less

able to show students the full operational picture as it is experienced in field command centers.

The Total Army School System (TASS), a non-resident instructional system being erected for the Reserve Components, has great potential for extending education to the field at large. Using the TASS network and courseware, the Army and the other services could conduct a large percentage of routine instruction using distance learning techniques.

At the end, however, we must return to the critical assumption. The only guarantor of success in either re-forming the education system or improving its rigor is the determined and committed participation by senior leaders. If the military is wise and active, it will produce this leadership itself. If it fails to do so, it exposes itself to the same kind of forceful external compulsion that was finally necessary to install high quality joint PME.

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Remarks by
Dr. Williamson Murray
Lindbergh Professor, National Air and Space Museum

It is an honor to have the opportunity to participate in this conference with its celebration of the Skelton Committee's examination of PME in the late 1980s.[1] I am particularly delighted to have this opportunity to comment on the overarching issues involved in PME, because I believe that we are at the beginning of a substantial strategic pause, when the United States will confront no great threat to its security. During that period, the most important thing the American military can do, after accomplishing the day-to-day tasks set by the leaders of the Republic, is to provide its officers with the intellectual understanding required to handle the terrifying challenges that will confront them in the next century.

Professional military education must be a crucial player in that preparation. As has been the case in the past, how well American officers prepare themselves intellectually by the serious study of war will determine to a great extent how effective they will be on the battlefields of the future. My remarks will then address where we were ten years ago, how far we have come, the importance of PME, and finally what we need to do to possess a serious intellectual basis to adapt and innovate in an era of scarce resources and great challenges.

PME, Ten Years Ago

The landscape of professional military education when the Skelton Committee addressed the topic in the late 1980s was an intellectual desert.[2] At virtually every PME institution, with the exception of the Naval War College, there was a general confusion of appearance with substance and training with education. The aim was generally to make the students feel good about themselves. PME represented the triumph of the 1960s educational philosophy at its worst.

The staff and war colleges taught a wide variety of subjects with no discernable focus. It was education as Lyndon Johnson described the Pecos River, a mile wide and an inch deep. At most of these institutions there were no grades, little reading, no examinations, and few writing assignments. A senior marine officer suggested to me about his time at the Army War College in the mid 1980s, "Since you studied law at law schools, medicine at medical schools, and business at business at business schools, I thought that you would study war at the war college. Boy was I wrong."[3] Finally, the faculty at these institutions were for the most part undistinguished -- dragooned into their teaching positions because the personnel systems had no other place to put them.

There was one exception in this landscape of mediocrity -- the Naval War College. There, in the early 1970s, as Harry Summers suggested earlier today, Admiral Stansfield Turner executed an intellectual revolution that scrapped the old approach and focused the curriculum on a graduate-level examination of three distinct subjects -- what has today evolved into the courses on strategy and policy, national strategic decision-making, and operations. Yet even here there was reason for despair, since the Navy then, as today, refused to send its best officers to Newport. Of the sea services, only the Marine Corps was willing to send its best officers to the Naval War College.

The Present

We have seen some significant improvements over the past decade, but there is still too much of an unfocused atmosphere at PME institutions, while the services for the most part still regard PME as a not particularly important part of their responsibilities. Too many senior generals regard PME as a time for their officers to rest in their busy careers, get to know their families, and play some golf. In other words, we still have a long way to go.

Let me turn first to the positive areas where Congressman Skelton can take justifiable pride in the improvements the services have made in some PME areas. The air Force has significantly improved the Air Command and Staff College. Similarly, the Marines have made major improvements at their Command and Staff College. Both institutions now possess civilian academics on their faculties. Under John Warden, one of the foremost thinkers in the Air Force, the Air Command and Staff College transitioned to an all-book curriculum. For their part, the Marines have not only hired a number of impressive civilian academics, but they have taken steps to upgrade the military faculty by establishing a small war college at Quantico and assigning graduating lieutenant colonels and to serve two years on the faculty of the staff college. This has ensured that their military faculty have come from the war college list -- the best available.

Where the Army, the Marine Corps, and the Air Force have made the most significant strides in improving PME has been in the creation of second-year courses for the top graduates of the staff colleges. The Army's Training and Doctrine Command established the first of these courses at Fort Leavenworth, with the impressive title of School for Advanced Military Studies (SAMS). The school has lived up to that title. The focus of SAMS was almost exclusively on the operational level of war. An intensive one-year curriculum, with academic rigor similar to that of the Naval War College, used military history, particularly the study of campaigns, staff rides, exercises, and intensive reading and writing assignments to provide a <u>real</u> education in the profession of arms.

By the early 1990s, the Air Force and the Marine Corps had been impressed enough with what SAMS was providing the Army to establish similar schools at their staff colleges. By 1998 the Air Force's School of Advanced Airpower Studies (SAAS) and the Marine's School of Advanced Warfighting (SAW) had achieved similar reputations for the quality of their education and graduates. Unfortunately, the Navy, since it found it

impossible to send its best officers to the staff course at Newport, also found it difficult, if not impossible, to provide first-rate students as exchange officers to the second-year courses of the other services, much less establish a second-year school of its own for the intensive education of its officers in the conduct of naval campaigns.

The record with regard to the area of PME is not nearly so satisfactory. The Naval War College still provides a first-rate graduate education in the study of war, strategy, and the complexities of American defense policies. But the Navy has remained, for the most part, oblivious to the importance of providing its senior officers with an education at the war college level. According to figures provided last year, out of the current crop of approximately 300 admirals, only 187 have been to the Naval War College (some undoubtedly to the junior course), twenty to the National War College, and none to the Army, Air Force, or Marines six war colleges -- a monument to the Navy's contempt not only for education, but also for its cooperation with the other services.

The situation with regard to the Air War College is particularly distressing. In the early 1990s, two of the finest military officers with whom this author has worked, (then) Lieutenant General Chuck Boyd (Commander of Air University) and Major General Chuck Link (Commandant of the Air War College) carried out a series of major educational reforms that brought in an impressive civilian faculty, focused the curriculum on the study of serious military subjects, and introduced real rigor into the course.

Unfortunately, over the four years after they left, their successors dismantled their reforms, reduced the core study of war, strategy, and operations by nearly 50 percent, introduced a set of electives that further watered down the curriculum, and provided the students with junkets around the world that supposedly provided them with understanding through osmosis rather than serious study. Once again the educational philosophy of 1960s "feel goodism" had reemerged along with a substantial amount of techno-babble to provide an "experience" that had little to do with the serious professional education of officers. Admittedly, there is a new team in Maxwell and there are hints of an interest in moving back in the direction of the Link-Boyd curriculum. Nevertheless, as with all things, it is easier to destroy than to build.

The situation with regard to the Army War College is not any better. Carlisle has introduced grades, but not much in the curriculum's focus has shifted back to the study of war. The curriculum remains firmly in the hands of those who believe that war is only one of a myriad of subjects the students should study. The 1996-1997 curriculum devoted as much time to the students' trip to New York as to the study of war. In fact, in the national strategy block of the curriculum over the first three months, the students received a one-day tour of the Civil War, one day on World War I, one day on the interwar period, one day on World War II, one day on the Cold War, and one day on Vietnam. Altogether they could not have read much more than 600 pages. One might contrast that seven-day period with the Naval War College's intensive three-month course with thirteen case studies and nearly 8,000 pages of reading on the parameters of strategy making.

The Army, of course, may believe that its war college curriculum should focus largely on internal U.S. matters. In that case, it might consider changing its forces to a cadre structure to support the National Guard and the Reserves. The Army Chief of Staff has recently appointed a sophisticated and intelligent general officer and student of war to become the commandant of the Army War College. What he will be able to accomplish in refocusing the Army War College on the study of war, strategy, and operations will indicate a great deal about how serious the Army is in preparing its officers for the next century.

The Historical Importance of Professional Military Education

What makes PME so important is the role that it has played in military innovation and effectiveness in war throughout the twentieth century. To a great extent, it has been a major factor in determining how military institutions will adapt to the actual conditions of war. As the great British military historian Michael Howard has suggested on a number of occasions, officership is the most demanding profession not only in a physical sense, but in a mental sense as well.

The history of the 1920s and the 1930s underlines this in spades. Those military institutions that took professional military education seriously did well on the battlefield, while those that did not, did poorly. Admittedly, there were other factors in play as well, but PME was clearly a major factor in the processes of innovation and adaptation.[4]

Of all the world's military organizations during the interwar period, the German Army took PME the most seriously. One gained entrance to the Kriegsakademie only by passing a rigorous examination that lasted sixteen hours, and only a small percentage of the officer corps was able to pass that hurdle. Even then, not all those admitted to the Kriegsakademie completed the two-year course. In the process of educating its officers, the general staff stressed careful, thorough study not only of the recent past, but military history in general. The intellectual excellence in the top levels of the German Army is suggested by the fact that Generals Werner von Fritsch and Ludwig Beck were two of the three authors of the 1932 edition of Die Truppenfthrung, arguably the finest doctrinal manual of land warfare ever written; and both were about to take over the German Army in 1933 as its commander-in-chief and chief of staff, as well.

Yet we need not look only at the Germans as placing PME at the center of preparing their officer corps for war during this period. The U.S. military throughout this period possessed a similar belief in the importance and relevance of military education. What happened at Newport with war gaming, participation in and designing of fleet exercises, and thinking about the potential of carrier aviation even before the U.S. Navy possessed a single carrier, all contributed to a Navy that possessed the fighting conceptions and intellectual foundation to plan and win the greatest war in naval history. One sees a similar emphasis on PME in the other services. The Schools at Quantico, the Air Corps Tactical School, the Army Command and General Staff College, and the Army War College, all focused of the study of war in the education of their student officers.

Perhaps nothing makes this emphasis clearer than the fact that a number of the future leaders of the U.S. military in World War II were not only students at PME institutions, but also served on their faculties. Admiral Raymond Spruance served not just one, but two tours on the faculty of the Naval War College. The aviation pioneer Admiral Joseph Reeves and Richmond Kelley Turner also did tours on the Naval War College's faculty.

Out of seven members on the faculty of the Army War College for the academic year 1939-1940, one was Colonel W. H. Simpson, Ninth Army commander in 1944-1945. Another was J. Lawton Colins, a future Army chief of staff. The next year, another future Army commander in the European Theater of Operations, Alexander Patch, joined the faculty. Similarly, one finds such future luminaries of the Army Air Forces in World War II as Harold George, Kenneth Walker, Clair Chennault, and Haywood Hansell as instructors on the faculty of the Air Corps Tactical School in the 1930s. I hardly need to point out to this audience that one would be hard pressed to find a single admiral or general over the past thirty years who has served on the faculties of the war colleges.

The Future of Professional Military Education

There remains much to be done to live up to the hopes of the Skelton report. The real issue in terms of PME reform is not whether the services have lived up to Congress' specific recommendations. The harsh fact is that, in all too many areas, particularly with regard to the war colleges, the services have not lived up to the spirit of what the Skelton Committee was asking them to do on the educational side of professional military education. Above all, the Skelton Committee was asking PME institutions to place the study of war, strategic history, operational history, and the business of making U.S. strategy at the heart of what they were doing at the staff and war colleges. As the above suggests, there remain considerable improvements to be made in this area.

The most important issue remaining has to do with rigor. There are three sides to this issue. The first has to do with the processes of selection. Between the wars, the Germans followed a rigorous process of selection that involved an eight-hour examination that eliminated the great majority of those taking the test (upwards of 95 percent); and then the Krieqsakademie eliminated a substantial number of those who had made the first hurdle in the process of the two-year school. Entrance to the German Staff Colleges is still determined by rigorous exams. On the other hand, the British Army does not require an examination; rather academic standing in the junior staff college determines who will eventually go on to the staff college.

One might not want to be as selective as the inter-war Germans were in determining who goes to the staff college. But the Army and the Air Force could certainly cut down on their 50 percent selection rate that, in effect, makes little distinction amongst the officers on active duty. Educating a smaller percentage of the officer corps (and eliminating the nurses, lawyers, dentists, and finance officers from the student body) would allow more attention to individual students, improve faculty quality, and raise educational standards. In addition, performance at PME institutions should determine

assignments as well as remain a permanent and important part of each officers promotion file.

But as the Skelton report underlined, rigor has especially to do with the content of what is taught at the staff and war colleges. Theses PME institutions are supposed to study a narrow band of subjects that have to do with war, grand strategy, national strategy, historical case studies that have to do with war, and the study of joint and combined operations. These schools are not supposed to be international relations courses and social science fads, or involve the pet rock collections advocated by narrow interests within the Beltway. JV 2010 is not a proper subject for study at the war colleges except to illuminate how "bumper stickers and advertising slogans" can replace substance in the Pentagon.[5]

Moreover, the Skelton Committee underlined that PME education at the intermediate and senior levels should be based on the same principles that guide the study of education at the graduate level at our best universities. Again, as Harry Summers suggested, the Naval War College provides the real model for academic rigor with a minimum number of lectures, graduate-level reading assignments (600 to 700 pages per week), and its rigorous papers and examinations. Those who graduate from that institution with high distinction or with distinction have reached an academic level equal to that of the best students in the best graduate schools in the United States.

The services were provided substantial authority by the Skelton Committee to hire the most outstanding civilian academics available in the areas of strategy, strategic history, national defense economics, war studies, and national security studies. Given the contempt that American academic institutions of higher learning continue to display towards such subjects,[6] one might have thought that they would h done better than they have. Only the Naval War College, the Marine Corps Staff ege, and the Air Command and Staff College have assembled truly first-rate civilian aculties. There can clearly be substantial improvement in this area.

On the other hand, one of the anomalies of the present system is that both the Air Force and the Army have been willing to lavish graduate education (two years towards a masters degree at a major university) on captains in preparation for their teaching on the faculties of the academies. These captains are for the most part drawn out of the ver op of their year groups.[7] Yet half of the cadets that these officers teach will leave the m ry service in a minimum of time, while only a few of the remaining 50 percent will reach the rank of general, and only then after the passage of at least a quarter of a century. On the other hand, only the Marines have made war college attendance a prerequisite for duty on the faculty of their staff college. As of yet, none of the services have been willing to provide graduate-level education for those who are going to teach at either the intermediate or senior level. Considering that a far higher percentage of students have the potential to reach 0-7 level within a decade (at least in the case of the war colleges), this seems to be an unacceptable situation.

The most distressing aspect of this conference has been the sustained assault of techno-educational "experts" on serious military education. Clearly, the majority of speakers have been advocating the turning of PME into either an engineering, system analysis exercise, or even worse into a Toffleresque combination of recent educational trends by suggestions of interfacing, conductivity, web surfing, and the like. Let us be perfectly clear about the latter case. It leads straight to the death of PME -- in fact, of any education at all. It is a return to the principles of 1960s education, with its emphasis on unstructured "learning and performance," a replacement of substance with style and fuzzy, meaningless concepts.

The former course, with its emphasis purely on subjects is an equally dangerous one. With its emphasis on straight engineering and technology, it represents the rebirth of Robert McNamara's system analytic, linear, engineering approach to military subjects. The only difference is that, this time, the enemy is not coming from within the Office of the Secretary of Defense -- it is coming from within the military itself.[8] If such a view prevails, the results will be as disastrous for the U.S. military as was Robert McNamara's dismissal of history, strategic thought, and the serious study of military history. Let us be perfectly frank about this: If we are to turn our war and staff colleges into schools of technology, as so many of our speakers have suggested, then we would do better to close them down entirely and send the students to study at real engineering schools like MIT and Cal Tech.

It is this author's contention that the study of the profession of arms demands a knowledge of strategic history, the conduct of campaigns not only in the twentieth century but earlier as well, and the historical issues that have determined performance on the battlefield. We have heard a senior admiral challenge Representative Skelton's defense of the use of history to elucidate the problems of today. Such attitudes, all too well entrenched at present among senior officers, represent an unwillingness to recognize the importance of history in broadening officers' understanding of their profession, the profession of arms. No less a student of strategy than George C. Marshall once suggested that no one who wished to understand history could do so unless they had read Thucydides' History of the Peloponesian War. We would do well to remember Marshall's wisdom as we think about professional military education in the next century. We did not in the 1960s, and the result was not only a lost war, but the collapse of the United States.

Endnotes

1 The Skelton Committee's examination of PME remains the most thorough and intellectually valid examination of what needs to be taught to our officers, and how to prepare them to defend this nation. It stands in stark contrast to the shallow and careless report done by CSIS this past year. For a critique of the CSIS report, see Williamson Murray, "How Not to Advance Professional Military Education," Strategic Review, Summer 1997.

Endnotes (continued)

2 Shortly before the Skelton Sub-Committee of the House Armed Services Committee convened to examine the subject of professional military education, this author wrote a harsh critique of the state of PME in the war colleges. See Williamson Murray, "Grading the War Colleges," National Interest, Winter 1986/1987.

3 Comment made by Lt. Gen. P. K. Van Riper, USMC Ret., to the author.

4 For a discussion of innovation during this period, see Williamson Murray and Allan R. Millett, Military Innovation in the Interwar Period (Cambridge, 1996).

5 I am indebted to Lt. Gen. P.K. Van riper, USMC Ret., for this characterization of JV2010.

6 See John Lynn, "The Embattled Future of Academic Military History," The Journal of Military History, October 1997.

7 What the service gains is suggested by the case of Major H. R. McMasters, who was the company commander for the 2nd Armored Cavalry regiment at 73 Easting during the Gulf War and who since then has earned his masters at the University of North Carolina, taught at West Point, and produced the definitive book on America's entrance into the Vietnam war in 1964 and 1965. See H. R. McMasters, Dereliction of Duty: Lyndon Johnson, Robert McNamara, the Joint Chiefs of Staff, and the Lies that Led to Vietnam (New York, 1997).

8 See my recent article, "Computers In, Clausewitz Out," The National Interest, Summer 1997.

WILLIAMSON MURRAY

Lindbergh Professor, National Air and Space Museum

Professor Williamson Murray received his B.A., M.A., and Ph.D. from Yale University. He spent five years on active duty with the United States Air Force in the 1960s, including a tour of duty in Southeast Asia. He also served eight years on the air staff as a reserve officer in the doctrine center. In his academic career he has taught at Yale University and the Ohio State University and has been a Centennial Visiting Professor at the London School of Economics and a visiting professor at the United States Military Academy. In addition, he has been a visiting professor at the Air and Naval War Colleges, a Secretary of the Navy Fellow at the Naval War College and the Matthew C. Homer Professor of Military Theory at the Marine Corps University. He is the author of *The Change in the European Balance of Power, 1938-1939, The Path to Ruin* (Princeton University Press, 1984); *Luftwaffe* (Nautical and Aviation Press, 1985); *German Military Effectiveness* (Nautical and Aviation Press, 1992); and *Air War in the Persian Gulf* (Nautical and Aviation Press, 1992). Professor Murray has also edited a number of collections dealing with military and strategic issues: *Military Effectiveness*, vol. 1, *World War I*, vol. 2, *The Interwar Period*, and vol. 3, *World War II* (with Allan Millett, Allen and Unwinn, 1988); *The Making of Strategy, Rulers, States, and War* (with MacGregor Knox, Cambridge University Press, 1992); *Military Innovation in the Interwar Period* (with Allan Millett, Cambridge University Press, 1996); *Brassey's Mershon American Defense Annual, 1995-1996, 1996-1997, and 1997-1998*. Professor Murray is also the author of a number of articles the most recent of which are: "Computers In, Clausewitz Out," *The National Interest*, summer 1997; and "The Gulf War in Retrospect," *Military History Quarterly*, fall 1997. At present, he is working on a general history of air war from 1914 through 1945 for Weidenfeld and Nichols and with Allan Millett on a general history of World War II for Harvard University Press.

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PME for the 21st Century Warrior

SESSION FIVE

Human Capital: What kind of officers do we need for the 21st Century and what kind of education and training infrastructure do we envision to support them?

Question: **What kind of officer will we need and do we have the best educational paradigm?**

Objectives:

1. **Specify the desired qualities of mind and character - the "cultivated intelligence" - this nation's military officers will need to dominate the operational environment of the 21st Century.**

2. **Identify the nature of an educational process and its attendant infrastructure that will produce the intelligence and the propensity to innovate, integrate, and inculcate technological advances in matters of policy, strategy, and doctrine.**

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Remarks by
Congressman Steve Buyer

Today's topic is professional military education -- PME. But first let me just share something with you. I heard one of the last speakers talk about the golf component of PME. I'm willing to stand here and admit the truth about it, which some of you will not laugh about, because we all recognize it. I first learned about PME when I went to the Officer Basic Course. I perfected my three handicap there. I know that's a rather sad statement, but it's true.

From 1976 to 1980, I went from age 17 to 21. I was trained at the Citadel by Vietnam veterans. These Vietnam veterans taught their courses intensely because they had seen death. They had experienced levels of fear and levels of courage that most people had never experienced. So when they taught us at the ROTC, they were very serious.

My first introduction to PME came after I left the Citadel and went to the Officer Basic Course. I was stunned. It was a check-in-the-box type of education that demanded little attentiveness. The instructors tap on the desk or clear their throat to let you know when to pay attention: the material that followed those "notices" was going to be on the next test.

So, I wasn't surprised when Professor Murray complained about the quality of PME graduates. There's nothing wrong with golf. But I just wanted everyone to know that, when I think about the subject of PME, I try not to get all wrapped up in the information age and what's it going to do to us, how we should transform it, and how we should prepare ourselves for the future. I believe we should pause and think about fundamentals.

The fundamental is the human ingredient -- the type of individual we need to be a good officer. What type of man or woman do we need to serve successfully in an integrated military to win the next battle?

Reflecting back, and borrowing from my Officer Basic Course notes, I see that following Prussia's defeats by Napoleon at Jena and Auerstadt in 1806, the Prussian military reformers led by Scharnhorst "professionalized" the officer corps with a goal of institutionalizing military excellence.

One of Scharnhorst's initiatives was the creation of a military school for officers. Back then it was, "The officers lead by example." Put all the soldiers in a line and never permit small units to think and operate on their own." Scharnhorst revolutionized that kind of military thinking.

There's so much of what you do in military education today, and what is being done at other schools, that is focused upon permitting individuals to think, to use their educations and their intuitive skills. We understand now that success on the battlefield is determined by small unit tactics. So, let's not overthink it.

There has also been some mention of the inter-world-war period, between 1919 and 1941. It is important to think about that time. The general officers who led the successful campaigns of World War II were the ones who maintained the military educational system during that inter-war period -- Eisenhower, Bradley, Ridgway, MacArthur, King, Halsey, Spruance, Arnold, Vandenberg. They all attended PME during that period, and that contributed to their tremendous success.

So when I think about PME today I have to ask whether there really is anything but an "uncertain future". The very nature of the future is uncertainty. So, I was tickled when I heard one of the speakers talk about how we have to know exactly where we're going and we have to have a prepared vision.

Uncertainty is another fundamental. It even comes right out of the Bible. A Bible proverb says, "If the bugler is uncertain, who will follow?" So what we are struggling with here -- not only in PME, but also in how we are going to fight future battles -- is trying to figure out where we're going.

The future is also uncertain for individual officers. They are going to have to operate in an austere fiscal environment, with budget reductions. Many of us are very critical in Congress about this "Well, you can just do more with less" philosophy. That is not a strategy for success.

What I am supposed to talk about today is what kind of officer will we need? I think it's very clear. We need one that is morally strong. As Tom Ricks pointed out in his recent book, Making the Corps, the values of today's society are not necessarily those required for an effective military. Honor, courage, commitment, dedication, duty, and selfless sacrifice are elements of a strong character that is still required by our military today.

What is difficult for those of us in Congress to grapple with at the moment -- and those who serve in the military -- is that military people are supposed to be the defenders of society. Yet today we have a society whose ideals are much different than the military's. And the schism is growing.

So when society now looks inward at some of its own problems, who does it turn to? When society has a drug problem, who does it turn to? Well, it turns to

the military: "They will help us in the drug war." Just last week, we had the Indiana National Guard tearing down crack houses in Gary, Indiana.

We also need officers who know how to think. One criticism of the PME system prior to the Skelton Panel was that the staff and war colleges emphasized format over the problem solving. It didn't matter if the tactical operation or the strategic solution was workable as long as the orders were issued in a proper manner.

The uncertain future, coupled with a fast-moving CNN, will require officers who are intuitive thinkers, who can work through the complex problems quickly, and produce workable solutions to crises.

We also need "techies" -- officers with technical skills. The information age has produced a variety of highly-technical battlefield systems that threaten to overload the mind of the commander or staff officer.

At the same time, the military leaders are increasingly involved in nontraditional operations that require extensive knowledge of the culture, economics, language, and government of potential adversaries. These officers will need to meet a growing number of criteria.

We all learn early on, and we've heard it a thousand times, that knowledge is power. But we have to leverage that power and then somehow reduce the risk so that we can be successful. Think about the Gulf War chemical weapons problem for a moment, when even our own intelligence on chemical weapons never got to some of the highest decision-makers. And we find that out six years later.

The technically competent military leader will need to understand the capabilities and limitations of technology -- of those technologies that are available. I have to tell you a story.

When I was asked -- well, I wasn't really asked, they gave me orders -- to deploy to the Gulf, they gave me a World War II vintage typewriter that was missing two letters: E and O. Now, those are two letters that you sometimes need. I actually had to sign for it! Can you imagine this? Well, I said, "I'm not signing for and I'm not taking this thing to the Gulf!" I actually did have to sign and take this World War II typewriter with me to the Gulf -- without an E and without an O, and the number 1 was the letter I. At that moment, I realized that there were three things that would survive a nuclear blast at Ground Zero: cockroaches, wing-tipped shoes, and that typewriter.

Now, I was a practicing attorney in a small town, and was used to a very sharp legal secretary. I dictated everything. So now I end up in the Gulf and, as a result of my jokes and complaints about this World War II typewriter, they gave me a laptop computer. I didn't even know how to turn it on. I'm now at the Western

Army Prison War Camp with a laptop computer that I didn't even know how to turn on, with no staff and no support. I felt pretty awkward.

So whenever I wanted to write, I had to do everything in longhand, and then I'd have to go down to KKMC. It is a rather sad statement, but I'd get the staff judge advocate, and I would dictate to him, and he would type the stuff for me. So this thing about being technically competent -- I know exactly what they mean. Maybe I was caught between generations. I don't know.

Another important issue is cultural awareness. When I think about having not so much an emphasis on training as on cultural awareness in the education environment, I wonder if General Wainwright would have surrendered at Corregidor if he had a better cultural awareness of the Japanese. If he had an idea of the atrocities the Japanese inflicted on prisoners of war, would he have surrendered? We didn't understand the Japanese culture, and how the Japanese then placed no value at all on human life -- especially the life of an individual who would dishonor themselves and disgrace their family by surrendering.

Thoroughly understanding how a Somali warlord thinks and operates is extraordinarily important. The cultural awareness in our studies, especially as we reach to all corners of the world, is very important.

Intuitive thinking will become more and more important. The future leaders, more than ever, are bombarded with thousands, if not millions, of bits of information. And the leader must be able to use his or her experience and intuition to recognize key elements of a situation and make a sound decision.

Every year I have the privilege of selecting individuals to go to the service academies. And I don't always select the individual who has all the straight As, with 1400 on their SATs. I look for the best well-rounded men and women I can possibly find who have the intellectual capacities to juggle many things at once. You give me that individual, and that will be a successful leader.

An officer also has to be very comfortable with uncertainty. Our military education system has emphasized analytical problem solving -- reducing the number of unknowns in a problem, comparing alternative solutions, and then making a decision. One of the alluring promises of the revolution of military affairs is that technology will be able to provide a complete picture of the battlefield to all levels of command, at all times.

I believe this is a false promise. Uncertainty, now more than ever, will be the hallmark of modern battlefield. Officers must be able to deal with a *lack* of information and still make sound decisions. Remember that chess players have perfect "battlefield awareness" -- they can see the entire board, but they do not know what the opponent is thinking.

Officers also must be able to think jointly. Twelve years after the Goldwater-Nichols Act, it is now accepted that no military operation will take place unless it is joint. Future officers will need to think jointly to ensure success on the battlefield. This requirement includes the reserve components. Educating the total force will certainly be a challenge for the PME system in years to come.

We love to talk about a seamless military. The Air Force and the Air Guard are doing an excellent job, as are the Marine Corps and Marine Reserve, and the Navy and the Naval Reserve. The Army has to have a total focus to be successful, and they have a problem at the moment.

The challenge of educating our future officers is how to include all of the requirements of PME with all of the "check-in-the-boxes" required for command. I don't even know how you can successfully negotiate a career today when you have to get your command slots; you've got to get your joint assignments; you've got to get your PME; and you've got only 20 years to do it in. Especially when we have reduced our forces and increased our operational tempo. We're stretched in all places of the world. If you've figured out how to make it work, I'm anxious to help implement that process. But I think we've got a problem.

I also believe that PME begins at the *pre*-commissioning phase. Some of you may not agree with me on that, but I think it's important. If we've only got 20 years to do everything, we'd better start earlier. And if the Service academies are doing one thing, the six military colleges are doing another, and the ROTCs are doing yet something different, we've got a problem.

We can front load this. In our basic training, NCOs are started on "day one" with an innoculation process that will turn a civilian into a soldier, completely transforming their way of thinking into a military culture. Why don't we do that at " "day one" with PME for our officers? I think we should. And we should front load as much as we can.

We got into a good discussion, and I must give great compliments to my good friend, Ike Skelton. There is this -- I don't want to call it a battle -- there's this difficulty here trying to figure out where we are going to get the officers. We've got OCS. We've got the colleges and the ROTCs, and the six military colleges and the academies.

Then there was this debate about whether you really need the academies. The academies are going to have to get their act together, because we're now producing as many CEOs of America as we are of the future generals of America. Now, that doesn't mean society doesn't get a benefit from the academy education, but where are the general and flag officers coming from? When we're getting more of them from the ROTCs and the six military colleges, the academies had better look inward.

The balance in the great discussion that we've had here is, as we're drawing down, who gets the ax in this process? When you look back, how did we get to where we are today? We started out with the academies and six military colleges and began to grow from there. Politically, how do you think it is when you have to tell a Senator from a particular state that his favorite university may lose its ROTC? Now, we're talking about political influences.

There's a reality out there in drawing down the services, not needing as many officers, that complements the question of how we are going to train them. There is a tremendous focus, I believe, on what is necessary -- the importance of a crucible. And the crucible is not only what you're seeing in basic training. The crucible is also the six military colleges and the academies.

I believe that we still need to maintain our OCS, and that we should begin to draw down some of the ROTCs around the country. But mostly I wanted to share with you that, I believe, PME has to start at the pre-commissioning phase.

I'm in a learning process. I want you to know that. This is my sixth year on the Personnel Subcommittee. I'm a very young man, relatively new to Congress. I've had to work very hard. I'm a Major in the Army Reserves. I came to the Congress with a Major's military education. I've had to work very hard to understand jointness and joint operations, be able to communicate with the CINCs and the Joint Chiefs, and understand the other services.

I've worked hard to be a good student of Ike Skelton. Bob Dornan -- sitting next to him permitted me to appear like the voice of reason. And I have become the chairman. As Chairman of the Personnel Subcommittee dealing with education issues, I share the following belief with my good friend Ike. We did Goldwater-Nichols under the Cold War scenario and there have been a lot of changes since then that we need to take a hard look at.

I compliment my colleague, Glen Browder, for organizing this conference. I will be a good listener, and I appreciate your having me here today.

Thank you.

THE HONORABLE STEVE BUYER
Fifth Congressional District, Indiana

Since 1993, the residents of Indiana's Fifth Congressional District have been served by Congressman Steve Buyer (pronounced Boo-yer) in the U.S. House of Representatives. The district includes all or part of 20 counties in North Central Indiana. Congressman Buyer remains on the forefront on issues that effect Northern Indiana. He currently serves on the National Security Committee, the Veterans Affairs Committee, and the Judiciary Committee.

Since coming to Congress, Congressman Buyer has been a leader in the fight to reduce government spending and bring responsible fiscal practices to the Congress. He has supported a balanced budget amendment, term limits, and efforts to rein-in federal spending. In 1995, he was a leading congressional proponent of the Telecommunications Reform Act.

Congressman Buyer, a veteran of the Gulf War, maintains his commission in the Army Reserve with the current rank of major. He has been a pioneer on health issues affecting active duty military personnel, veterans, and their families. He has been the leading congressional advocate to provide health care and other assistance to Gulf War veterans who continue to suffer from yet undiagnosed illnesses.

Congressman Buyer, as Chairman of the House National Security Committee's Subcommittee on Military Personnel, has become a nationally recognized leader on national security and defense issues. He has appeared on such television news programs as NBC's "Meet the Press," "McLaughlin's: One on One," "Nightline," and other network news shows.

Chairman Buyer has been a strong advocate for increasing the quality of life for military personnel. In addition, last year he was appointed to lead the congressional investigation into the allegations of sexual misconduct, sexual harassment and fraternization in the military. His hands-on investigation has taken him to military training centers and installations around the world. His efforts have played a significant role in changing the way the military responds to such allegations.

Congressman Buyer received a degree in Business Administration from The Citadel, and was commissioned as a 2nd Lieutenant in the United States Army. He obtained his law degree from Valparaiso University School of Law in 1984.

Congressman Buyer and his wife, Joni, have two children, Colleen and Ryan. The Buyer family lives in Monticello, Indiana, and are members of the United Methodist Church.

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Remarks by
VADM Daniel Trantham Oliver, USN
Deputy Chief of Naval Operations, Manpower and Personnel

An earlier speaker mentioned that we are in the post-Cold War era, which means that if we're between world wars, it's an experience we haven't had in sixty years. If we are in between wars, then we are in an era that none of us understand, and we have never been in before. Couple that with the concerns that we in the U.S. Navy, at least, are having with officer retention -- that we're seeing most notably right now with aviation, but also in our other unrestricted line areas -- and we spend a lot of time trying to understand the motivations for our young officer corps.

Some of the things that General Sheehan mentioned with regard to trust, the dialogue between today's leadership and the next generation leadership, were very appropriate to our concerns.

I don't have anything new, I fear. However, I would like to speak to four things that will reinforce some points that have been made earlier. Before I do that, I will just answer the question that we were asked to address: What type of officers will we need in the future? What characteristics will they need? They will have to be smart and principled. And do we have the proper educational paradigm now? My belief is, no.

I want to stipulate a couple things up front. Number one is that you're talking to somebody who, by necessity, deals in a very pragmatic way with these times and with these things, and usually with a pretty short time horizon. I also speak primarily about U.S. Navy unrestricted line officers, which are those who drive submarines, ships and aircraft. I want to say right up front that, in my judgment, Goldwater-Nichols was a huge success for the purposes for which it was passed, and I think we are all much, much better off because of it. I thank Congressman Skelton, Arch Barrett, everybody involved in that. It was something that needed to be done, and we are lot better off for it.

However, in anything like this that moves the military in a new direction, so much of what we do is zero sum. There are always unintended consequences. And I will address some of those in my four points.

Vice Admiral Tracey mentioned earlier that a CNO Executive Panel Task Force under the supervision of Dr. Bob Murray is looking at the continuing education of Navy officers in the next few decades. They will be addressing some of these things that I'll be talking about, and so these will not be new to those that are involved there.

I liked Colonel Beauchamp's comment that PME is everything. It's a lot more than just a single curriculum at a particular school. What I'd like to do is put up the only slide I am going to put up. It's a simple slide, borrowed from a young man who characterized himself as a Generation Xer. He used this slide during a DoD quality of life symposium.

The slide is pretty all-encompassing. It shows education as a continuum that goes from birth to death. Sort of soup to nuts, if you will. We can drop off the primary and secondary education parts and go directly to the tertiary part of this. He was describing himself and his generation, what their aspirations were, what motivated them, etc. The point he made was that lifelong, self-initiated learning was important to his generation. They were not looking for a lifetime of employment, but relying on some employer to assist them in building for themselves a lifetime of employability.

How much that directly translates to what we're trying to do, I'm not so sure. But I was interested in the right-hand side of the slide, where it says "tertiary college and university graduate school," followed by "work-related learning" and "all sources of informal learning".

Well, the military colleges and universities are the Service academies, ROTCs, and OCSs. That's sort of the price of admission. In his paradigm, the price of admission also included graduate school. And if you didn't get it before you started off on whatever your first of five to seven careers was, then you had to do it for yourself along the way, and you were going to look for an employer who would provide that for you.

Do we do that in the military? Do we provide that graduate school? Is that a price of admission? Well, maybe it is and maybe it isn't, and that's why, I think, our paradigm is not exactly right. I'll give you an example in just a minute of "work-related" learning. We do that very well.

We train our aviators how to fly airplanes; we train our surface warfare officers in the art of seamanship, and our submarine officers as well. We also train them in lots more than just that. We train in underwater acoustics, for instance, and tactics and doctrine, and all that other kind of stuff in what we call service schools. Lots of times we call it technical training. And then, of course, all sources of informal learning. We can throw tons of stuff into that.

Back to the graduate school piece just for a second. Graduate school is something that most of our young people think that they want as either part of compensation or as a price of admission to the workplace. It's either intrinsically good or not.

But whether or not we provide it, and whether or not it's important to us, is problematic. Earlier today somebody mentioned my friend, Vice Admiral Don Pilling. He's the Vice Chief of Naval Operations and I'm sure he won't mind me using him as an example. Very successful; very well liked and highly admired and respected by all of his peers; Brookings Fellowship; a tour on the National Security Council; all of the operational tours that you would expect. He did not go to a war college, but he has a Ph.D. in mathematics, so he has checked the graduate school box. The question is, did any of that education matter to him in his career? Could he have had the same career without that Ph.D. in mathematics from Cambridge? My guess is yes.

There's another Navy flag officer, an aviator, a highly respected C4I expert, who, because of his tours, has no master's degree; has no war college. You can ask, well, does he have any of these things: work-related learning, graduate school? What's his price of admission? Well, he commanded an aviation squadron in combat, commanded a nuclear aircraft carrier in a combat environment, and is obviously a graduate of the nuclear engineering course that qualified him to do that. So, does he have graduate education? It's not in his record, documented as such. He has some work-related learning. And yet his work-related learning was directly relevant to what he has ended up doing for us, the taxpayer, the country, etc. Whereas Admiral Pilling's graduate education, which has its own box, was not necessarily that.

All of this is my not very good but rambling way of getting around to stating that the first thing that we need to do -- and I'm confident Bob Murray's doing this -- is to inventory what, in fact, we *do*.

I've got a master's degree that was a whole heck of a lot shorter, less rigid and less relevant to what I have been doing in the U.S. Navy than the 24 months I spent getting what amounts to a master's degree in aeronautical application in flight training. So, maybe we don't have as good an inventory of what we do as we think we might have.

Another reason we should inventory what we do is because, if we're going to sink cost into doing these things, we ought to know what they are, and we ought to know why we do them. Not to mention the fact that we in the military like tangible recognition of things, and probably if we had a ribbon for getting a master's degree, I would be wearing one. But that's pretty trivial, and I wouldn't submit we do it for that reason.

The second thing I think that we need to do, the second point, is we need to look at prioritizing things. The Goldwater-Nichols requirement to get joint

education is important, but let me tell you what it did, I believe, to our junior officers in their career planning. A JO that comes in doesn't have much choice. They get the college and university. They get commissioned, and now they get their internship, which is either the aviation, the submarine, or the surface warfare indoctrination. They go off to do their division officer tours, and then they decide whether they are going to stay with us or not.

If they do decide to stay, that's at about the six or seven year point. And they say, "Okay I'm going to try because I'm going to stick it out for 20 years, at least, and I'm going to command something. I'd like to command a squadron or major surface ship, or something like that."

In the old days it used to be, "When they give me a break from this rather intense, content-intensive career, I'm going to get a graduate degree, so if things aren't working out all that well at the 20-year point, I can go out and do something else with some credentials that will sell on the outside. All of these things I've been doing in the Navy don't sound very exciting to somebody on the outside if I don't have a degree that goes along with it."

That was the incentive. Well, now they all get forced at the 12-year point, forced or incentivized actually, because it's become part of our culture, into clambering for [illegible]nt job. They all know they want to go do that. And so when they get some discr[illegible]nary time, as soon as they're eligible -- which, quite frankly, is not until they make lieutenant commander -- then they go to a joint job. That means that if they're going to go try to get a graduate degree, they do it in a window between the six- and ten-year point, or the 10- to 11-year point. Because at the 10-, or 11-, or 12-year point at the latest they've made lieutenant commander, and now, if they've got that kind of time, they are going to go joint.

So, we are forcing graduate degrees into a three-, four- or five-year period -- early, relatively speaking, in an officer's career, and certainly early relative to when they would ever come back as a flag or general officer and rely on that degree for any particular reason. It's just the way things are.

Is that an unintended consequence? Maybe, but I'm not so sure. The point is, an officer looking for a job is thinking there are three things he or she would like to get out of a tour. They'd like to get credible, operational credentials with a competitive fitness report, to get "jointed", and to get a graduate degree, if possible. If they can only get one of those three, it's not as good as if they can get two of those three. And if they can get all three at one tour, all the better. So they are just things that we need to look at as we continue to push this thing along.

The third thing I'd like to do is to caution against the use of blunt instruments -- blunt instrument being a term that was used in an earlier session. I don't think Goldwater-Nichols, in its entirety, was a blunt instrument. I think there are some features of it that are a little bit blunt. It would be easy to get most of the Navy

officers to war college. You only need to say that you can't be a flag officer without going to the Naval War College.

I would support that, if we made it retroactive, because I'd like to go to War College. But we have, in a sense, done that by the requirement that all flag and general officers, with very few exceptions, be qualified joint specialty officers. And that's not bad. It's not bad to have all of our flag officers with JSO experience. But think about how much of the Navy is made up of flag officers for a minute. Captains are less than one percent of the Navy, and flag officers are less than five one-hundredths of one percent. It's just a very, very small number. Ninety-five percent of all of those commanders at the 20-year point are not ever going to be flag officers in the United States Navy.

We make rules that force behavior in folks at the 12- to 20-year point in order to qualify all of them for something that 95 percent of them are not going to be when they reach the end of their military career 10 to 15 years later. That qualifies, in my judgment, as a blunt instrument. It also has an effect that we need to think very carefully about, I believe. We only select a couple of dozen unrestricted line and flag officers every year. A couple of dozen. That's a very, very small number. We ought to be looking for things that incentivize that group to be as diverse as possible in order to cover the spectrum of requirements that we need at that rather rarefied level, rather than incentives that force more uniformity in that group.

I use a line sometimes when I'm counseling very junior officers. I say, "You need to figure out why you are going to stay in the Navy. It's a noble profession; it's going to be here; it's not going out of business; it has a lot of unique characteristics; it is service to your country. But when you set your career aspirations, set your aspirations at making captain. You can work towards that. The percentage that gets selected for flag is so small that, to aspire for flag officer when you're a lieutenant is like going into the priesthood with an aspiration to be the Pope. It may be a nice outcome, and it may be exactly the right thing for you, but it is the wrong reason to be in the business." And so, when we apply these instruments to the degree that they have the effects that I've described, I would describe them as blunt, and we should think about them very carefully.

My fourth point, and last one here, is that there are some ideas that we need to explore as we think about how to fit all of these requirements into what seems like a very short period of time. Distance learning has been mentioned, and I applaud any of the applications there that can work.

Making space in a career could be done in several different ways. We could make careers longer; we could hire more officers; we could give sabbaticals during which the clock stops on a career so an officer can do something and then come back. Instead of competing with peers who have used that time to better career

advantage, they can compete with people who had formerly been behind them a couple of years. There are different ways that we could address this without having to necessarily make the current requirements go away.

And then, to return to one of my earlier points, if we legitimatize, categorize, or recognize some of the things that we do a little bit differently, we could take better credit for some of the stuff we do, or at least cut out some career redundancy and make a better use of some of the education that is, in fact, going on.

Here is a final point that's related to Congressman Buyer's suggestion that we do PME during pre-commissioning, with a different slant on it. We could reach the point where, even for our unrestricted line community, we could require more than a bachelor's degree for commissioning. Our recruiting command folks would go berserk over that, but there are professions that require more than that baccalaureate-level entry, and maybe we wouldn't have to do all of that education in house.

So finally, in closing, I'll quote Colonel Beauchamp again. I think that a "more strategic and holistic approach in this very human endeavor" is called for.

Thank you.

VICE ADMIRAL DANIEL TRANTHAM OLIVER, USN
Deputy Chief of Naval Operations, Manpower and Personnel

Vice Admiral Oliver is a native of Camden, South Carolina. An NROTC graduate of the University of Virginia, he was designated a Naval Aviator in September 1967.

His early operational assignments include tours with Patrol Squadron TEN, Patrol Squadron EIGHT, Patrol Squadron THIRTY, and Patrol Squadron SIXTEEN where he served as the Commanding Officer. He also served a tour as Associate Professor of Naval Science at the University of Virginia.

In June 1982, Vice Admiral Oliver became a White House Fellow. During his Fellowship, he served as Special Assistant to the Secretary, U.S. Department of Health and Human Services. In September 1983, Vice Admiral Oliver reported to the Resource Appraisal Division (OP-81), on the OPNAV staff in the Pentagon, and in March 1984, he became Administrative Assistant to the Chief of Naval Operations, Admiral James D. Watkins.

In July 1987, Vice Admiral Oliver assumed command of Patrol Wing TWO based at Barbers Point, Hawaii, and in June 1989 he returned to Washington, D.C. to become the Executive Assistant to the Chief of Naval Operations, Admiral C.A.H. Trost. Following a subsequent tour as Director, Total Force Training and Education Division (OP-11), on 14 August 1991, he assumed responsibilities as Commander, Fleet Air Forces Mediterranean in Naples, Italy.

In September 1993, he returned to the Pentagon as Director, Assessment Division (N81). In March 1995, he became Director, Programming Division (N80), and in November 1995 assumed a concurrent assignment as Director, CINC Liaison Division (N83). Vice Admiral Oliver assumed his duties as Deputy Chief of Naval Operations, Manpower and Personnel (Chief of Naval Personnel) on 20 September 1996.

Vice Admiral Oliver holds bachelor and master degrees from the University of Virginia and is a graduate of the Harvard Business School Advanced Management Program.

Vice Admiral Oliver's personal decorations include the Defense Superior Service Medal, four Legions of Merit, Meritorious Service Medal, Navy Commendation, and Navy Achievement Medal.

He is married to the former Darriel Webster of New Canaan, Connecticut. They have five children and three grandchildren.

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NAVAL POSTGRADUATE SCHOOL
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OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

Remarks by
Harry J. Thie
Senior Researcher, Rand Corporation

Human capital – what is it? One definition is that human capital is the aggregate of the skills, knowledge and abilities of an organization's individuals and groups that produce value both within the organization and to its customers. Inside an organization, the correct skills, knowledge and abilities produce efficiency. Externally, skills, knowledge and abilities produce customer relations effectiveness.

Using the above definition, the unified CINCs apply the human capital developed by the services to enhance military effectiveness around the globe for diverse missions. So the military needs a proper mix of skills and knowledge to gain internal operating efficiencies and to be effective on battlefields, however defined.

Human capital has a pragmatic face. You do not build or develop it in organizations for itself; you develop it for a reason. You want human capital that has value to you in your military services, and to the CINCs who use your forces. At the end of my remarks, I will return to the subject of human capital and talk about the career management rules within which it is currently developed for officers. But before doing that, I will cover briefly four topics relevant to the question assigned our panel:

1) Who are the future warriors?
2) What will they do?
3) How many of them may there be?
4) How might their organizations support them?

My comments are based on work that I did at RAND over the last few years, in examining officer and enlisted career management practices.[1] I also add insights from my experience in, and observation of, these matters over the years.

[1] Bernard Rostker and Harry J. Thie, *The Defense Officer Personnel Management Act of 1980: A Retrospective Assessment*, R-4246-FMP, Santa Monica, CA: RAND, 1993. Harry J. Thie and Roger A. Brown, *Future Career Management Systems for U. S. Military Officers*, MR-470-OSD, Santa Monica, CA: RAND, 1994. Harry J. Thie, Margaret C. Harrell, et al., *A Future Officer Career Management System: An Objectives Based Design*, MR-788.0, Santa Monica, CA: RAND, forthcoming. Sheila Nataraj Kirby and Harry J. Thie, *Enlisted Personnel Management: A Historical Perspective*, MR-755-OSD, Santa Monica, CA: RAND, 1996.

In our 1994 report on officer career management, we looked at future career practices in a context that took us out about 10 to 15 years, say to the year 2010. As the most likely case, we posited that the military would evolve in a straightforward way -- that certain changes already underway would continue in a readily understandable manner. A large military would become a smaller military -- there were over 1.2 million officers at the peak of WWII; over 400,000 at the peak of Vietnam; and there are about 225,000 now.

This scenario posited other changes in the environment within which officers would be developed and managed: 1) known threats would become varied threats; 2) the unitary mission of global conflict would become diverse missions within an overall policy of selective and flexible engagement; 3) single missions for units would become multiple missions for units; 4) variable hierarchies would replace the fixed organizational hierarchies; 5) advanced weapons would become integrated systems and processes; and 6) a service focus in operational matters would continue to be replaced by a joint perspective.

For those, who do not like this evolutionary case, we also examined more radical excursions based on variations in size, organization and technology. I will discuss the effects of these later. As we looked at careers, the starting question was "careers for whom." Who is a future officer, and what does a future officer do?

Over three years, through interviews and focus groups, we asked many people those questions. Several of you here today were part of that process. We talked to political appointees, academics, serving officers, retired officers, people with legislative backgrounds, civil servants, enlisted, and policy makers. The following is what emerged from the question, "Who is a future officer?" The suggestions sorted into three major clusters.

1. People did not say an officer was a "member of a profession." They said things like:

a) Officers must make a commitment; they must espouse norms and values such as integrity and selfless service.

b) Officers must adhere to a formal code of laws and ethics, and must show virtue, honor, patriotism.

c) Entry into and continuation as an officer must be based on competence; officership is a meritocracy.

d) Officers share a common body of knowledge and expertise that comes about through study and deep experience. This knowledge includes history, political science, theory, doctrine, naval science, military science, leadership, and other high-value skills.

e) Jointness has become important in the last decade, and will continue to be so in the future.

Statements like these represent the defining characteristics of a profession, so we stated that officership would continue as a profession. The implications of this are that acculturation in the profession's values will be needed at entry and throughout a career. Education -- keeping up with the profession -- will be important. Experience will be important. Professionals have deep knowledge and expertise.

2. The second cluster dealt with a different kind of characteristic of future officers. We frequently heard the ubiquitous phrase "high quality." Eventually we pinned its meaning down to intellectual and physical vigor. Future officers would be expected to have high levels of cognitive ability and physical stamina. Future officers should also be:

a) Conscientious -- willing to expend energy toward goals

b) Versatile -- able to accomplish multiple tasks at a point in time

c) Adaptable -- able to learn and relearn over time

Of particular interest is that these five characteristics -- cognitive ability, physical ability, conscientiousness, versatility, and adaptability -- are what the psychologists call enduring characteristics. These are characteristics that are largely inherent in an individual and are not easily changed later in life. People have varying levels of these characteristics when they enter your organizations. You don't develop, train or educate for these characteristics, except at the margin. You select people with these characteristics as prospective officers.

The military has had, and will continue to have, a "select the best" strategy. The military strives for a homogeneous entering group. Neither all militaries around the world nor all organizations can, or should, afford such a strategy; they instead should select a mix of people with varied levels of these characteristics. After all, not all are expected at entry to be able to rise to the highest levels of responsibility. But, if you want people with high levels of these characteristics and other related work style and personal interest characteristics, you must have the appropriate selection instruments in place.

3. The third cluster of attributes that we heard about the future officer concerned what an officer does.

In the broadest sense, an officer does what the nation asks -- all missions, against all enemies, as the oath requires. Future officers would continue to wear uniforms, and, in the words of one navy admiral, "get shot at." This differentiates officers -- indeed the military -- from the defense civilian and contractor work force, although I must note that the first casualty in Somalia was a defense civilian.

Future officers will lead in the broad sense of leadership. They set direction, align forces, and empower people. This differentiates officers from the NCO and Petty Officer corps, which has evolved in its own right to become the force managers and technicians.

Last, officers apply particular knowledge and experience in solving national security problems and in attaining national security objectives. In contrast to the enduring personal characteristics that are selection criteria, the things that an officer does are developed attributes. You train and educate for these.

After this litany of what a future officer is and does, it is fair to ask whether they can change with time. The answer is -- no and yes. Some stay the same, and some change.

In the category of "not different from past or present" are membership in the profession based on acceptance of norms and values, continued competence, and adherence to laws and ethics. Also in this category are possession of certain enduring characteristics that underlie performance.

In the category of "different from past and present" are knowledge and expertise that is the domain matter of the profession. In the profession of officership, this changes over time, as it does in all of the professions. History arguably is not changeable but is added to over time. On the other hand, doctrine and theory for military and naval science, and paradigms for leadership and management, are not constants. Change in the domain knowledge of officership is not unlike change in medicine wherein CAT scans, angioplasty and new drugs have changed the domain of expertise. Miniaturization, digitization and other advances change the domain of officer expertise. Tanks replace horses; steam replaces sail; turbines replace pistons. Is technology part of the domain of officership knowledge and expertise? Certainly. Technology -- how you do things -- has always been part of the core knowledge of the profession.

Developed attributes -- what particular officers must know how to do and have experience in -- is also in the change category. The nature of the needed occupational knowledge and skills for the future should be no surprise. Occupational classifications derive mainly from what the military will be asked to do (missions), how the military organizes to do them (organization), and the systems and processes used by the military to accomplish the work (technology).

In our career management research, we posited that developed attributes -- occupational knowledge and skill -- would organize into four major groups. It is within these four groups that officers -- members of a profession -- will further specialize, and will require knowledge and varying levels of military experience. The four groups are:

1) Line: this group is more broadly defined than current Navy usage. These are the unique military skills -- particularly those directly involved in operations and related military functions.

2) Specialist: any military skills, as defined above, that also require recurring assignments and repetitive use because of advanced education or high cost, long duration training and experience. Depth of knowledge is a characteristic of this group. Examples of such skills in the future are electronics, communications, acquisition, and nuclear.

3) Support: skills generally analogous to civilian occupations that are needed to support functioning of military organizations, and where general military experience is needed or will assist task performance. Examples are supply, personnel and transportation.

4) Professions: civilian professional skills not usually requiring any significant, or only limited, military experience. Medical, dental, legal and chaplain are the traditional core of this group.

In summary, my observations about officership for the future are:

1) The core of the profession does not change.

2) The characteristics of the people you select for entry do not change.

3) What you want people to know and to have expertise in and experience with does change.

4) Missions, organization and technology drive change.

In our research, we pulled apart the officer corps for all the services at the unit, grade and skill level of detail. The numbers and percentages I present below are for officers in operating accounts. These billets do not include the ten to twelve percent of officers who are carried in the individuals account. Many of the latter group are new officers in initial training and education.

Under the reasonable assumptions earlier outlined -- i.e., that the military evolves in a straightforward way -- there will be about 177,000 officers in all of the services. They will be somewhat more highly graded than now, with about forty-seven percent in the grades of O4 to O6. Aggregated, some forty-five percent will be in the line category; seventeen percent in each of the specialist and support categories; and twenty-one percent in the professions. These grade and skill percentages will vary by service, as they do now, but the differences become more pronounced as you go toward the year 2010.

We also explored other assumptions about how the military might evolve based on varying size (smaller and larger), organizational change (outsourcing, streamlining, downgrading), and technology (user friendly; not user friendly.) When you do this, you find that the size of the officer corps could be as low as 128,000, or as high as 221,000 (excluding individuals accounts.) The grades of O4 to O6 can

vary from 53,000 to 93,000 -- as low as 42 percent of officers. Content in the skill groups can vary by plus or minus 6 percent, with some groups gaining and some groups losing across the various options. Specialist and Support groups could be as low as 45,000, or as high as 70,000.

There are lots of other combinations of options that could be explored as well. My point is that, in planning educational opportunities either for all officers or for selected groups of officers, you need to be aware of the magnitude of the challenge and how its dimensions could change significantly as the true environment unfolds over time. The vision that all officers must be given continuous or even periodic educational opportunity needs to have a plan of action with it. Otherwise, in the earlier words of Colonel Beauchamp, vision becomes hallucination.

My last topic deals with what are called objective careers -- that is, clear patterns of systemic advancement that are prescribed by the organization so that the organization builds and keeps the human capital needed for its internal and external uses. Objective careers can be contrasted with subjective careers, which are the stopping points in and out of organizations that individuals pick and choose for themselves across their lifetime of work.

Personnel management practices that organizations use should have external fit -- they should match their environment. I submit that the existing officer career management system did exactly that. I described its environment earlier -- large military, global conflict, known threat, large organizations, fixed hierarchies, advanced weapons, and service focus. I can characterize the existing career management system as one that is standardized in that it prescribes but one path through the organization that constitutes success. All must hew to this path. The career is short, and many officers leave before the investment in human capital is recouped. High turnover exists throughout the career stream as a result. Uniform policy is mandated. The rules for entry, development, promotion, and separation/retirement are mostly fixed. Moreover, these uniform policies lead to a clamor for equal outcomes across all services and skills. Successful outcomes are judged solely on promotion and grade attained.

This system produces what I call interchangeable officers. If a Lieutenant Colonel or Commander goes down, another springs up to take their place. The replacement thinks and acts exactly like their predecessor because they have been developed in exactly the same way. The gene pool is small, but precisely optimized for the environment. There is nothing wrong with this system per se. It does what it is intended to do.

However, in the likely future environment -- smaller military, varied threats, selective and flexible engagement, multiple missions, smaller organizations, variable hierarchies, integration of weapons and processes, and joint mission essential tasks -- the existing career management system does not appear as optimal.

Our most recent research suggests that a different system should be desired. Such a system would be more customized, in that there would be many paths to

success through it. People who enter would need to surmount a second selection hurdle somewhere between eight and twelve years of service. Some would be channeled into other skill groups; some would leave. Those who stayed would be able to serve longer in careers than now, but still largely at the service's choice. Greater stability would exist later in a career. More flexible policy would lead to equitable (fair) outcomes across service and skill groups. Development would be deeper, with more education and a service and joint orientation. Emphasis would shift, from promotions and grade held, to skills and experience.

I call this the unique officer. Each one is developed based on their choice of, and guidance into, one of many routes through the organization. As a result, a more diverse gene pool results, which seems to better fit the uncertain and more quickly changeable environment. While objective careers prescribed by the organization still exist, the multiple paths allow for more subjective choice as well, which seems to better fit the likely desires of a future officer corps.

In conclusion, human capital needs for the future will be different. The profession remains, as does the prevalence of certain enduring characteristics in those who enter it. What is different is the domain of professional knowledge and experience that all officers must have, and the occupational knowledge and skill that each particular officer must have in their chosen field. The number of officers remains large, but how officers apportion by service, grade, and skill depends on the future size of the military and how mission, organization and technology change. Career management practices to include development will also need to change to fit the changed environment.

HARRY J. THIE
RAND Corporation

Dr. Harry J. Thie joined the RAND Corporation as a senior researcher in 1991. Prior to that he served on active duty with the United States Army in a variety of military positions in the Department of the Army and the Department of Defense.

Dr. Thie's research has focused on military manpower, personnel and training issues particularly those related to military career management. He directed a comprehensive study requested by the Congress to evaluate alternative future career management systems for officers. Current research is examining changes to this officer career management system to fit the needs and environment of the future. In addition, he has worked on research concerning the training and career management of aviators in the active and reserve component of the U.S. military; alternatives for joint officer management as future site and organizational context lead to change in the joint duty assignment list; tenure for general and flag officers; personnel readiness models; personnel tempo; privatization of military training; and management of the enlisted force.

Dr. Thie is a member of the Institute for Operations Research and the Management Sciences, the Military Operations Research Society (including service as a Director and Officer), and the Inter-University Seminar on Armed Forces and Society. He earned a bachelor's degree in history at Saint Bonaventure University, a Master of Science at the Georgia Institute of Technology, and a Doctorate in Business Administration at the George Washington University.

NAVAL POSTGRADUATE SCHOOL
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MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Remarks by
Richard H. Kohn
Professor of History
University of North Carolina at Chapel Hill

It is a pleasure and an honor to speak to such a distinguished audience, so let me thank Congressman Ike Skelton, the Naval Postgraduate School, and the Office of Naval Research for their gracious invitation to participate in this conference.

To the questions, what kind of officers do we need for the 21st Century, and what kind of education and training infrastructure do we envision to support them, my answer comes in three parts.[1]

First, the United States needs the highest quality people who can be recruited to the colors. While that is a truism, accomplishing the goal will be increasingly difficult.

As the military establishment shrinks, as technology grows in significance, as compensation comes under increasing pressure, as the conditions of service continue to stress individuals and families, as divisions over gender and other policies divide our military and civilian leadership -- and lead some groups to disparage the quality and fighting capacity of the armed forces -- and, most importantly, as military affairs become less significant to the American people, a shrinking proportion of our brightest and most capable youth will be attracted to military careers. At the same time, our best officers may choose increasingly to leave for greater opportunities in the civilian economy.

Those officers who do stay will need to be ever more diverse in this multi-racial, multi-ethnic, and multi-cultural nation -- diverse beyond large numbers of women, blacks, and Hispanics, to include more Buddhists and Moslems and Hindus and Jews as well as Christians; people from all corners of the country; and, most important, people of all classes and perspectives. If our forces are going to serve all over the world, we will need people comfortable with other cultures, colors, languages, foods, and ways of living -- familiarity that comes largely from life experience and not from school.

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[1] Session 5, titled "Human Capital," Conference Agenda, 3 pages, in possession of author.

Most of all, we need to attract people from the American elite, from the suburbs as well as the cities and small towns. If one-third of our nation lives on the crabgrass frontier, one-third of our officer corps should originate from there, also; but I doubt seriously that to be the case today. The strength of the American military has always been its diversity and its correlation with the heterogeneity of the population. There is growing evidence that such heterogeneity, at least in background, opinion, orientation, and perspective, has diminished.[2]

In order to compete for the best and most diverse cohort of our youth, the services may have to change the character of their recruiting and the conditions of service, experimenting with innovative approaches. For example, they could shorten enlistments, move ROTC back into our elite universities with comprehensive, four-year scholarships for *each and every* cadet and midshipmen, and reach out to populations that have been heretofore under-represented in the force.

Let me provide a historical illustration. When, about ten years ago, the Air Force raised the service obligation of pilots to nine years, a significant slice of American youth probably ceased to be attracted to the service, unwilling to mortgage the decade of their twenties just to fly. A service that draws its leadership disproportionately from less than 20% of its officer corps must assure the finest human capital at the beginning of the career cycle.

Now, I know the reason for such polices is cost -- the cost to train pilots who might leave for the airlines, or the cost per cadet in a college or university. Yet, given the costs of weapons, training, operating, and supporting the forces, and given the indispensability of leadership to the operation of our forces in battle and the winning of our wars, can we afford to let accountants control the quality of future leaders? Succumbing to the pressures -- length of initial term, obligations for specialty training, location of ROTC, limitations on scholarships -- is simply penny wise and pound foolish.

We spare no effort, and pay almost any price, to give our people the finest weapons in the history of warfare. We ought similarly to spare no cost when it comes to furnishing the finest officers to our young men and women, who, after all, are responsible for their lives in battle and the safety of our country.

Remember that ugly acronym from the adolescence of the computer age: GIGO -- "garbage in, garbage out." G can stand for garbage, or good, or great. The choice will be up to our national leadership.

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[2]Thomas E. Ricks, *Making the Corps* (New York: Scribner, 1997).

Second, our officers will need to be broadly and deeply educated, as well as tough and competent -- people of judgment, wisdom, balance, and depth -- to operate their forces under a more disparate assortment of missions than ever before in American history. They must be people able to adjust to accelerating change, not just in technology but in concept and strategy. Knowing *when* to fight as well as how, and *what* to destroy as well as how to destroy it, will become increasingly significant.

We will need a larger proportion of thinkers, as opposed to doers, than in the past. If Peter Drucker is correct, and the developed world is entering a post-capitalist age in which *knowledge is the only meaningful resource,* then the decisions of American officers, particularly senior leaders, will be the determining factor in war and military operations, more so than in the past.[3]

The United States, heretofore history's most ardent and effective practitioner of capital-intensive war, must learn to rely as much on strategy as resources, as much on cleverness as overwhelming force. In the situations short of total war, in which the nation will be increasingly involved over the next generation, connecting ends and means will be critical for success, and for minimizing the number of casualties we will incur.

The changes needed to assure that such officers will possess the qualities I just described conflict with cherished practice.

First, the services will need to broaden the education of its officers. We ought to start with ROTC and our service academies, but my recommendations for reform are so radical as to be impractical at present.[4] However, to make one small suggestion, the service academies should undertake a mandatory program of "junior year abroad". By that I mean spending the third year either at another academy or at a civilian school in the United States or abroad. My guess is that the only real impediment to such a program is the integrity of their football programs -- a small price to pay if we are serious about breadth, and Jointness, in the military establishment.

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[3]Peter F. Drucker, "The Rise of the Knowledge Society," *The Wilson Quarterly,* 17(Spring 1993):65.

[4]Believing that a college education and initial education in the profession of arms are, in the information age, too important, too expensive, and too complex to be crammed into four years at a government institution, and remembering that higher education is acknowledged to be among the most successful American "industries," the academies should become post-graduate two-year courses for men and women who choose a military career. Each academy with its present facilities could graduate 2,000 officers a year and ROTC could be abandoned. Officers in each service would then possess a common education, indoctrination, and preparation. In order to attract the best American youth, the services should each distribute by competition at least thousand four-year college scholarships to prospective officers, allowing "walk ons" to fill the remaining spaces.

Similar changes will be necessary elsewhere in professional military education, including foreign language fluency, multi-cultural curricula, rigorous historical study, specialty training in understanding technology and technological change, and increased emphasis on research and writing, so that officers learn critical thinking -- learn to distinguish explicitly between rigor and hogwash.

Second, a masters degree *in residence* at a civilian university should become as important for higher responsibility as attendance in residence at a staff college. Our officers need, in mid-career, to return among the American people, and avail themselves of the very best intellectual experience available in our society. I am, for example, dubious about granting masters degrees at service colleges because it may lessen the frequency with which officers educate themselves outside the government. Nothing is more dangerous to our officer corps than isolation and parochialism.

Third, we will need many more officers expert in history, international relations, security and strategic studies, and other such subjects. Requiring education out on the economy will also encourage such programs in our civilian universities, thus broadening the American people's familiarity with military affairs, now a diminishing understanding. Civilian students love these courses.

Now, I know there currently rages a controversy over the proportion of officers educated in technology and the social sciences. Obviously, we need both; but if the distinction in an uncertain future is to know *whether* to act as well as *how* to act, the tilt should be toward the softer subjects.

The writer James Michener used to tell a story about his entry into the Naval service. Four prospective Navy applicants, including himself, were taken into small room at the very beginning of their service in World War II.

A grim-faced selection committee asked, "What can you do?" The first man replied, "I'm a buyer for Macy's, and I can judge very quickly between markets and prices and trends." The selection board replied, "But can't you do anything practical?" The man said no, and he was shunted off to one side.

The next man was a lawyer. He replied, "I can weigh evidence and organize information." He, too, was rejected.

Michener indicated that he was a writer, and you can guess how far that got him.

The fourth man said boldly, "I can overhaul diesel engines." The committee members jumped up, embraced him, and made him an officer on the spot.

At the end of the war, the buyer from Macy's was an assistant to the Secretary of the Navy, in charge of many complex responsibilities requiring instant good judgment. He took courses in naval management and government procedures until he became one of the nation's real experts.

The lawyer wound up as assistant to Admiral Halsey and, in a crucial battle, deduced where the Japanese fleet had to be.

Michener was ultimately a Naval Secretary to several Congressional committees who were determining the future of America in the South Pacific.

And what was the engineer doing at the end of the war? He was still overhauling diesel engines.[5]

Mitchener's conclusion that expertise, while necessary, could be hired, and that insight, judgment, and wisdom were indispensable even for a technological service, is fair warning. Some might argue that, fifty years ago, science and technology were less necessary than they are today and will be tomorrow, but such would be a misreading of the history of military technology.

Fourth, the services will have to rethink their overwhelming bias in favor of operations in the assignment and promotion of their officers. Now, I recognize that operations will always be primary; but in times of change, especially whenever we cut organization and lower budgets, the careers of people with more varied assignments or who have taken time out for graduate education or faculty duty or career broadening experiences, get killed.

Systems that require proscribed careers with zero defects, without opportunities to take risks and learn from mistakes, will not grow the best leadership, nor will promotion criteria that constantly privilege operations and command. The Navy is most guilty here, but I suspect the other services are hardly better. Only the Marines, perhaps because they have been cut less, seem to have improved on this score. For a brief moment in the 1990s, under the influence of Commandant Al Gray and the leadership of Generals Walt Boomer and Paul Van Riper at Quantico, an assignment on the faculty at Quantico ranked second only to command in importance as a criterion for promotion to the highest grades. Perhaps it thus comes as no surprise that, earlier this year, there were five -- an unprecedented number -- of Marine four-stars.

The Army's OPMS 21, under the leadership of David Ohle - now the DCSPER of the Army, the Air Force in revising the OER among other changes, and the Navy, if it

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[5]James A. Michener, *A Michener Miscellany, 1950-1970* (New York: Random House, 1973), 52, 54.

implements some of the recommendations presented to this conference by VADM Tracey, Chief of Naval Education and Training, are beginning to address this challenge.

However, the solution lays only partly in the Pentagon. Congress must allow the services to overpopulate their officer corps, to assure billets for schooling and as a basis for the expansion of the services in a future mobilization. It is not fashionable to speak of mobilization and citizen-soldiers, I know. People write that the age of mass warfare is over, and that the United States need not think of an expansible army, even though that has been the policy for our entire history. But the one thing that history does teach is that the future is unknowable, and that no matter what analytical techniques we employ, someday, sometime, at some critical point, we will be surprised.

Finally, we need men and women who identify themselves as members of the profession of arms -- that is, people who identify themselves as professionals in the waging of war, officers who are not only outstanding in the management of violence (to use Morris Janowitz's classic definition of the military professional), but who have a broader understanding of, and perspective on, their role and place in American society.[6] For many in the services, particularly the Air Force and probably the Navy, this may involve a very deep cultural transformation.

Two aspects of the profession of arms strike me as particularly weak in our officer corps today.

First, officers must know, understand, and appreciate their client: the United States of America and the American people. Like the rest of the American population, military officers are frequently ignorant of American history; and, more than most, focused as they are on the technical requirements of their jobs and living apart from American society on their bases or overseas. The former deputy head of West Point's history department worried last year that only about thirty per cent of the cadets take a semester of American history -- mostly those identified by a diagnostic as deficient in the subject.[7]

The recent book by the Pentagon correspondent for the *Wall Street Journal*, Tom Ricks, paints a grim picture of the Marines' view of American society, which seems to range from pessimism to contempt.[8]

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[6]Morris Janowitz, *The Professional Soldier: A Social and Political Portrait* (Glencoe, IL: The Free Press, 1960).

[7]Col. Charles F. Brower IV, remarks in discussion at "Teaching Military History," Organization of American Historians Annual Convention, San Francisco, CA, April 1997.

[8]Ricks, *Making the Corps*, particularly 276, 281, 285-86, 293-95.

Second, military officers should possess a very sophisticated, deep, and detailed understanding of civil-military relations, and particularly civilian control of the military. In my discussions with audiences at the service academies, staff colleges, war colleges, and senior officer executive programs - -in most cases the top portion of officers in the year groups -- I have found not only views similar to those discovered by Tom Ricks, but widespread misunderstanding of the proper role of a professional military in a democratic republic.[9]

Likewise, the prejudice against the press is troubling, particularly the propensity to blame it for American failures in Vietnam and afterwards -- a largely discredited interpretation. The military's difficulty in dealing with this essential channel of communication with the public, particularly in recent peace operations, should disturb everyone in government -- military and civilian.[10]

No profession can adapt to change, remain healthy, or even retain the independence to fulfill its core responsibilities if it loses touch with its client, or neglects the relationship. Nor can the United States undertake to teach democracy, especially to military establishments elsewhere in the world -- a world where democracy is little understood and often leads to autocratic regimes suspicious of western values and the United States in particular -- if our own officers "don't get it."[11]

Presently, there is abroad in the land a concern over a gap between the military and society beyond what has existed in the past, a concern that the gap is growing, and that

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[9]Since publishing "Out of Control: The Crisis in Civil-Military Relations," *The National Interest*, No 35 (Spring 1994), 3-17 and "An Exchange on Civil-Military Relations" [Letters from Gen. Colin Powell, Secretary John Lehman, Lt. Gen. William Odom, and Professor Samuel Huntington with my response], *ibid.*, No. 36 (Summer 1994), 23-31, I have lectured at West Point (1994, 1996), Leavenworth (School of Advanced Military Studies, 1994), Maxwell AFB (Air War College, 1994-1997; School of Advanced Aerospace Studies, 1994), National War College (1995 twice, 1996), and executive programs for 0-6/GS 15 and flag officers/SES (twice each in 1996-1997).

[10]See Warren P. Strobel, *Late Breaking Foreign Policy: The News Media's Influence on Peace Operations* (Washington: United States Institute of Peace, 1997).

[11]For the fragility of contemporary democracy outside the developed world, see Robert D. Kaplan, "Was Democracy Just a Moment?" *The Atlantic Monthly*, 289(December 1997):55-80; Fareed Zakaria, "The Rise of Illiberal Democracy," *Foreign Affairs*, 76(December 1997):22-43. See also Richard H. Kohn, "How Democracies Control the Military," *Journal of Democracy*, 8(October 1997):140-53.

it may endanger military effectiveness or the subordination of the military to civilian authority. On the one hand the officer corps appears to be alienated more than in the past from American society, and vocal about it. On the other, elites know increasingly less about the military, do not care, and pressure the government and the military for changes and for policies that may harm the quality of the armed forces.

Some survey data indicates that the officer corps has become political and politicized -- and *partisanly* so. Other data suggests that the American people trust most those institutions that are *least* democratic -- the military, the police, and the Supreme Court -- and *dis*trust those that are *most* democratic -- Congress and the presidency.

Our officer corps may be more divorced from the American elite in values and attitudes than at any time in American history, becoming less diverse in this respect as the American elite has become more heterogeneous in its thinking. If this is the case, we may be heading for considerable civil-military conflict, with negative possibilities for American government and national defense.[12]

My colleague at Duke, Peter Feaver, and I will undertake a major research project on this subject over the next two years, to review the evidence and consider the implications of the gap between the military and society. If the problem exists, we may be able to suggest some policy changes to avert trouble.

Whatever the reality, the United States has been blessed with as loyal and successful a set of armed forces as any nation in history. The key to that loyalty and success has been the officer corps. Everything else comes and goes, but the officer corps remains. Officers lead our forces in war, recommend policies that prepare us to deter or best our adversaries, and operate our forces in peacetime. They provide the continuity; they have the expertise; and theirs alone is the responsibility, professionally, for American national security. The recruitment, training, education, and development of this group of Americans must be a national priority.

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[12]See Ricks, *Making the Corps*, 279-283; Ricks, presentation to the Triangle Institute for Security Studies, Raleigh, NC, November 5, 1997; Ole R. Holsti, A Widening Gap Between the Military and Civilian Society? Some Evidence, 1976-1996 (Cambridge: Harvard University John M. Olin Institute for Strategic Studies Project on U.S. Post Cold-War Civil-Military Relations, October 1997); Andrew J. Bacevich and Richard H. Kohn, "Grand Army of the Republicans," *The New Republic* (December 8, 1997), 22-25; Jonathan Broder, "The army of the right," *Salon*, <http://www.salonmagazine.com/news/1998/01/06news.html>, January 6, 1998; Richard C. Brown, *Social Attitudes of American Generals* (New York: Arno Press, 1979).

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Richard H. Kohn chairs the Curriculum in Peace, War, and Defense at the University of North Carolina at Chapel Hill, where he is Professor of History. He also serves as Executive Secretary of the Triangle Institute for Security Studies, a consortium of faculty at Duke, Carolina, and North Carolina State interested in national and international security issues.

Born and raised in Chicago, Illinois, he was educated at Harvard College (AB, magna cum laude, 1962) and at the University of Wisconsin-Madison (MS, 1964; Ph.D., 1968), where he concentrated in United States military and 18th century history, and minored in military studies. He was Assistant Professor of History at the City College of the City University of New York from 1968 to 1971, and served on the Rutgers University faculty as Assistant, Associate, and Professor of History from 1971 to 1984. During the academic year 1980-1981 he held the Harold Keith Johnson Visiting Chair of Military History at the US Army Military History Institute and Army War College. From 1981 to 1991 he was Chief of Air Force History and Chief Historian for the United States Air Force, serving also from 1985 to 1990 as Adjunct Professor at the National War College. In 1991 he was Visiting Scholar in Strategic Studies at the Paul H. Nitze School of Advanced International Studies, Johns Hopkins University.

Professor Kohn has lectured at numerous universities and to a variety of academic and military audiences, and has served as an advisor and consultant to various academic and government organizations and agencies.

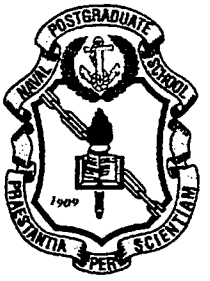
Professor Kohn is the recipient of the Organization of American Historians Binkley-Stephenson Prize, the Society for Military History's Victory Gondos Memorial Service Award, two Department of the Army Certificates for Patriotic Civilian Service, and the Department of the Air Force's Organizational Excellence and Exceptional Civilian Service Awards. In 1992 he was elected to membership in the American Antiquarian Society, the nation's third oldest historical society.

A specialist in American military history and civil-military relations, he is the author of Eagle and Sword: The Federalists and the Creation of the Military Establishment in America, 1783-1802 (1975). He has also edited, co-edited, or co-authored some eight other volumes on American military history, including the first-ever American issue of the *Revue Internationale d'Histoire Militaire*, the periodical of the International Commission on Military History; titled "The United States Military under the Constitution of the United States, 1789-1989"; it was also published in book form by the New York University Press in 1991. Most recently, he was a co-author of The Exclusion of Black Soldiers from the Medal of Honor in World War II (Jefferson, NC: McFarland & Co., 1997), the report that resulted in the award of seven medals of honor to black soldiers of that conflict, and author of "How Democracies Control the Military," *Journal of Democracy*, (1997). Currently he is working on a book about presidential war leadership in American history.

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PME for the 21st Century Warrior

A Conference Sponsored By





NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

Presentation by
LTG Richard A. Chilcoat, USA
President, National Defense University

LIEUTENANT GENERAL RICHARD A. CHILCOAT, USA
President, National Defense University, Fort McNair, Washington, D.C.

Lieutenant General Dick Chilcoat was born in Wilmerding, Pennsylvania. He was commissioned as a second lieutenant in 1964 upon graduation from the United States Military Academy. Prior to attending West Point, he was an enlisted soldier and attended the U.S. Military Academy Preparatory School. He also holds a Master of Business Administration from Harvard University, and his military education includes the Infantry Officer Advanced Course, Command and General Staff College, and National War College.

On 25 July 1997, General Chilcoat assumed his duties as the ninth President of the National Defense University, Fort McNair, Washington, D.C.

He commanded the Devil Troop Brigade, 5th Infantry Division, Fort Polk, Louisiana. He then served in Europe as the Chief of Staff, 3rd Infantry Division, United States Army Europe and Seventh Army. Returning to Washington, he served as Executive Assistant to General Colin L. Powell, the Chairman of the Joint Chiefs of Staff, and as Deputy Director, Strategy, Plans and Policy, Office of the Deputy Chief of Staff for Operations and Plans, United States Army. He then served as Deputy Commanding General of the U.S. Army Training Center and Fort Jackson, South Carolina. In July 1994, General Chilcoat was assigned as the 43rd Commandant, United States Army War College, Carlisle Barracks, Pennsylvania.

Lieutenant General Chilcoat's assignment upon graduating from the U.S. Military Academy was the 4th Infantry Division in Fort Lewis, Washington, where he served in the 8th Infantry. He next attended the Officer Fixed Wing Aviator Course, United States Army Aviation School, Fort Rucker, Alabama. Following flight school, he was assigned to Vietnam, where he commanded a Fixed Wing Section, 138th Aviation (Radio Research) Company and served as the S-2 (Intelligence officer) with the 224th Aviation (Radio Research) Battalion.

General Chilcoat was next assigned to Europe, where he commanded the Fixed Wing Section, 207th Aviation Company. His follow-on assignment was as Executive Officer, 3rd Battalion, 19th Infantry and later as the deputy G-3, 24th Infantry Division (Forward). He returned to the United States in 1969 and attended the Infantry Officer Advanced Course. Following graduation, he returned to Vietnam as Assistant S-3 (Operations), 2nd Brigade (Separate), 25th Infantry Division, followed by successive commands of A Troop, 1st Squadron, 9th Cavalry, and B Troop, 3rd Squadron, 17th Air Cavalry. His subsequent assignment was as S-3 (Operations), 3rd Squadron, 17th Air Cavalry, United States Army, Vietnam.

Following his second tour in Vietnam, General Chilcoat was assigned to the United States Army Combat Arms Training Board, Fort Benning, Georgia. After the Harvard Business School, from 1974-1977, he was an assistant to the Dean, USMA Academic Board, and taught Social Sciences at West Point. He also served as a member of the USMA Athletic Board. Following Command and General Staff College, he returned

to Europe for duty with the Office of the Inspector General, United States Army Europe and Seventh Army. He next commanded the 3rd Battalion, 6th Infantry, United States Army, Berlin. His next assignment was as G-3, 2nd Armored Division (Forward), with subsequent assignments in Washington as Strategic Policy Planner, J5, Office of the Joint Chiefs of Staff, and Senior Speechwriter to the Army Chief of Staff, General John A. Wickham, Jr.

General Chilcoat's awards include the Distinguished Service Medal, the Defense Superior Service Medal, the Legion of Merit, the Bronze Star Medal with one Oak Leaf Cluster, the Defense Meritorious Service Medal, the Meritorious Service Medal with two Oak Leaf Clusters, Air Medals, Army Commendation Medal with two Oak Leaf Clusters, Army Good Conduct Medal, Combat Infantryman Badge, Senior Aviator Badge, Parachutist Badge, Ranger Tab, Joint Chiefs of Staff Identification Badge, and Army General Staff Identification Badge.

General Chilcoat has published the following articles: "Strategic Art: The New Discipline for 21st Century Leaders," Strategic Studies Institute Monograph, October 1995; "Preparing Strategic Leaders in the Age of Information," Army Green Book, October 1995; "The 'Fourth' Army War College: Preparing Strategic Leaders for the Next Century," Parameters, Winter 1995-96; "Strategic Leadership in the 'Fourth' Army War College," Joint Forces Quarterly, Summer 1996.

In addition, General Chilcoat has completed executive development courses at Eckerd College (Management Development Institute), "Leadership Development Program," 1992; Massachusetts Institute of Technology (Center for International Studies), "Seminar XXI: Foreign Politics and the National Interest," 1992-93; Harvard University (JFK School of Government), "Strategic Public-Sector, Negotiations Program," 1995; Massachusetts Institute of Technology (Center for Organizational Learning), "Core Competencies of the Learning Organization," 1995; and Massachusetts Institute of Technology (Center for Information Research), "Managing Information Technology," 1995.

General Chilcoat and his wife, Dixie, have two children, Michael and Ashley.

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"VISIONING"
AN INFORMATION AGE UNIVERSITY
(in an Information Age JPME System)

Military Education for the 21st Century Warrior

Naval Post Graduate School-Office of Naval Research
Monterey, California
15 January 1998

LTG Dick Chilcoat
President
National Defense University

Building NDU for the Future



Ladies and gentlemen, I am your 25th speaker today, by my actual count. I'll tell you, the discussions have been extraordinary and I have taken copious notes.

I want to say, like every other speaker has, that this conference is really necessary and quite timely. Thank you, Dick Elster, and thanks to the entire team of the Naval Postgraduate School, the Office of Naval Research, and our elected Representatives who have caused this to happen and who have attended and participated. Thank you all very, very much.

I think we all can agree that there is work to be done in the Professional Military Education system - - in the joint system. I am one who does not believe that radical surgery is necessary, although there were a few "drive- by shootings" today that suggested that. I do, however, come to this conference as a change agent. I've seen too much over the last three and a half years, as I mentioned this morning -- graduated three resident classes, four nonresident classes, and talked to two classes currently in session at NDU. I will tell you that I am very proud of our educational staffs, our leaders, our students, our facility, and our institutions.

I am an advocate for PME and JPME. But I certainly agree that some work is necessary. That work is largely in the management of change vice reform. I'm not going back before Goldwater- Nichols and the Skelton Panel and use examples that cause me to think about reform in the 21st Century. I'm going forward into the future, trying to understand what the implications of the future are for PME and JPME. Change management will be a theme throughout my presentation. It's very high on my list.

On Monday, I visited Sarnoff Labs in Princeton, New Jersey, and gave pieces of this presentation to senior officials there who are leading- edge researchers thinking and trying to understand how technology and education can come together in substantive, substantial and profound ways.

I then hopped on an airplane to Boston, visited the JFK school at Harvard, and talked to a bunch of Russian generals about PME of the future. I had a very sad and sobering conversation with them. Throughout most of my career, I had always looked at the Soviet system as kind of -- not co- equal, perhaps, like the old pyramid and hierarchical systems, which all of us cut our teeth on. Certainly it was a system to study and understand. But, clearly, their system is in decline, their senior leaders are really worried about it, and we had very interesting conversations.

I then hopped in a taxi, went over to my old school, Harvard's Business School, and talked to them. In fact, Jim Locher and I were classmates from the "B" school in 1974. Jim, you would be amazed. They are taking the venerated case study method and digitizing it. Jim and I were in a section where there were 80 students with one professor. Tim MacArthur came in and said we are going to transform the business school from the industrial age into the information age. And when you have a war chest of several billion dollars, as Harvard does, you can do lots of exciting things. I had a chance to share with them some of the ideas I'm going to share with you tonight.

Yesterday, we had a great discussion session with all of the former presidents of the National Defense University. I was trying to point out some trends that I am concerned about. We talked about resources. That subject has come up here today, and I am going to bring it up again tonight. All of our discussions yesterday related to what we've been talking about today.

In my presentation, I am going to try and talk about technology, information technology, and its relationship to PME. I am trying to 'vision' with you tonight ten to fifteen years into the future -- to give you a glimpse of what an information age university might look like. And, as I have gotten into this, I couldn't vision without thinking about the system in its totality, what I call the JPME system -- the JPMES. Tonight I am going to offer you a vision of that system. Jim Locher said today that he offered a modest proposal. I am offering a few other modest proposals as well.

This is a great conference. I'm delighted to be here. And I thought I would talk during dinner, because it has been a long day. I would like to dialogue, if time permits, because we must dialogue on these issues. It's not enough to hear presentations. The discussion today was rich, but what I missed was dialogue. If we are going to make some serious changes to our system, we want to make sure they are well thought out, well discussed, and that we know where we are going.

We had some rich conversations about some unintended consequences of Goldwater- Nichols and subsequent reforms. When we create change and manage change, we are always going to have to deal with unintended consequences. That shouldn't cause us any anxiety as we think about and manage change in the future.

I have been a great champion of Goldwater- Nichols. The Skelton Panel and its work has been lauded greatly today, and it's well- deserved. It really did us a great service. I think the Services have capitalized on that great work. But there are some tough issues that remain. And I'm ready to go back and look at those issues -- work them. That, I think is the beauty of this conference.

The conference report is very important. It's going to be tough to synthesize all the divergent points of view and everything that's been expressed. But it's worth doing. It's worth working hard to get it right, because I think you are going to add an important body of knowledge to all of these issues. The proceedings from this conference follow the Cheney Report; follow other work that's been done within the colleges and the universities; follow a great piece of work that I thought the Chairman's Review Panel in '95 did. We are adding to the body of knowledge that exists and, if we can build some consensus on all of this, I think we can go forward with a vision for JPME in the future.

Agenda

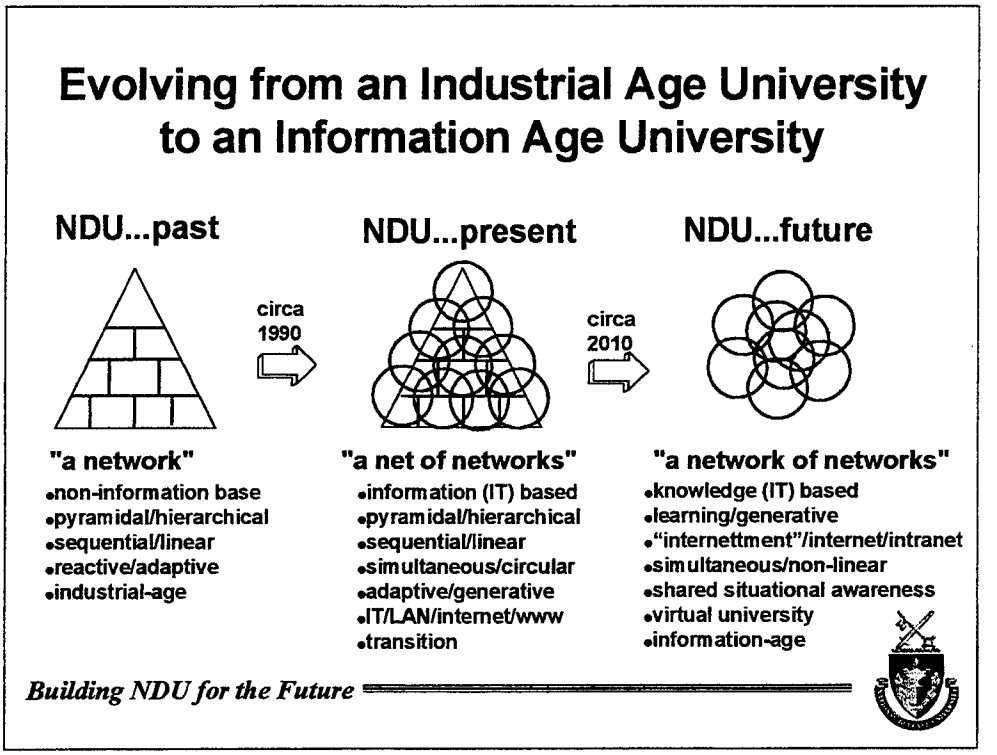
- A Context for JPME/PME in the Information Age
- A University in the Information Age
- A JPMES in the Information Age

"Visioning"

Building NDU for the Future



What I will do is to set the context and then give you a vision for a university and educational system for the information age.



I contend that we are evolving from the industrial age to the information age. I'm using NDU as an example here, and I'm still learning and have a lot to learn about the university. But NDU is evolving from what I would call an industrial age institution with simple networks and a pyramidal/hierarchical organizational structure where things happen sequentially and linearly. It's kind of reactive and adaptive. But it is transforming itself, and information technology is a big part of that transformation.

The circles represent networks within a conventional organization. NDU is going from an institution of networks to a network of networks. This gets you to the heart of the information age and knowledge- based organizations.

I'm also interested in learning organizations. We have an expert who is going to talk on that tomorrow. I believe in learning organizations and the concept behind them -- because they give you shared situational awareness in the organization. Everybody understands the organizational vision, mission, goals and values. And every single person in the organization is able to contribute to all of those things because they are in a learning organization.

The current guru in this area is a fellow named Peter Stringer. I tell Peter that there's a sixth discipline, information technology, that allows you to do things in a very powerful way. If you only have the in- box/out- box system and the normal distribution processes that traditional organizations use, I don't think you can hope to be a learning organization.

What We Are Not Talking About!

- **replacing the human dimension with technology...**
  (we want leverage!)
- **physically consolidating the JPME/PME schools...**
  (we want connectivity!)
- **"crowding out" the service schools...**
  (we want them both!)
- **displacing resident instruction with distant learning...**
  (we want the proper blend!)
- **sacrificing education for training...**
  (we want learning!)
- **developing techno-geeks instead of warriors...**
  (we want warriors!)

Building NDU for the Future



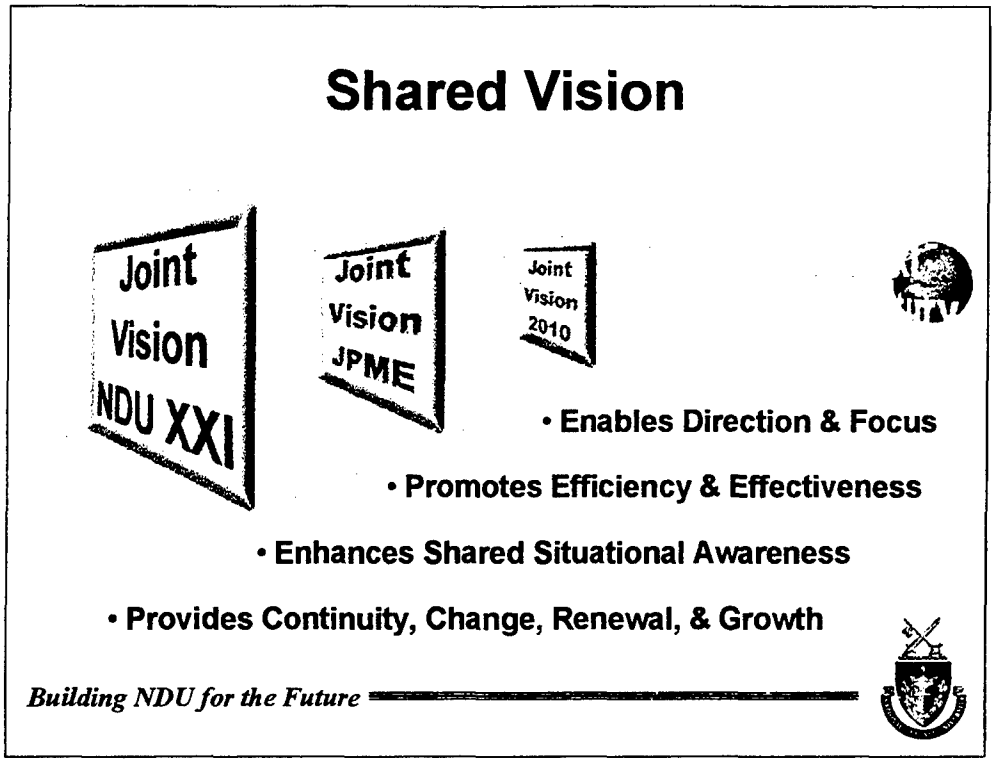
With these changes, I'm not trying to replace the human dimension with technology. I want leverage. I'm not trying to physically consolidate all of the colleges and universities. What we want is *connectivity*. We're not trying to crowd out the service and joint schools. We need them. As long as we have four separate services, we have great justification for having separate institutions. The day we unify the Armed Forces of the United States, I'll be the first in line to unify all the colleges and universities. So, I want to get rid of that myth.

I'm also not talking about displacing resident instruction with distance learning. We want the proper blend. Somebody said that Peter Drucker has predicted the demise of the traditional American university. He thinks it will become something quite different from what it is today. I know better than to take on Peter Drucker but, for the moment, my vision would be a blend of resident instruction and distance learning.

As Joe Redden said today, we've got a ways to go with distance learning. But talking with folks at Sarnoff Labs makes your eyes water. They said the next revolution in information technology is digital video, and the systems and the technology we have right now are stone age compared to what we'll have in five years. We will find the proper role for distance learning. It's an exciting part of JPME, but I think Joe said, "It's not the panacea that it's sometimes portrayed." And we are sure not sacrificing education for training.

I listened carefully to the dialogue on education and training today. I believe that the distinction between education and training is blurring. So I don't spend a lot of time arguing whether JPME is education or training. It's both, but there's some work that we can do to improve them. I've stood in front of seven war college classes and said, "We're not trying to make you computer scientists or techno- geeks instead of warriors, okay? We want warriors." We need to get beyond that thinking.

Intentionally Blank



If there's a single message in my presentation tonight, it's on this slide – Shared Vision. The Congressman referred to it, a number of you have referred to it, and I'm referring to it. We need a shared vision for PME and Joint PME. We at the National Defense University will tell you that we are in the midst of a serious intellectual drill to define our purpose, our vision, our mission, our values, and our goals. This serious intellectual work has to precede physical change.

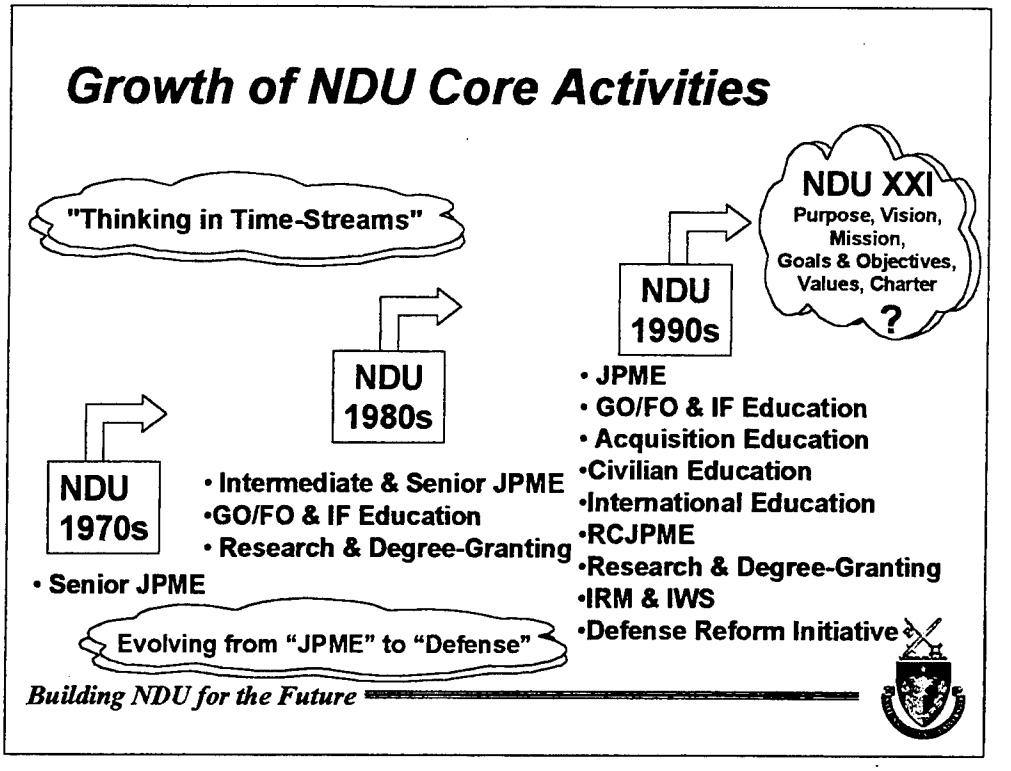
General Sullivan, former Army Chief of Staff, used to say, "Intellectual change has to precede physical change." That same thought, my friends, applies to the PME system as well. But this piece (pointing to the Joint Vision 2010 block) is missing right now. I don't want to be too critical, because we really have come a long way. The work the J- 7 folks are doing with the OPMEP, and all the work that was acknowledged early this morning is great work.

There is a current vision for PME, and it is codified in the OPMEP, but it goes downrange only maybe to the end of the palm. We need to reach out, we need to go deeper – a lot deeper. We need to look into the future ten to fifteen years and develop this vision, and then we need to make sure that it's captured in JV 2010, or whatever JV 2010 is going to be in the future. A new chairman will take Joint Vision 2010 in new, exciting and expanded directions, and we need to make sure that PME is part of it.

If you look at the original vision for Joint Vision 2010, there were only a couple lines in there on Professional Military Education. Now there's an expanded version of the original articulation of JV 2010, and there's a lot more in there in terms of professional development, Professional Military Education, and joint education.

But, for me, it still needs better clarity, more specificity, and we need to codify Joint Vision 2010 for PME. Then all of that, of course, needs to be made consistent with the service visions. I'm fascinated by the fact that it's only been in the last five years or so that the Armed Forces of the United States have had a vision. My hope is that as JV 2010 matures, and that may take a decade, it will have a synchronizing effect that will have profound implications for improving our of jointness.

Shared vision will do a lot of good things for us. It will promote efficiencies and effectiveness we do not have at the moment. And it would accomplish what we're trying to achieve on the battlefield today in terms of shared situational awareness -- answering the three simple questions "Where am I?", "Where's the bad guy?", and "Where are my buddies?" We need to do the same thing within our organizations, and within our PJE system. Shared situational awareness is as important in the schoolhouse as it is on the battlefield. It provides direction and focus.



We are facing many challenges at the National Defense University as we think about the future. In the '70s, the focus was strictly on JPME. Our core activities changed in the '80s and '90s -- a divergent trend that for me sends up a red star cluster. Questions of focus and of proper resourcing of missions, and a whole host of other things come up. So now we are in the midst of a serious attempt to determine what the National Defense University of the 21st Century is going to be. What will be its purpose, its vision, its mission, its goals and its objectives? What values will we hold? And how should we update our charter.

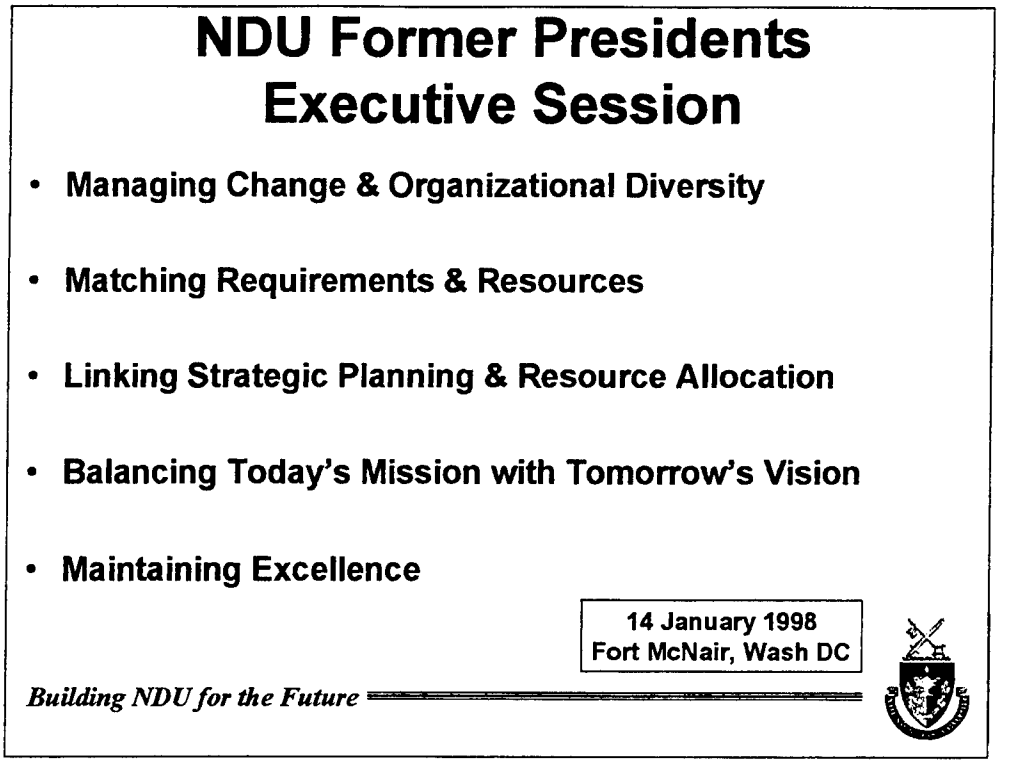
We're doing a lot for JPME in the National Defense University. We are heavily involved in acquisition -- heavily involved in civilian education, and getting more so with the implementation of DLAMP -- the Defense Leadership and Management Program. We set up a center for hemispheric defense studies, which will train and educate very senior leaders from within the western hemisphere, primarily from Latin America. The Honorable Deborah Lee talked about the need to provide JPME for reserve components, and we involved in that. Of course, we're involved in research and degree granting. And we are involved in information.

The defense reform initiative has just had a major impact on us. As alluded to several times today, this raises a whole new set of questions and issues that have to be worked. Neither we at the university, nor anyone else I think, understands the full implications of all of this.

Are we indeed, then, evolving from a PJE system to a defense system? In the trends I see working at the National Defense University, the center of gravity is shifting, and we need to understand the implications of that shift. The resources in question are extraordinary, and we have some serious challenges that we have to work.

Now, these are *my* problems. I don't want to worry you about them. But as we talk about the larger, overall concepts of JPME, NDU is not alone -- a number of colleges and universities in the system are also going to have to deal with these trends. I don't know if these trends are good or bad, but they do have serious implications. That's why I was talking to the former presidents yesterday; and why I'll be talking to a board of visitors in February; and why, ultimately, I'm sure I'll find my way into the tank to talk to chairman and service chiefs about it. Our senior leaders, as many of you have said today, have got to be cognizant of these kind of trends. And that's one of the reasons I am delighted about this conference.

This is a boulder that needs to be pushed uphill, and those of us in the community cannot do it by ourselves. This requires help from the Joint Staff, from the Office of the Secretary of Defense, and from Congress. I'm delighted to see this collaboration, and collegiality, and teamwork in talking about these trends.



I am going to go fast now, because I think I have covered about four-fifths of my message. This slide shows some of the issues on the table at the meeting of former NDU Presidents we had yesterday.

"Building NDU for the Future"

- **Capitalizing on Traditions of Excellence...Accommodating the Factors of Change...Creating Renewal & Growth**
- **Making Best Use of Resources**
- **Enhancing Education, Research, & Outreach**
- **Transforming from Industrial Age to Information Age**
- **Preparing Leaders for 21st Century**

Building NDU for the Future



The theme for my presidency is "building NDU for the future". This is a point worth making, because some serious criticism was rendered today of the PME system. I take that on board, but our challenge is as shown in the first bullet -- capitalizing on the strengths of the current system. And there *are* current strengths. We have to recognize them, and know what they are. And then we need to accommodate the factors of change -- and there are many -- that we have talked about extensively today. And then, we can talk about creating renewal and growth, even in an era of constrained resources. We are transforming ourselves, and the three core competencies of any great college or university are right here (bullet 3) -- education, research, and outreach. NDU's best efforts are in these areas.

What Does the Future Mean... for the Future of JPME?

- **Revolution in Military Affairs?**
- **Revolution in Military Thinking?**
- **Revolution in Military Education?**

Building NDU for the Future



The other thing that got me thinking about the questions this conference is dealing with was mentioned this afternoon. What does the future mean - the future of JPME? If we are in a revolution in military affairs - a RMA - how should it impact our military thinking, and should it create a revolution in military education? I think so. I'm looking for a revolution in military education, but I do not want to do it precipitously. I want to do it rigorously. I want responsible reform. I do not want radical surgery within a short period of time. That would not be smart.

Why Think About It?

- **The world's changing.**
- **The nature of future conflict is changing.**
- **The U.S. Armed Forces are changing.**
- **The demands on military leaders are changing.**
- **The requirements for leadership, materiel, doctrine, training and education are changing.**
- **Therefore, the JPME/PME system must change to keep pace...must lead, not lag, change...despite constrained resources...and continue to provide our most important competitive advantage...professionally competent leaders.**

Building NDU for the Future



The PJE system has got to lead -- not lag -- change. My belief is that we may be lagging change right now. I was down at Fort Hood three weeks ago. The Army is conducting its digitized division experiments down there. The Armed Forces of the United States are digitizing themselves, and our schoolhouse is behind all of that. Yet we don't yet have the resources to experiment, discover, explore, learn, and create. I worry about that. But we've got to do it. It's been said a hundred different ways today, and I say it again here: it is the PME system that creates our most compelling, competitive advantage. We have great ships; we have great tanks; we have great airplanes. But, as somebody else said today, you can't make it happen without great leadership.

The current system, I think, has provided that competitive advantage. I heard a senior leader say, not too long ago, that our advantage may be 10 to 15 years ahead of any other military force in the world. I don't know whether it's 10, 15, or 5, but I know this: we have the advantage. We do not want to fritter it away. So we've got to get system reform right, or about right, so that we don't get it exactly wrong.

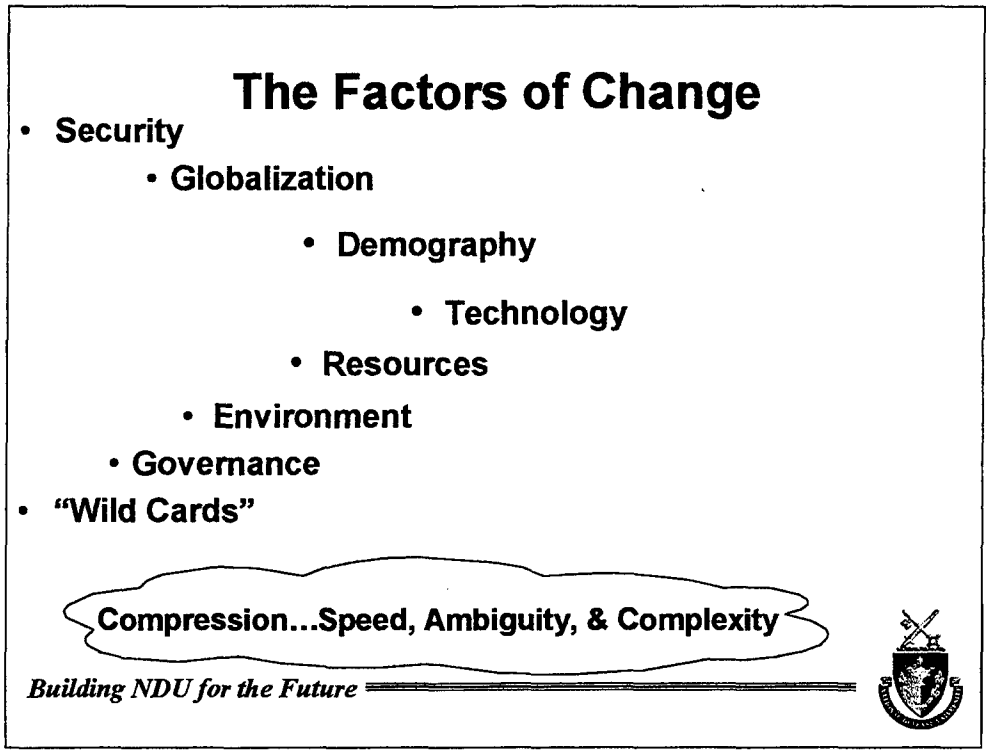
The Nature of Future Conflict & The Environment

- Regional dangers
  - Asymmetric challenges
    - Transnational threats
      - "Wild cards"
- VUCA...Volatility, Uncertainty, Complexity, & Ambiguity...and Constrained Resources
- Technology & the Human Dimension

Building NDU for the Future



We have talked about this a lot today, so I won't go into it any more.



These are the factors of change. They were the factors of change in the 1940s. So what's different today? It's what you've talked about today -- compression, or, as General Bob Scales said, "speed and knowledge." The delta in speed, ambiguity and complexity has exponentially increased from the industrial age to the information age. That's what's different.

Implications for U.S. Armed Forces

- **need "high-quality" people**
- **need "innovative leadership"**
- **need "agile organizations" [*learning organizations*]**
- **need "enhanced materiel"**
- **need "improved joint doctrine & training"**
- ***need relevant JPME programs...must keep pace..."our leaders must become perpetual students of the military art and supporting technologies."***

Expanding JV2010 (May 97)

Building NDU for the Future



There are vast implications in all of this for PME. They have been captured in recent publications – to name just a few: perpetual students, the need for new supporting technologies, and, of course, learning and organizational theory.

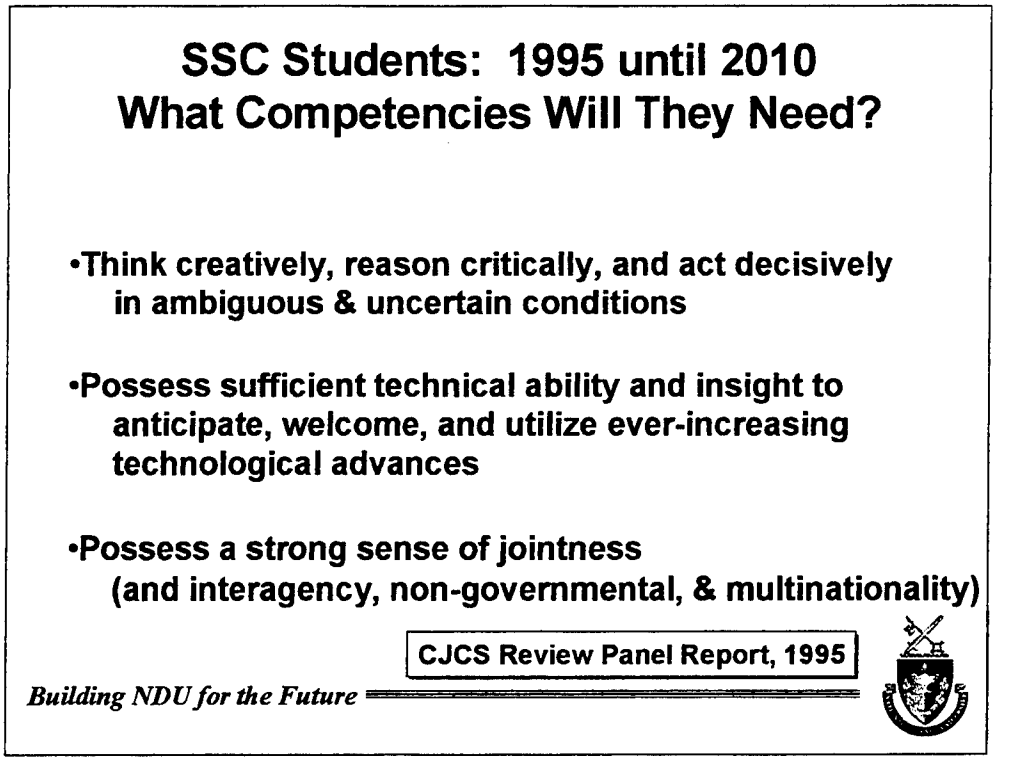
Implications for Future Leaders

- **CJCS Blue Ribbon Panel (1995)**
- **USAWC Flag Officer Surveys (1996-1997)**
- **Cheney Report on PME (1997)**

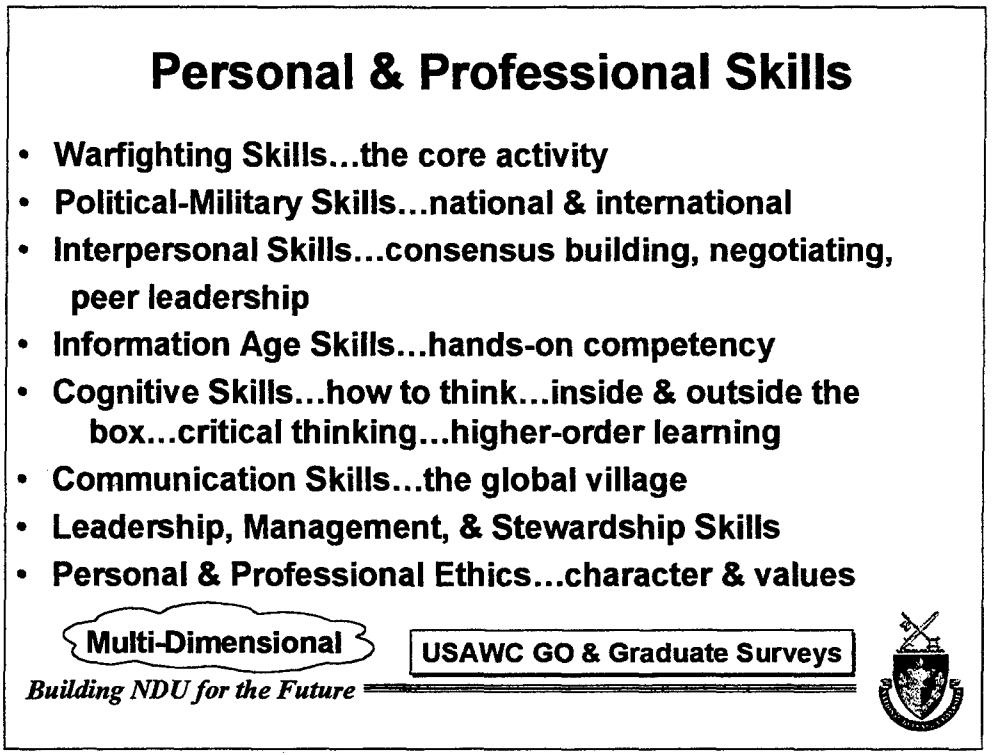
Building NDU for the Future



We've spent a lot of time today talking about what future leaders will have to be, and we've had some really good help. I paraphrase from the chairman of the CJCS Blue Ribbon Panel in '95: All of your war colleges, my friends, get tremendous feedback. They are not operating on remote control or automatic pilot; and gravity is not running your senior service outreaches. They have tremendous feedback mechanisms. We survey our graduates; we survey our students; we survey the senior leadership. We are not ignorant of what it's going to take to be successful in the future.



What are our future military leaders going to need between now and 2010, or maybe even 2015? They've got to be thinkers. They've got to be comfortable with technology. They don't have to be technologists, but they've got to be comfortable with it – which has led me to believe that some degree of hands- on competency is necessary. They've got to have jointness, and they've got to be comfortable with joint, multinational, and non-governmental operations.



In a nutshell, more than ever before, our leaders in the future are going to have to be multi-dimensional. We've talked a lot about that -- about the progression between the tactical and strategic levels of war.

Developing the cognitive skills of our future military leaders is also critically important, and key to this is the notion of the interchangeable versus the unique officer. I tell my war college students that thinking is what it's all about. Harry Summers said it well today: "You can train for what you know about it, but you've got to *educate* for what you *don't* know about it." I also tell the students, "You've got to be able to get *inside the box* and *outside the box*. But if you get outside that box, you'd better do it responsibly. Anybody can get outside the box, but you've got to do it responsibly." It's like doctrine. You've got to know when to use doctrine, and on the future battlefield, you've got to know when to deviate from doctrine. This is a thinking- man's game, in which education is important. Education -- especially the highest levels of education – and training are both important. We must do both.

We talked today about ethics and communication skills. I believe that the time has come to mandate, or at least strongly suggest, some computer skills for students and faculty in the schoolhouse. This is very controversial, but we need to talk about it.

Technology...An "Enabler" to Education

- **Establish student [and faculty] technological core competencies**
- **Create PME/JPME electronic connectivity ["network of networks"]**
- **Improve "system of systems" education and training [learning]**

Cheney Report, 1997

Building NDU for the Future



The Cheney report was interesting for me because of its emphasis on developing technological core competencies, and standards -- yes, I use that nasty word that no one in the educational world likes to hear mentioned -- and it also talked about connectivity, which I will also preach about tonight. And, of course, it talked about improving learning on our system of systems.

Intentionally Blank

What Is An Information Age University (IAU)?

- **The students, staff & faculty leverage IT to enhance education, research, & outreach.**
- **The IT leverages the human dimension...enables a "learning" institution.**
- **The institution is a complete IT-based enterprise.**
- **The University and "University system" are internetted & intranetted (electronically connected) and integrated ("core missions" compatible).**

Building NDU for the Future



Let me switch gears and describe what an information- age university might look like. In my opinion, the students, staff, and faculty have to be able to leverage information technology to enhance the three core missions. But it is a leverage of the human dimension - and it is that leveraging which allows us to deepen the educational experience and create what I would call a true learning institution.

Let me be critical of my beloved university and say that we are a collection of stovepipes. It's outrageous for me to say that because it isn't true, but I always like to stretch a point to make the point. We need to find ways to increase collaboration, communication, and the creation of knowledge. The whole institution should be an IT-based enterprise, like what the business school at my former alma mater is doing. In one year, they have taken the institution not just paperless -- they said, "That's nothing!" --but *processless*. From the time a student is admitted into the business school, it's all a matter of working with the Internet. And now they are even digitizing their case studies. Jim [Locher], we couldn't even get *in* the place today. Well, *you* might. Undoubtedly, you have more computer skills than I do. But it's incredible and impressive how they've digitized the Harvard Business School. And they're just one example of what's going on out there in the digital world right now.

The university and the university system -- I'm using NDU as an example -- are both interneted and *intra*netted. That means electronically connected, outside *and* inside. And they are integrated -- probably the key word. Gerry Galloway, our great dean at ICAF, uses the word integration to say the same thing. It means you can move electrons. The faculty can move them from one to another; the students can move them from one to another, and the cross collaboration is incredible.

With this kind of internetting and intranetting, you can do your educational mission, your research mission, and your outreach mission, not only at your university, but also through links to the Armed Forces Staff College, the Information Resource Management College, the Institute for National Strategic Studies, and the newly- established Center for Hemispheric Studies. And all of those links are seamless!

Characteristics of an IAU

- **Students, staff, & faculty are IT competent...on the desktop, in the classroom & lecture hall, and in the simulation "center"**
- **State-of-the-art hardware & software are at hand**
- **Institutional IT infrastructure (classroom, lecture hall, simulation "center", campus) is state-of-the-art**
- **IT support (training & maintenance) is robust & reliable**
- **Academic programs are IT-based, "as appropriate"**

Building NDU for the Future



Everybody is IT competent. To me, that means you've got to have some standards that are mandated. And I'm ready to do that. I've stood before a lot of war college classes over the last three years and said, here's what you need to do right now. And, by the way, this is a changing game. You've got to be competent on the desktop, in the classroom, in the lecture hall, and in the simulation center. And I'm already starting to put "center" in quotes.

Down at the Armed Forces Staff College, they are building a wonderful simuation facility. I know first-hand what wonderful facilities they have up at the Army War College,. Those facilities can do marvelous things for experiential learning. Interestingly, at the National Defense University, we thought we were never going to have that kind of capability. But you know what? We are now renovating both buildings at ICAF and National, and whoever did the specs was thinking out into the 21st Century. They are going to be hard- wired; they'll have fiber; they're robust and they will be able to grow. So the simulation center at the NDU could very well be just the facilities both those colleges are housed in, with a small gaming and simulation center acting as a nerve center for all that.

The keys are the Internet and a lot of different technology that will allow us to use the facilities to deepen the educational experience of our students. In the future, we have got to have state- of- the- art technology, and training. And a tough lesson that we are all learning in the era of constrained resources, is that the IT has got to be robust and reliable. If it breaks, if it's never up, your faculty and students lose confidence quickly. Your programs should be IT-based as well.

A great teacher with a blackboard and a piece of chalk can still do wonders, but I am slowly coming to the conclusion that five to ten years from now a blackboard and a piece of chalk may not get it. Or, at least that teacher may be disadvantaged relative to one who knows how to use information technology and bring it into the classroom in ways that are meaningful and deepen that experience.

Characteristics of an IAU (cont)

- **Curriculum is a blend of IT-based active learning (seminar), passive learning (lecture), and experiential learning (exercises, games & simulations)..."an information age pedagogy"...distinction between education & training is blurred...learning is desired outcome.**

- **University is a blend of resident and IT-based non-resident programs...continuing education...career-long learning ...provides "learning on demand."**

Building NDU for the Future



I'm coming to the conclusion that our curriculum should be a balance between what I call passive learning -- there's always going to be a place for the lecture -- and active learning. Your war colleges have brought active learning -- the adult learning methodology, the seminar -- to a high state. I don't know how many educators I put through the Army War College over the last three years, and their eyes watered at what was taking place in the seminar.

Now, that's contrary to much of what I heard this afternoon. And if anybody wants to challenge me, I will give you names. The Army War College Board of Visitors has former Secretary of Education Lauro Cavezos on it. He marveled at the educational work that is being done at that senior service colleges. So, I don't accept assertions that there is not some good education going on here. I've had too many people come through the institutions and say otherwise. Plus, your senior service colleges are being accredited by regional accrediting associations who know what they're doing, and who say that we are doing a good job.

So, the challenge is not reforming the current system. The current challenge is managing change, and figuring out how we take the current system and continue to keep it relevant and productive in the future.

I've already talked about blending resident and IT-based nonresident programs to create career- long learning, continuing education, and learning on demand. All of that has got to be part of the vision for any Information Age university. But we also have to develop an Information Age pedagogy. And the third element of that pedagogy, as has been mentioned a couple of times today, is experiential learning.

I've come to believe that the seminar system that we have is wonderful. I know a generation of students who will tell you so. But the next leap in learning is experiential learning -- the use of games and simulations and exercises to take that seminar which sits around the table and discuss scenarios and design strategies to get us military guys out of Bosnia, all in a shared experiential space. We need to get from around the table into the simulation center, using the technology that senior leaders will use in the future to make decisions, do their work and create virtual reality at the strategic level of war -- much like we have done in our tactical combat training centers at Twenty- nine Palms, Red Flag, Blue Flag, and the National Training Center. The NTC methodology is also relevant to teaching what I call the strategic art.

This information age pedagogy, then, is a combination of passive-active and experiential learning. Bob Brace, the great dean from the Army War College, and I used to debate what the blend is going to be? I'm big on experiential learning, so I want to get the students into the simulation center and get their hands dirty using theory, practicing, applying, etc. Bob, very wisely, has told me a number of times: "It's got to be the right blend -- not so much passive, lots of active, and sufficient experiential learning to get the job done."

We've had fascinating discussions with many folks on that issue, and that's not unexpected. That kind of tension goes on all the time in your academic institutions. It's proper. It's creative. It sometimes gets emotional, but it's tremendous dialogue for your students, staff and faculty. As I share these kinds of ideas with our students in the schoolhouse today, they thrive on them. They love them, because they know that we are trying to keep PME relevant to both today and tomorrow.

Characteristics of an IAU (cont)

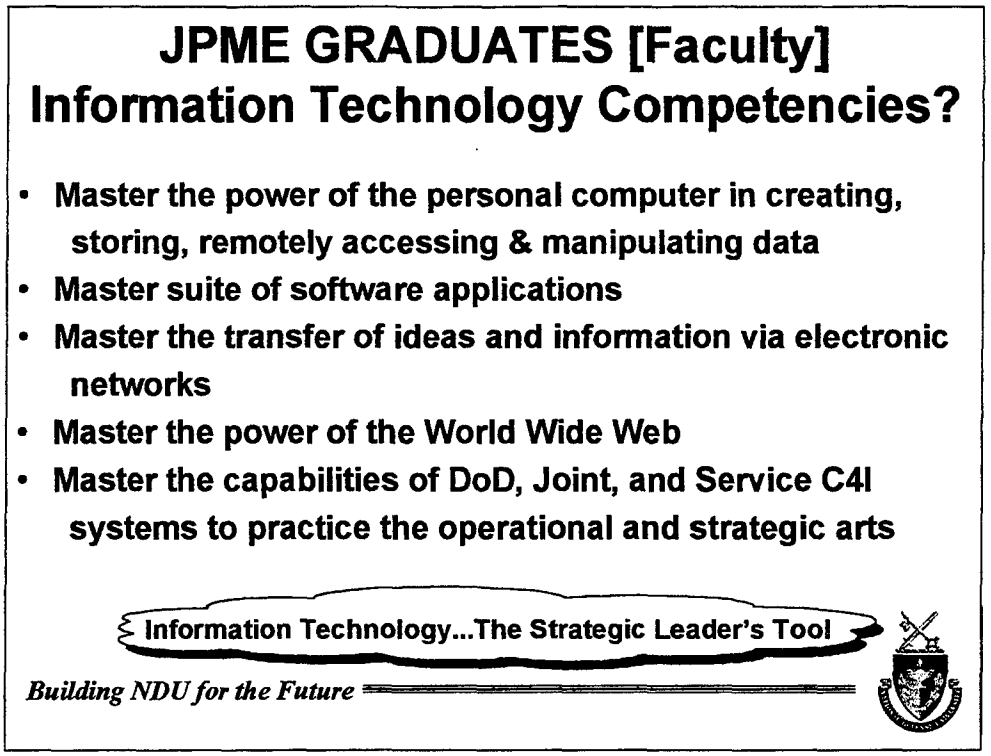
- **University is a "learning organization"...shared vision... shared situational awareness...everyone contributes...is flat, seamless, tailorable, & virtual**
- **Students are taught and practiced in the art & science of "thinking in the information age"**

Building NDU for the Future

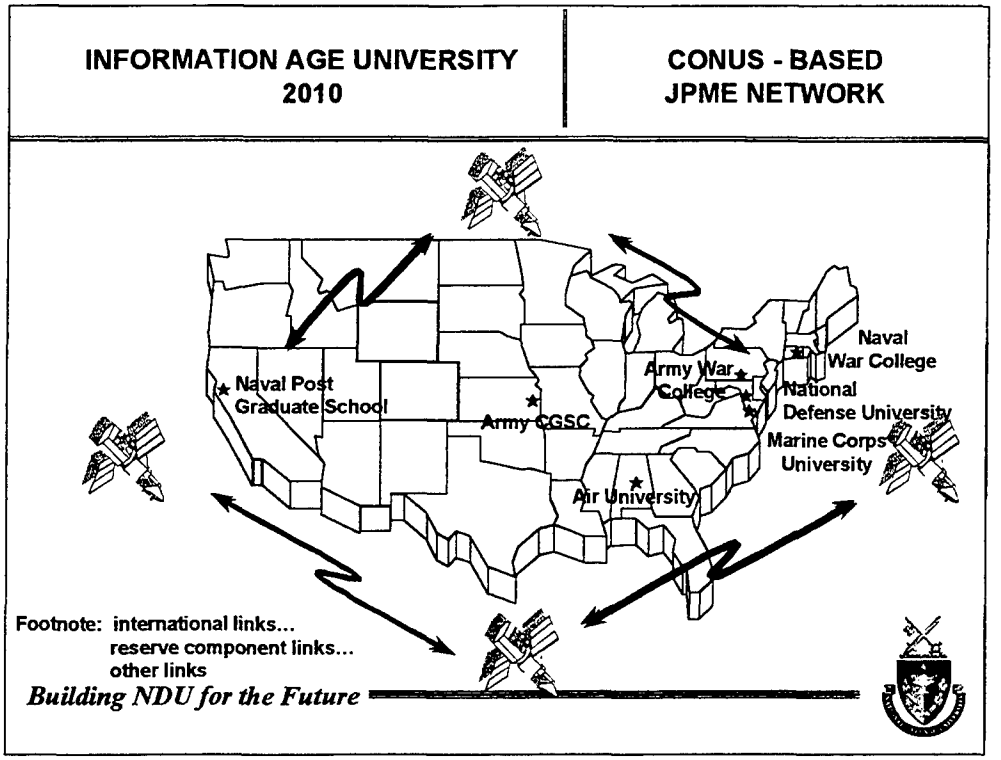


What about learning organizations at NDU? Everybody contributes. They are flat, seamless, tailorable, and, when necessary, virtual. The next best thing to actual hand-to- hand combat experience, for Army soldiers, is at the NTC. It is virtual reality. It creates virtual veterans. And we need to do the same thing in our schoolhouses. The bottom line needs to be students who can be experientially taught and practiced in the art and science of thinking in the information age.

A lot of educators who are up in the step in the American Academy of Higher Education think technology will actually change the way we think. I believe that instinctively and intuitively. The problem is, I can't articulate to you how it's going to change. We are all familiar with Bloom's taxonomy of learning and thinking. He did that work in 1956. It's kind of been the benchmark for how we think about thinking and learning. Dr. Susan Studds, who works in NDU's Academic Affairs Office and is our academic conscience, thinks that perhaps the taxonomy in that ladder that Bloom talks about in his research may change -- that the order or steps up the ladder from analysis, to synthesis, to evaluation may change. Others think that there may be an even higher step, perhaps discovery, on top of the ladder. But most serious educators who are thinking hard about technology, education and the future think that it is going to change the way we think. While we think linearly and sequentially, our kids are growing up immersed in this stuff. Do they think like we do, or in some other, circular or simultaneously parallel way?



We need to be developing these IT core competencies. I tell Army War College classes, "I can't mandate these right now because my faculty won't let me. But I challenge you, when you leave the Army War College, to be able to do this. Because you're going out there into a digitized Army, instead of Services."



This is what the system will look like.

MERLN

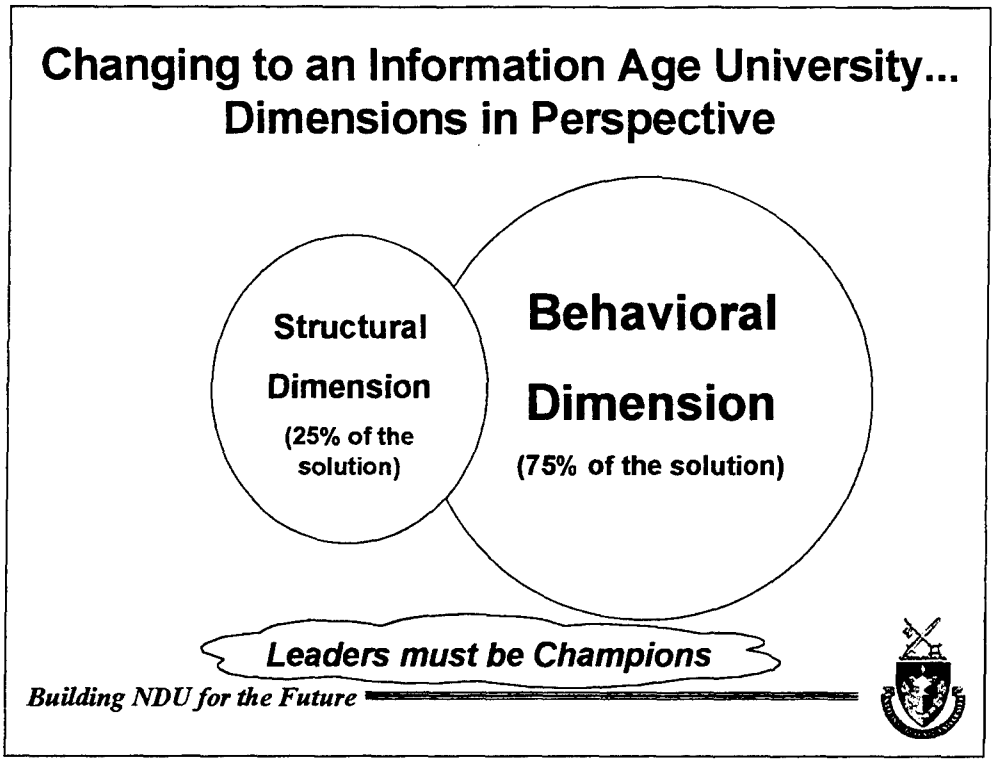
(Military Education Research Library Network)

- **MECC Library resources on one website.**
- **Cooperative MECC Library Working Group product for fast easy access: online catalogs, local databases, commercial databases, e.g., e-journals**
- **Expanded research capability available to each MECC school**
- **MERLN places MECC in prestigious company: Big 10, State of Georgia, Washington Research Library Consortium, National Association of Libraries**

Building NDU for the Future



We've already done it with our libraries. And we are in very select company -- we are not in the dark ages. We are right up there, in the way that the MEC has tied our libraries together -- right up there with the "Big Ten" schools. And this is just a microcosm of how we need to tie the entire system together. It was done by our librarians. We have some great libraries and librarians.



Research done at the National Defense University says that going to an Information Age university is tough. And the structural part is only about 25 percent of the problem. Seventy- five percent of the problem is behavioral. Those of us who are leaders in the community need to be champions, because, if we don't champion this, we'll never overcome the inertia which every academic institution and organization that has any kind of a bureaucracy has to deal with.

Resourcing

- **Initial program to establish baseline**
  - **5 - 7 years**
  - **10-15% of mission budget**
  - **must include IT support personnel plus faculty & staff training**
- **IT investment must continue after establishing baseline to accomplish long-term objectives**

Building NDU for the Future



The management of various institutions I have spoken to indicates they typically spend 10 to 15 percent of their operating budget on IT. They say that is enough to get their organizations into the information age. To me, that's a reasonable investment percentage to become relevant in the information age. But there are very, very few institutions in our PME system that are spending that much, because we don't have it. We don't want to sacrifice our faculty, and we don't want to sacrifice people to make that kind of investment. And so we have a dilemma. And we've got to work it.

Joint Vision JPMES: Essential Elements
Joint Professional Military Education System

- **The JPMES provides relevant military education to selected officers, civilians, and international fellows... recognized world-over as a "system of excellence."**
- **The JPMES is a key component of JV 2010... specifies human, educational, & technological objectives for JPME.**
- **The JPMES is a single, distributed, seamlessly integrated architecture for education with electronic connectivity between all Service and Joint schools, colleges, and universities, active and reserve components, national [and international].**

Building NDU for the Future

(1 of 4)



This is the first slide of the Joint Vision part. I've just described the university, and now I'll try to describe the system.

I've told my buddy, [Colonel] "Mac" McClain, from J- 7, "Mac, you've *got* to do this work. This is *your* work. I'm doing your work for you. And I think this ought to be codified in the next OPMEP." And Mac looks at me and says, "Chilcoat, you're crazy." But I'm serious about this. And here's what is probably the key thing: We have got to get JPME into the joint vision. It's not there now. If we don't get it in there, JPME will wither and die on the vine.

If we can get JPME into the Joint Vision, the senior leadership will then sign up for resourcing and commitment and do what has to be done to protect this competitive advantage I've talked about. It's a competitive advantage that will only come when the whole PME system is a single, distributed, seamlessly integrated architecture for education with electronic connectivity.

Joint Vision JPMES: Essential Elements *(cont)*

- **The JPMES is expansible to the DOD civilian professional development system, the USG Interagency, and the international community.**

- **The JPMES fosters educational efficiencies and effectiveness by electronically interconnecting institutions, libraries, wargaming and simulation centers, students, staffs, and faculties...provides connectivity, communication, coordination, cooperation, collaboration, and creation...enables an "information-age pedagogy."**



Building NDU for the Future

(2 of 4)

From connectivity, we will get communication, coordination, cooperation, collaboration, and creation – that's C- 6. Right now we've got C- 3, C- 3I, C- 4, and C4I; but we'll go all the way to C- 6I. This is the essence of information age pedagogy. And the system has got to be expandable to the DoD Civilian Professional Development System, the interagency, and the international community.

There is a serious question in my mind right now, given the trends at work at the National Defense University, whether we are on our way from JPME to becoming a defense university to becoming an interagency university. That's profound stuff. Somebody raised this possibility late this morning. What are the implications of these kind of trends for JPME? Is it good? Is it bad? Does it dilute the effectiveness of this competitive advantage I argued for?

Joint Vision JPMES: Essential Elements *(cont)*

- **The JPMES synchronizes the educational potential of the system...capitalizing on the expertise and diverse perspectives of the joint and service schools...to create synergy for the overall system and its individual institutions...establishes a "learning system."**

- **The JPMES combines resident and IT-based non-resident programs to provide continuing education and career-long learning opportunities..."deepens" the educational experience.**

Building NDU for the Future

(3 of 4)



I have already spoken about this.

Joint Vision JPMES: Essential Elements *(cont)*

- **The JPMES continues to codify joint educational policy, learning areas, and objectives and perform accreditation...and establishes core technological standards for institutions, students, and faculties.**

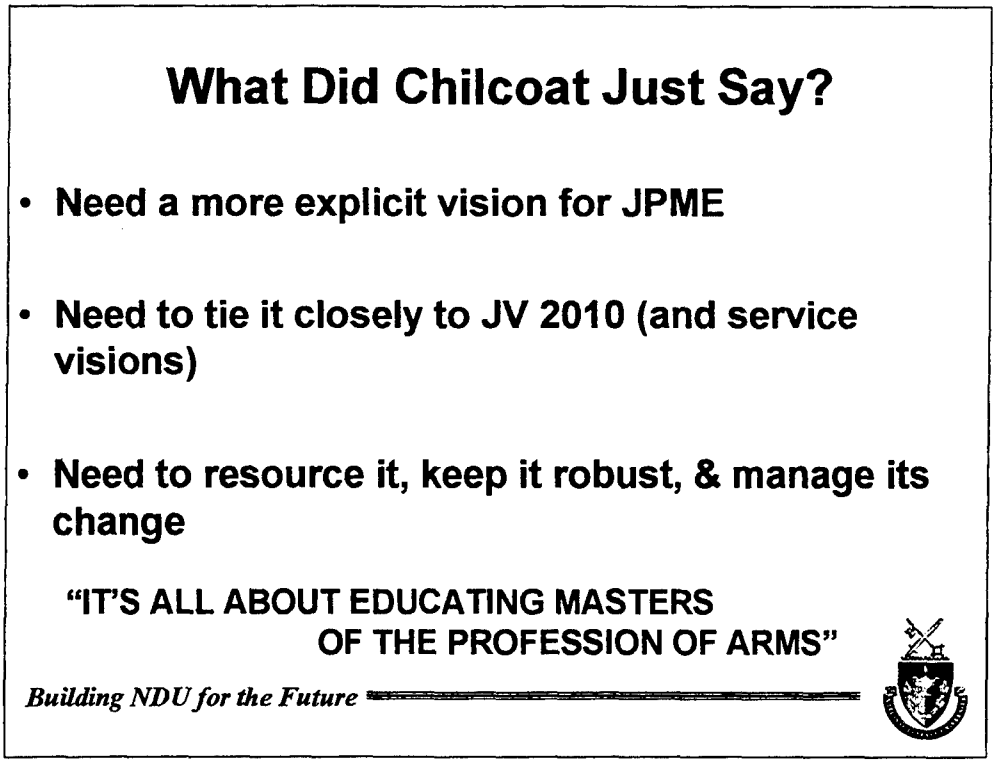
- **The JPMES promotes the joint culture, its ethic and values... while helping to sustain service-specific capabilities, cultures, and ethics.**

Building NDU for the Future

(4 of 4)



The system has got to promote the joint culture. Schneider and Graves have written about this recently. There is a joint culture out there, my friends. And it needs an ethic. But the joint system has got to help sustain the service-specific capabilities, cultures and ethics as well. So, I'm not one of these guys who's trying to crowd out service schools and service-specific education, because we need more jointness. I'm not about to do that, my friends. Don't put me in that box.



We need a more explicit vision for JPME, and it needs to be tied more closely to JV 2010 and the service visions because, over the next ten years, the service visions and the joint vision will become shared.

This is going to take us a while, but it will be an exciting process bringing it together. The most important thing is the need to resource it, keep it robust, and manage its change -- not radical surgery, but managed, deliberate change. It is all about, and I take Jerry's phrase on this, educating masters of the profession of arms.

You have been very patient with me, and attentive. And I thank you. I will be delighted to take any questions that anybody has, or comments. Believe me, I wish I had all the answers in this business. Kathryn?

Q. Sir, you talked about the resources of today, and then you talked about five to seven years to get to the base line?

A. Right. And I don't have a clue as to what this would take in terms of millions or billions of dollars. But, I've talked to a lot of folks who are working this challenge in education, in business, industry, and elsewhere. They talk 10 to 15 percent of their operating budgets to achieve this kind of change. I think it's affordable. I've worked the numbers at the Army War College; you helped work them over the years at the National Defense University. And I'm going to be an advocate for ensuring that we can resource it. But right now we are seriously not able to do that. Rich?

Professor Mitch Brown, NPS: You said you aren't sure about the general resources needed. My comment will be very simple. Today, Admiral Gaffney tallked about the resource investment process. If we actually believe that we will be needing JV military degrees in the 21st Century, then the alterative to not investing is ludicrous. If we don't, we will lose control and lose our money to management process if we don't advance the leadership.

General Chilcoat: Amen, brother. We're not even competing now, in my opinion, because we are not yet in the Joint Vision. We're engaged, we're getting there, but we need to drive it home. It needs to be in there, *explicitly* -- just like the main operational concepts of precision strike, focused logistics, full dimensional protection, *and* -- oh, by the way -- JPME. If you get it in there, then you can begin to compete seriously for the resources needed to make it work.

The admiral said this morning that NPS has a great class out here in innovation. How many students have already experienced that class? Twelve. You know how many great classes I've seen over the years in innovation? About zero. If you have a great class out here in innovation, I'd love to be able to export it electronically throughout the JPME system. And it should be easy to do it. It should not threaten anything that the Naval Postgraduate School does. In fact, it elevates the prestige of the school by being able to electronically export that kind of instruction.

But for us to do that today would be a very awkward concept. The video is not quite there yet. Incidentally, in a very short period of time, you will be able to create a virtual seminar with digital video in ways that we have not even been dreamed of before. We'll be able to have correspondence students around the world, doing their work not by using U.S. mail, the telephone, and the fax. We'll be able to bring them all together, show them a big screen like this -- eight or twenty of them -- to digitally create a seminar, and collaborate on strategy, on operations, and on tactics. It's coming.

As I said, the guys at Sarnoff say it is the next revolution. We've been through the mainframe, the PC, and now the web. Toeffler can describe it better than I do. The next revolution in information technology is digital video, and we should be poised and ready to jump on it in the PME world. This conference is a great venue for beginning to do that. And, again, my congratulations to NPS and ONR -- my deep congratulations!

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PME for the 21st Century Warrior

SESSION SIX

Supporting the Growth of Military Human Capital: Infrastructure Requirements for Creating and Sustaining a Learning Organization

Question: **What are the infrastructure requirements for creating and sustaining a learning organization to support the future force?**

Objective: **Focus on and identify the characteristics of future educational systems needed to deliver professional military education, the role technology will play in those systems, and the resource commitment necessary to create and sustain them.**

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Presentation by
Dr. Ed Schein
Sloan Fellows Professor of Management,
Massachusetts Institute of Technology Sloan School of Management

and

Remarks by
Dr. Carson K. Eoyang
Program Director of Training, Federal Aviation Administration

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EDGAR H. SCHEIN
MIT Sloan School of Management

Dr. Schein received his PhB in 1946 from the University of Chicago. He earned a BA in 1948, and an MA in 1949 in Social Psychology from Stanford University, and received his PhD in 1952 in Social Psychology from Harvard University. He is presently a Sloan Fellows Professor of Management Emeritus Senior Lecturer at the Massachusetts Institute of Technology Sloan School of Management.

Dr. Schein investigates organizational culture, process consultation, the research process, career dynamics, and organizational learning and change. In *Career Survival: Strategic Job and Role Planning* (Pfeiffer, 1994), he presents concepts and activities for managers and employees based on research he first reported in *Career Dynamics: Matching Individual and Organizational Needs* (Addison-Wesley, 1978). His latest book, *Strategic Pragmatism: The Culture of Singapore's Economic Development Board* (MIT Press, 1996), describes how the board created the Singapore economic miracle. His areas of expertise lie in the fields of career development, leadership development, organizational change, and organizational learning.

CARSON K. EOYANG
Program Director of Training, Federal Aviation Administration

Dr. Eoyang joined the FAA as the agency's chief training officer in April 1996. His current responsibilities are to provide program management and oversight over all FAA's training activities encompassing 47,000 employees, to advocate and monitor an annual training budget in excess of $94 million, and to lead a training community of about 800 instructors and training administrators.

Prior to his current appointment, Dr. Eoyang was the Director of Training for the National Aeronautics and Space Administration. Appointed to the Senior Executive Service in 1989, he served as NASA's chief training officer for seven years. During 1993 he was recruited to join the Vice President's National Performance Review as team leader for program design. From 1994-96 he also served as founding co-chair for the federal Human Resource Development Council, the principal advisory committee to the Office of Personnel Management on training and development in the federal government. In 1993 he was awarded the Presidential Rank of Meritorious Executive, recognizing the top 5% of the Senior Executive Service.

Dr. Eoyang's previous experience includes 15 years at the Naval Postgraduate School as a tenured associate professor, several assignments in the Departments of Navy and Defense, a year as a Guest Scholar at the Brookings Institution, and 3 years at the McDonnell Douglas Astronautics Company. He has numerous academic publications including a 1994 book entitled "Citizen Espionage: Studies in Trust and Betrayal" and a chapter in the 1996 edition of the Handbook of Public Administration. In addition to a variety of honors and awards, Dr. Eoyang has served on a number of boards including the Training Officers Conference, George Washington University's Department of Human Resource Development, the Asian American Government Executive Institute, and the Organization of Chinese Americans. He earned a bachelor's degree in physics at the Massachusetts Institute of Technology, an MBA at the Harvard Business School and his Ph.D. at Stanford University.

HUMAN CAPITAL IN THE INNOVATIVE ORGANIZATION OF THE FUTURE

1. THE KNOWLEDGE WORKER OF THE FUTURE

2. THE INNOVATIVE ORGANIZATION OF THE FUTURE

3. DILEMMAS AND ISSUES

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Dr. Schein: In trying to figure out what to talk to you about, I had some conversations with Ruben Harris. He reminded me that one of the things you're trying to work on is a topic all the world is concerned with -- it's not just a military issue for the military. And it boils down to the three topics shown on this slide. Hopefully I'll have an opportunity to have you raise some questions, because none of what I am going to say is "cut and dried". I'm not going to lead you through 16 points, and present an answer. I'm going to speculate a bit about what we really mean when we talk about the "professionalization" of an organization of the services.

What does it mean when we say, "In the future it's all going to be about the knowledge worker." I'm going to talk a little bit about some of the characteristics I see in this person called the "knowledge worker." A question immediately arises, "If the environment is changing very rapidly, aren't organizations going to have to be learning organizations?" They're going to have to innovate. So I want to spend the bulk of my time talking about what that really means.

If we imagine an organization having a culture that would really be benign to this knowledge worker of the future, what would that culture look like? And then, finally, if we put these issues together, what are some of the real dilemmas and questions that arise around that topic?

WHAT WILL THE KNOWLEDGE WORKER OF THE FUTURE BE LIKE?

--LESS RESPONSIVE TO FORMAL AUTHORITY, MORE RESPONSIVE TO THE AUTHORITY OF KNOWLEDGE AND SKILL

--MORE CONCERNED ABOUT SELF AND TOTAL LIFE STYLE THAN SPECIFIC CAREER ISSUES

--LIKELY TO BE INVOLVED IN A DUAL CAREER SITUATION, HENCE LESS MOBILE GEOGRAPHIC ALLY

--MORE MOTIVATED BY PROJECT AND JOB CHALLENGE THAN ORGANIZATION; LESS LOYAL TO ORGANIZATION

--MORE MOTIVATED BY CONTINUOUS GROWTH AND LEARNING

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Dr Schein: Let me start with the knowledge worker of the future. What are those folks like? This is, of course, speculation. None of us knows exactly where the world is headed, but it seems to me there are some characteristics of this knowledge worker of the future that are already visible; and it seems to me, if anything, they're going to be more characteristic than ever. They're going to be much less responsive to formal authority, and much more responsive to the authority of knowledge.

When you think about someone who's very highly trained in a particular field, if their boss comes from another field, the fact is that the boss doesn't count for very much relative to a colleague whom they feel knows even more than they do. The way you see this is that, usually in academic departments, deans are viewed as a step down on the hierarchy rather than a step up. And if you're a senior professional in one of those departments, being a department chairman or being the dean is viewed often by such professionals as a sign that they have now failed as an academic, and they have to move over into administration.

I think we have to take that tendency seriously. I'm being a little facetious about it, but I happened to grow up in an academic environment. My father was a physicist. This all happened at the University of Chicago at the time when there was this very powerful group of physicists who were creating chain reactions, and so on. And what I remember about this issue is the debate they would have about whose turn is it in the barrel to be the department chairman. It was clearly the less desirable job, to be in the position of authority.

And I think that notion -- that once you train someone to be an autonomous professional, they then automatically lose respect for formal hierarchy -- is something that's going to be one of the major issues that we're going to have to deal with. How is that going to resolve itself in the future?

I think we see all kinds of evidence -- especially in our younger generations -- that professionalization, more education, and today's social norms create people that are generally more concerned about themselves and their own lifestyles. In many industrial organizations, the concept of organizational loyalty is dead. Loyalty is no longer even expected. You're loyal to your field. You're loyal to the project. You're loyal to the particular thing you're doing, but if the company gives you an assignment that doesn't challeng you, it's "Goodbye, see you tomorrow. I'll go to some other organization where I can be challenged, and where I can really use my talents." If this is really true, you can imagine what kind of problem this poses for a military organization that more or less depends on loyalty and commitment.

I think one of the other characteristics, it's very clear, is that we are entering an age of dual careers. It's no longer possible to manage a professional person individually. You can't say, "Okay, you're next job is here," because the question immediately comes up, "Well, what about my spouse?" If we can't move together, and if we can't both have jobs in this new area you want me to work in, then I won't go." This is one of the reasons why organizational loyalty is not what it used to be.

I think that people are much more challenged today by the actual work they do than by a greater sense of mission or where their job fits within the bigger picture. I think the more we professionalize people and make them autonomous experts, the more we will find that their motivation is the use of their skill, and the increased knowledge that they get from using their skill.

Saying, "Well, we're going to professionalize the organization," and I hear this not only in the military; I hear this from lots and lots of companies, I think we have to ask what we are really buying into? Is this is really what we want? What kind of culture will we have to have in order to make professionalization possible? What effect will it have on our infrastructure?

In the spirit of creating dialogue, let me ask if this make sense to any of you? Do you see this happening? And what, if any, questions does it raise for you?

Unidentified: The one thing I don't see you addressing here is teamwork. One of the things that distinguishes the armed services from other organizations is the intensity of its teamwork. People do feel rewarded, even in corporate business, by being part of a team -- part of something larger than themselves -- and by realizing their own goals within the team. I don't think that's been completely vitiated by the trend you're talking about. That motivator is still very strong in the Services. It can be capitalized on to ameliorate some of the negative trends you're talking about.

Dr. Schein: That's a great comment, and it reminds me of an experience I had some years ago when I was a human resource consultant for the Apple Corporation. One of the things Apple was very proud of was that they did not expect employees to be loyal to them. Similarly, they did not expect to be loyal to their employees. In other words, "If you're obsolete, out you go."

The question then arose, "Well, then how did they get going on any kind of coordinated effort?" They said that the loyalty and commitment to the project team was unquestioned, but they noted that the day the project ended, they dispersed and went off on their own way. In a way, this is paradoxical. The same people who are disloyal, in a sense, to an organization's larger mission, can get extremely committed to a project that requires a lot of teamwork.

I've often thought about this. The organization of the future is going to have to be much more thoughtful about how it organizes its work and its tasks, and not expect people to be loyal to vague generalizations, but only to particular missions, particular projects, and particular things that they really care about. It's obvious to the professional that, unless we're a team, it's not going to work out. I think they have to see the logic.

Lots of companies today are saying that teamwork is expected. But then, as one person said, "I wonder what kind of team we are." The word team," of course, can mean many things. This person figured out that they were a track team. Now,

think about what a track team is. A track team is a whole bunch of individual contributors adding up points, unless you're part of the relay team. Now, in the relay team, those four people really have to work together. But you can have a world-class shot putter and a couple of good runners, and the total points have to add up, but they are not necessarily interdependent. So they don't have to be a team at every level.

RADM Marfiak: Yesterday one of our speakers mentioned the fundamental doctrine of the Constitution of the United States, and said we had to provide for the common defense. Nowhere in there did he cite that we only had to provide when we felt motivated or challenged by the project. The continuity of mission is one of the distinguishing characteristics of a military organization. I would note that most of the ships and aircraft that we work with -- when you're done with the project, you don't really have the option of leaving to go back.

So maintaining that motivation, maintaining that continuity of mission, I think, is one of the distinguishing characteristics of the military organization. One of the challenges we face, I believe, is how we motivate people continuously, given the fact that that mission is liable to endure for considerable periods of time longer than their personal interest might otherwise dictate.

Dr. Schein: It's an interesting issue. I am reminded of an experience with the Navy. For a number of years, MIT had a contract with the Naval War College. We were teaching a three week management course to captains who were newly promoted to admiral. Many of them were on their way to the Pentagon. During the evening dialogue, when people sort of let their hair down a little bit, we observed quite a bit of depression about the fact that they were moving from something that had real project focus -- a base, a ship, a particular thing -- to the bottom of a vague hierarchy that certainly had a mission, but their own role in it and what kind of team player they would have to be, was suddenly very, very ambiguous.

So I guess the issue is, if we talk about attachment to mission or project or whatever, for people to be motivated by it, there has to be a degree of specificity that allows them to link what they think they're good at with what the goal is. I think we're often a little vague about that.

You get CEOs of companies saying -- you know, we issue a slogan. It is printed on little 3x5 cards and everybody is given a card that says, "These are our company values." Then you talk to the employees, and they say, "Oh, yeah, I've got the card someplace." It has no meaning to them because it's disconnected from whatever they see their own particular skills to be.

So, if we take project mission as a larger concept, I think the question is, "Can we connect people's subjective sense of their career to the bigger whatever it is, and produce team players?"

I want to make a remark about the U.S. culture in this regard. I've been

struck by the fact that, ultimately, the U.S. culture is extraordinarily individualistic. That is the way the Constitution is written, the Bill of Rights, our legal system. It's all about, ultimately, protecting the individual. And so you ask yourself, "In an individualistic society, how do you create good teams? How do you get teamwork?" My answer is that you have to appeal to a higher, overarching value. In the U.S. culture, it is pragmatism. Above all else, we want to get the job done. If, in order to get the job done, one has to be part of a team, people will be part of a team.

But it's not, as in some Asian cultures, an intrinsic motive for Americans to want to be a part of something. It's rather a particular necessity. If, in order to win the basketball game, hockey game or relay race, we have to be superb team players, we'll do that. But the deep motivation is to win; to get the job done.

And so that's also something we also have to recognize -- that the project, the mission, has to draw on that personal desire to get the job done; to win, to do it better than somebody else. We can't just expect that announcing a need for teamwork is going to produce an intensive level of motivation.

Let me go on. Now, if this is a picture of the kind of individual that we think is going to be more characteristic of our future organizations, what would an organizational culture have to look like to support this kind of person and the kind of learning orientation we're talking about in the organizations of the future?

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CHARACTERISTICS OF INNOVATIVE CULTURES

1. PRO-ACTIVE OPTIMISM

ONE CAN MANAGE ONE'S ENVIRONMENT AND FUTURE; LEARNING AND CHANGE ARE DESIRABLE

2. COMMITMENT TO ALL STAKEHOLDERS

OWNERS, CUSTOMERS, EMPLOYEES, SUPPLIERS, COMMUNITY, ETC. ARE EQUALLY IMPORTANT

3. THEORY Y ATTITUDES IN LEADERS

PEOPLE ARE CAPABLE AND WILLING TO WORK TOWARD ORGANIZATIONAL GOALS AND CONTROL THEMSELVES

4. ORGANIZATIONAL SLACK

SOME EXCESS RESOURCES ARE DESIRABLE FOR CREATIVITY AND INNOVATION TO OCCUR

5. KNOWLEDGE AUTHORITY

POWER AND INFLUENCE DERIVES FROM KNOWLEDGE AND SKILL, NOT FROM POSITION OR PERSONALITY

6. TASK ORIENTATION

FOCUS ON THE TASK NOTSTATUS OR POSITION

7. BUILDING AND MAINTENANCE OF TRUSTING RELATIONSHIPS

WORKING ON TASKS AND BUILDING RELATIONSHIPS ARE EQUALLY IMPORTANT FOR THE LONG RUN

8. OPEN COMMUNICATION IN A FULLY CONNECTED NETWORK

TASK RELEVANT INFORMATION MUST FLOW FREELY

9. ORGANIZATIONAL DIVERSITY

VARIETY AND DIVERSITY IN PEOPLE AND GROUPS IS NECESSARY AS A SOURCE OF INNOVATION

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There are nine primary characteristics of what I think of as an innovative culture. Before I start, have some fun and rate your own Service organizations on a 10-point scale for each of these nine primary characteristics.

First, it seems to me that one of the characteristics of the kind of supportive culture we're talking about has to be what I call "proactive optimism." You have to believe that you can manage your future environment, and that learning changes are intrinsically desirable. In most U.S. organizations, people say, "Yeah, well what's the deal? We, of course, think this way." But not all organizations, not all cultures, automatically assume that learning and change and innovation and improvement are a good thing, as we, of course, routinely do.

Second -- and this is more in reference to industrial organizations -- there has to be a feeling that all the "stakeholders" in a company matter, not just the owners or stockholders, but other entities as well. The results of a number of research projects suggest that really great companies that have survived for a long time have never taken the position that the only people who count are the owners or stockholders. Successful companies take the position that they should be just as concerned about customers, employees, suppliers, and the surrounding community. Somehow, the needs of all those "stakeholders" must be integrated, or the company will become too biased in one direction.

I can't figure out how this would play out in a military organization. Who are your stakeholders? But, I would think the logic would be the same -- that if you don't worry about all the human constituencies that are the stakeholders, you're going to end up with a culture that will be inimical to some of them, and that will undermine your ability to be innovative.

Third, an innovative organization must fundamentally believe in people, and nurture what McGregor called Theory Y leaders. Innovation comes from the individual creativity of people. The theory X leader, who thinks people are fundamentally lazy and have to be controlled and motivated, inevitably produces organizations that are obsessed with control. They install time clocks and assume that if you're not watching workers all the time, they're not going to do the right thing, or not going to tell you the truth.

I think, based on my experience with teaching in the military -- particularly in programs like these at Newport and getting to know these admirals -- that the military training system weeds out the Theory X people very early in their careers. They're the ones that, as the joke goes, get shot in the back as they lead their troops forward. They're the one's unable to motivate the people below them, so they don't make it through early rounds of leadership training.

So, in fact, by the very nature of the military, I think most of the senior officers I met tend to be Theory Y people. I don't believe that, after the captain of a ship asks the radar operator what he sees on the scope, he runs over and double checks whether the radar operator is telling him the truth. This might happen in an

industrial context – where there's so much mistrust between the boss and the subordinate that the boss would actually want to check for himself. It seems to me the military, par excellence, is an organization in which you have to trust people. Therefore, leaders who are unable to trust get weeded out early.

Dean Miller, USNA: I'm one of those "failures" you called a dean. My own perception, when I was wearing the uniform, was that the federal government certainly – and maybe even the Department of Defense -- is a Theory X organization, and the challenge is being a Theory Y leader in a Theory X organization.

Dr. Eoyang: Just a follow-up comment. Research done at the senior service colleges indicates we have a lot of Theory X leaders still around, and particularly at the higher levels. We are concerned about that, because they do get in the way of a learning organization.

Dr. Schein: You know the data much better than I. But there's one qualification that I think is important, and that is not to confuse the Theory X leader with an autocratic leader. In the industrial literature, somehow McGregor's basic point that a set of inner attitudes correlates with leadership style got missed somewhere. So whenever we see an autocrat in a very tightly structured disciplinary organization, we say, "Ah, Theory X." The point I want to make is, and that McGregor made, is that the style, whether you're autocratic or participative or involve your people and so on, is more driven by the actual task to be performed. And that the Theory X person would naturally want to be autocratic and mistrusting, but they're lots of Theory Y managers who are also autocratic because the task requires it. But they nevertheless trust people and trust their particular information that's coming up to them. So, let's at least make that discrimination.

Dr. Kohn, UNC Faculty: I would comment that the organizational structures, it seems to me, of ground forces historically are based on Theory X because you are instructing an organization and setting up a series of human interactions designed to get individuals to expose themselves to death and maiming. That is really a problem for Theory Y leadership in most situations.

Dr. Schein: Again, I think maybe you should elaborate the comment. What you described was a situation that requires high discipline and high autocracy. But, would that platoon leader fundamentally mistrust his sergeant? Because that's where the issue is. Not whether they're autocratic or not, but will they trust each other?

Unidentified: I think the issue of trust can be built in. I'm not a sociologist or a psychologist, but I have been thinking about this for a number of years. It seems to me that the organization assumes at its core the kind of structure and procedures that you have to have to counteract the natural human inclination either to succumb to an emotion, to fear, or to self-preservation. And so there is an inherent tension. Military organizations since ancient times have tried to balance those kinds of

conflicting motivations. Technical formations, for example, in ground forces are not just the products of technology. They are the product of the desire to keep human beings from breaking and running in battle

Dr. Eoyang: I think the vast majority of literature, of both military sociology and military psychology, says that unit cohesion is the number-one factor that determines teamwork, and that affects combat effectiveness and survival. Loyalty to one's colleagues and teammates, and protecting each other, have more influence over combat behavior than authoritative rules and procedures.

Unidentified: I agree with you about the sociological and psychological literature, particularly of the last 30 years. But there is some recent historical literature that raises the possibility that there have been varying influences in particular times and places; that unit cohesion is not a universal over time.

Dr. Schein: I think it's a good debate. I agree with Carson (Eoyang) that the evidence that I see, both in industry and in the military, would suggest, as before, that it's the project, it's the work team, it's your buddy that are the most powerful sources of motivation. That's not the only theory of Theory Y. There's a more fundamental theory about Theory Y that, I think McGregor tried to get at. And that is whether I can trust the *information* or not.

I gave you the example of the captain of the ship and the radar operator because it is difficult to imagine a military organization in this high-technology age working if you mistrusted every piece of information that came from an enlisted man who's manning a particular station because, fundamentally, you didn't believe that he was motivated to his job?

It's at that level where Theory X really hurts. It is intolerable for organizations to have managers who, deep down, believe that their subordinates are out to screw them, that they're going to lie to them or give them misinformation in order to make their own job easier. That is the kind of leader who would be rapidly weeded out because, I think, his operation would fall apart quickly.

Technical efficiency requires absolute trust in each other's information. You cannot simply check it off.

VADM Blair, Director, JCS: I think we have a particular problem in the Navy because so much of our business is done with expensive, complicated pieces of equipment. That requires confidence that the maintenance and operating procedures are being done correctly. Whatever the attitudes of your leaders are, we have built a by and large Theory X system to keep our equipment up.

The extreme is the control of nuclear weapons. We don't give people general guidance. We don't say, "Use your initiative and your ability. And if you tell me that that's the number of weapons you have, and that's their state, that's fine. I'll go about my business." We have double checks, triple checks. We have

things like two-man control systems, which are specifically built on *not* trusting one person. And, although that's the extreme case, we have an entire equipment maintenance system called PMS which is built on checks, double checks and sampling systems. The system is built around making sure that people have done what they were supposed to do -- by checking on them at various frequencies.

My experience is that most of us think of that as basis for operations. And, using a variant on your example, I think what you say is true. When the chips are down and the sonar man says you have a contact out there, you don't go in and pretend that you can read his waterfall diagram better than he can. He's been doing it for 20 years. You act on his information.

But in the Navy, in particular, because of the consequences of a person at a very low level failing to check the oil level or do the maintenance on these complex machines we operate -- that one guy who didn't respond to Theory Y leadership -- we pay lots of money and devote lots of manpower to fix what went wrong. So, a lot of people are captured by that system. They think they can run whole organizations the way you maintain pieces of machinery.

I think we've always had to balance this in the Navy, and this is also true in the other services. As Dick Chilcoat was saying, it's still a mixed picture.

Dr. Schein: It's a mixed picture, but it's also an integrated picture, I think. If your relationship with that employee is a Theory Y relationship, that person is connected to the project and to the mission and is committed to doing the job. That same person, I think, will understand why they have to go through the checklist and why they have to go through the extra steps.

I think in an effective airline, for example, the captain who knows he has to go through those 20 steps before he can take off doesn't resent going through them every time. He doesn't say, "Hey, I wish I could drop this stuff and just fly the airplane." If the relationship is a Theory Y relationship, that captain would understand that he shouldn't entirely trust his memory. He shouldn't entirely trust himself.

And, therefore, some of the arbitrary impositions of discipline that are put on professionals can be acceptable to them as part of the job. And that's the relationship I think we have to look for. In no way can we dispense with the hierarchy and with discipline and with tight, formal procedures in a more technologically complex world.

I think the issue is how to get professionals who do have some sense of their autonomy to see the rationale behind some disciplinary, autocratic, and arbitrary appearing checklist procedures that are imposed on them? We have to invent ways to do that. So I don't see it as an "either-or" problem -- that either we turn people loose and let them think for themselves, or we keep very tight control on them. It is, rather, how do we take these new people, who we want to be empowered, and

get them to accept the rationality of control systems that are imposed on them because of the great expense associated with a single mistake?

Fourth, an innovative organization must have some "organizational slack". If you're so tightly structured that there's no excess time, there is going to be no room for innovation. Innovation requires a certain amount of excess capacity -- opportunities in terms of time and resources to work on them.

Fifth, an innovative organization must have "knowledge based authority". We have already talked about that.

Sixth is task orientation. An organization that isn't demonstrably concerned about what it's doing stifles innovation.

Seventh is trusting relationships. If you do not have trusting relationships, innovation will be undermined because creative thinking and new ideas are produced by interaction between people. If you can't calibrate who your fellow professionals are, if you don't trust them, if you're in a competitive relationship with them, it's guaranteed that you're going to undermine each other's ideas instead of building on them and, therefore, in the end will be a less innovative culture.

Eighth is open communications in a fully connected network. You know, some of the great innovations of the last 20 years were produced after companies determined that they could create an engineering network where every engineer is connected to every other engineer worldwide. Companies used that network to share and solve each other's problems -- to have, in a sense, the equivalent of the informal seminar on a worldwide basis. There's enormous evidence that the real learning of how to do something better, comes not from formal education, but from sharing with colleagues who are working in similar areas some of the know-how that they develop on the job.

Finally, I think the companies that are beginning to really think hard about this learning organization issue are finding that they have to deliberately create diversity, not only at the individual competence level, but at what you might call the subcultural level. An organization which has different units that are good at doing different things, and whose units have developed different sets of cultural norms and skills, is able, as the environment shifts and the need for new cultures is identified, to draw talent from these units to build the required cultures.

For example, though this didn't happen inside the Navy, one could argue that one of the ways the nation's nuclear industry grew was that it drew from the strong nuclear base within the U.S. Navy. A very large number of the senior managers in U.S. nuclear companies come from the Navy's nuclear force. A subculture had built up a set of skills that, when society needed them in another arena, was able to draw on it's own subculture for the talent needed. That goes on within organizations all the time, and, therefore, if you want innovation, you have to maintain a certain amount of diversity.

DILEMMAS AND ISSUES

--THE CONTINUING BUT CHANGING ROLE OF HIERARCHY

--GOAL AUTONOMY VS. PROCESS AUTONOMY

--CONFLICT RESOLUTION MECHANISMS AMONG KNOWLEDGE WORKERS: WHAT IS THE COURT OF LAST APPEALS IN THE KNOWLEDGE BASED SOCIETY?

--HIGH RATES OF TURNOVER AND DIFFICULTY IN BUILDING STABLE KNOWLEDGE BASE

--BUILDING "FUNCTIONAL FAMILIARITY;" COMMUNICATION SYSTEMS AND TASKS THAT ALLOW MUTUAL CALIBRATION

- --THE ROLE OF SIMULATION
- --THE ROLE OF PRACTICE FIELDS
- --THE ROLE OF DIALOGUE;

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I will now discuss dilemmas and issues. The requirement for hierarchy will not go away because hierarchy is still needed for coordination. You've given several examples of why discipline, hierarchy, and autocracy are relevant to certain kinds of task performance. However, I think the nature of hierarchy will inevitably change, and perhaps become more limited.

We have hierarchies in universities, and they work perfectly well because the deans and the presidents and the provosts and the department chairmen know the limitations of their power are and don't attempt to interfere in areas where the faculty feels their power is. So, on career issues, promotions, and so on, the hierarchy functions very well. But if the dean tries to tell Professor X what he should be working on, he's likely to have a fight on his hands. So, the hierarchy doesn't disappear with knowledge based workers. It becomes redefined as to what its function is so it doesn't interfere with the professional function of the professional employees that you've got in the organization. We might want to discuss that a little bit.

On this issue of goal versus process autonomy for the knowledge worker of the future, I believe we think we have to empower them in setting their own goals. This is a mistake. Professionals want to align themselves with projects, with missions, with things that have a bigger meaning that allow them to self-enlarge. What they resent is having their process autonomy taken away from them.

Research was done that showed that the scientists at Bell Labs didn't mind being told that they should be working on a particular line that was important to the telephone industry. What they resented was every other week some controller coming around and looking at their budget. What they would have liked is freedom on *how* they do their job. There's a real issue there.

One of my biggest issues and dilemmas -- and I think the military may be ahead of others on this -- is how to resolve conflict among the experts and knowledge workers. If they disagree, what is the court of last appeals for resolving the issue, particularly under the time pressure inherent in military operations? I don't know the answer to that. But the key may be that to build a team out of a set of autonomous experts, you have to help them to become "functionally familiar" with each other. That is, they have to be able to calibrate each other's styles and know how they work.

I've had the experience of working with fellow faculty on designing workshops, and so on. If I don't know how the other person thinks, we get into fights about what we should do. If we work together for a length of time, participate in simulations together, have dialogues -- I become functionally familiar to him, and visa versa. If that person says, "I can have it ready by tomorrow," I know whether that *really* means tomorrow, or "day after tomorrow," or whether that means he's not going to do it at all. That kind of "insider knowledge" is crucial to building effective teams among experts and getting conflicts resolved amongst them.

The single biggest problem that I foresee for you, it's that, as you successfully professionalize the military and have more and more knowledge workers out there, there's greater and greater potential for disagreement among them about what you should do next. The traditional hierarchy will begin to break down. Having someone whom knowledge workers don't respect say, "Okay, gang, I've listened to you, and here's what we're going to do" -- which, I presume, is the traditional way you've done it -- is not going to be a satisfactory answer.

The boss will be no more expert than the two experts who are disagreeing. Therefore, the boss won't necessarily make a good decision. Instead, I think, there's going to be much need to develop reflective dialogue skills --practice fields where people get familiar with each other so that, under time pressure, people who disagree know each other well enough that they will be able to find a resolution in the time allotted.

I think that's a big challenge, and that's the point I want to leave you with. The picture is to address these infrastructure issues so that functional familiarity is built between the professions. Thank you.

Dr. Eoyang: Now, in the spirit of dialogue, I'd like to use the remaining time in the session to promote dialogue not only between the audience and Professor Schein, but also within the audience. I'll have the prerogative o the discussant to raise the first question with Ed, and then invite comments from the audience.

Ed, in your last slide, you lay out a number of characteristics of what innovative organizations should look like and what they should do. Yesterday, we spent most of the time talking about PME in terms of educating and training individuals. Would training individuals in some of these processes be sufficient to bring about the institutionalization of these practices on an organizational level?

Dr. Schein: What I see companies doing more and more is unit training, unit simulations, maneuvers that are done by groups, so that the teamwork and the functional familiarity gets built during the training period itself. My suspicion is that the military has been doing this much longer than companies have, by the way. In a lot of these areas, I think the military is way ahead. I seem to remember that, twenty years ago, there was already a movement to exercise platoons and squadrons as units, rather than bringing together a bunch of individually trained people. And, I think that's definitely the direction that these things have to go.

As you define projects and missions, you decide who the key players are, who are going to have to work together, which experts are going to have to be functionally familiar with each other. You provide lots of opportunities for them to have dialogue, joint training sessions and simulations, so that that familiarity gets built up to a sufficient degree that they really calibrate each other under more tense conditions.

We're going to have to invent group and even organizational-level education and training activities.

LCDR Perkins, NPS Student: First of all, let me say this is an extraordinary conference. I would gladly spend a third year here to edit the conference proceedings, if Vice Admiral Oliver would allow me.

It's also nice to be able to talk to leaders like General Chilcoat, Admiral Meyer, Mr. Snider, and the other folks I've encountered so far. I have a comment about yesterday's proceedings, and it's based on generational issues.

A large part of what I saw yesterday was generational thinking – the thinking of the post-Vietnam generation. I can say this because I was born in 1963. I'm included in a mixed generation, between the X Generation knowledge folks we just talked about and the Baby Boomer/post-Vietman generation of officers. I don't want to say I'm fluent in either one of them, but I can certainly point to familiars. What I saw yesterday was a generation that was -- I don't want to say ignorant – but not very much worried about civil-military relations. I saw a generation that demonstrated concern about the operational and tactical level of war, but let the politicians worry about the strategic level of war. What I saw was a generation that worried about technology in everyday life.

What I didn't see, though, was substantial talk about the Generation X and the knowledge based workers that will enter our service and war colleges in the next five to ten years. The Generation Xers tend to be much closer to civilian life. The main difference between when I got into the Navy eleven years ago and now is, eleven years ago, when an officer was about ready to leave the service, that's when he started thinking about what he wanted to do after the service.

When an officer comes in now, within two or three years, as an ensign or first lieutenant, he is already thinking about what classes he needs to take at NPS or other colleges, and what jobs he needs, to get out at 20 years and get a good job. He's less worried about command and more worried about what he's going to do after it. Officers now are less than officers used to be – I shouldn't say that – It's just that a naval career now is more a job than a way of life.

The Generation Xers are more comfortable with technology. So you can imagine that, when Generation Xer pops into General Chilcoat's classroom, it will be like a technology Romper Room. But the problem with the Generation Xers is they do not have the patience to think critically, think in conceptual terms, think in temporal terms, and to be able to think strategically and forward. And, just from your background, I'd like your comments and see if you have any insights along those same lines. Thanks.

Dr. Schein: You know, the thing that strikes me most is that society has really changed in a very fundamental way in the last ten to twenty years, around the whole concept of career and the psychological contract between organizations and

individuals. It used to be that the concept of lifetime employment meant something. In the military, it couldn't be taken for granted. In a lot of organizations, it was taken for granted. If you look at the pattern of layoffs that has occurred worldwide over the last twenty years, that contract clearly has been broken all over the place.

It is no longer possible for a person to grow up today -- and I see this in my kids -- believing that it's possible to count on a career without tremendous amounts of self-reliance, self-management, and worry about how you are going to take care of yourself in a world that you can no longer trust. I expect that influences thinking about the military as much as it influences thinking about individual corporations. People are learning how to be more self-reliant. That's why there's no longer loyalty to organization -- only to projects and, on occasion, missions.

That means that the attraction of a career, whether it be military or industrial, really has to be built on whether it can enable that person to fulfill their personal needs. I don't think we can count on vague overarching notions of security or lifetime employment any more. That plays into the same point that you're raising. At the same time, because of the technological skills that people have, they are more capable of taking care of themselves. They're not as dependent upon others as they used to be.

On the notion of organizational hierarchy, one very quick story showed me how stereotypical my thinking was. My daughter-in-law, who works in a managerial position for a high-tech company in Silicon Valley, was going to have her first baby. She was promoted approximately six months before the baby was due, and she was going to take maternity leave. She had built up a marketing team in her company. I got very curious about how she was going to manage as a manager, suddenly having a baby and taking all this time off. Would she assign a temporary manager or would she step down? What would she do? In due course, she had her baby and went on leave. We were talking at some point after that and I asked her, "By the way, what did you do about your team and its management?" Her answer absolutely floored me. "Nothing," she replied.

She did not, apparently, even consider that just because she was the manager and had authority, that she must do something about her lack of on the job presence -- either replace herself or assign somebody else. She said, "The team can take care of itself. They all know what the reality is. They know I'm at home and can call me up."

But this notion that you don't have to do anything about authority is a new attitude, isn't it? We sort of almost take it for granted that you've got to do something to fill a management void. Well, I expect that the new generations have many non-traditional attitudes that may surprise us about how they see work getting done, about how much they trust each other, and about how much they count on intrinsic motivations to get the job done. They have faith that people will exercise good judgment; that they will do what needs to be done even if we don't formally impose authority on them. Again, if the task requires it, of course, we impose formal

authority. But it's no longer the stereotypically correct, "only way" to coordinate things. Professionals cannot coordinate in a lateral way if they aren't functionally familiar with each other.

So, again, I want to close with this important notion. We have to give these knowledge workers time to get to know each other, to calibrate each other, to learn to trust each other. Once that has happened, we can then leave them alone much more. If that hasn't happened, then they're just going to fight.

Dr. Melich, NPS Faculty: I was wondering if you have any quantitative information about how much organizational slack you need to accomplish this level of integration -- to instill confidence amongst coworkers? It seems to me that one of the discussions that has been going on about JPME is that people need to have time together to build these relationships. It sounds very much like your "functional familiarity."

Dr. Schein: Quantitative? Well, one could look at things like how much overhead 3M, a company that is known for its innovation, devotes to research and development, to time off, and so on. My hunch is it has more to do less about quantity and more with the strength of the organization's commitment to bring people together.

I'm very struck by what I heard from General Scales, about the after-action reviews that have been developed in the Army, where you create, hopefully, a quality dialogue among various hierarchical and technical levels after an event, a set of maneuvers, or a simulation. That might be organically the best way to do it. Then you don't even have to define that as organizational slack. It simply becomes part of the learning process that you do, something you build in time for afterwards -- to create a set of dialogues where you really analyze what happened. And, of course, it's in that process of dialogue that people become functionally familiar with each other.

Again, I think it's not so much a matter of time or quantity, as inventing ways of creating this kind of dialogue and creative time, preferably, around real tasks. In other words, just getting a bunch of professionals together and saying, "Let's have a dialogue" may not mean anything to them. But, let's have a simulation, or let's do something important together, and *then* have a dialogue about how we did. That may mean a great deal.

Dr. Eoyang: In the Baldridge quality competitions, the most outstanding American corporations will invest anywhere from four to ten percent of payroll on training and human capital development for their entire work force. The Volcker Commission, in its recommendations for reforming the Federal Civil Service, recommended that two percent of payroll would not be an unreasonable investment in human capital. On average, across the federal government, we spend about 1.5 percent of payroll on training and development -- not specifically on education, but on the whole range of training involvement activity.

As we're all aware, in periods of great budget austerity, training and education accounts are often the first to be cannibalized in the face of operational priorities, facilities, and hardware acquisition. And I think for an organization to make a serious commitment to growing human capital, they must protect their investment in training accounts, and not allow either the comptrollers, the budgeteers, or even Congress, to cut back on long-term investments in human capital. Those investments need to be stable, they need to be made explicit, and they need to be made wisely.

Dean Brace, Army War College: Sir, I've been a great fan of yours for over the thirty years of my career, and you haven't let me down today. I'd just like to make a few comments, if I could, about your presentation.

It's with some trepidation that I make my comments, because I will put the subject of leadership and some of what you talked about this morning in the category of sex, politics, and religion. We're all cautioned not to talk about any of those, particularly in an open forum, fearing what we might strike up.

I would like to make some observations on your Theory X and Theory Y observations. One thing, I think, we talked around. It is my experience that Theory X is rooted in fear, a word we haven't really mentioned here this morning. But I think we've kind of talked around. Theory Y is rooted in trust, as we have mentioned. I think we all know that either one of those will get the job done. The question is how well it gets done. Fear has a tendency to close us, while trust has a tendency to open us. And I want to see if that's within your major points here this morning.

You also mentioned styles. I completely agree with your comments that the Theory Y leader does, on occasion, have to be autocratic. In my mind, leadership is very much a constructive activity. We're building either an individual or something for the future. Nonetheless, it's a constructive activity. You all know, in the construction business, you have a set of tools, and one of those is a hammer. And for even a quality Theory Y leader, the real challenge he has is to know when to pick that hammer up and use it appropriately, and when not to. "Hammering" day in and day out will probably get you a lot closer to Theory X side of the scale than Theory Y.

And finally, Sir, I'd like to share with you and my colleagues here perhaps one of the better lessons of leadership I've learned in my career.

I had an opportunity one time to be sitting with a bunch of young soldiers, and one of them made a statement that got my attention. He said, "You know, Sir, we have the best noncommissioned officers in the Army in this outfit." And I said, "Well, you know, that's really saying a mouthful. What's the secret to their success? This young specialist thought for a moment, and he gave me a profound lesson in leadership when he said, "Well, Sir, they share their knowledge rather

than show it off." And I think that's exactly what you're talking about here today, and it's a great lesson. Thank you very much.

Dr. Schein: Thank you. Let me just give you one final anecdote because I know we're a little over time, because it helps focus for me the issue of sharing, the issue of team building, and so on.

There is a fair amount of research on the behavior of airplane cockpit crews, and some very dramatic examples of commercial air crashes where the primary pilot had the information that would normally produce a good decision, but he focused on the wrong things and tragedy ensued. For example -- and I think this happened in Oregon -- the flight engineer yelled and screamed that the plane was out of gas; that they were going to have to land even though air traffic control was telling them to make one more circuit. They crashed three or four miles short of the field.

United Airlines simulated the same situation in their simulators, and they found, to their amazement, that the same thing happened. If the Captain gets really focused on what he's trying to do -- to get the wheels down to make that one more circuit and get a proper landing -- he becomes blinded to tactical information that is very, very relevant to what he's doing. But he's so focused he doesn't hear it. So, they said, "Well, what would it take in that cockpit to get the captain to hear that information?" They found that if they put a peer pilot who had the same level of authority into the copilot's seat, and that peer yelled in his ear, "We're out of gas, buddy," then he heard it.

In other words, only if someone of equal or even higher rank was speaking to him would he pay attention. This was a powerful and disturbing lesson, and it has led, as I understand it, to now training cockpits as teams rather than seeing them as a hierarchy of captain and co-captain and a flight engineer. Because that flight engineer, if he's of a lower rank and it's not a team, his information might, under certain circumstances, be completely ignored.

I think there's a huge lesson in that. Just having the expert there, in a hierarchical situation, does not guarantee that expert knowledge will be used. So, we have to simultaneously redefine what the hierarchy is and does to rebuild the team so that the expert is paid attention to -- to get them thinking of a joint mission rather than a set of discreet jobs.

So, this functional familiarity and team building that Carson (Eoyang) referred to is really the important part of what I'm trying to get across to you for this organization of the future. Thank you.

Dr. Eoyang: Thank you, Ed, although, as Director of Training for the Federal Aviation Administration, it really pains me to end on a story about how airplanes crash. I'd like to add my respects to Congressman Skelton, the Postgraduate School, and the Office of Naval Research for creating this truly unique conference. As an indicator of the importance of this conference, I point out the enormous

human capital investment by the PME brain trust -- the very busy and very important people in this room. As a member of the Federal Human Resource Development Council, and FAA's Chief Training Officer, I know that there is no other federal department or agency that would make, or would even conceive of making, an investment of this magnitude. Indeed, I doubt if there are very many, if any, private corporations that have the vision or the motivation to support such a conference by their senior leadership.

The conference hosts and every participant here deserves great credit for attending to a neglected but vital component of the future, not only of our military, but of our nation. Thank you very much.

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Dr. Schein requested that the accompanying article be added as an addendum to his presentation.

INNOVATIVE CULTURES AND ADAPTIVE ORGANIZATIONS*

Edgar H. Schein

Both students of organizations and managers are today increasingly concerned about the capacity of organizations to adapt to rapidly changing environmental conditions. The rate of change in the technological, economic, political, and socio-cultural environments is increasing, and organizations are, therefore, finding it more and more important to figure out how to *adapt.*

Adaptation in turbulent environments involves more than minor adjustments to the present way of doing things. It often requires genuinely *innovative* thrusts — new missions, new goals, new products and services, new ways of getting things done, and even new values and assumptions. Most importantly adaptation involves the development of the capacity to manage "perpetual change". Organizations will have to "learn how to learn" (Schein, 1980; Argyris & Schon, 1978) and to become "self-designing" (Weick, 1977).

The difficulty is that organizations are by their nature and often by design oriented toward stabilizing and routinizing work. Organizations develop cultures that are expressed in structures and processes that permit large numbers of people to coordinate their efforts, and that permit new generations of members to continue to perform effectively without having to reinvent the organization each time (Schein, 1985). How then, can one conceptualize an organization that can function effectively yet be capable of learning so that it can adapt and innovate in response to changing environmental circumstances? How can one conceive of an organization that can surmount its own central dynamic, that can manage the paradox of institutionalizing and stabilizing the process of change and innovation?

* The ideas expressed in this paper are the result of extended conversations with Tom Malone, Diane Wilson, and various other colleagues. Our goal was to identify the main characteristics of innovative, adaptive, creative systems and cultures. Special thanks also to Lotte Bailyn, Marc Gerstein, Randy Davis, Bob McKersie, Michael Scott-Morton, and John Van Maanen for their insightful comments on an early draft of this paper, and to the Management in the 90's project for the financial support that made the research on which this paper is based possible.

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In this essay I want to address some aspects of these questions and to present a point of view based on my research into the dynamics of organizational culture. In particular I want to focus on *innovation* as itself a property of culture. In other words, what kind of organizational culture would consistently favour innovation?

This question is of especial interest at the present time because of the rapid advances that are being made in the field of information technology (IT). There is ample evidence to suggest that the introduction of IT into organizations not only forces cultural assumptions out into the open, but that the potential of IT as a strategic aid to organizations will not be fulfilled unless, at the same time, those organizations develop (or already possess) what I will define as " innovative cultures ".

The definition of " innovation " is itself a major problem. For purposes of this paper I will adopt a broad and imprecise definition — new ideas, behaviour patterns, beliefs, values, and assumptions covering any aspect of the organization's functioning. In particular I want to ensure that we consider both 1) "*content innovation* "— new products, services, and ideas pertaining to the mission of the organization, and 2) "*role innovation* "— new ways of doing things, new definitions of roles, and new approaches to performing in roles (Schein, 1970 ; Van Maanen & Schein, 1979).

Defining what is "new" is, of course, also problematic. In analyzing a case of culture change in a large corporation, I found that some of the major changes that the organization felt it had made really reflected an affirmation of some of its most basic assumptions (Schein, 1985). What then had changed? Was there any innovation? My sense about this issue is that we must define innovation ultimately by the perceptions of both members of the organization and those outsiders who are in interaction with the organization and, therefore, in a position to perceive changes. If both insiders and informed outsiders agree that something is really "new", then we are dealing with an innovation.

This definition will not satisfy the positivistic empiricist. Measuring consensus in perceptions is difficult and messy. However, if we are to understand what really goes on in this organizational domain, and if we are to develop better concepts and theoretical insights, we are at this stage better off with the rich and messy insights of the ethnographer and the clinician (Schein, 1987).

The paper is divided into several parts. In Part I, I will provide my own view of the central variables needed to analyze organizations: 1) A socio-technical paradigm ; 2) Culture; 3) Information technology; 4) Structure; and 5) Process. In Part II, I will spell out in hypothesis form what I consider to be the necessary assumptions of an innovative culture. Part III explores some of the key characteristics of IT and states several hypotheses about the relationship of IT to innovative capacity, and Part IV states some conclusions and unresolved issues.

In order to be efficient in laying out these ideas I have made minimal references to what is a vast literature on organization design and innovation. My goal is not to summarize what we know, but to be provocative and push into an area of cultural analysis that has not, to my knowledge, been explored very much as yet.

I. A Basic Socio-technical Paradigm for Analyzing Organizations

I will start with some of my underlying assumptions about the nature of organizations. There are many models available for the analysis of organizational systems. Many of them are flawed from the outset, however, because they conceptually separate the *task* and *technical* elements from the *human* and *organizational* elements. For example, most models of strategy and organization design advocate that one should start with a concept of mission or goal, and then design the organization to fulfill that mission or goal. The human elements are typically thought of as something that *follows* and must be adapted to the mission and the technical/structural elements.

In contrast, a socio-technical model would argue that one must integrate the human considerations with the technical ones in the initial design process. The initial formulation of the mission and goals of the organization is, after all, a product of human beings in entrepreneurial, technical, and managerial roles. The assumptions, beliefs, values, and biases of these human actors will limit and bias the technical and structural options considered, and will certainly affect the kind of organizational design that is evolved.

Furthermore, if the people who will be using a given system (however it may have been invented) are not involved in the initial design of the system, all kinds of unanticipated problems may arise that make the system less effective than its technical designers had forecast. We see this especially in the realm of information technology where the difficulties of implementation far outstrip the difficulties of invention.

For example, when an information system is initially designed, the human consequences are often either totally misunderstood or actively ignored. First a "small" example observed by Lotte Bailyn where the introduction of Personal Computers (PCs) to an executive group was slowed down by the frequently discovered fact that executives do not type and do not like to go into a learner mode. The enthusiastic implementers created a typing program to deal with this issue and, to provide effective feedback to the learners, arranged to have a bell ring every time a mistake was made (on the theory that an aural signal would get better attention than a visual signal). But, the signal was also public and no-one wanted others to know when they were making errors, so the system had to be redesigned with the less vivid but more private feedback signal.

A "larger" example occurred in one division of an aerospace company. The general manager needed detailed performance and schedule information for each project and program in the company, and designed a system that would provide such detail. The system allowed him to identify schedule or performance problems as soon as they arose, so he could check on what was going wrong. He felt he needed that information to deal with outside stake-holders.

What this manager did not anticipate was that the project managers and engineers would feel very threatened by the knowledge that their day to day behaviour was being monitored. If the manager asked questions about problem areas, they found it difficult to respond because they had not had a chance to look at the reasons for the observed deviations from plan. The system designers should have anticipated this problem inasmuch as it is a well-known phenomenon in the psychology of control. What typically happens is that subordinates who feel threatened or embarrassed by revealed information attempt to subvert the system by refusing to enter data or feeding in false information to protect themselves. Such behaviour typically leads the system designers to invent more elaborate information devices that cannot be falsified, leading to an escalation of resentment and tension in the organization.

An even more dangerous outcome is that the subordinates become dependent on the boss to be the control system and cease to exercise whatever self-control they had been exercising (McGregor, 1960, 1967). " If the President has all the information, we will fix only those problems that he shows himself to be concerned about ".

The socio-technical solution is initially to involve all the people concerned in the system design. This was eventually done in the above

case because the manager realized that it was dysfunctional to create resentment in his subordinates. The whole organization launched into a " redesign " of the system and invented a solution. It was concluded that the manager had a valid need for the information but he did not need it simultaneously with all of the employees. So the project members suggested a *time delay* — they would get the information as soon as it was available so that they could get to work on any problems that were identified. The manager would get the same information a couple of days later so that by the time he inquired about problems, or even before he inquired, the project teams could tell him what was wrong and how they were dealing with it. The time delay solved everyone's problem and led to a much more motivated effective organization. The essential control stayed where the information was — in the project teams.

Enough is known today about the human problems of information and control systems, about the design of equipment, and about the human problems of automation to make socio-technical design entirely feasible. What typically stands in the way is cultural assumptions about the role of management and the role of technical designers in the initial creation of innovations. It is for these reasons that organizational culture must be analyzed first in defining the conditions for adaptation and innovation. (See Fig. 1)

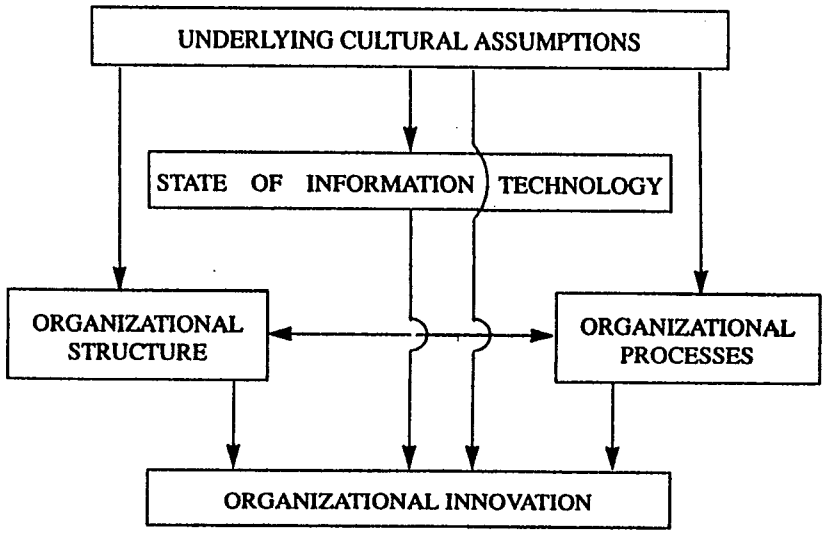


FIGURE 1. A SOCIO-TECHNICAL MODEL OF ORGANIZATIONAL INNOVATION

The model emphasizes that one can study adaptation and innovation from the point of view of the organizational processes that must be present, from the point of view of the organizational structure that must be in place, and from the point of view of the information technology that must be available. However, inasmuch as the culture will determine how the technology is ultimately used, and will influence both the structure and the processes used by the organization, it is the cultural assumptions underlying innovation that will influence each of the other elements. Adopting a socio-technical model reminds us that we cannot bypass the analysis of the cultural and human forces at work in organizations.

Culture

The overarching determinant of how organizations work is the culture that is evolved in the organization as its members cope with the external problems of survival in the environment and their internal problems of integration (Schein, 1985). Culture can be defined as the pattern of learned basic assumptions that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to the problems of survival and integration.

Culture manifests itself in overt behaviours, norms, and espoused values, what can be thought of as the artifacts of the culture. Culture is also expressed in some of the less conscious and operational values that members share. But unless one deciphers the underlying, often implicit and unconscious pattern of *taken for granted assumptions,* one has not really analyzed the culture *per se.*

Culture and its overt manifestations stabilize the daily life of members and provides meaning to what they do. Stability and hence predictability is essential for the members of an organization. Without predictability they cannot function and cannot avoid the anxiety that attends loss of meaning. Culture, once in place, is, therefore, an inherently conservative force.

The "strength" of a culture will be a function of several variables : 1) the strengths of the initial convictions of the organizational founders ; 2) the stability of the group or organization : 3) the intensity of the learning experience in terms of number of crises survived and the emotional intensity of those shared crises ; 4) the degree to which the learning process has been one of anxiety avoidance rather than positive reinforcement. The more the culture serves to reduce anxiety, the more it will resist change.

Cultural assumptions tend toward a consistent paradigm to the extent that the culture creators have a consistent set of assumptions in the first place and to the extent that the organisation's learning experiences provide consistency. If the members of an organization learn inconsistent things in order to survive and remain integrated, they will have inconsistent and possibly ambiguous assumptions that they can nevertheless feel comfortable with (Martin, 1987).

To the extent that culture is a learned product of group experience, there will be a culture wherever there is a group, in the sense of a set of people who share common experiences over a period of time. Inasmuch as most organizations differentiate themselves over time into many sub-groups, one will have sub-group cultures in each of them, their strength varying as a function of the same factors identified above. A total organization, then, can have a total culture as well as a set of sub-cultures, and any given member of the organization will simultaneously "possess" elements of all of the cultures that he or she is a member of (Van Maanen & Barley, 1984). And some of these will, of course, be family, community, occupational, and other groups that the person belongs to and identifies with outside of the organization.

Given that members of organizations have multiple group memberships and that they will identify to different degrees with these various groups, it is not at all anomalous to have a strong overall culture, yet have "deviant" elements within it, or to have entire sub-cultures that are deviant or "counter-cultural" because of their external connections such as to a strong professional group or an international union (Martin & Siehl, 1983).

We know that culture evolves and can be changed, but we have not analyzed carefully enough what the characteristics are of any given culture that would more or less facilitate change and innovation. Or, to put the question more directly, is it possible to conceive of a type of culture that would be innovative, that would have as its learning dynamic the invention of environmentally responsive new solutions rather than conservative self-preservation? And is it possible to conceive of a type of culture that would favour socio-technical design innovations instead of the traditional technology driven ones?

Before answering these questions in Part II, some attention must be given to the other elements in the model.

Information Technology

Cultures are built around and respond to the core technologies that caused the organization to be created in the first place. One may expect organizational cultures to vary, therefore, as a function of the kind of core technology that is involved. Chemical, high-tech, heavy manufacturing, financial, and other service industries will each evolve

somewhat different "industry" cultures that will influence organizational cultures.

But all organizations have in common the need to communicate, to get information to the right place at the right time to make it possible to appropriately divide labour and coordinate the effort of organization members. The flow of information can be likened to the life blood of the system, and the information channels can be likened to the circulatory system. The state of IT in use at any given time is, therefore, likely to be an important determinant of the organization's capacity to learn. What then should be the characteristics of the information system to maximize the capacity of the organization to learn, adapt, and innovate?

Information technology is central to this analysis because its own evolution has made possible innovative leaps of extraordinary magnitude. Today some organizations are being designed on totally different premises by taking advantage of the capabilities of IT. We can conceptualize this best by distinguishing three kinds of utopian visions that have grown up around IT:

1) *The Vision to Automate:* Most of the critical functions in the organization are taken over by robots or computerized systems run by highly skilled and trained professional operators.

2) *The Vision to Informate:* By building accurate models of critical processes in the organization it is possible not only to automate such processes but to make the processes themselves visible and understandable to everyone in the organization. This is what Zuboff (1988) calls " informating " the organization, and obviously has tremendous implications not only for workers but for managers at all levels.

2a) *Informating Up:* In this vision, IT is used to aggregate and centralize as much information about all the parts of the organization as possible to facilitate planning and control by top management. The organization becomes transparent to its top management.

2b) *Informating Down:* In this vision the design of systems forces an analysis of the core production and other processes of the organization and makes those transparent to workers. Instead of understanding only a small piece of the total process, workers become familiar with the whole process and can, therefore, make decisions that previously were made by various layers of management.

3) *The Vision to Transform:* A few organizations think of even more radical innovations by asking how one might organize the basic work, the communication patterns, and authority relations, to fully take advantage of the possibilities inherent in IT. Socio-technical design considerations become primary to integrate the technical and human capabilities.

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Such organizations may take a totally different form, being more like complex networks in which communication and authority chains shift around and change according to the requirements of the task and the motivation and skills of the people.

Adaptation and innovation are involved to varying degrees in each of these visions, but in the vision to automate and the vision to informate up, we are only talking of converting processes that are already resulting in more efficient execution of those same processes. Thus robots and various other kinds of machine controlled work are important innovations in the production process and sophisticated information systems that permit high levels of centralized control are innovations in the degree to which information can be rapidly collected and centralized, but it is only with informating down and transforming that we get more radical innovation in the nature of the organizataion itself. In these instances IT creates new concept of how work is to be done and how the management process itself is to be defined. What this means is that the cultural assumptions about the nature and use of IT will themselves be a crucial determinant of how IT will be used to create further innovation.

Organizational Processes

Over time every organization develops a set of processes, recurrent events that insure that the primary task of the organization is fulfilled and that permit the members of the organization to coordinate effectively with each other. Such processes concern how members communicate with each other, how they solve problems and make decisions, how they implement decisions arrived at, how they organize work, supervise, reward, punish, and, in general deal with people (Schein, 1987, 1988).

Such processes are a reflection of the culture as defined above, but the basic cultural assumptions are largely implicit and invisible, whereas the processes that evolve over time are visible and analyzable. In order to fully understand any given organization, therefore, we need to specify both the underlying assumptions and the observable processes. For purposes of this analysis, then, the question is what kinds of cultural assumptions must be present to facilitate organizational processes that will increase the likelihood that the organization will be able to learn, adapt, and innovate?

Organizational Structure

Some processes become stable and are articulated in rules, manuals, organization charts, and other more permanent documents reflecting how management feels things should be done. The ultimate division of labour as embodied in job descriptions and organizational units, the basic organization design in terms of who reports to whom and who is

accountable for what are typically thought of as the major elements of the "formal" structure. But as in the case of organizational processes, these structures are ultimately a reflection of the underlying cultural assumptions. One of the common misconceptions in this area is that structure can be analyzed as a factor separate from culture. If one starts with a socio-technical model of organizations, one cannot separate structure from culture. One can, however, ask whether some formal structures are more likely to facilitate or encourage learning, adaptation, and innovation, and, if so, what kinds of cultural assumptions will favour the evolution of such structures?

In most organizations one also finds an "informal" structure, those processes that are observed to be relatively stable but are supported only by implicit norms and are often regarded to be unsanctioned or even to run counter to the formal structure. It is the existence of such counter structures based on sub-cultures that may be "counter-cultures" that may determine in important ways what kind of innovation is possible.

The informal structure also includes "compensatory" or "parallel" structures that are designed to offset or supplement what may be weaknesses and dysfunctional elements in the formal structure (Schein, 1980, 1988). Such compensatory or parallel structures may be relatively permanent such as standing committees or may be temporary processes such as task forces and project teams set up to work only on specific and time bound tasks.

Most organization theories acknowledge the fact that without the informal organization things simply would not get done effectively, and, therefore, that the informal structure must be explicitly analyzed and well understood if we are to understand the total system and how it works. For purposes of this paper the question then becomes what kind of cultural assumptions would favour the evolution of patterns of formal and informal structure that would most favour learning, adaptation, and innovation?

To sum up, it is my argument that in order to determine the necessary and sufficient conditions for an innovative organization, we must specify the characteristics of the culture that favour the kind of information technology, organizational processes, and formal and informal organizational structure that increases the likelihood of the occurrence of innovation.

II. Characteristics of an Innovative Culture

Organizational cultures can be analyzed along many dimensions. I will specify a minimum set, as shown in Table 1, and state in hypothesis form the assumptions necessary for innovative capacity. Table 1 can also be used as a diagnostic device for analyzing any given culture.

TABLE 1

CULTURAL DIMENSIONS THAT INFLUENCE INNOVATIVENESS*

1. ORGANIZATION—ENVIRONMENT RELATIONSHIP

Environment Dominant	Symbiotic	Org. Dominant
		X

2. NATURE OF HUMAN ACTIVITY

Reactive, fatalistic	Harmonizing	Pro-active
		X

3. NATURE OF REALITY AND TRUTH

Moralistic Authority	Pragmatism
	X

4. NATURE OF TIME

Past Oriented	Present Oriented	Near Future Oriented
		X

Short Time Units	Medium Time Units	Long Time Units
	X	

5. NATURE OF HUMAN NATURE

Humans are basically evil	Humans are basically good
	X

Human nature is fixed	Human nature is mutable
	X

6. NATURE OF HUMAN RELATIONSHIPS

Groupisms	Individualism
	X

Authoritarian/paternalistic	Collegial/Participative
	X

7. SUB-CULTURE DIVERSITY/CONNECTEDNESS

Low	High
	X

* The X on each dimension indicates the ideal condition for high innovativeness.

1. Organization-Environment Relationships

HYPOTHESIS C1. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT ASSUMES THAT ITS ENVIRONMENTS ARE CONTROLLABLE, CHANGEABLE, AND MANAGEABLE.*

Organizations can be distinguished by the shared assumptions they hold about the degree to which they dominate or are dominated by their various environments. At one extreme we have organizations that feel completely dependent and assume that their existence and survival is out of their own control. They act fatalistic and are passive in the face of environmental turbulence. They accept whatever niche the environment provides.

At the other extreme we have organizations that hold the shared assumption that their own behaviour will influence the environment and that survival and growth are a function of the extent to which they actively are able to dominate some aspects of their environment. Implied is the further assumption that progress and improvement are possible, a basically optimistic orientation toward the environment.

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Innovative capacity will increase to the extent that members assume that innovation is possible and necessary, which derives from their optimistic assumption that the environment can be influenced. Organizations that pessimistically assume either that they are dominated by others and/or assume that their environments are fixed will find it difficult to conceive of new ideas and will find it even more difficult to marshal the energy to try out new ideas.

2. The Nature of Human Activity

HYPOTHESIS C2. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT ASSUMES THAT THE APPROPRIATE HUMAN ACTIVITY IS TO BE PROACTIVE, ORIENTED TOWARD PROBLEM SOLVING AND IMPROVING THINGS.*

All organizations make implicit assumptions about whether the appropriate behaviour of members is to be 1) reactive, fatalistic, and oriented to getting what pleasure one can out of one's lot in life (Dionysian), 2) to be proactive, optimistic, and oriented toward improving things (Promethean), or 3) to take a middle ground of trying to harmonize and compromise between one's own needs and whatever environmental constraints and possibilities exist

(Apollonian). As will be noted these assumptions are the individual level counterpart to the assumptions relating the organization to its environment.

An innovator in the midst of reactive or harmonizing people will find it virtually impossible to get even an audience much less a commitment to new ways of doing things. In Dionysian or Apollonian organizations, innovators are likely to be called whistle-blowers, boat-rockers, or trouble-makers, and thus to be neutralized. And if the culture is too fatalistic it will of course not attract or retain innovators in the first place.

One may wish to speculate whether there is an upper limit to activity orientation. If there are too many innovators and if the culture strongly encourages innovation will that cause other problems that, in the end, will undermine innovation by making life too chaotic and unpredictable? I believe not, because if too much innovation becomes a problem, the organization will invent and evolve processes and structures that reduce innovation to a tolerable level. In other words, if the organization is going out of control, its own innovativeness will enable it to invent mechanisms to achieve greater discipline and control.

The reverse is not true. An organization that is too passive or fatalistic cannot invent "proactivity." It will stagnate until it fails or is taken over by others who will forcibly change the culture by massive replacement of people with a different activity orientation. I am hypothesizing, therefore, that one cannot have too much innovativeness but one can have too much conservatism and passivity.

3. The Nature of Reality and Truth

HYPOTHESIS C3. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT ASSUMES THAT TRUTH IS TO BE ARRIVED AT BY PRAGMATIC (VS. MORALISTIC) MEANS.*

Organizations can be distinguished by the degree to which they hold shared assumptions about how one determines whether something is true or not. When a complex decision has to be made involving uncertain futures and information of uncertain validity, what criteria does the organization use to determine when it has enough and the right kind of information to make the decision?

At one extreme one finds a heavy reliance on tradition, dogma, the authority of moral principles, or the wisdom of elders. At the other extreme one finds pragmatism embodied either in a search for scientific verification or a trial and error attitude if formal verification is not possible or practical (England, 1975). If the decision is in a domain where verification by physical means is not possible, pragmatism would imply that the decision makers debate out the issues and subject each alternative to sufficient scrutiny that the one that survives can be accepted with some measure of confidence.

In organizations dominated by dogma or authorities of various sorts it is not only difficult to articulate new ideas but even more difficult to get the sanction to try them out. An exception is, of course, the situation where the innovator is the person in authority, a situation that arises from time to time in history but that is hard to specify as an organizational condition or to predict. To increase the innovative capacity generally, a positive value must be put on novelty, on breaking tradition, on trying out new things even if they are risky, and such a value must be supported by an underlying assumption that "the truth" is not already known.

The pragmatic end of the continuum also implies a more positive attitude toward trial and error, risk taking, and the acceptance of unsuccessful efforts or failures. The more the organization is committed to dogmas, rules, systems, and procedures that become institutionalized, the harder it will be for members to take the risks necessary for innovation to succeed. The message in such moralistic organizations is "try new things only if you are sure you will not break rules or fail," a prescription for conservatism and playing it safe.

4. The Nature of Time

HYPOTHESIS C4A. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT IS ORIENTED TO THE NEAR FUTURE (VS. PAST, PRESENT OR FAR FUTURE).*

HYPOTHESIS C4B. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT USES MEDIUM LENGTH TIME UNITS (VS. SHORT ONES THAT DONT ALLOW INNOVATION TO DEVELOP OR LONG ONES THAT MAKE INNOVATION DIFFICULT TO EVALUATE).*

All organizations hold implicit assumptions about the relative importance of the past, the present, and the future, and all organizations have implicit assumptions about the appropriate length of time units for different kinds of tasks. Some organizations measure themselves in short units such as weeks or months, some use intermediate units such as quarters and years, and some use longer units such as 5 or 10 year spans. All organizations use all of these units for various different purposes, and, as Lawrence and Lorsch (1967) pointed out years ago the different functional units of an organization such as sales and Research and Development (R & D) will have very different assumptions about what it means to be "on time" and how long units of work are.

It is likely that in each organization's culture there will be found assumptions about the "really important" time units. The actual size of the relevant time units will vary from company to company, so the determination of what is "past," "present," "near future," and "far future" must be determined for each organization studied by getting members' consensus on these units. The size of such time units is also influenced by the core technologies that the organization is working with. The development of new products, for example, takes much longer in the pharmaceutical industry than in the consumer goods industry.

Organizations that live in the past or present will find it difficult to place a value on novelty because they are focussed on what has worked or is working now. People with new ideas can be dismissed easily because their ideas do not "fit" what the organization likes to think about. On the other hand, if the organization is focussed on the *far* future it may be unable to launch any innovation because it is assumed that there is always plenty of time to try things "in the future." A near future orientation should, therefore, be most favourable to innovation.

It is also clear that too short a time orientation will always make innovation difficult because one can always show that short-run costs are too high to justify continuation of the trial and error involved in innovation. On the other hand, if the time units are too long, some innovations that are failures will be allowed to continue too long, the organization will lose money, and the whole innovation process will be undermined because people will remember how they were hurt by past innovations. The ability of the organization to develop a sense of an optimal length of time for an innovation thus becomes a very important determinant of its learning capacity.

This optimal length of time will be subjectively defined in most organizations, and must be measured within each organization, as indicated above. The precise length of the units is not as important as the members' ability to recognize that giving an innovation too little or too much time is equally destructive to the overall innovation process.

Optimal length time units also play a role in the selling of an innovative vision, whether that comes from leaders or from other innovators in the organization. The vision of the future cannot exceed the ability of members of the organization to understand what is proposed, nor can it promise benefits that will only be realized by the next generation. To be motivated to implement something new, people have to be able to see what benefits that will bring them within their own "lifetime."

As Jaques has argued (1976, 1982) the length of time over which organization members have "discretion" appears to vary with organizational rank. On the shop floor supervisors check on employees by the hour or the day. At lower managerial levels one has discretion over weeks, and so on up the ladder until the most senior management is supposed to define its tasks in terms of years. In communicating the future impact of proposed innovations it becomes critical then to consider over what time units the audience is used to thinking. "Optimal" time units, in this context, are partly defined by the actual innovative task that is being proposed or undertaken.

5. The Nature of Human Nature

HYPOTHESIS C5. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT ASSUMES THAT PEOPLE ARE ULTIMATELY NEUTRAL OR GOOD, AND, IN ANY CASE, ARE CAPABLE OF IMPROVEMENT.*

Organizations make implicit assumptions about human nature, both in terms of whether it is ultimately good, neutral, or evil, and in terms of how malleable or fixed it is. If organizations are cynical about human nature (McGregor's Theory X) they will not encourage innovation or, worse, will mistrust innovators as having ulterior motives. In such organizations innovative capacity often is devoted to defeating organizational goals. Workers invent elaborate processes and devices to make life easier for themselves at the expense of organizational efficiency (Argyris, 1964; McGregor, 1960; Roethlisberger & Dickson, 1939).

On the other hand, if the organization holds optimistic assumptions about human nature (McGregor's Theory Y), it will expect people to be innovative, will encourage innovation, will listen to new ideas, and will be more likely to trust them. At the same time, for innovation to be encouraged organization members must feel that they are all "perfectible" in the sense that one's personality and contribution is not fixed. If one knows one can grow and improve, this knowledge (assumption) acts as a powerful stimulant to personal development and innovation.

6. The Nature of Human Relationships

HYPOTHESIS C6A. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT ASSUMES THE IDEAL OF INDIVIDUALISM AND THE PURSUIT OF INDIVIDUAL DIVERSITY.*

HYPOTHESIS C6B. *BUT, IF AN ORGANIZATION HAS A FEW INNOVATIVE INDIVIDUALS WHOSE IDEAS ARE ADOPTED, IT CAN IMPLEMENT SOME TYPES OF INNOVATIONS FASTER TO THE EXTENT THAT IT ASSUMES THE IDEAL OF GROUPISM.*

HYPOTHESIS C6C. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT ASSUMES THAT COLLEGIAL/PARTICIPATIVE METHODS OF DECISION MAKING ARE THE MOST APPROPRIATE.*

HYPOTHESIS C6D. *BUT, IF AN ORGANIZATION HAS INNOVATIVE PEOPLE IN SENIOR LEADERSHIP ROLES, IT CAN IMPLEMENT SOME INNOVATIONS FASTER TO THE EXTENT THAT IT ASSUMES AUTHORITARIAN/PATERNALISTIC METHODS OF DECISION MAKING.*

This dimension of culture has to do with prevailing assumptions about the ideal human relationship. Two dimensions are involved here:

1) The degree to which the organization assumes the ideal of "individualism" (that all good things ultimately come from individual effort) or "groupism" (that all good things ultimately come from the group, implying that ultimately all individuals must subordinate themselves to the group), and,

2) The degree to which ideal relationships are seen as collegial/participative (implying that power and influence in decision

making is a function of who has what expertise relevant to any given task to be accomplished) or as autocratic/paternalistic (implying that power and influence reside in positions, statuses and roles, or are a function of the specific personality of the individual).

The hypotheses around these two dimensions are more complex and contingent because under certain conditions innovation could occur anywhere along these two dimensions. Basically a culture that values individuals and individual diversity will have more ideas to draw from and create more incentives for ideas to be put forward. However, when it comes to acceptance of ideas and implementation, the strongly individualistic organization may be at some disadvantage. In other words, in a groupist organization it will be harder to get new ideas to be articulated, but if they are adopted, such an organization will be far more effective in implementing them because individuals who may dissent will suppress their dissent for the sake of the total group's welfare.

In such organizations the burden of innovation probably falls on the leadership in that they are the most likely to be able to get an idea adopted in the first place. What the determinants are of innovativeness in the leaders of groupist organizations then becomes the secondary but critical question.

Collegial/participative decision making is more likely to identify the relevant areas in which innovation is needed, to surface good ideas, to stimulate creativity, and to produce a state of affairs where everyone understands the idea so that it will be properly implemented. This assumption is central because collegial/participative decision making influences so many phases of the total innovation process from invention to implementation, particularly if the new idea or process is complex and hard to understand.

If, on the other hand, an autocratic or paternalistic leader has innovative ideas that are sound, if the ideas are not too complex to communicate, and if the socio-technical implications have been correctly thought through, it is possible for the organization to implement such ideas more rapidly and totally.

The danger in this situation is threefold: 1) That the leader will impose an idea that is wrong under conditions where subordinates are neither motivated nor rewarded for pointing out the potential problems; 2) That the idea will not be successfully communicated leading to paralysis and frustration; or 3) That the idea will be

implemented incorrectly because the leader did not discover that subordinates did not fully understand what he or she had in mind and/or did not accept the consequences of the innovation.

One additional point bearing on this assumption needs to be brought out. If predictions about the ultimate impact of IT are correct, then leaner, flatter, more highly networked organizations are the likely consequence (Drucker, 1988; Malone, 1987). Such organizations cannot work effectively, however, if their managers are still operating from hierarchical models buttressed by autocratic or paternalistic assumptions (Schein, 1989). The basis of authority in such networks will more likely be the degree of skill or expertise that any given member has at any given moment in time relative to the task to be done. Positional authority will mean very little. Obviously such systems will function better if they hold collegial/participative assumptions in the first place.

7. Sub-cultural Diversity

HYPOTHESIS C7. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT ENCOURAGES DIVERSE BUT CONNECTED SUB-CULTURES.*

As organizations grow and mature they develop sub-cultures as well as overarching cultures. The nature and diversity of such sub-cultures will influence the organization's innovative capacity. For any given group, culture is a homogenizing force. However, if the organization contains within its total system, enough diverse sub-systems with their own diverse sub-cultures, it can manage to innovate by empowering people and ideas from those sub-cultures that are most different from the "parent" yet best adapted to a changing environment. Drawing on diverse sub-cultures is, in fact, the commonest way that cultures evolve, and this process, if properly managed, is therefore one of the most important sources of potential innovation.

The sub-cultures must be connected and part of a parent culture or their elements will not be seen as relevant if introduced into the parent. For example, in a highly geographically decentralised organization new ideas may well spring up in an overseas subsidiary, but those ideas are only importable into the parent organization if the subsidiary is perceived to be genuinely part of the larger culture. If the ideas are brought in via transfer of people from the subsidiary, those people will only have credibility and influence if they are perceived to be part of the larger culture and sympathetic to it.

It is this diversity within unity theme that accounts for so many current management statements that the effective organization is one that can both centralise and decentralise, that can be loose and tight at the same time. To restate the point, diversification and decentralization are effective as innovative forces only to the extent that the separate units are perceived to be and feel themselves to be connected to the whole. If they do not feel connected they will not be motivated to innovate on behalf of the whole. If they are not perceived to be connected, their ideas will not be perceived as relevant.

To summarize, in order to be innovative an organizational culture must assume:

1) That the world is changeable and can be managed,
2) That humans are by nature proactive problem solvers,
3) That truth is pragmatically arrived at,
4) That the appropriate time horizon is near future,
5) That time units should be geared to the kind of innovation being considered,
6) That human nature is neutral or good and is, in any case, "perfectible",
7) That human relationships are based on individualism and the valuing of diversity,
8) That decision making is collegial/participative,
9) That diverse sub-cultures are an asset to be encouraged, but that sub-cultures have to be connected to the parent culture.

Having stated these conditions for what must be true in the overall culture, what further conditions must be present in the state of information technology?

III. Characteristics of an Information Technology for Innovation

I am making the assumption that *any* open system can function only if it can take in, move around, and appropriately process information. Information is the life blood, and information channels are the circulatory system of the organization. If the organization is to be capable of innovation, what must be true of the information system?

Parenthetically, I am assuming that if the above specified cultural conditions are not present, the organization is not likely to develop or implement an ideal information system, or if such a system should for some reason be present, it will misuse the system in ways that I will detail below. So having an ideal system from a technological point of view will not by itself solve the problem of innovation. Technology alone will not cause things to happen. However, given the right conditions for innovation in the culture, it is possible to specify how an information system will enhance the chances for innovation.

1. Networking Capacity

HYPOTHESIS IT1. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT HAS TOTAL NETWORKING CAPACITY.*

My assumption here is that both the capacity to invent new ideas and the capacity to implement innovations may require at any given point in time connecting everyone to everyone else. I am not assuming that those connections have to be operational at all times, only that it will favour innovation if the capacity is there. Especially important will be channels between sub-cultures so that new ideas that may arise in sub-cultures have a chance of being perceived by other sub-cultures and the parent culture.

The network does not have to be electronic. It can exist in the form of frequent meetings that involve everybody, a heavy travel schedule that gets everyone to all parts of the organization, an efficient mail system, a good phone system, etc. The more sophisticated technologies become more relevant as the constraints of time and space become more costly.

2. Routing and Filtering Capacity

HYPOTHESIS IT2A. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT CAN OPEN AND CLOSE CHANNELS AS NEEDED.*

HYPOTHESIS IT2B. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT CAN FILTER INFORMATION IN THE CHANNELS AS NEEDED.*

My assumption here is that fully connected network is not desirable at all times. For certain kinds of tasks and for certain stages of the innovation process, it may be more efficient to keep open only those channels that are necessary for efficient implementation. The organization must have the process capacity to diagnose its information needs but it must also have the technical capacity to implement its diagnosis in the sense of opening and closing channels as needed.

In arguing for this capacity, I am not reverting to an authoritarian system, i.e. some higher authority that opens or closes channels as needed. I am suggesting that such capacity can be available in a collegial/participative system as well in that members can choose to open and close channels themselves as they perceive this to be appropriate.

Just as the organization needs the technical capacity to open and close channels, so it needs the capacity to filter information flows along given channels to 1) avoid information overloads, 2) to prevent inappropriate information getting to some members, and 3) to insure that appropriate information gets to those members who need it. Again this implies diagnostic capacity along with the technical capacity of the system, and again, it implies that such filtering can be designed without reverting to an authoritarian hierarchical system. A good example of such a system is the Information Lens and Object Lens technology developed by Malone that allows the members of the network to specify rules for routing and filtering that are then automatically implemented (Lai & Malone, 1988; Malone, et al. 1989).

3. Connectivity to Environment; "Openness" of the System

HYPOTHESIS IT3. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCRESE TO THE EXTENT THAT IT HAS MULTIPLE OPEN CHANNELS TO AND FROM ITS ENVIRONMENTS.*

Organizations are open socio-technical systems embedded in multiple environments. If they cannot accurately track what is going on in those environments they cannot identify areas in which innovation is more or less important. Similarly, they cannot assess the effects of their own innovative and adaptive efforts if they cannot observe the effects of their innovative behaviour on those parts of the environment that are intended to be impacted.

Multiple channels to the environment are nece y, but they must also be connected to the appropriate decision points within the organization so that the incoming information can be processed appropriately. Many organizations know a great deal but the knowledge stays in departments that cannot effectively utilize, integrate, and act on the knowledge (Schein, 1980).

4. Capacity to Evolve Own IT System Technologically

HYPOTHESIS IT4. *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCRESE TO THE EXTENT THAT IT HAS THE CAPACITY TO FULLY UNDERSTAND AND IMPLEMENT INNOVATIONS IN INFORMATION TECHNOLOGY ITSELF AS THESE MAY APPLY TO VARIOUS ASPECTS OF THE ORGANIZATION'S TASKS.*

What is implied here is the organization's capacity to modify its own use of IT as new possibilities become available and as new ideas arise on how to use existing technology. This means that somewhere in the total system must reside good information on current capacities and good information on future possibilities. Such information may come from internal or external sources, but the information has to get to the right places to be acted on appropriately. Various aspects of IT such as office automation, CAD/CAM, and so on must not only be well understood, but must be flexibly adopted to support the basic mission of the organization (Thomas, 1988).

IV. Interaction of Culture and Information Technology

Implied in the above analysis is that cultural assumptions can and will limit the degree to which IT can be and will be used. The kind of information network described above will simply not be installed in organizations that do not believe in proactivity, in mastering their environment, in participative decision making, and so on. But that is not the whole story. The technology itself can and will gradually affect organizational cultures by what it makes possible, and in some cultures the interaction between the culture and the technology will, in the long run, be *destructive* to adaptive capacity and innovation. In order to examine these interactions we must first examine some of the properties of I.T. and show how those can become forces to unfreeze the present culture.

I.T. as a Force Unfreezing Culture

If one thinks of the information technology community as itself a sub-culture, one can identify certain of its assumptions that, if

implemented lead to the unfreezing of other cultural assumptions. Specifically, the IT community assumes that it is intrinsically good for organizations to have more information, more widely distributed, and more rapidly disseminated. The designers of IT are therefore likely to highlight the following properties of the technology. IT increases:

1) *Accessibility:* more people can more easily access information that is electronically available in a network;

2) *Rapidity:* information and feedback can be obtained much more rapidly by electronic means in computer based networks;

3) *Simultaneity:* information can be presented to large numbers of people simultaneously even though they are geographically dispersed and are in different time zones;

4) *Presentational flexibility:* information can simultaneously be presented in different ways to different people;

5) *Complexity:* complex relationships and contextual factors in information can be more easily represented with computer aided systems (e.g. three dimensional modelling);

6) *System awareness:* creating information systems requires accurate modelling of processes, and these models then become transparent to information users (the essence of what Zuboff means by "informating");

7) *System/network accountability:* networks make it possible for all members to become aware of their mutual inter-dependence, of the fact that there is no necessary higher authority in the network, and hence that all members of the network can be simultaneously accountable for network output;

8) *Team work capacity:* the combination of simultaneity and network accountability makes it possible for real team work to occur where every member realizes his or her part, and where all contributions are transparent, thus forcing mutual trust (i.e. any abuse by any member is immediately visible to all other members of the network);

9) *Task based authority:* in a functioning network it is possible to designate decision-making power to whoever at any given moment in time has the most relevant information, and this authority can rotate among members of the network as the task changes;

10) *Self-designing capacity:* it is technologically and psychologically possible for the network to constantly redesign itself and to adapt to changing circumstances if the necessary power and flexibility have been built in initially.

As can be seen, these characteristics introduce a strong bias toward collaborative team work in that such work becomes not only much more feasible in an electronic environment, but also more appropriate to the complex tasks that most organizations will face in the future.

What all this means is that the introduction of IT is a force that may stimulate culture change by first of all forcing some cultural assumptions out into the open (i.e. assumptions about formal authority and managerial prerogatives), and second, by clearly making alternative methods of coordination possible. Thus if either the leadership of a total organization or some sub-culture within the organization introduces sophisticated IT networks, this will force cultural re-examination and reveal which cultural assumptions will aid or hinder further utilization of IT. The further implication of this line of argument is that the introduction of IT may be one of the *most powerful* ways of unfreezing a culture and starting a process of change toward more innovative capacity in general.

1. Presence of an IT Sub-culture

HYPOTHESIS 1/C 1: *THE CAPACITY OF AN ORGANIZATION TO INNOVATE WILL INCREASE TO THE EXTENT THAT IT HAS SOMEWHERE WITHIN ITSELF A FULLY FUNCTIONING TECHNOLOGICALLY SOPHISTICATED I.T. SYSTEM THAT CAN BE A DEMONSTRATION OF I.T. CAPACITY AND A SOURCE OF DIFFUSION TO OTHER PARTS OF THE ORGANIZATION.*

In other words, there must be among the sub-cultures of the organization at least one sub-subculture that is congruent with the assumptions of IT or there will not be any place within the organization where IT can be appropriately utilized. However, such a sub-culture is only a necessary and not a sufficient condition for organizational innovation, because the larger culture may prevent diffusion of the innovation.

2. Destructive I.T./culture interactions

HYPOTHESIS 1/C 2A: *THE PROVISION OF I.T. FOR PURPOSES OF AUTOMATION TO A MANAGEMENT THAT OPERATES BY THE ASSUMPTIONS OF THEORY X WILL IN THE SHORT RUN PRODUCE PRODUCTIVITY IMPROVEMENTS BUT IN THE LONG RUN WILL PRODUCE EMPLOYEE DEPENDENCE AND ANXIETY THAT WILL REDUCE THE PROBABILITY OF INNOVATION.*

HYPOTHESIS 1/C 2B: *THE PROVISION OF I.T. FOR PURPOSES OF UPWARD INFORMATING TO A MANAGEMENT THAT OPERATES BY THE ASSUMPTIONS OF THEORY X WILL ALLOW SUCH MANAGEMENT A LEVEL OF SURVEILLANCE AND CONTROL THAT WILL ALIENATE EMPLOYEES, CAUSE RESISTANCE, REBELLION, REFUSAL TO USE THE SYSTEM, FALSIFICATION OF DATA ENTRY IF POSSIBLE, AND ULTIMATELY, TOTAL DEPENDENCY AND ABDICATION OF PERSONAL RESPONSIBILITY.*

6-40

HYPOTHESIS 1/C 2C: *THE PROVISION OF I.T. FOR PURPOSES OF INFORMATING DOWN TO A MANAGEMENT THAT OPERATES BY THE ASSUMPTIONS OF THEORY X WILL PRODUCE SHORT RUN PRODUCTIVITY AND INVOLVEMENT GAINS, BUT WILL, IN THE LONG RUN, BE SUBVERTED BY MANAGEMENT'S NEED TO CONTROL AND TO ASSERT WHAT IT REGARDS TO BE ITS PREROGATIVES AND RIGHTS.*

HYPOTHESIS 1/C 2D: *A THEORY X MANAGEMENT WILL NOT BE ABLE TO TRANSFORM AN ORGANIZATION IN TERMS OF I.T. CAPABILITIES BECAUSE THE HIERARCHICAL CONTROL MENTALITY WILL PREVENT THE NECESSARY EMPLOYEE INVOLVEMENT IN SYSTEM DESIGN AND UTILIZATION.*

If one examines cases of IT implementation failure, there are some specific patterns that not only explain the failure but that suggest certain interactions which, even if successful in the short run, would be destructive to the organization's longer range capacity to innovate and adapt. These interactions involve specifically the cultural assumptions around participation and control, and are shown in Table 2.

TABLE 2

POSITIVE AND NEGATIVE INTERACTIONS BETWEEN I.T. AND CULTURE

I.T. VISION	THEORY X*	THEORY Y*
AUTOMATE	Negative	Positive
INFORMATE UP	Very negative	Positive
INFORMATE DOWN	Very negative	Very positive
TRANSFORM	Not feasible	Very positive

* Theory X is used here as shorthand for hierarchical, authoritarian control orientation, based on cynicism about human nature. Theory Y is used here as shorthand for idealism about human nature and a belief in collegial/participative relationships that permit high degree of self-control

The various IT visions are shown down the left side and the two cultural extremes with respect to participation and control are shown along the top. These can most easily be characterized in terms of McGregor's Theory X and Theory Y, especially as these apply to the Chief Executive Officer (CEO) or senior management as individuals.

The specific hypotheses embedded in Table 2 have been stated above. The logic behind the first of these hypotheses derives from prior and current research on automation, especially the research of Hirschhorn (1987), which shows that workers in highly automated plants become anxious because of their high level of responsibility, and the absence of supportive bosses. Because they often do not understand the complex technology they become highly dependent on information that they do not understand. This combination of dependency and anxiety can lead to psychological denial and the inability to manage any crisis conditions that may arise. That is, when the system sends alarm signals, the anxiety level is so high that workers assume that the information must be wrong and ignore it.

The scenario underlying the second hypothesis has been played out in a number of organizations, and is potentially the most dangerous because the sub-culture of IT plays directly into the assumptions of a control oriented Theory X management. In the short run there is the illusion that the IT system has given management the perfect and ultimate control tool, especially if the system designers can also be categorized as Theory X. If one has control oriented designers working with control oriented managers one is bound to get an organization that will look perfectly controlled but that will sooner or later fail for lack of employee commitment and involvement. And certainly there will be no motivation or capacity to innovate.

Evidence for the third hypothesis comes from Zuboff's study of the paper mill that dramatically increased its productivity as workers learned the logic behind the automated system they were using and discovered that they could run the plant perfectly well without lots of managerial control. But managers were not willing to give up this control; they started to order workers to do things that they already knew how to do, and to take credit for some of the improvements, leading workers to resentfully abdicate and consequently to underutilize the system.

What is important to note is that the same system implemented with a Theory Y management would have entirely positive results because the managers would be happy to have workers exercise more control and take over the system. It is only the control need characteristic of the Theory X manager that produces the destructive/negative results.

The fourth hypothesis is self-evident, in that the Theory X dominated organization will not have transformational visions in the first place, and will not be able to elicit the innovative capacity to start a transformation process.

In summary, the capabilities of IT in combination with a hierarchically control oriented management will produce negative results in each of the IT visions, though those results may not show up initially. If the designers of the system are also operating from hierarchical control assumptions we have the potential of great harm to the organization in terms of its long run ability to innovate and to adapt to changing environmental circumstances.

The implication is that the cultural assumptions around employee involvement, the importance of hierarchy as a principle of control, the prerogatives and rights of managers, and the nature of authority are the critical ones to examine in any IT project, because the potential of IT as a force for innovation will not be achieved if those assumptions are too close to Theory X.

Summary and Conclusions

We can summarize the hypotheses about IT by stating that an organization's capacity to innovate will increase to the extent that it has:

1) The capacity to connect everyone,

2) The ability to open and close channels as needed,

3) The ability to filter information in the channels,

4) Multiple channels into and from the relevant environments, and to the relevant decision centers,

5) The capacity to use the most advanced IT systems,

6) At least one fully functioning advanced IT system somewhere within the organization,

7) A Theory Y management that will use the IT applications appropriately and sensitively.

We noted that culture will constrain the ability to implement IT solutions, but, at the same time, IT is a powerful force to surface and unfreeze cultural assumptions if it can be introduced anywhere in the organization.

If the IT capacity is present and if the cultural assumptions favour innovation, the organization will develop processes and structures that will increase the likelihood of members inventing and implementing those new ideas that will make the organization more adaptive in a rapidly changing environment.

The crucial point of this analysis is to note that if such technological and cultural conditions are not present, it is pointless to work on organizational processes and structures directly. People will simply resist the kinds of changes that may be necessary. Only if we can create the appropriate synergy between culture and IT capability will we get the long range benefits we are looking for.

The interweaving of cultural and technological factors is the essence of the socio-technical model of organization design. I hope that the above hypotheses can stimulate thinking about how to increase the probability of innovation, and can serve as a kind of diagnostic grid to assess in any given group the degree of "innovativeness." Above all, I hope that by focusing on culture I have made it clear why resistance to change and the desire of organizations *not* to innovate are entirely normal and understandable phenomena.

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PME for the 21st Century Warrior



SESSION SEVEN

Observations on Professional Military Education a Decade after the Skelton Panel Report

By

Congressman Ike Skelton

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

Remarks by
Congressman Ike Skelton

Thank you so much, Admiral. After hearing such a kind introduction, I can hardly wait to hear what I'm going to say.

Were my parents still living and present to hear your generous words, Admiral, my mother would have believed them and my father would have been amused by them. Thank you very much. I do appreciate this opportunity to share some thoughts with you. But in sharing thoughts, particularly on the military, you have to be very accurate. You can't come close. You have to say exactly what you mean.

As the admiral told you, I'm a country lawyer by profession. I have practiced law and tried lawsuits for some 20 years before going to Congress.

There is a story about two elderly country trial lawyers that illustrates what I mean by accuracy. One was Lawyer Sam; and one was Lawyer Bill. They were great friends, but great competitors as well. One day, they had a jury trial in which they both gave profound closing arguments. Lawyer Sam got up and gave his closing argument to the jury. The remarks were, of course, very well done, as only a country lawyer can do.

During his closing argument, Lawyer Bill got up and proceeded to inaccurately invoke the Bible. He spoke about Moses walking to Rome, he talked about Peter giving the Sermon on the Mount, and various other inaccuracies based upon the Holy Book. When the closing arguments were over, the judge sent the jury to the jury room for deliberation.

A large crowd milled around while waiting for the jury to return. Lawyer Sam went over to Lawyer Bill and said, "You old hypocrite. You don't know anything about the Bible. Trying to tell the jury that you're religious! Shame on you!"

Lawyer Bill said, "I am too religious. I used to teach Sunday School!"

Lawyer Sam says, "Why you can't even repeat the Lord's Prayer."

Lawyer Bill said, "I certainly can."

Lawyer Sam said, "All right." He pulled out a five dollar bill, put it on the

counsel table and said, "Five dollars says you can't repeat the Lord's Prayer. Lawyer Bill opened his wallet, put five dollars down on the table, and said, "I can *too* repeat the Lord's Prayer."

By this time, all the spectators had gathered around the two. Lawyer Bill raised his hand and everybody bowed their heads, and he said, "The Lord's Prayer is: Now I lay me down to sleep, I pray the Lord my soul to keep. If I should die before I wake, I pray the Lord my soul to take." Lawyer Sam looked at him, looked down, shook his head and said, "Go ahead! Take the money. You *did* know it *after all.*"

I thank the Provost, Dick Elster, the Superintendent, Jim Burin, and, of course, my good friend and former House colleague Glen Browder for inviting me today. It's good to be among such a distinguished group -- to see so many familiar faces: Emma Aver, Karen Heath, Fred Pang, Bob Goldich, Mark Smith, Don Cook and so many others whom I have known so well through the years. Special thanks to Sam Farr who represents this district so ably and well. And many of you have met my long-suffering and dedicated staffer, Bill Natter, who is in the audience with us today.

Together we've experienced and witnessed dramatic changes over this past decade: Glasnost, the fall of the Berlin Wall, German unification, the Persian Gulf War and, most incredibly, the disintegration or implosion of the Soviet Union. Today, Europe is reshaping itself into a European Union. Asia, after more than a generation of phenomenal economic growth, is undergoing economic difficulties. The United States has been described by the Secretary of State Madeline Albright as the "Indispensable Nation."

Our successful performance leading a coalition force in the Persian Gulf serves as sufficient testimony to our critical role in this world. Only the political leadership of the United States, bolstered by the professionalism and strength of its military forces, could have put together and led such a coalition. As a result of the changed international security environment over the last decade, our military forces have undergone significant reductions, both in size and in funding. This has been a difficult and painful process -- for those in industry, DoD civilians, but most especially for those of you in uniform.

Against this backdrop of events, I would like to share my thoughts about the nature of Professional Military Education -- or, as it's known, PME -- nearly ten years since chairing a special panel of a former House Armed Service's Committee that reported out in 1988. Our report contained a quote from the noted British soldier-author, Sir William Francis Butler, regarding the relationship between education and military field experience.

Sir William Francis Butler wrote, ***"The nation that will insist on drawing a broad line on demarcation between the fighting man and the thinking man is***

liable to have its fighting done by fools and its thinking done by cowards."

This quote, a favorite of mine, remains as true today as when it was first penned. Indeed, it would seem even more important today that such a line not be drawn -- for today's military leaders face a challenge that is far greater than military leaders have ever faced.

Today's military leaders must have, first of all, the technical skills to employ effectively the sophisticated weaponry and equipment at their disposal. Second, they must have the ability to manage these "hardware" assets. Third, they must have the ability to manage the highly trained, skilled manpower in their command. Yet technical and managerial skills are not enough to make a military leader. Much more is required to meet the leadership challenges of the future. Military leaders of today and tomorrow -- and that's you -- must understand the importance of military history, the study of tactics, operational art, and strategy through the ages.

In the afterglow of the Allied victory over the Axis powers in World War II, Winston Churchill best described the crucial role played by the American officer corps during that war: ***"That you should have been able to preserve the art not only of creating mighty armies almost at the stroke of a wand, but of leading and guiding those armies upon a scale incomparably greater than anything dreamed of, constitutes a gift made by the officer corps of the United States to their nation in time of trouble."***

Those officers benefited immensely from an excellent military educational system before the war. The period of the 1930s -- with the United States in the grips of the Great Depression -- were lean times for the American military. Too poor to hold maneuvers, the services invested in the educational development of their career officers. The Army sent its best to the Command General Staff College in Fort Leavenworth and the Army War College, then at Fort McNair. The Navy sent its finest to the Navy War College at Newport, Rhode Island. This was the golden age of military education: George Marshall, Dwight Eisenhower, Joseph Stillwell, Omar Bradley, Hap Arnold, Chester Nimitz, Bull Halsey, and Raymond Spruance were just some of the distinguished American leaders of World War II who benefited from study at these institutions. Later they helped put together and execute a national strategy that won the war.

As those of you having visited Newport know, Admiral Nimitz, speaking of the Op Plan Orange, later remarked that the entire Pacific campaign had previously been thought out and fought in the classrooms of the Navy War College. The only major surprise was the deployment of the Kamikaze toward the end of the Pacific war.

Regretfully, in the early postwar war period after Hiroshima and Nagasaki, our military leaders neglected this attention to the study of military history. Our nation paid a heavy price in blood and treasure for this neglect in a place called Vietnam. However, in decades past, the United States has been blessed with

outstanding strategic thinkers: Alfred Thayer Mahan, the father of modern naval thought; George C. Marshall, the architect of victory in World War II; and Maxwell Taylor, the man responsible for NATO's strategy of "flexible response." Each of these Americans made profound contributions to our nation's security by sound and original strategic thinking.

It is that "...no commander or military historian sufficiently dedicated to his profession could possibly be surprised by any development in warfare, whether it concerns strategy and tactics, methods and weapons, equipment and uniforms, discipline and morale, civilian and political attitudes." A study of history's pivotal battles shows that the great captains -- Hannibal, Caesar, Napoleon, MacArthur -- were in the debt of outstanding soldiers of the past.

Stonewall Jackson's successful Shenandoah Valley Campaign resulted from his study of Napoleon's tactics; and Napoleon, who studied Frederick the Great, once remarked that he thought like Frederick. Alexander the Great's army provided lessons for Frederick two thousand years before Frederick's time. The Athenian general Miltiades, who won the battle of Marathon in 491 B.C., also won the battle of el-Alamein in 1942. The Macedonian Alexander the Great, who defeated the Persians at Arbela in 331 B.C., set the example for the Roman victory at Pydna 155 years later. The English bowman who won Crecy in 1346 also won Waterloo in 1815. Montgomery, Bradley, MacArthur -- who won battles in the 1940s -- might well win battles a century or so hence.

More recently, General Norman Schwarzkopf profited from his study of military history in his familiarity with Stonewall Jackson's use of the flanking maneuver. The famous left hook of armored forces, cutting through Iraq's right flank, avoided the fixed defenses that Saddam had built up along the Saudi-Kuwaiti border. Thus, I believe every truly great commander has linked himself to the collective experience of earlier great captains by reading, studying and having an appreciation for history.

Now this does not mean that today's soldiers should simply copy from the past. While the essence of major tactics can and must be learned from the past, the thinking student in military history will learn much more than that. He will learn how to apply tactics innovatively, in varying situations and under difficult conditions. He will learn how to be flexible and how to adapt rapidly to change.

The battles of Bushy Run, Cowpens, and Blue Licks in early American history offer tactical lessons, as do the Indian War battles of the Rosebud and the Little Big Horn. More recently, the Marines at Skopje and the First Calvary Division in the at Wadi al Batin. Our leaders must be students of human nature under war conditions. How men react to discipline, fear, hunger, lack of confidence and shock. And they must know about the minds and emotions of potential adversaries. Such examples begin with Gideon of the Old Testament, who proved to be an early propagandist spreading stories of his invincibility among the enemy Midianites. At night, Gideon's

force of a mere 300 men -- blowing trumpets and waving torches -- caused panic to sweep throughout the Midianite's encampment, resulting in an easy victory for him.

Further, the student of military history must learn a profound respect for things such as the weather, which are beyond his immediate control. When the Germans invaded Russia in 1941, they failed to take into consideration the bitter and devastating winters on the Russian steppes, which was experienced by Napoleon in the previous century. Thus, those who are aware of the element of fortune in warfare will be better prepared to deal with it when, inevitably, it goes against them, or to exploit it when, just as inevitably, it works in their favor.

Military leaders of today and tomorrow need to manage the force and handle the big, expensive and highly technical new weapons. But they need to be more than technically competent and managerially proficient. They also need to be exemplary leaders. History teaches that it's difficult to translate technological advances into battlefield successes, that the consequences of new technologies aren't easily predictable in advance, and that even profound technical superiority is not a guarantor of success in combat. Our ability to prevail in any future conflict may well depend less on the quality of our weapons than on the theories and strategies and tactics through which they are employed. Where are the strategic thinkers of today? Today it seems this country excels in training tacticians, but is it producing the kind of strategic thinkers who helped win World War II or the Cold War?

We are, perhaps, succumbing to a tendency to pragmatize -- what Alexis deTocqueville described as "our tendency to take a straight and short road to practical results." So today we must ask if our military now has a place for strategic thinkers. Does the professional military system foster such people? Do we, in fact, now need them any less? Or more?

These were some of the questions our Professional Military Education Panel set out to address in 1987. That effort represented the first comprehensive review of Professional Military Education in the 200-year history of Congress, and, in short, brought us to "Yes!"

Yes, we have a military that has a place for strategic thinkers. Yes, we have a professional military system that can foster such people. And, yes, we need them as much now as ever before.

Earlier speakers at this conference -- Mark Smith, Major General Don Cook, who worked with our Military Education Panel -- reviewed the recommendations for Professional Military Education that came about as a result of our work together. I need not go over those recommendations in detail now, but I will tell you that we are very pleased that most of the recommendations were adopted by the Department and service's voluntarily.

One of the few legislative changes we made enabled the Secretary of Defense and Secretaries for the Army and the Air Force the same flexibility in hiring and paying civilian faculty that the Secretary of the Navy has had since 1956.

Now the Department of Defense and the other two Services could compete with the leading universities in the country and attract excellent faculty, as Stansfield Turner had done at the Navy War College in the 1970s. Over the past decade, Professional Military Education, and especially Joint Professional Military Education, has received greater attention from the services and the department. This conference is a reflection of that greater attention.

PME is a part, an extremely important part, of a process to develop the officer corps from each of the Services. To win at all levels - tactical, operational, and strategic -- we must be ever mindful that second place does not count on the battlefield. As I review the various topics to be covered at this conference, I realize that such leaders need to be aware of and understand the developments in policy and technology. I realize that more will be said about the technological dimensions of this challenge in the next panel and in the address of Admiral Tuttle at lunch today.

As many of you know, we are in the midst of a revolution affecting all of society. The industrial age is giving way to the information age. Computers at the office, computers at home, cable television, and the development of the internet are just some of the broader manifestations of the information revolution. The birthplace of that revolution is here in this state -- in Silicon Valley -- and its stronghold is just up the coast in Redmond, Washington, corporate headquarters for Microsoft. The greatest impact of the revolution is taking place in this country, but other countries are feeling the effect, too.

Those of you at this institution know very well that the information age is having profound effects on the military. Nikolai Ogarkov, the Soviet Chief of Staff, was talking about the revolution in military affairs back in 1984. The Gulf War provided glimpses of that revolution: laser-guided bombs, F-117 aircraft, the JSTARS ground-surveillance aircraft. The technologies of the new military revolution include digital communications, GPS satellites, stealth, simulators, and computer processing.

As the Services confront this latest military revolution -- this latest manifestation of technological change -- what are the implications for Professional Military Education?

First, as many of you already know from your own children, we have a younger generation that feels quite comfortable with the changes produced by the information age. A seven-year-old child can do amazing things with a keyboard and a computer screen.

Second, for the military, that means there will be a greater impact at the two lower levels of Professional Military Education, the primary and intermediate levels. Today's newly commissioned ensigns and second lieutenants, up to those who are now commanders and lieutenant colonels, have to understand and be comfortable with the technological innovation spawned by the information revolution. They are the ones who will employ the new weapons at the tactical and operational levels of war.

Third, incorporating the latest manifestations of technological change in PME does not mean changing its fundamental nature. Understanding the political and economic changes taking place in the world today -- the emergence of China, the proliferation of weapons of mass destruction, innovations taking place in the business sector -- is every bit as important as understanding the newest developments in technology. My own view is that these changes must be examined from the historical vantagepoint and placed in a historical context. This has been the traditional approach of military education, and should continue to be.

The history of the past 200 years is one of increasing technological change, changes in international power structure, and debates over the proper use of military forces. Military officers must understand this history and use it as a foundation to understand and work in the turbulent times we encounter today, and which you may well face in the years ahead.

Ladies and gentlemen, let me finish my comments by drawing together a few of the matters I touched today on with specific regard to the Navy. I mentioned that most of our panel recommendations were adopted by the Department and Services voluntarily. However, one recommendation that still lies unfulfilled is getting the Navy to send its most competitive officers to both -- and I will repeat - to both intermediate *and* senior professional military education schools.

The Navy has two excellent educational institutions: The Naval Postgraduate School and the Naval War College. The former is more technically oriented, and the latter less so. So the question arises: Could the Navy adapt the Naval Postgraduate School as its school for intermediate level education, and keep Newport's Naval War College as its senior level school? Is there a way that this unfulfilled recommendation could finally be remedied?

Years ago, when I went to law school, I had a contracts professor named Professor Pittman. Mr. Pittman would ask very difficult questions during the class hour, and at the end of the class he would gather his books, walk up the center aisle toward the door of the back of the classroom, pose a very interesting and difficult question to us students and, then, in his deep voice, resonating voice, would say, "*Think* about it."

So, in the words of Professor Pittman to you on this last question I say, "*Think* about it."

QUESTIONS TO CONGRESSMAN SKELTON FROM THE CONFERENCE FLOOR

Vice Admiral Blair, USN Director of the Joint Staff: Congressman Skelton, it is good to see you again. You have thought more than many people about the utility for military officers of studying history. It seems to me that, in the infancy of a technological revolution, the study of recent history is probably more relevant than looking too far back.

Congressman Skelton: I would disagree with that, Sir.

VADM Blair: Let's talk about it, Sir. When I think about those in the Navy -- the service I'm familiar with -- those giants of the '30s who said that they planned the campaigns of World War II on the gaming floor at Newport, they missed the relative role of the battleships and aircraft carriers pretty badly. Although they talked about sweeping west across the Pacific, their idea of what they would sweep across the Pacific with was pretty misguided.

It took December 7, 1941 to get the relative roles of those two platforms straight. In fact, they changed about twice during the war, as you know. Towards the end of the war, the battleships were the anti-aircraft vessel, and the carriers were the strike weapons, whereas conventional wisdom had it the other way around.

Similarly, it seems to me that the generals who went into World War I completely missed some of the important lessons of the Civil War -- the last major conflict before theirs. They underestimated the impact of trenches, barbed wire, and machine guns, and they paid a terrible price in terms of misleading and mismanaging their forces.

It seems to me, as we stand at the leading edge of the technological revolution -- this information age about which you spoke -- that the intense study of technology and recent military experience, coupled with the lessons of the past, is going to put us more in the right direction than simply thinking about the study of military history as we have traditionally known it.

I'm interested in your looking back at how the study of history has been used to do better -- whether you would agree with this, or whether you think it's unchanged by the technological change that has swept across us.

Congressman Skelton: Admiral Blair, I don't really think we would disagree. I think it's very important to understand, number one, that tactics - pure and simple tactics - really don't change. Whether you have a sword or spear in your hand, or whether you have a tank at your disposal, the tactics themselves do not change.

How you perform those tactics with the latest technologies makes a great deal of difference. There are only so many ways to take a hill. There are only so many ways to capture a fleeing enemy. But I think it's very important to understand

the very roots of tactics, operational art, and strategies, and then overlay it with the studies of which you speak. I don't think you should start at the end of this whole intellectual effort, just looking at technological changes and what's at your disposal. I think you'd better understand basic tactics. Sometimes, many times, we've seen good old-fashioned tactics, operational art, or even strategy outfox those with better weapons.

So I think that overlaying a very basic, strong foundation at all three of the levels is very important. What you said about World War I, and how the devastation of the machine gun was not taken into consideration, is true. Many other types of technological advances have not been taken into consideration at opportune times. But I still think a very basic understanding of how you do things is very, very important.

In law school, the first year we studied some pretty basic things. Whether you're studying law, how to win in court, how to win on the seas, or how to win on the battlefield, it's not all that different. You learn the more advanced ways of success as you go along. But you still need to understand the very basics that you learn in some of these battles to which I referred.

Dick Kohn, University of North Carolina, at Chapel Hill: I would just add to the dialogue between you and Admiral Blair by remarking that technological change is not an instantaneous process. It sometimes takes a very, very long time for technological change to work itself through. The difficulty for military leaders is to recognize that change, when it occurs, and exactly what is happening.

The gunpowder revolution, in which we still live, took many decades to play itself out in the 16th and 17th centuries. I believe the information revolution might be dated as far back as 1940, with the construction of the large computer at Bletchly Park for the breaking of German codes and for the beginning of the Bean War between the British and the German Air Forces.

So I agree with you that basic understandings must be applied to what is almost a continuous process that frequently works itself out in technological change. The information revolution is likely to be a very long-standing and evolutionary set of changes that move at different paces.

Congressman Skelton: Thank you, Dr. Kohn. The Gulf War involved some early use, Admiral Blair, of technology. The Global Positioning System (GPS) used by the Colt teams enabled them to call back, after using their laser, and get the first round from a very skilled 155 TOW gun team on target. But it went to a very "basics-educated" crew of 155 soldiers. So you have a combination of the advanced technology of GPS and the "basic education" of a gun crew, which goes back for ages. Anything else?

Unknown: Congressman Skelton, I have a comment, and a question for you. The comment concerns Admiral Blair's initial question, which clearly indicates that he didn't attend his own service's war college. I would suggest the curriculum at Newport indicates very clearly, as George C. Marshall suggested, that if you want to understand strategy, you start with Thucidides, which is about as far back as you can go in militarily historical works.

My question to you, Congressman, is how do you feel about the subject of rigor and what the Service's have done in the Professional Military Educational system to address that question over the last ten years?

Congressman Skelton: As Don Cook and Mark Smith will attest, we started out our military education panel down at the Air War College and shifted to the Marine Command and General Staff college by the number two or three hearing. It appeared quite clearly to us that there was not a lot of rigor.

In one hearing session, we got rid of everyone -- all the colonels at the Air War College -- and one major stood up and said, "I can get through here without cracking a book." Another one stood up and said, "This place is a snap." That changed our entire thinking and started us looking at this thing called rigor.

Those of you who defend our nation and our nation's interests should study as hard for one year or two years as I did in three years of law school. That's bringing it to a personal level, but I think we were successful, Dick, in causing that to pass.

I have been to most of the war colleges in the last two years, and it appears to me that they are studying quite hard, quite well, quite thoroughly, and none of them can stand up and say, "This place is a snap" any more.

Beverly, you had a question?

Former Congresswoman Beverly Byron, CNO Executive Panel: I'm wearing my CNO Executive Panel (CEP) hat today. The CEP is currently doing a task force on military education at the request of the Chief of Naval Operations. One of the things we are looking at -- and one of the things that I look at while wearing another hat as Chairperson of the Naval Academy Board of Visitors -- are the time constraints on our young officers.

I'm totally in agreement that advanced degrees are required in this day and age. But, how can we take a young officer off his career track for the two years needed to get an advanced degree, while at the same time they have the Goldwater-Nichols commitment?

At the same time, we are drawing down the total numbers we have in service, and as we look at the core that is going to be left as we continue to draw down, we

have to find the brightest, the best, and the most capable. How do we meet all these criteria at the same time, and keep the morale of the young officers up?

Congressman Skelton: Next question. [laughter] When we had our panel, it was apparent that the Navy -- and I suppose your question is broader than the Navy, but it's aimed there, Beverly -- would send its aspiring young officers to one of the two schools -- the intermediate or the senior school -- at Newport, if it fit into their regimen while so many were at sea.

Obviously, as was explained to me by the late Admiral Boorda, they didn't have enough sailors to go around. You weren't on the subcommittee when I chaired it, but I made a deal with him that I would provide 200 additional Navy officers -- 50 per year over four years -- if he would do his best to get the officers to the war colleges. He lived up to his side of the agreement, and I lived up to mine.

It's not easy to do so. The Navy -- in particular those who are submariners -- have a more difficult time fitting all of this together. But I think it's absolutely important that the Navy work even harder to see that those who will make decisions are given that opportunity. They're not going to be lieutenants forever. Some of them are going to be admirals. Some of them are going to be making decisions and recommend decisions that have huge stakes -- life or death -- victory or defeat. And the officers who are best able to handle those decisions will often be those who have participated in the rigors of a war college or, preferably, two.

I think the Navy is just going to have to do its best to do that. It has done better, Beverly, in recent years. Now, with the drawdown -- with the size of all military decreasing -- this is a very serious problem. If I had my druthers, I would do my best to keep a strong officer corps in all Services in the eventuality of the need for enlargement, which, of course, we hope never comes to pass.

But the Army makes it happen. The Air Force makes it happen. The Marines are beginning to make it happen. I think the Navy, even with its specialty in deployments, could do so as well. I give them great credit for making giant strides thus far.

Professor Ron Tammen, National War College: Mr. Skelton, I am on sabbatical from the National War College, currently at Monterey Institute for International Studies, here in Monterey.

A question about congressional relations. If we look at PME's relationship with Congress over the last five years, we see the following pattern: five years ago the Congress, specifically the Defense Subcommittee of the Senate Appropriation Committee, took a look at consolidating all the PME institutions, and a consolidation report was done by DoD.

The committee found the report to be inadequate. It then put language in that cut the PME budgets of all the schools by 14 million dollars. Failing that, the next year they cut the student end strength of all the schools by approximately one-third. Failing that, they took on ICAF's budget by reducing all their military construction funding. Failing that, they took on the National War College's military construction budget and cut it all out. All those funding cuts were restored, in no small measure due to your heroic efforts on Capitol Hill.

My question for you, though, is how, and using what patrons, should the PME establishment try to establish a better, long-term relationship on Capitol Hill? What patrons can we look to, aside from yourself? Do you have some recommendations for us?

Congressman Skelton: This is not brain surgery. This is a matter of the Chiefs, the Head of Personnel and the Secretaries making this an important issue in testimony. It has to be done. If you don't do it, you're eating your seed corn, because these are the ones that win, or prevent battles, by thinking.

I've been up to my eyeballs in PME understanding, and appreciate what those on my panel did and do. I might point out that John Kyle, who is now over in the Senate, was on our panel. I think that the Service Chiefs, Secretaries and others who testify will have to make this a lead item, rather than "also ran" item. We do pay attention to hearings, and those issues that are in the forefront are the issues we work on more thoroughly.

So the Service's and the Service Chiefs and Secretaries are going to have to ring the bell much louder, because it's so absolutely necessary that we not eat our own seed corn -- the seed corn being the bright young men and women that go to each of these schools.

James Kittfield, National Journal Magazine. Congressman, one of the lessons of Goldwater-Nichols and Skelton Panel seems to be that, on occasion, the active military needs a nudge from the outside. I think the people who are now retired four stars who were behind that -- like Shawn Meyer and David Jones -- will say that that kind of change just cannot happen from within the institution.

Yet there are a lot of us in Washington who observe that the sort of intellectual giants behind Goldwater-Nichols have retired from the Congress. You think of Sam Nunn, Les Aspin, and a host of others. We're waiting to see people coming up behind them who have the interest and the intellectual curiosity about the military to take their place and, quite frankly, we're not seeing them.

How concerned are you that, as this trend continues and fewer and fewer people in Congress have military experience or an inclination to learn about the military, at some future time another Goldwater-Nichols type reform will be needed, and there won't be a guiding hand from Congress to supply it?

Congressman Skelton: It concerns me, but I don't think it's absolutely necessary to have worn the uniform to have great interest in the military. Some of the military's best advocates have not, for one reason or another, or did not, or could not be in the military services. It's a matter of interest. Time takes its toll.

Those who were there when Goldwater-Nichols was passed -- and I remember it so very, very well -- Arch Barrett is in the audience today, really the heart, soul, and brains of what turned out to be Goldwater-Nichols. He's a national treasure, in my opinion. And what it did was something that was absolutely necessary.

Shawn Meyer and David Jones lit the fire. A Congressman by the name of Dick White had a group of hearings and retired, and Arch prevailed on me to take up the gauntlet. And I put a bill in, my very first bill on this issue, and it did not sit well with the Joints Chief of Staff. I'm here to tell you -- not one of them had a sense of humor. I have a special asbestos folder in my office in which I keep a letter I received from PX Kelley.

But it was a long effort that took four years and more. Bill Nichols, Chairman of the subcommittee that handled this jurisdiction, went to Beruit in 1983 and had hearings aboard a ship, and I think Arch was with him. Karen, you may have been with him. Bill took it up as his own cause.

I was there to be of some little help. Barry Goldwater was the chairman of the Armed Service Committee in the Senate. We had passed it -- what, three times, Arch?--- and it was killed in the Senate. The chairman at that time was Senator Tower. When Barry Goldwater became chairman and Sam Nunn took a great interest in it, Jim, Bob Locher, and Sam Nunn, for whom he worked, worked really hard on that end, and we were finally able to get the bill that originated in the House passed in the Senate. Of course, it took its name from Bill Nichols and Barry Goldwater.

It worked -- not perfectly -- but it worked. It created a much shorter chain of command. I remember going over to the visit with the Marines in Beirut, when they were still digging out from the bombed barracks. We found that the chain of command from the President over to that Marine colonel had 22 links in it.

Well as a result, we and Goldwater-Nichols changed that considerably. We lowered the power and influence of the Service chiefs. That did not set well with them. We increased the power of the Chairman, created a jointness requirement, and created a Vice-Chairman of the Joint Chiefs of Staff. Interestingly enough -- and, Jim and Bob, you may remember -- that was the very last provision that we were able to agree on in conference.

Thanks to Sam Nunn -- I remember sitting there arguing the matter -- thanks to Sam, a Vice-Chairman of the Joint Chiefs was adopted. They bitterly fought that, but we prevailed. It's interesting that Bill Crowe, then Chairman of Joint Chiefs of Staff, came back a year later and said that giving him a Vice-Chairman was the best thing we had ever done.

It concerns me a little bit that the corporate knowledge of Goldwater-Nichols is not in either the House or the Senate, with some exceptions. Should Goldwater-Nichols issues be reopened? You can bet your bottom dollar that the services would each come over and want to make substantial changes that would probably undo some of the jointness. It concerns me that we're not totally joint yet, and I don't see it happening in the immediate future.

Well, ladies and gentlemen, thank you. This has been a real thrill and highlight for me. And, Admiral Tracey, I thank you for your kind comments. I look forward to being on the panel this afternoon.

Thank you very much.

THE HONORABLE IKE SKELTON
Fourth Congressional District, Missouri

U.S. Rep. Ike Skelton (D-MO) has represented Missouri's Fourth Congressional District in the U.S. House of Representatives since 1977. His district includes 23 counties stretching from Blue Springs, to Missouri's state capital, Jefferson City, to the Ozark region of the state.

Skelton, a native of Lexington, is a graduate of Wentworth Military Academy and the University of Missouri at Columbia where he received A.B. and L.L.B. degrees. He was named as a member of Phi Beta Kappa and the Law Review. Prior to his election to Congress, Skelton served as Lafayette County Prosecuting Attorney and as a Missouri State Senator.

A leader in the House on defense issues, Skelton is a senior member of the National Security Committee, currently serving as ranking minority member of the Subcommittee on Military Procurement. He is also a member of the Subcommittee on Military Personnel. Skelton also serves on the House Permanent Select Committee on Intelligence. Skelton's district is home to two military installations -- Fort Leonard Wood and Whiteman Air Force Base. Skelton was instrumental in bringing the Army Engineer School to Fort Leonard Wood and the B-2 Stealth bomber to Whiteman.

As most of the Fourth Congressional District is comprised of small towns and farming communities, Skelton looks after the needs of rural America. He is a former chairman of the Small Business Subcommittee on Procurement, Tourism and Rural Development and the Congressional Rural Caucus.

Skelton is an Eagle Scout, a member of Sigma Chi social fraternity, a Lions Club member, and vice chairman of the Board of Trustees of the Harry S. Truman Scholarship Foundation. Skelton is an elder of the First Christian Church in Lexington. He and his wife Susie have three sons.

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PME for the 21st Century Warrior

SESSION EIGHT

Integrating Policy, Strategy, Technology, and Doctrine

Question: **How, when, and where should technology be integrated into the continuum of military education?**

Objective: **Identify instances that highlight the need for the military educational system to more adequately prepare officers to integrate emerging technology into evolving strategy, policy, and doctrine.**

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Presentation by
RADM Robert W. Nutwell, USN
Deputy Director, Space, Information Warfare, Command and Control (N6B)

REAR ADMIRAL ROBERT NUTWELL, USN
Deputy Director, Space, Information Warfare, Command and Control (N6B)

Admiral Nutwell grew up in Silver Spring, MD, and New Providence, New Jersey. He was graduated from the U.S. Naval Academy in 1966 and entered flight training shortly thereafter, achieving designation as a Naval Aviator in October 1967. He has served in three A-7B/E Corsair II squadrons: VA-215 from 1968 to 1970, including combat operations in Southeast Asia; VA-25 from 1973 to 1976; and VA-105 from 1978 to 1980 as Executive Officer and Commanding Officer.

Following assignments to the Commander Naval Air Force Atlantic Fleet staff from December 1980 to January 1983 as the Attack Readiness Officer and Flying Hour Budget Manager, Admiral Nutwell completed nuclear propulsion training. He was assigned as the Executive Officer of USS NIMITZ (CVN 68) from June 1984 to July 1986. He then served in the Office of Chief of Naval Operations (Naval Warfare Directorate) as the leader of an intelligence assessment team.

From February 1988 to August 1989, Admiral Nutwell was Commanding Officer of the Amphibious Transport Dock USS TRENTON (LPD-14). He was then assigned as commissioning Commanding Officer of the nuclear-powered aircraft carrier USS GEORGE WASHINGTON (CVN 73). Admiral Nutwell was Deputy Director for Plans and Policy (J-5), U.S. European Command, Stuttgart, Germany, from May 1993 to June 1995. His most recent assignment was as Commander Carrier Group THREE / Lincoln Battle Group.

Admiral Nutwell has flown over 3,000 hours in tactical jet aircraft, including the A-7 Corsair II and FA-18 Hornet strike fighter, and accumulated over 700 carrier landings. A graduate of the U.S. Naval Postgraduate School and of the Naval War College, he holds a Master's Degree in Operations Research and is qualified as a Surface Warfare Officer. His decorations include the Defense Superior Service Medal, Legion of Merit with three gold stars, the Meritorious Service Medal with two gold stars, and the Air Medal. Admiral Nutwell is a co-recipient of the 1992 Navy League John Paul Jones Award for Inspirational Leadership.

Admiral Nutwell is married to the former Lynn Greenley of New Providence, New Jersey, who is a reference librarian. They have two sons, Brian and Kevin.

Innovation in Naval Warfare JMA Network Centric Warfare

This briefing contains Planning, Programming and Budgeting System (PPBS) data and is not to be disclosed outside the Department of Defense (DoD) and other government agencies directly involved in the defense planning and resource allocation process. Disclosure of PPBS information to Congress and the General Accounting Office (GAO) is covered by statute and other procedures. Information in this document is controlled by the disseminator. Further use or dissemination is prohibited without consent of the originator.

Good morning, Admiral Tracy. Thank you for the invitation to speak. Admiral Blair, Admiral Oliver and other distinguished members of audience, I'm really delighted with the chance to participate in this conference. My boss, Vice Admiral Arch Cebrowski, and I spend as much time as we possibly can going to conferences because we really enjoy them and it gives us a chance to preach the gospel according to N6.

This morning, you will hear about the concept of network- centric warfare.

Issue

"What is the optimal combination of task organization, force structure, and distribution of capabilities for Naval forces to implement the Network Centric Warfare concept?"

Before I start on the slides, let me see if I can connect a little bit to this conference. The slides I'm going to give show you were presented yesterday. They are a distilled version of what we will be presenting to the Joint Mission Area Assessment Conference that OPNAV is holding to prepare for the Year 2000 POM process. It's kind of kicking off the investment planning for the next six years. Its place as a keynote brief at the JMA conference shows you the level of importance that OPNAV assigns to network- centric warfare as a new warfighting concept.

Overview

- Description of the NWCW concept
- Implications of NWCW
- Recommendations

I know a lot of folks have at least a dim understanding of network- centric warfare. I'm going to try to explain it a little bit, at least from the N- 6 perspective, to convey to you our concept of network- centric warfare.

I'll be very candid. Our thinking is evolving here. There's no single story line, and we don't pretend to have the final answer. We're thinking through this together.

As far as the connection with this conference, we in N6 are strong believers in the idea of top- level warfighting concepts driving everything else we do: our activities, our investments and all the other functional areas, such as training and education, doctrine, operations and acquisition. Everything needs to derive from a top- level, war- fighting concept.

Network- centric warfare is the N6 offering. The CNO, I think, understands it as the warfighting concept that is going to drive our development of the Navy of the 21st Century. It applies to warfighting; it has warfighting in the title. But the philosophy applies equally to the business sector, and it may ultimately have as great a reward for the business side that supports the Navy, as it has on the warfighting side.

If you want to talk about Professional Military Education and the implications of this concept, you need to start by understanding the concept itself. I'm going to try to persuade you that network- centric warfare is the embodiment and the application of the information revolution -- of the revolution of military affairs -- to naval warfare. If we think of it that way, then we can see how it fits.

What is Network Centric Warfare?

- A new warfighting concept which multiplies combat power by linking platforms, advanced sensors, long-range precision weapons, and command nodes in a robust information network.

This is a first attempt at an overview. It's more than networking. That's what I'd like to emphasize. It's folding in the different elements of the revolution in military affairs: the long- range precision strike, dominant battlespace awareness, and advanced sensors into an integrated concept.

NWCW - The Warfighting Concept for the 21st Century

- Adapts Information Revolution to warfighting
- Exploits the Revolution in Military Affairs
- Implements Joint Vision 2010
- Preserves combat power in declining force

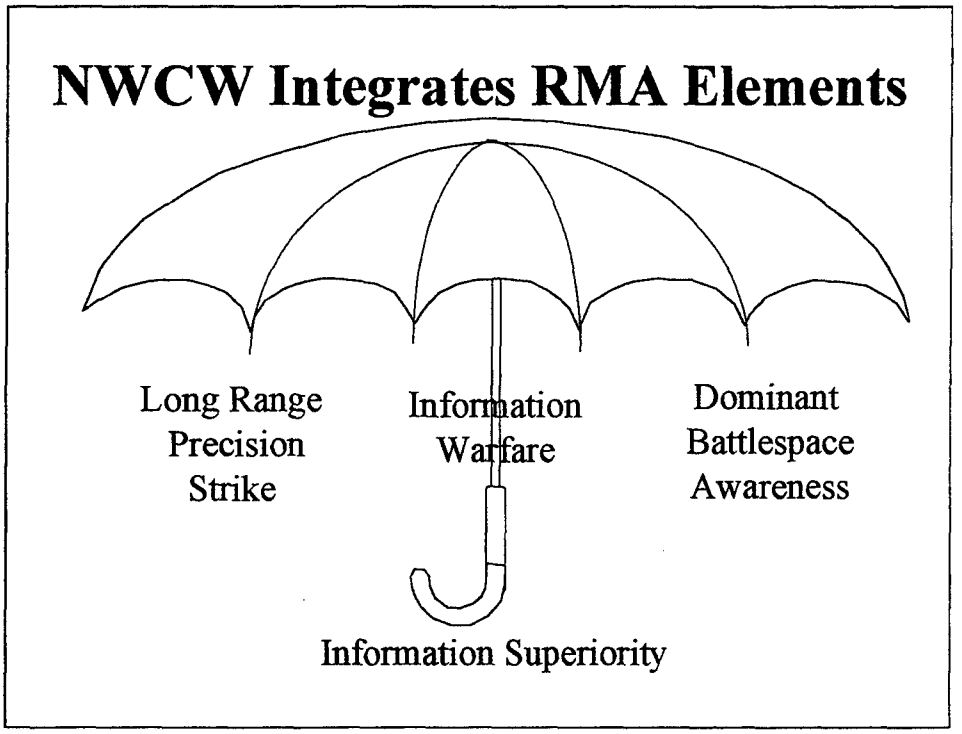
The question is not whether Network Centric Warfare will happen. The real question is whether the Naval Services and the U.S. Military will lead this revolution or be victimized by it.

Network Centric Warfare Defined

- Warfare which derives its power from the robust networking of a well informed force which may be geographically dispersed.
- Enabling elements include
  - a highly webbed information service
  - access to all appropriate information sources
  - weapons reach with precision and speed of response
  - value-adding command and control processes (to include high speed automated assignment of resources to need)
  - integrated sensors hosted on the information network and closely coupled in time to the shooters and C2 processes

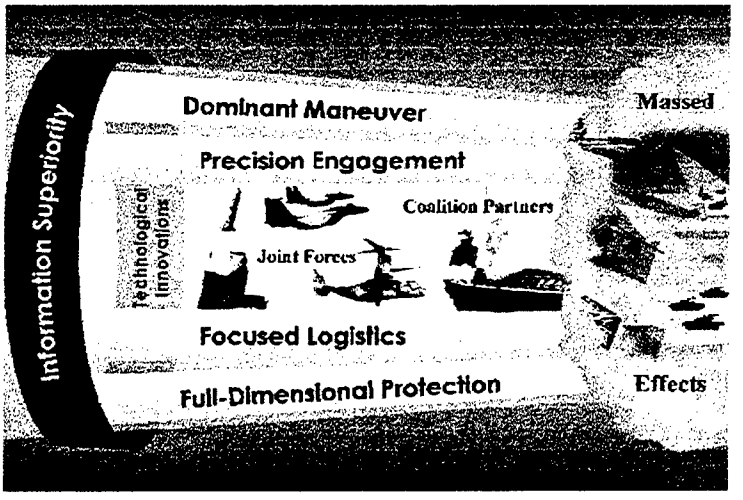
This is the official N- 6 definition, which emphasizes the importance of information networks, and the fact that this is an integrating concept that pulls together all the elements of the RMA, with the networking concept being the glue that pulls it all together.

Network Centric Warfare is applicable to all levels of warfare and contributes to the coalescence of strategy, operations, and tactics. It is transparent to mission, force size and composition, and geography.



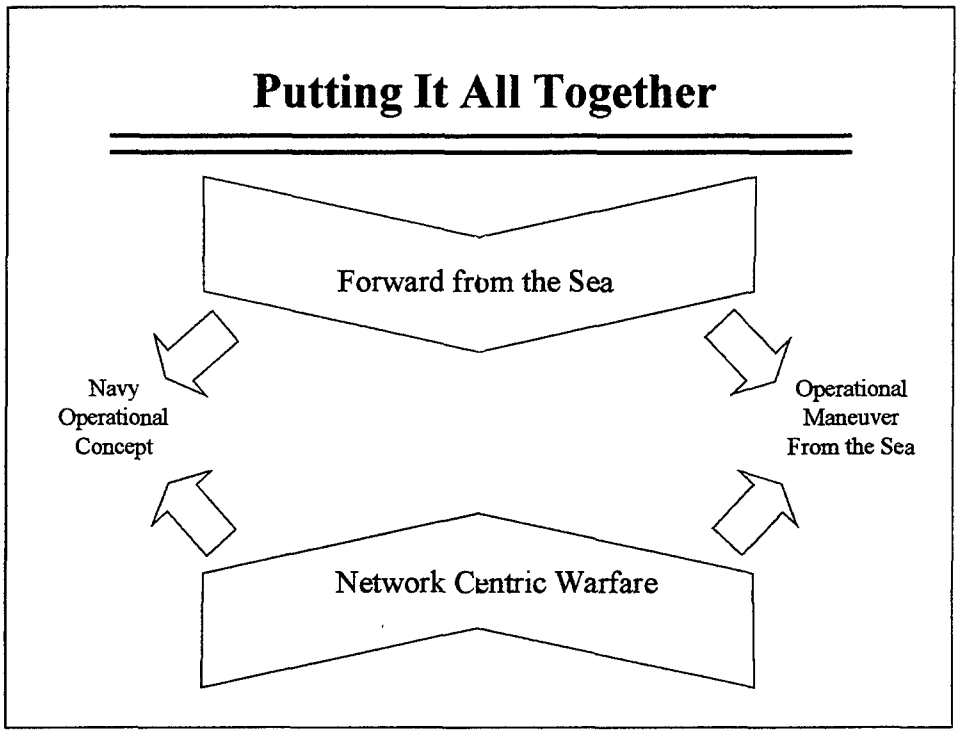
I'd like you to think of it as an umbrella concept that embraces the different elements of the RMA. That's important. It's great to understand that we've got long- range weapons and dominant battlespace awareness, but how we are going to actually *use* that in an integrated way to produce the desired effect? That's what we're trying to do with network- centric warfare -- to articulate a concept of operations that shows how all it's all going to fit together. And we've got a ways to go. What I'm going to show you is some of the initial thinking, and how this concept of operations will eventually develop.

NWCW Integrates JV 2010 Concepts



Another way to think of network-centric warfare is as an integrator of the various pieces of Joint Vision 2010. Joint Vision 2010, again, takes the traditional principles or elements of warfare -- engagement, maneuver, protection, and logistics -- and gives them fancy, new names.

But if you read the fine print in JV 2010, the things that enable those new pieces are information superiority and information technology. So you still need something that says, "How is that all going to work together in an integrated way?" And that, again, I think is the role that a concept like network- centric warfare can address.



Finally, in the big picture of where network- centric warfare fits, I would propose that the top- level doctrine that emanates from the "Forward...from the Sea" and the earlier "From the Sea" documents implements the Navy's and Marine's top- level operating concepts.

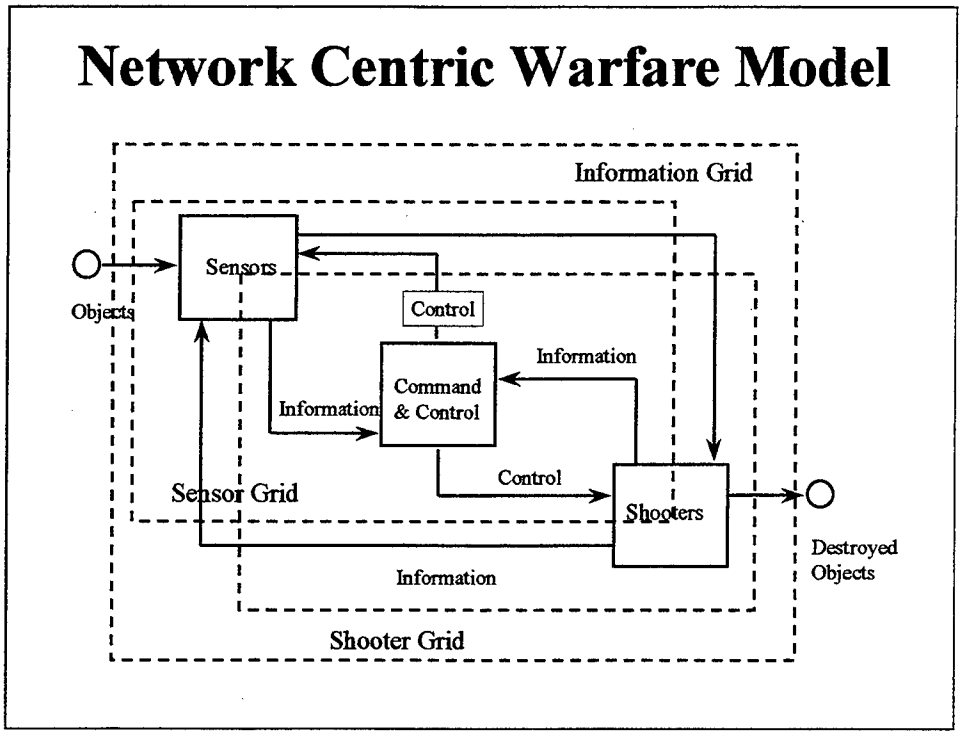
How Does NWCW Multiply Combat Power?

- Gets the right info to the right place at the right time
- Exploits advanced sensor products
- Enhances C2: improved situational awareness, comms, planning and decision support, execution oversight (I.e., provides *speed of command)*
- Fully enables use of advanced weapons: targeting, synchronization, BDA

How does network-centric warfare multiply combat power? I'm going to show you some examples of how this idea has a dramatic effect on the integrated, net combat power of a force by getting the right information to the right place at the right time. It's nothing more dramatic than that. A very simple concept that is difficult to implement.

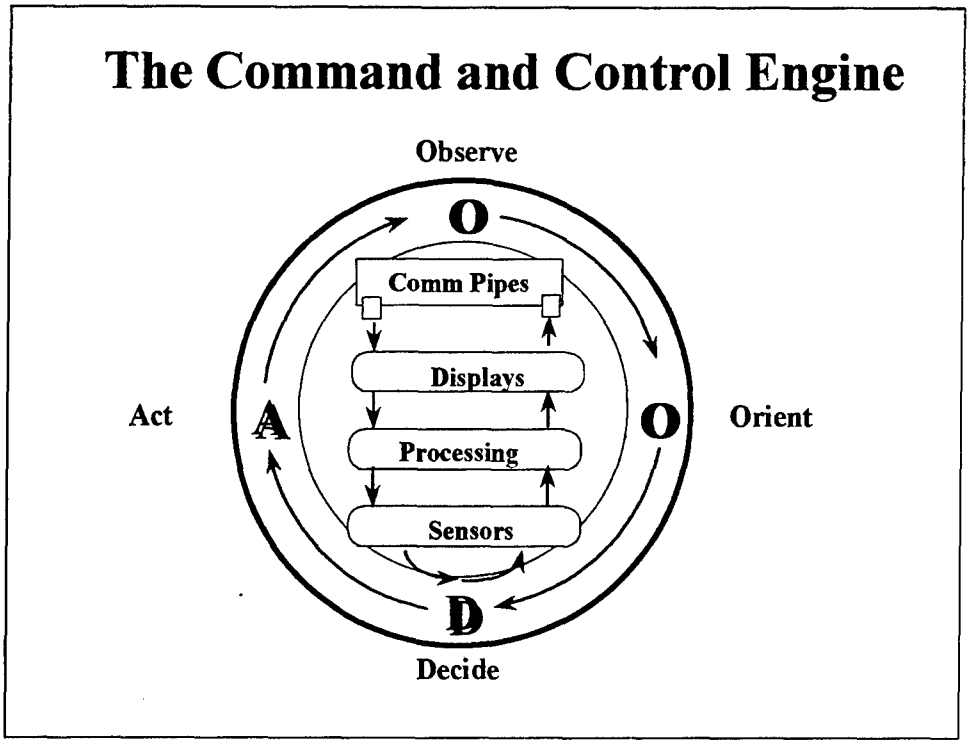
It fully enables the capabilities of advanced sensors and advanced, long- range, precision weapons by linking them into an integrated architecture. It takes the command and control process -- the guts of any military organization -- and greatly enhances its effectiveness.

I'll show you how we think that's going to work in a minute.



This is the model of a combat force that Admiral Cebrowski and his staff have developed. To help articulate how this all works, in any force you've got sensors; you've got shooters; and you've got a command node. The idea behind network- centric warfare is to lash all that together in the most efficient way to achieve the desired result. Sensor-to-shooter is an example of the architecture many people are talking about.

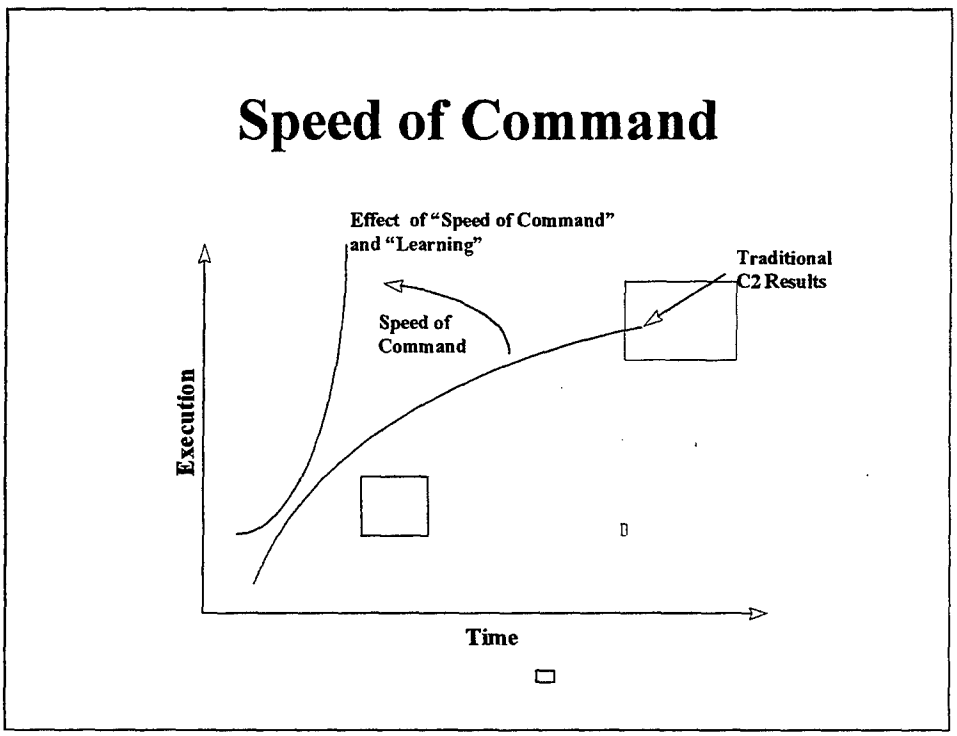
You get the information that a shooter needs, the targeting information, directly from the sensor without having to go through a command node. That applies in some situations, and not in others. But that's an example of how you need to look at the architecture to get the best use out of all these components.



Most of you are familiar with Colonel John Boyd's infamous OODA loop. To really understand how network- centric warfare works, you've got to get down to that level of detail -- to the basic functions of command and control: observing, orienting, deciding and acting. Some people don't like the OODA loop because it looks too sequential to be useful in a dynamic combat situation. We're only going to be doing all that on a continuous basis, and that's okay. But you still have to get through all those functions in some way. So you have to think about how that's going to be done in your architecture.

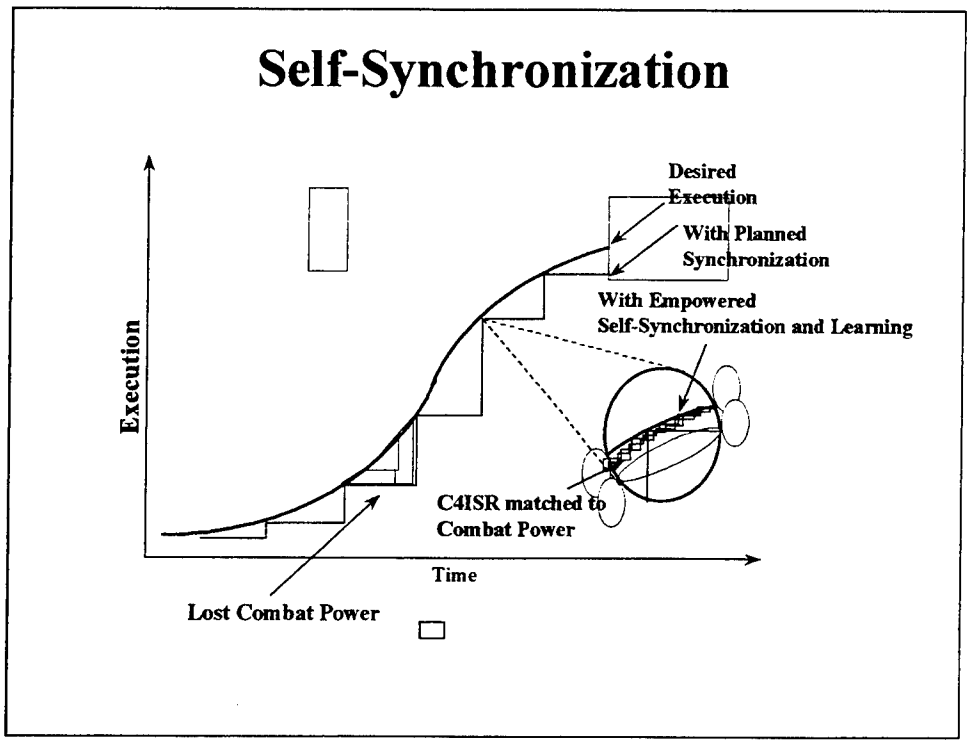
Network- centric warfare networking enhances processing in two ways. One is through effectiveness -- the ability to process more effectively for a better result. Take, for example, the common tactical picture. In the modern networks that we're building now, such as GCCS, with the common operational picture that will be fielded this year, we all have a much better picture of the battlefield than we've ever had before.

With GCCS 3.0, the Navy will, for the first time, have the ground picture. We've never had an adequate picture of the ground battle in the battle group before. That's an example of how you enhance this process. The other way is by speeding it up the processing. That's where you get into the idea of speed of command.



Speed of command is another term Admiral Cebrowski has coined. The idea here is to get through your command process more rapidly than the enemy gets through his. This goes back to Colonel Boyd's original philosophy, which is still very valid: "If you get through that decision cycle quicker than the enemy, you will retain the initiative."

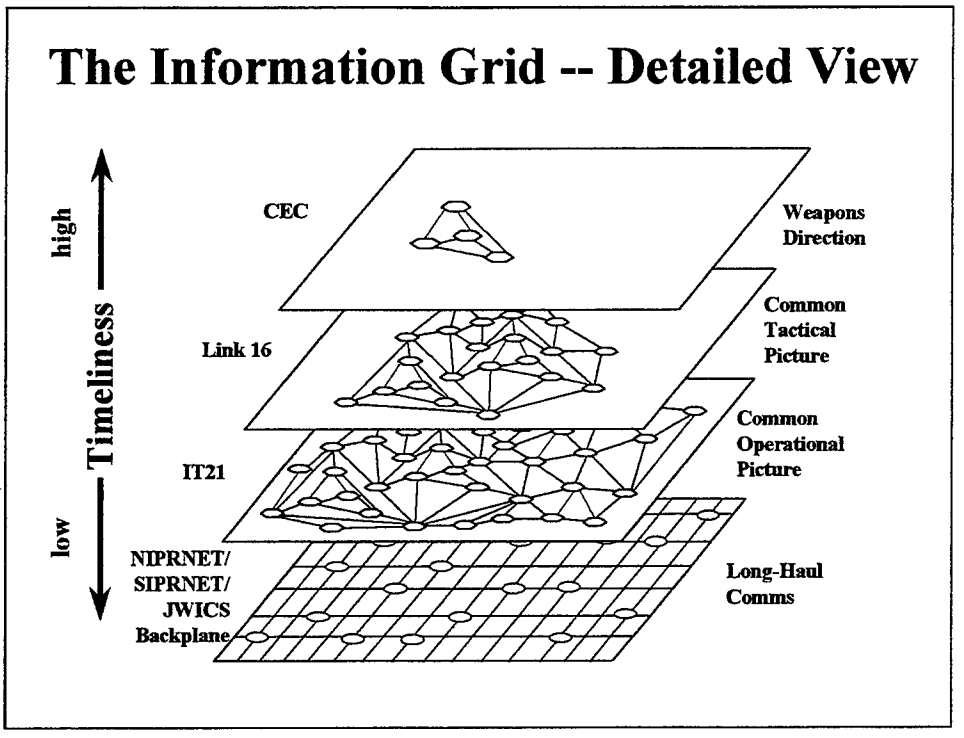
That's one of the most fundamental principles of warfighting. History is replete with examples where the inferior force that took the initiative was able to achieve victory. So how you retain the initiative is to go through speed of command. You move the execution of the results curve to the left on the time line, and, hopefully, the enemy's curve looks something like this. That's why he's always reacting to us instead of the other way around.



Another idea is synchronization. If you have a very good communications connectivity -- if everybody has an accurate tactical picture -- then you can do a lot more self- synchronizing than we do now.

In other words, you let your subordinate forces synchronize themselves based upon some mission- type orders and general commander's intent.

The other way of synchronizing is command directed, but that takes time. Everybody waits for the commander to tell them what to do. When you're command synchronized, you get the kind of function where nothing is happening for awhile until the commander decides what to do, and then you get a burst of energy; then another lull. This is combat power applied in pulses. What you'd like to do is apply speed of command where it is appropriate and in a continuous process.

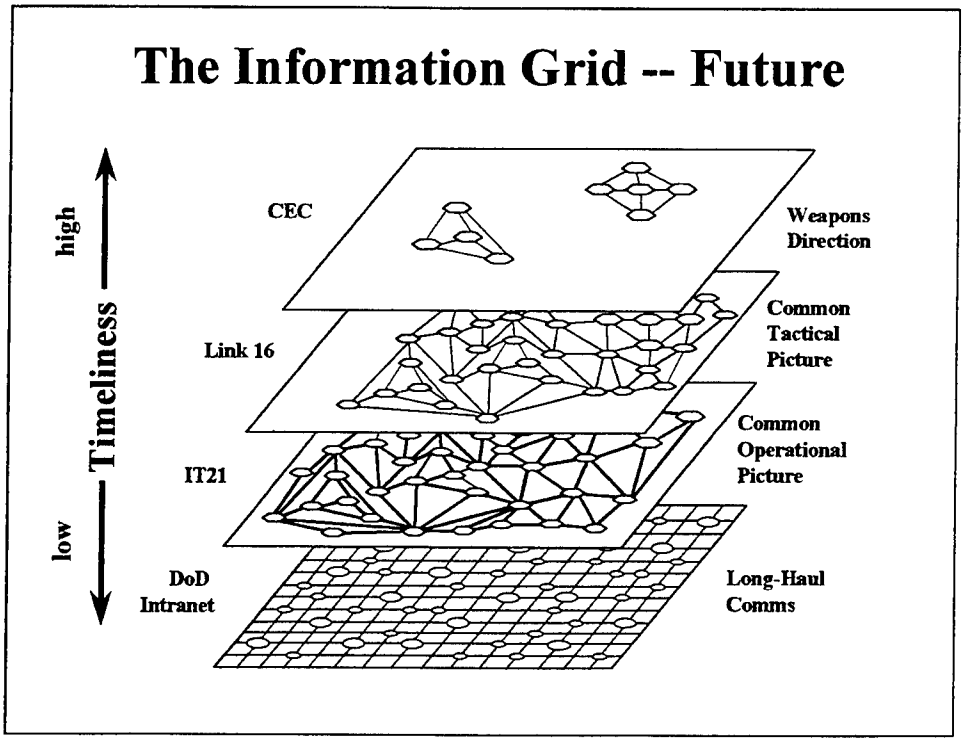


It's important to understand the basic information technology architecture -- what we like to call the information back-plane that's going to enable network- centric warfare. What we've got right now is a three-tiered hierarchy. If you include the DSN, it is a four-tiered hierarchy.

There are three different levels of information networks which will enable network- centric warfare. We're also dealing with the data links -- Link 11 and Link 16 are still being fielded; but that's going to be the joint architecture of our back plane for tactical- level command and control.

At the sub- tactical level, many of you are familiar with cooperative engagement capability -- CEC -- which was initially developed by the Surface Navy for air- defense application. That's basically for weapons direction, at the sub- tactical level.

IT21 -- information technology for the 21st Century -- is basically an *intra*net. Some of you, I hope, are familiar with the concept of a Navy or DoN intranet that will provide planning and coordination, and support at the IT- type network at the operational level of war. In the joint lingo, this is the joint- planning network, the joint- tactical network, and the joint- composite-direction network. Then you've got the DSN in the back plane that you know overlooks all that from long haul communications.



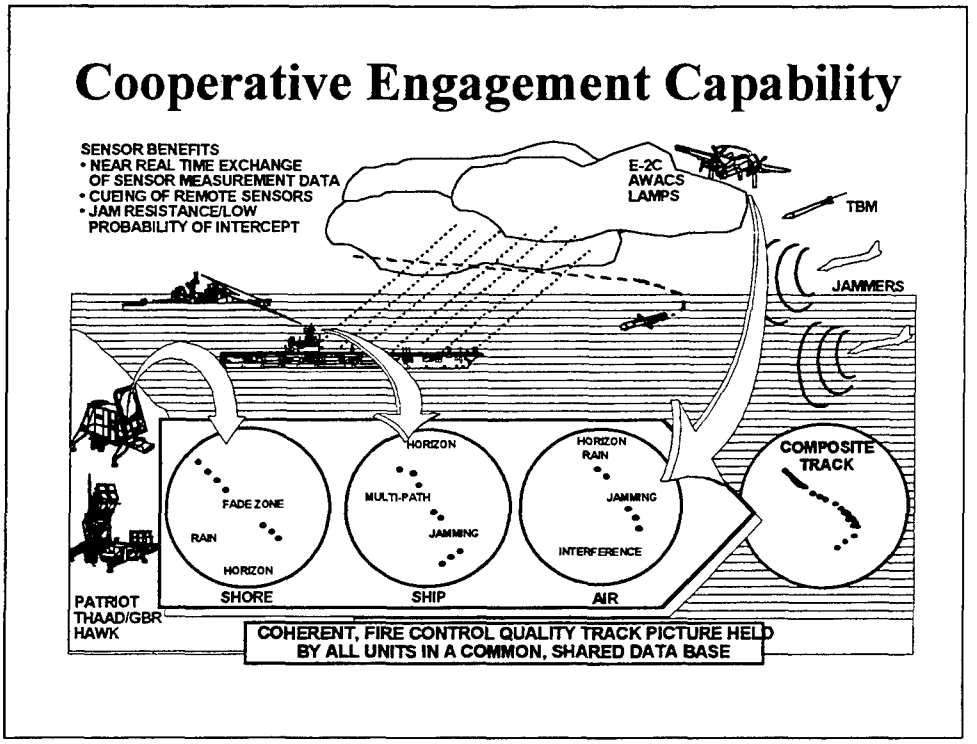
These networks are evolving. The future is probably going to look a lot like this -- with a lot more nodes, and a lot better connectivity everywhere. Just to show you how our thinking is still evolving, this slide is probably out of date already. I think what's really going to happen is that the upper three, or maybe even all four, levels of networks are going to merge together.

It's already happening at the IT21 and Link 16 levels. I've already got tactical commanders who want the IT21 network, your JMCIS, GCCS, command and control applications – that kind of tactical information -- on JMCIS. So there's a merging of these networks. That's what's happening right now.

Examples of NWCW

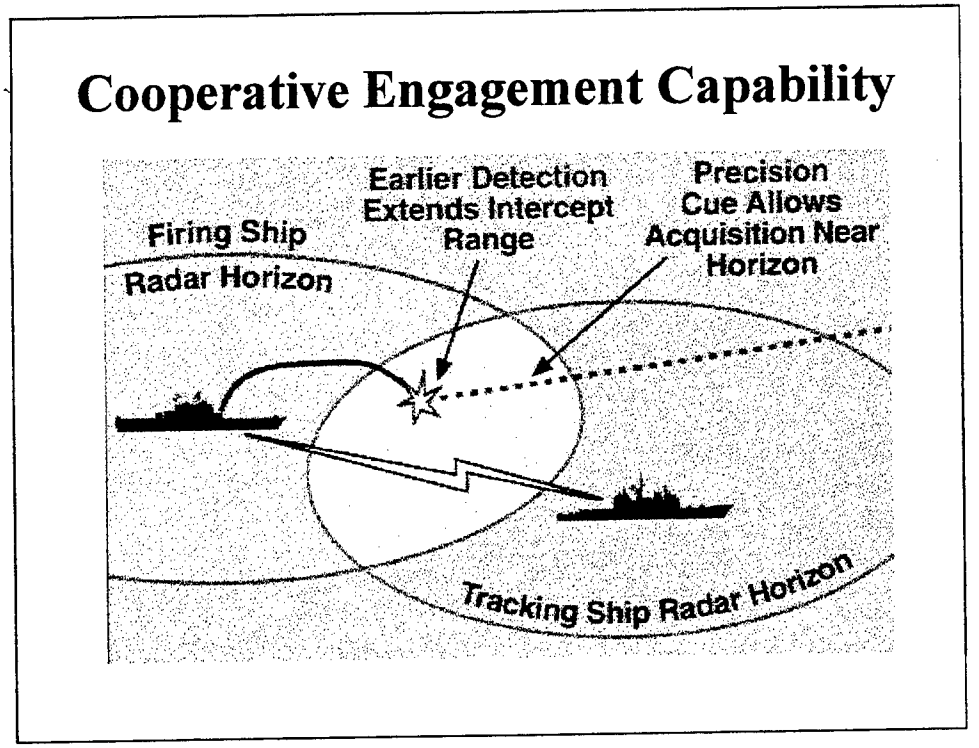
- Air Defense - CEC
- SEAD - HARM Sensor to Shooter
- Strike/Naval Fires - Ring of Fire, Silent Fury
- Networked Undersea Warfare - Distant Thunder

I'm going to give you a glimpse of how network- centric warfare is being applied with great success in several different warfighting areas today.

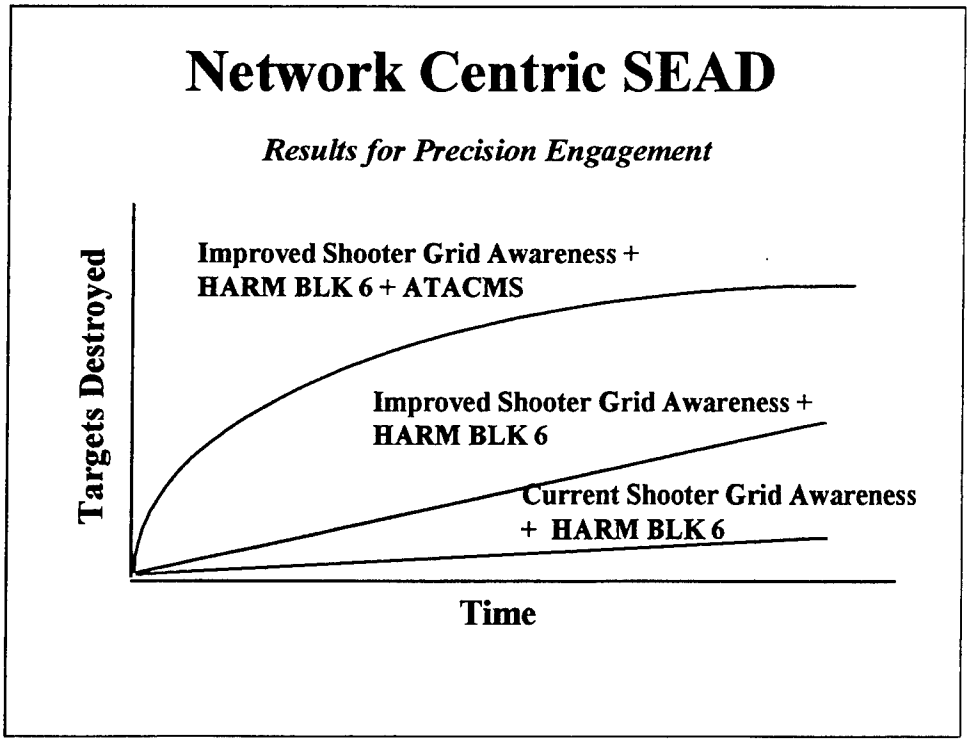


I've told you about CEC – Cooperative Engagement Capabilities – already. We're going to have a very high- speed data link between AEGIS platforms and the E- 2. It's going to pass fire- control quality data that enables one ship to fire using the fire control solution of another ship.

This gives you two huge benefits. First, it gives you a much more accurate track through composite tracking, where you've got several different sensors from different angles looking at the same target. With a high- speed computer in this high- speed data link, you'll fuse all that into a single track. It will take out all the ambiguity – resolve all the multiple tracks – and give you a much cleaner picture, particularly against low- observable targets. Composite tracking will give you a much better chance to pick your target out of the clutter.



The second benefit is that it greatly extends the firing range of an otherwise horizon-limited-by-its-sensors surface combatant. The SM-2, Block III and Block IV missiles can go way, way over the horizon. So what you do is enable a ship to fire over the horizon on another ship's solution. The result is to multiply the combat power of a force by two or three without adding a single weapon or a single sensor. It's the network that does it. That's the power of network- centric warfare.



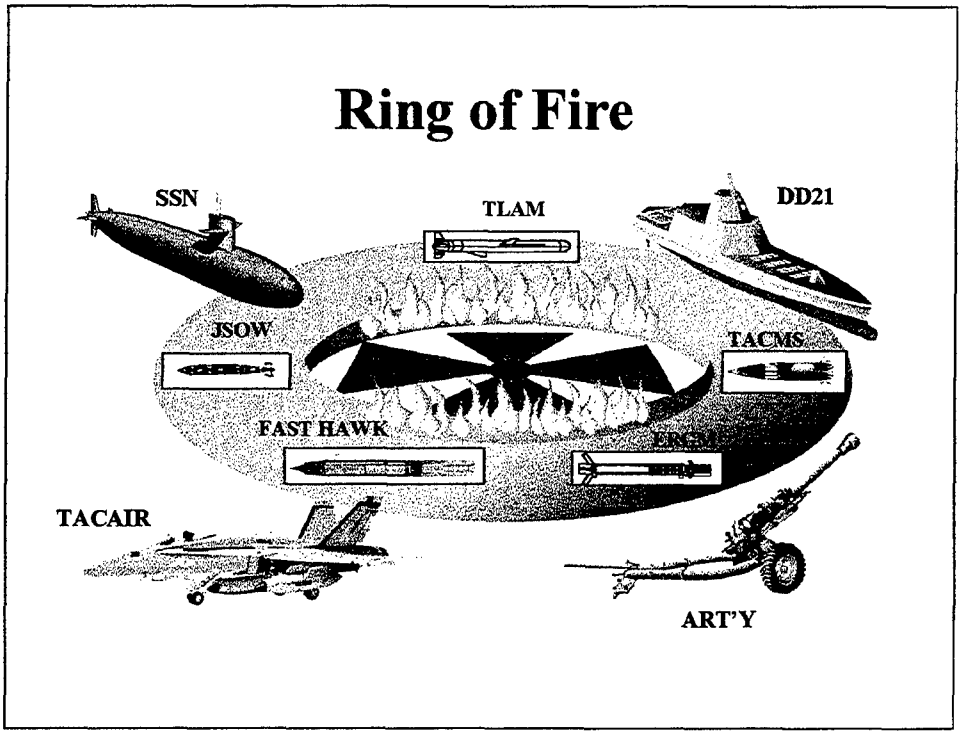
Network Centric Warfare can also be applied to the Suppression of Enemy Air Defenses.

The Joint Staff "Sensor to Shooter" study analyzed the number of SAM sites killed in a hypothetical scenario using HARM Block 6 under three assumptions:

- the lower curve shows the number of sites projected to be destroyed using the current sensor grid
- the next curve shows the number destroyed with an improved sensor grid - the "Dominant Battlespace Awareness" of the RMA
- the highest curve shows the dramatic results obtained if we add a long-range, precision-guided hard-kill weapon such as ATACMS or JSOW to Case 2.

This capability would change the whole game of SEAD. In fact, the new rule would be, "if you radiate, you die." We might have to change the name of the mission from "suppression" to "destruction of enemy air defenses - DEAD"!

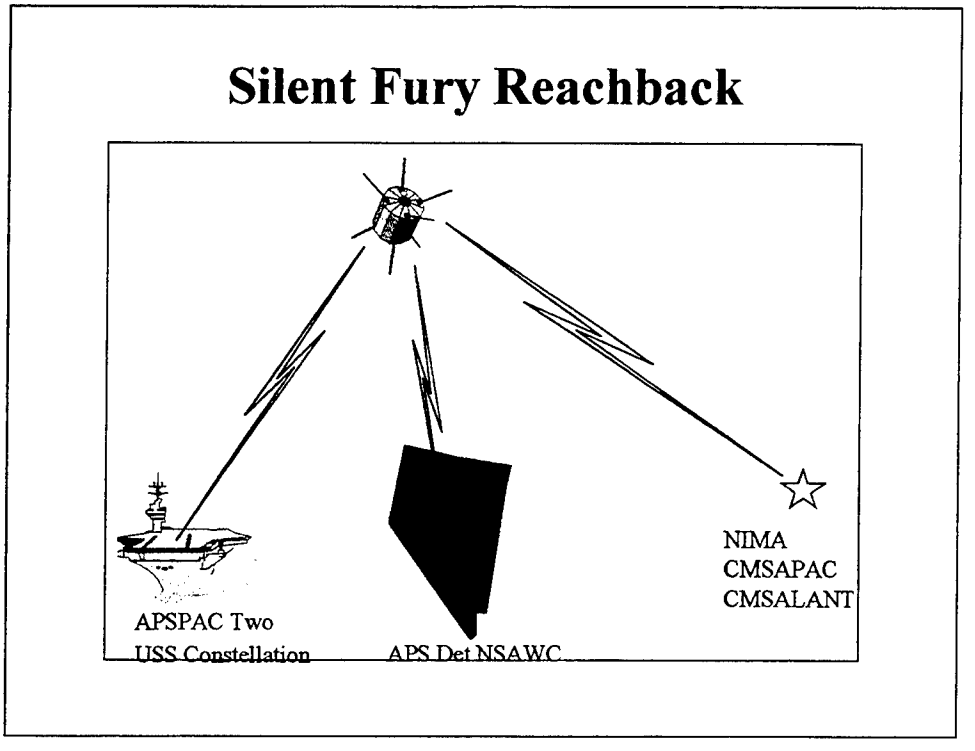
Two points to emphasize: the significant improvement in combat power came from the synergistic effect of networking advanced sensors and long-range precision weapons. Second, the effect was dramatically non-linear. This is the kind of effect that stops offensives by making the enemy question the viability of his strategy.



During Fleet Battle Experiments Alfa and Bravo, VADM Herb Browne and his staff demonstrated a new concept in the coordination of naval fires called the "Ring of Fire".

In the scenario, the simulated shooters - surface ships, submarines, and tactical aircraft employing GPS-guided weapons as shown on the slide - were linked to USS CORONADO via SATCOM and line of sight radio. Calls for fire from FOFACs ashore were transmitted by SATCOM to the prototype Land Attack Weapons System - the heart of "Ring of Fire" - onboard CORONADO. LAWS automatically recommended an assignment of shooter and weapon for each mission based upon pre-assigned guidelines and priorities and weapon availability. It also deconflicted fire missions.

This system will provide "speed of command" in land attack warfare - another application of the concept of Network Centric Warfare.



A second exercise conducted during Fleet Battle Experiment Bravo was "Silent Fury". This exercise demonstrated the ability to plan a large number of strike missions for GPS-guided weapons, such as will be required when JDAM and JSOW are deployed in quantity.

The demonstration was conducted with CVW-9 on USS NIMITZ. It relied heavily on SATCOM-enabled "reachback" for target planning support to the Naval Strike and Air Warfare Center at Fallon, to the LANT and PAC Cruise Missile Support Activities, and to NIMA.

"Reachback", though not a new concept, is a key feature of Network Centric Warfare and Warfare Support. It makes the most current information from non-organic sources available to the battle group, and it will be central to reducing operating costs by moving support functions such as disbursing and personnel management off of the ship.

Implications of NWCW

- Distribution of Capabilities
- Force Structure
- Architecture
- Requirements/Programs
- Acquisition
- Doctrine/Operations
- Organization
- Personnel
- Support

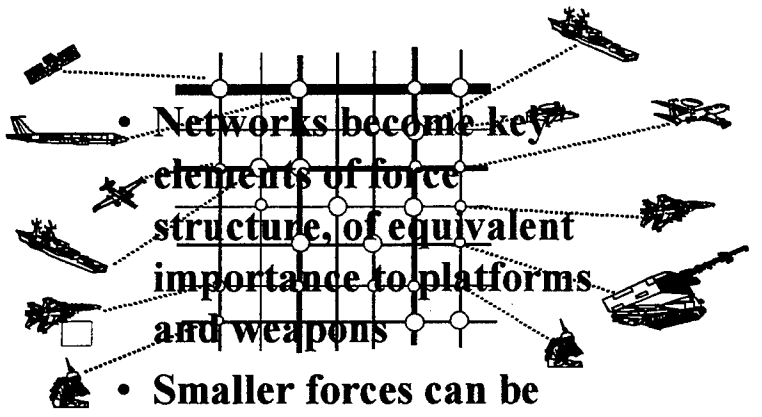
The network-centric warfare concept has profound implications for every functional area of the Navy. The information revolution and the revolution in military affairs -- that's what network- centric warfare is all about.

Distribution of Capabilities

- Sensors, shooters, C2 need not be co-located
- "Thin Shooters" (and "Thin Sensors"?)
  - How thin?
- "Reachback"

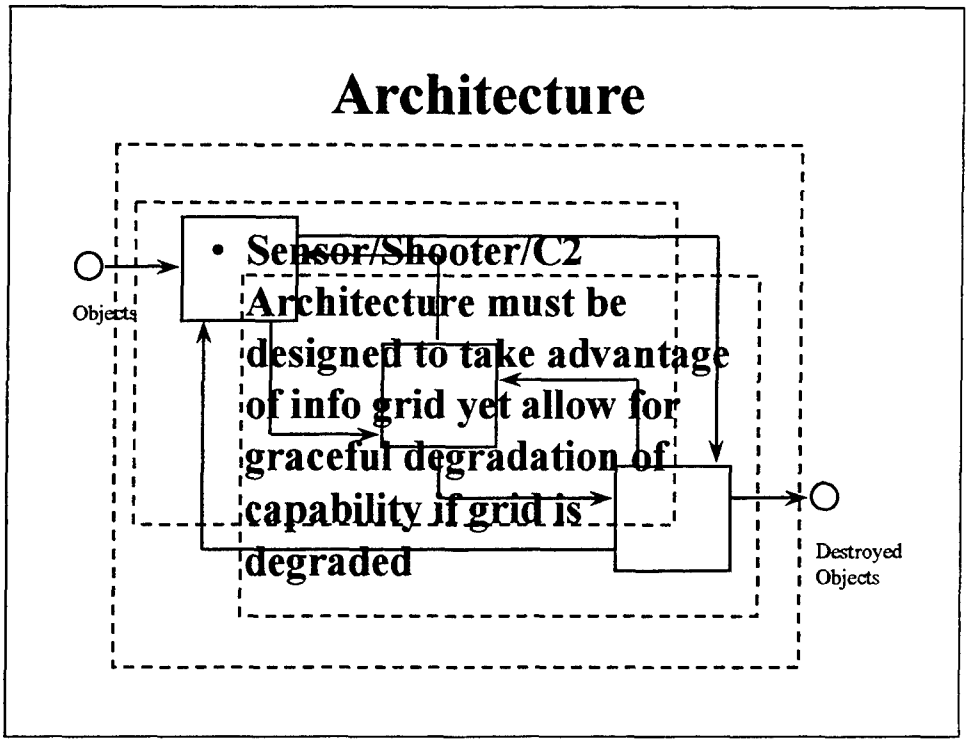
Regarding distribution of capabilities, you no longer need to co-locate sensors, shooters and command nodes. You can have things like thin shooters that don't have sensors -- that was the arsenal ship -- basically a shooter with no commander, control, no sensors, and dependent totally on the network for its C3 support.

Force Structure



- Networks become key elements of force structure, of equivalent importance to platforms and weapons
- Smaller forces can be equally effective

We need to think of networks as key elements of the force structure, just like platforms, weapons and sensors.



Architecture has become very important -- functional, operational architecture. How is it all going to work together? How is the JSTARs going to get its targeting information to the cockpit of a Hornet, or to the DDG that's going to fire a TLAM?

You've got to work the functional architectures, but right now we're not organized in OPNAV to do that. This is a major issue we're working on the OPNAV staff -- the need for an operational requirements architecture, and how we're going to put that together.

Requirements/Programs

- Must buy bandwidth and C2 applications to optimize overall capability
- Balance of investment shifts toward C4
- Need more emphasis on integrating C4 into platform, sensor, weapon requirements
- Need a REQUIREMENTS ARCHITECT

In our requirements and resourcing programs, we need to think of the importance of those networks. One of the questions from the Joint Military Assessment studies was, "Are we buying enough bandwidth to go with all the exciting new warfighting applications we're buying, such as tactical TLAM, which requires a data link?" The answer, in general, is, "Probably not." We need a better balance between bandwidth and new weapons.

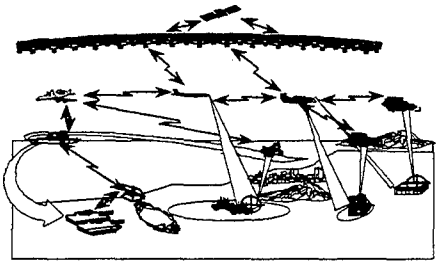
Acquisition

- Treat C4 systems as combat systems (design, engineering, installation, support)
- Need better integration with sensors and weapon systems

We need to treat C4 systems as combat systems in the way we design, engineer, procure and support them. It's not ADP and we shouldn't treat C4 systems the same way we treat ADP.

Doctrine/Operations

- Need to develop CONOPS for NWCW and new CONOPS for each warfare area reflecting network centric approach
- Need to protect the networks
- Implications of loss of electronic stealth

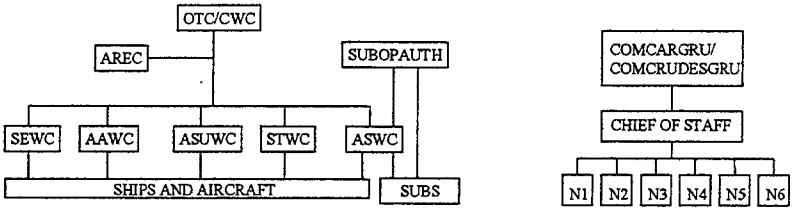


There are a couple of things we really need to think about in the doctrinal area, in the operational area, here. We're building ourselves a pretty healthy vulnerability, in the sense of our growing reliance on information technology and these new networks. We have to think about how we're going to protect them; and we know the enemy is going to take some of them away -- if we fight a smart foe. So the networks must be able to degrade gracefully and still be able to get the job done. There are lots of implications in the support area. I won't dwell on those.

Support

- NWCW enables "Just in time" logistics concept
- NWCW information grid is a necessary condition for USMC's Seabasing concept
- Need to integrate tactical support with tactical IT

Typical Staff and CWC Organization



How best can we use improved ... ?

- situational awareness
- information access
- communications

I want to just hit a couple more points. We were talking about this earlier, with Admiral Tracey and Admiral Oliver. There are some profound implications for organization, leadership and command of the new information technology.

Everybody talks about flatter organizations. In a sense, we certainly have flattened the organization in terms of information flow. It's much easier for everybody in an organization to communicate -- vertically, horizontally, diagonally. Anybody can send the CNO an e-mail, for example, and he can send one to anybody else. That's a net plus, although I know there is some concern about seniors having such good visibility at the ranks. But, in general, that's a wonderful thing. It enables us to share the information, as needed.

What's the implication for command and control of this new information flow? And do we really want to change the hierarchy, the line of command, as we are changing the lines of communication? Do we want to flatten the organization from a command and authority standpoint? We have to think about things like span of control and responsibility and accountability before we go about reengineering our structures and flattening our organization in that way.

Alternative Organizing Schemes
Subordinate Commanders

Modified CWC	JV 2010	NWCW Grid	Medium
SCC	Protection	Sensors	Land
ACC	Engagement	Information	Sea
AADC	Logistics	Shooters	Air/Space
MIWC	Maneuver		C2/Cyberspace
	Information		

The CWC concept as currently evolving has a Surface Combatant Commander, an Air Component Commander, an Area Air Defense Commander, and a Mine Warfare Commander.

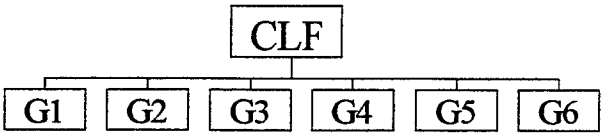
Another approach would be to divide subordinate commanders by the JV2010 functions of Full Dimensional Protection, Precision Engagement, Focused Logistics, Dominant Maneuver, and Information Superiority.

A third approach would be to assign subordinate commanders by the three grids in the Network Centric Warfare construct. Thus, there would be subordinates for Sensors, Information, and Shooters.

The final proposed structure breaks subordinates' responsibilities along geographic lines.

Note that this list has not been exhaustive, so other structures are possible. Note also that all of these except the Modified CWC structure have a subordinate commander for Information.

Role of Command



- No longer a conduit for crucial info
- Value added is "command" - assessment, guidance, decision, synchronization
- Must preserve authority and accountability of commanders

Where is the role of command? Command is no longer a conduit of information. That's the benefit of the new means of communicating, and that's probably good. We're not husbanding information like we used to.

So, now you reduce command to its true value-added essence -- strategic leadership; visioning, providing guidance, and adding value to and assessing the information. That's what command is really all about. That function is still there. Technology hasn't changed that.

Personnel

- Training and Education - we need people who understand Information Technology and Information Management; need to redesign curricula (e.g., from Thermodynamics to Information Science)
- Information Warrior Community/Career path
- Retention?

Finally, in the area of personnel - - of most interest to this conference - - I think there will be some very profound implications for education and trainind at the undergraduate level, the graduate level, and the professional military education level.

As far as the undergraduate level goes, I think we need to take a look at the technical part of the curriculum – at the balance between traditional science and information science. Maybe you don't need two years of steam engineering or two years of electrical engineering – you may need something less than that – and a lot more information science, to understand the basic underlying technology that's revolutionizing everything we do.

At the PME level, we need warfighters who understand how to use this new technology. You don't need to get into the science, but you do need to get into the applications, how to use it, and what the doctrinal impacts are. So network- centric warfare, the concept of operations that goes with that, would be a key element of the PME.

Recommendations

- Reassess balance of investments
- Improve integration of C4 into functional warfighting requirements
- Improve integration of C4 and combat systems
- Establish study groups to assess implications and make recommendations in each functional area - doctrine/ops, organization, training & education, support
- Recommend two organizational constructs be chosen and wargamed (perhaps at Global in July 1998)
  - INW JMA recommends the Network Centric Warfare Grid Organization and the Geographical Organization as the two test cases

These were the recommendations we presented to the JMA conference, and I won't go into those in detail.

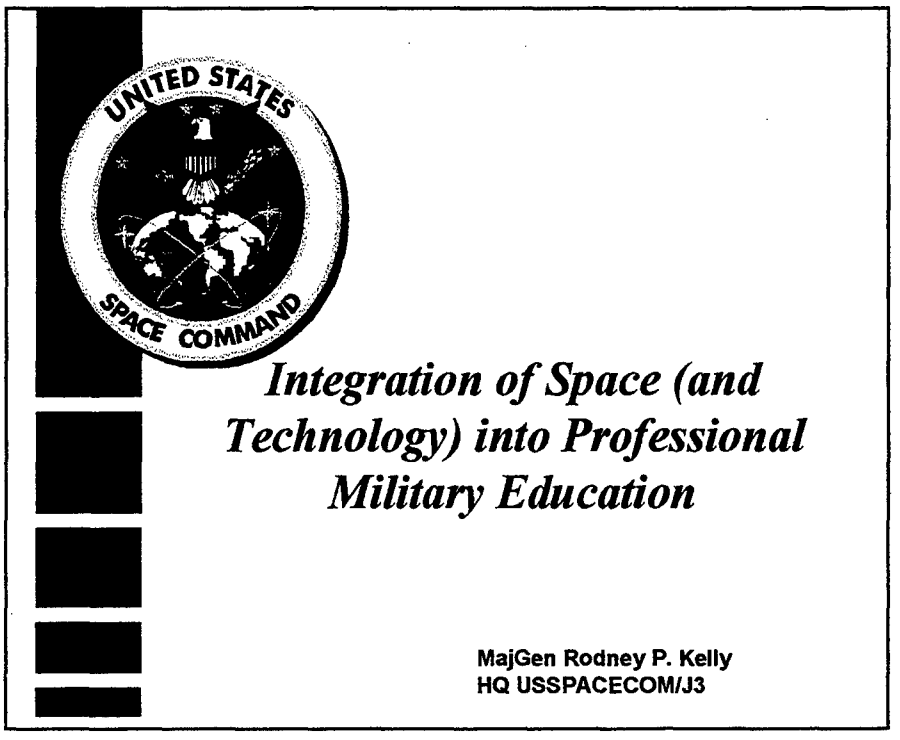
As far as education goes, it is most important that we exploit the information revolution. I know this is happening, to some degree, with the Naval Academy's Curriculum 21 study, and I know there have been some fundamental changes here at the Naval Postgraduate School in the information science curricula -- in the new arms course for flag officers. Those are the kinds of things we need to be doing across the board to fully exploit this exciting information revolution.

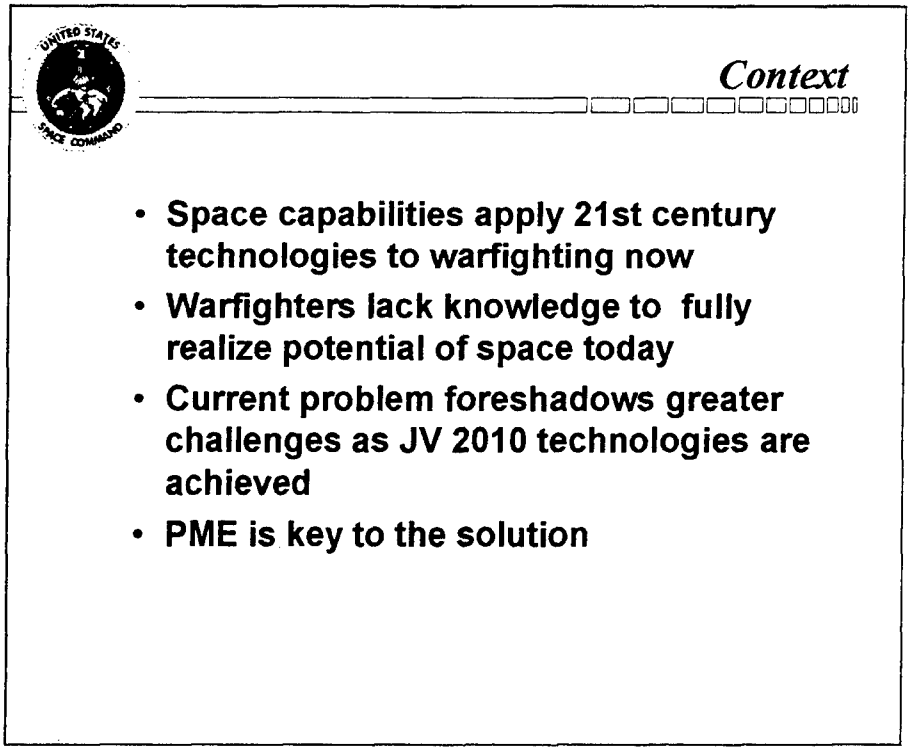
Thank you for your attention. I'll defer to the next speaker, and look forward to your questions.

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NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

Presentation by
Maj Gen Rodney P. Kelly, USAF
Director of Operations, J-3
Headquarters, U.S. Space Command





I'd like to start by putting my remarks in the context of this conference. Over the last several months we have been actively engaged in trying to get space integrated into the core curricula of our service and joint PME schools. In November, I presented a version of this briefing to the Military Education Coordination Conference, and I was asked to give it here, as part of the broader issue of integration of technology into PME.

And, I do believe that our current efforts directly apply to where we should be going in applying JV 2010 technologies to warfighting. Essentially, space capabilities represent the application of 21st century technologies to warfighting today, and, to be honest, we, the DoD are not doing a great job of it. Our warfighters just don't have the knowledge to fully realize the potential of what's out there now, much less the incredible technological advances, both in space and otherwise, looming on the horizon.

Our PME system must play a key role in soving this problem.



Here is an overview of our effort to advocate the integration of space into PME. I'll start with a brief introduction to U.S. Space Command, who we are and what we do.

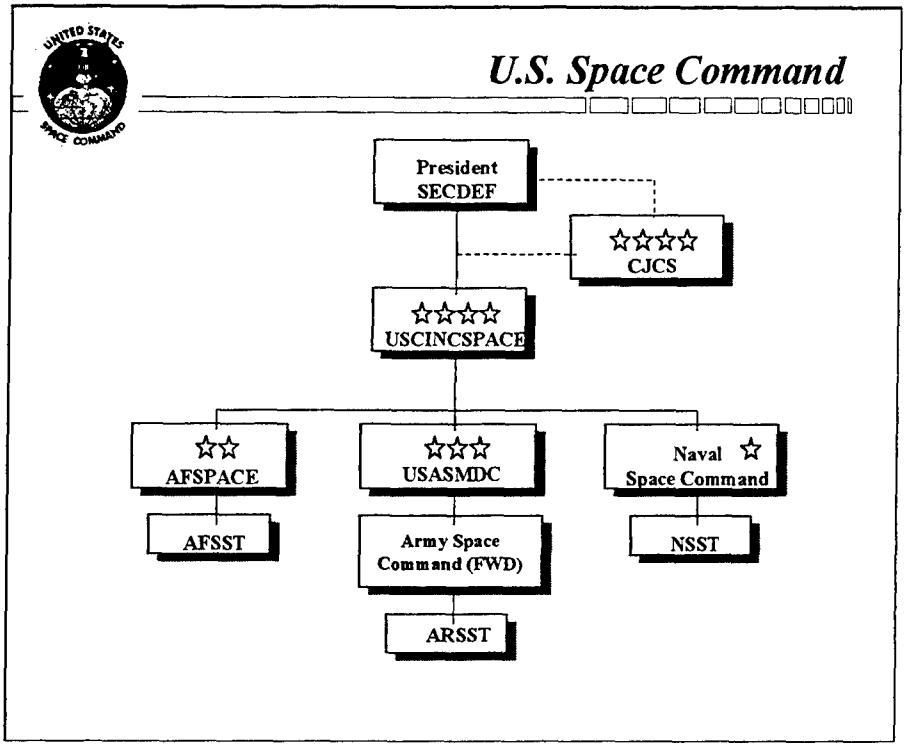
Then I'll use a quote from the Officer Professional Military Education Policy, again to put space cababilities into a context of JV 2010 technologies.

I'll show you that space is important to warfighting, and that our warfighters don't know enough about it.

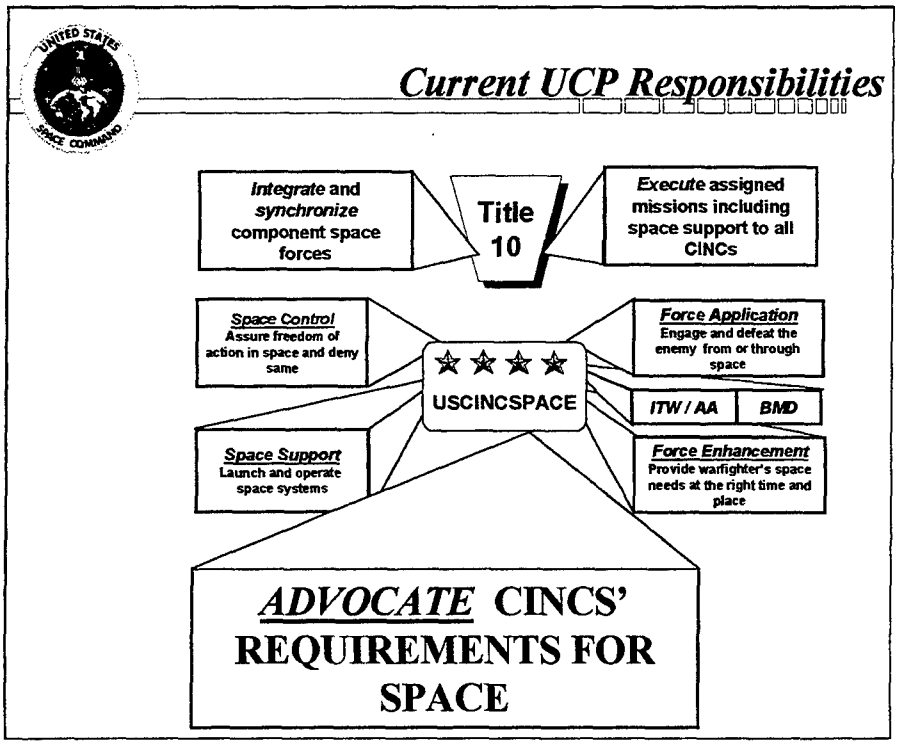
I'll describe what we think are the solutions to the problem, a big part of which is the doctrinal foundation built by our professional military education system.

Our objective, then, is to educate warfighters in what they need to know about space to improve their warfighting capability, now and in the future.

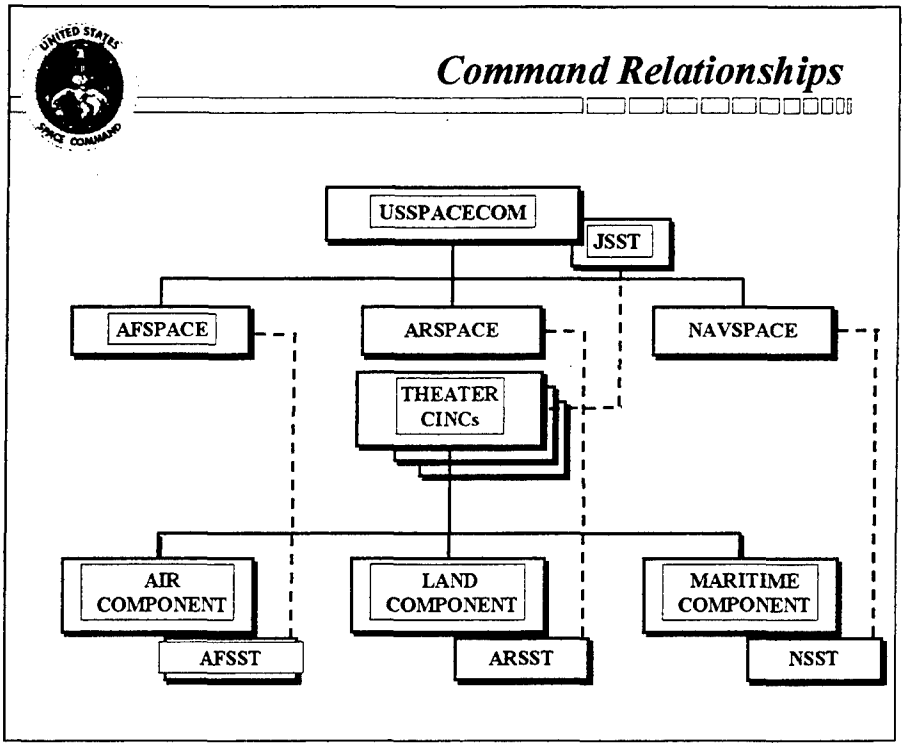
And I'll describe what we at SPACECOM can provide to help make it better.



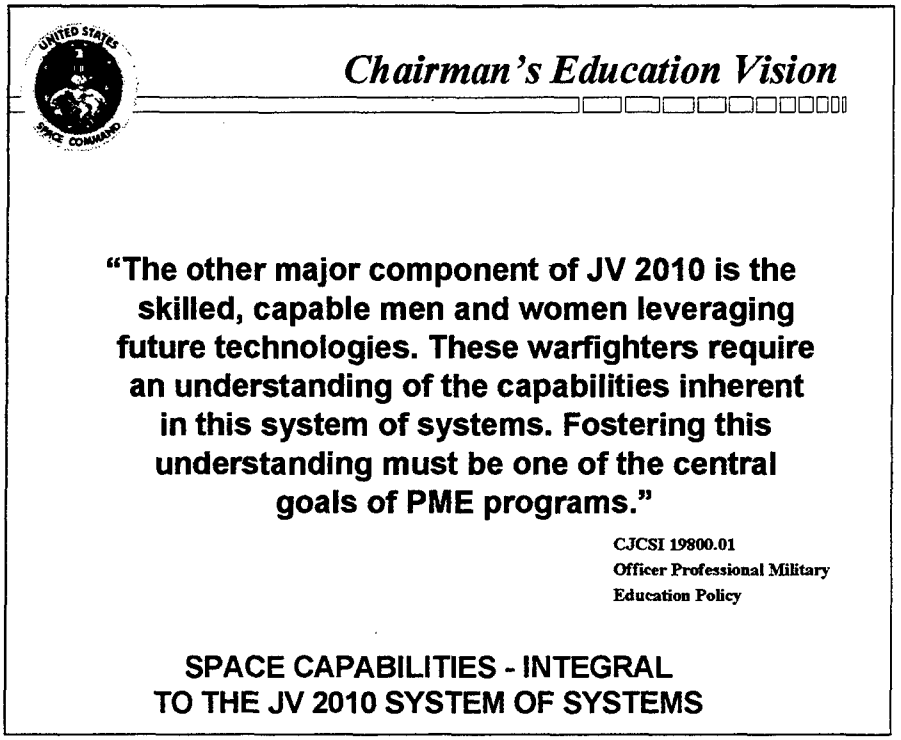
U.S. Space Command is one of the nine unified combatant commands. Were headquartered in Colorado Springs. Our current CINC is General Estes. We've got a typical unified command structure with Army, Navy, and Air Force components.



One of our key Unified Command Plan responsibilities is to advocate space requirements for all the Unified CINCs. It is in this role that we are working towards integration of space into PME.



Our primary interfaces with the other combatant commands are through our Joint Space Support Teams and our component space support teams during exercises and real world operations. We also coordinate space requirements with the other CINCs through our Integrated Priority List process, fulfilling our space advocacy role.

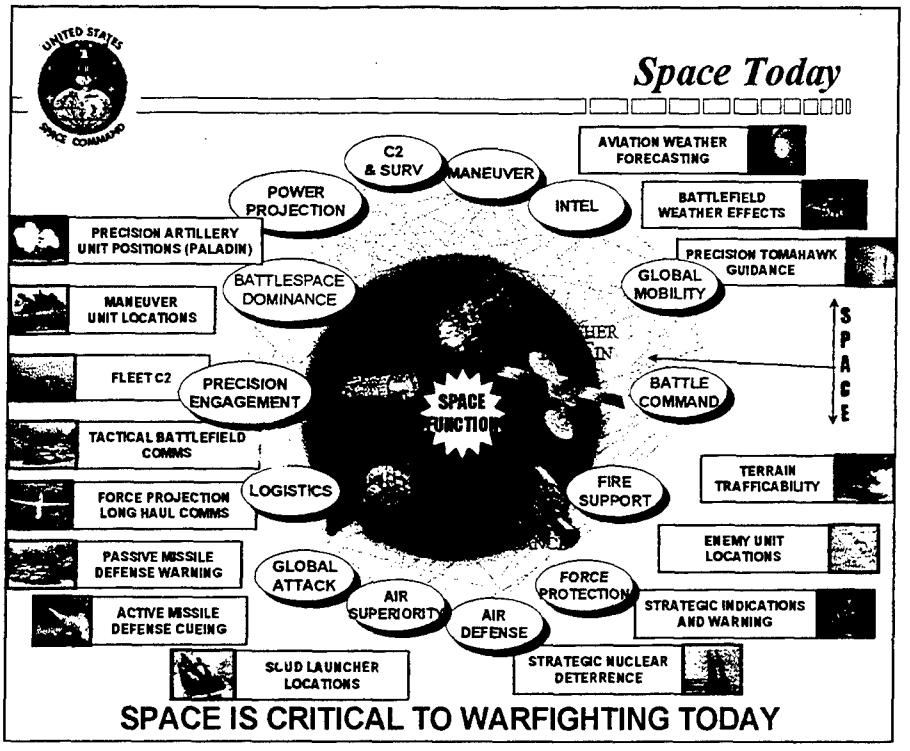


I pulled this quote from the Chairman's Officer Professional Military Education Policy.

We don't think you can achieve Joint Vision 2010 without total integration of space capabilities into the system of systems.

To do this our warfighters have got to understand these space capabilities.

Clearly this goal is central to the theme of this conference.



I think the best way to show the impact of space on warfighting today is to look at warfighting functions; the Army's Battlefield Operating Systems, the Air Force Core Competencies, and Naval Expeditionary Forces Critical Operational Capabilities (I've listed some of their components around here), and see how the space functional areas, communications, position/navigation, weather/terrain, warning, and reconnaissance/ surveillance, influence them.

For example, the space based navigation system, Global Positioning System enhances the Army Fire Support BOS by providing precise artillery firing unit locations. The new Paladin Howitzer has a GPS card built right in to its black box computer system.

GPS also enables precision engagement by providing navigational information to the cruise missile weapon systems.

In fact GPS receivers have proliferated throughout our forces enabling just about every combat function. Interestingly, GPS is used not just for locations, but for accurate time information. In Korea they are using PLGR time to synchronize frequency hopping SINCGARS radios across the 2 ID, and for synchronization of all combat operations. They no longer have to do the old time hack routine.

Likewise, space-based communications play a key role across the warfighting functional areas, from strategic command and control of forces world-wide, to fleet command and control, to tactical communications on the battlefield, with deep long range patrols for example.

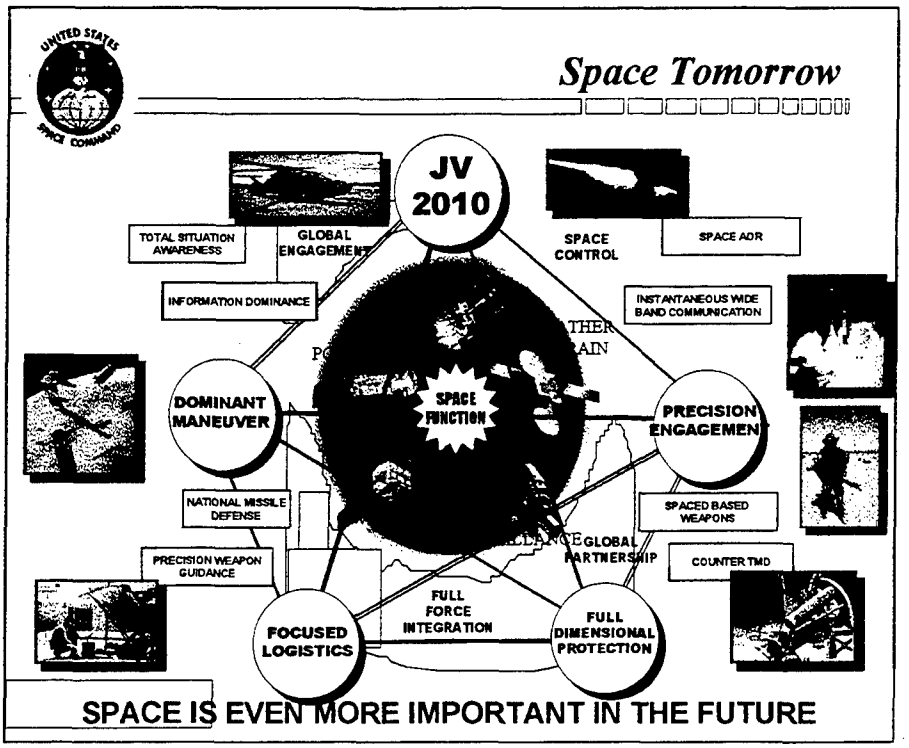
Space-based warning assets play a critical role in force protection. From DSP, information is provided to support all TMD pillars - active cueing information, impact locations for passive defense, launch locations for attack operations, and communications capability for BMC3.

Weather information from space also has significant impact on operations, supporting aviation in all the services, as well as how weather affects infrared, laser, and other weapons systems. The capability now exists to direct downlink the kinds of weather information you see on CNN to units on the battlefield.

MSI satellites like LANDSAT and SPOT provide terrain information, not only for accurate mapping, but for trafficability information too, enabling maneuver on the battlefield

And of course, reconnaissance and surveillance satellites provide battlefield intelligence to commanders.

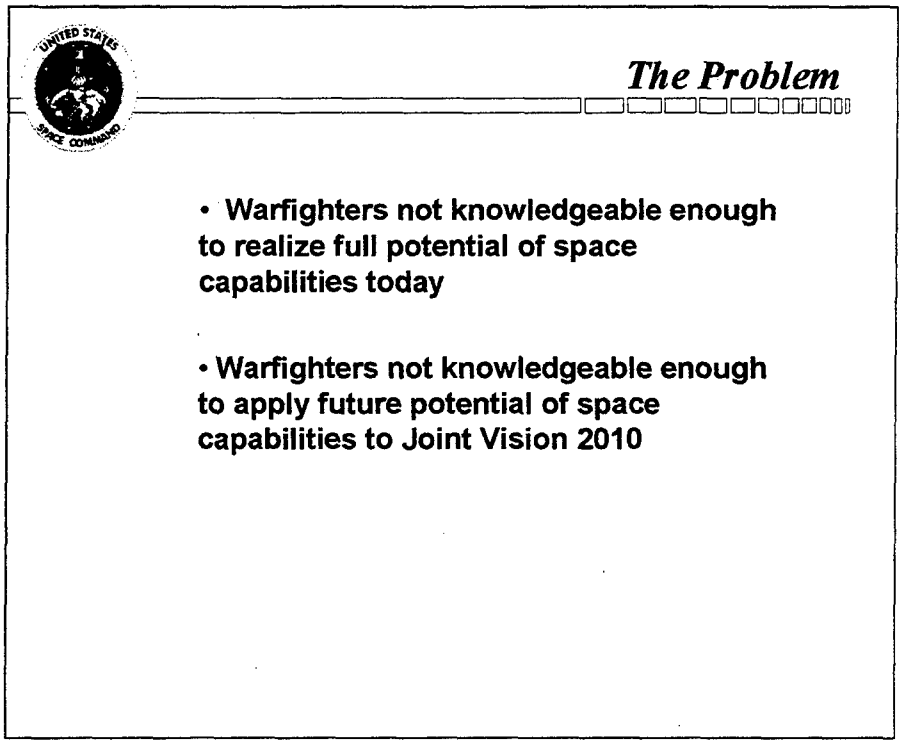
At the strategic level, space plays a key role, enabling our National Military Strategy, providing early warning for nuclear deterrence, and indications and warning for go to war decision making.



As we work towards JV 2010, our CINC's vision builds on current space functions, fully integrating space capabilities into dominant maneuver, precision engagement, full dimensional protection, and focused logistics. In fact, the total situational awareness and information dominance envisioned for JV2010 will be impossible to achieve without space.

Global engagement from space will be possible, allowing for National Ballistic Missile Defense, protection of the U.S. from cruise missiles, and potentially even engagement of enemy forces from space.

Control of Space, the assured access to space, protection of space assets, and space denial, will be critical, not only to our military capabilities, but to free market economies worldwide.



The problem, which we have observed during exercises and real world contingencies, is that our warfighters do not understand how to employ, or even ask for the capabilities that space provides.

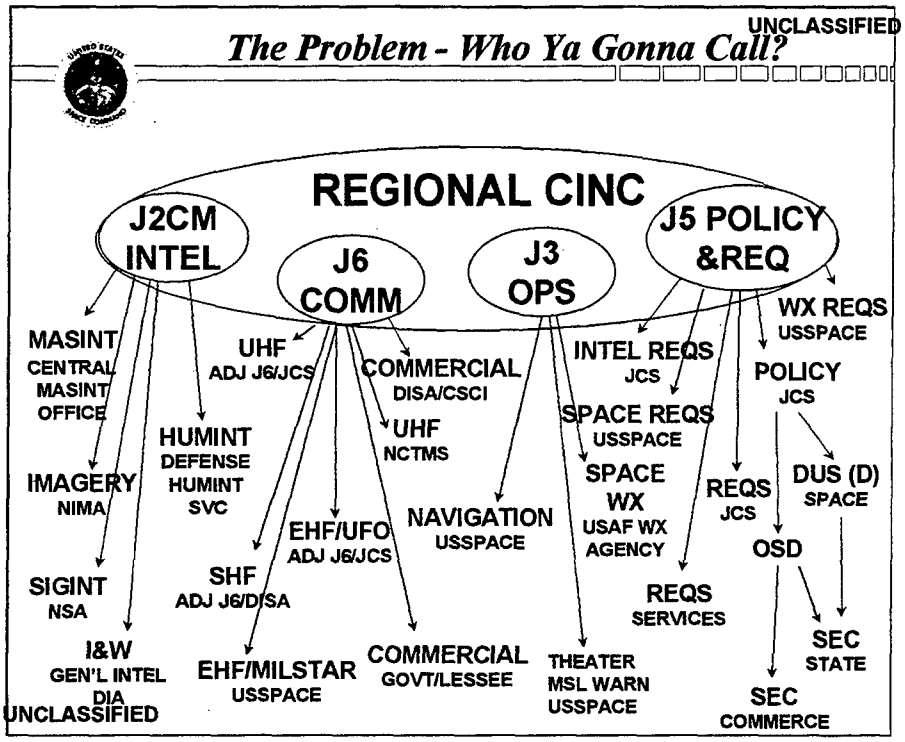
I talked earlier to how space impacts warfighting functions at the strategic, operational, and tactical levels of war. At least once a month I speak to the J3's of various geographical CINCs involved with actual contingencies or exercises, and they are always surprised at the capability space brings to the battlefield. And, they want to know how they can get it.

Along with the capabilities space provides, come limitations and vulnerabilities. We are working hard to minimize these, but we must guard against taking space capabilities for granted. For example, we are hearing about a relatively inexpensive GPS jamming capability that could bode ill for the kinds of applications I spoke about earlier.

As space technology advances by leaps and bounds, we seem to be falling behind in military applications of these technologies. Particularly exciting are the capabilities represented by Personal Communications Systems and Direct Broadcast Service. In the near future, your cell phone, through low earth orbiting satellite systems like Irridium and others, will be able to reach anywhere in the world from anywhere in the world, not just for voice, but for rapid data transmission. Being able to bring in 120 channels of television through a very small satellite dish like those sold by DirectTV and Prime Star is a capability that boggles the mind in terms of military situational awareness. Lack of knowledge of these technologies and their potential applications will not help the attainment of JV 2010.

At the strategic level, the protection of the U.S. homeland, a vital national interest, against ballistic missile attack, will occur in space. Many people think that capability already exists, while in fact a decision has not yet been made that we need it.

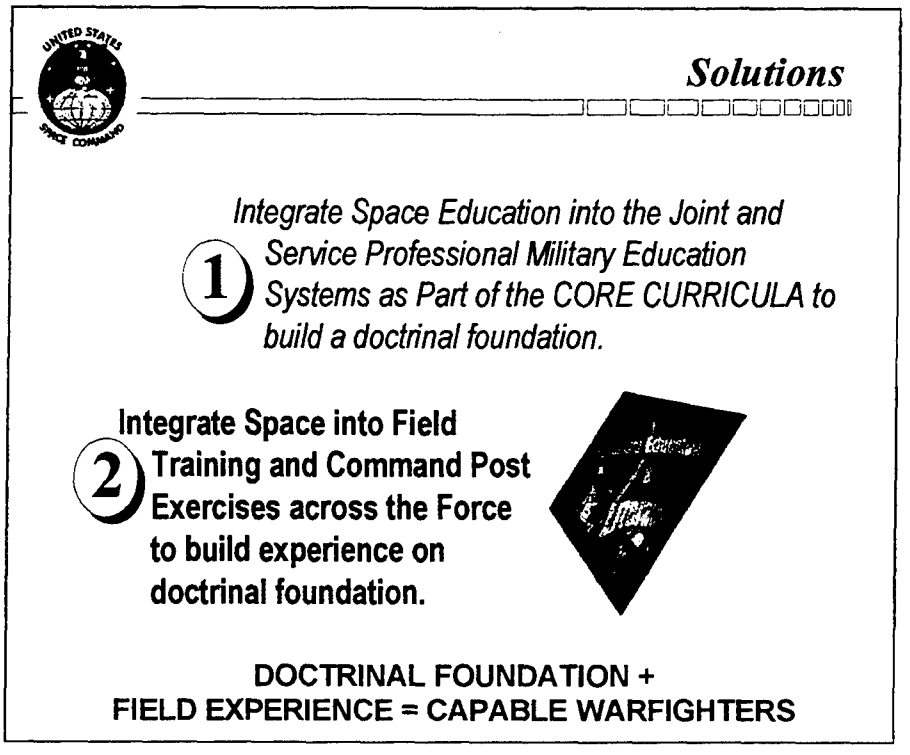
And, as free market economies become increasingly dependent on space, protection of those assets will become a key strategic mission.



This slide highlights what every four-star who comes back to play space wargames at any of our service schools highlights in the wargame lessons learned. Given all of the capabilities of all the sensors we have in space, whether commuinications, intelligence, or those that provide other operational pieces of the puzzle, who do you call, how do you task it, how do we get the information that we get from space based assets to the warfighters. That is our teaching challenge.

When we start warfighting these sensors, the same way we warfight any other platform we have, then we will start getting the battlefield situational awareness that Admiral Nutwell just covered in his network centric warfare brief. That is where our potential is as a nation to have the greatest advantage. Someone has said that our choices in the future are going to be greater. Well, these are the choices we have today - that warfighting commanders need an understanding of. How do you put that into effect operationally?

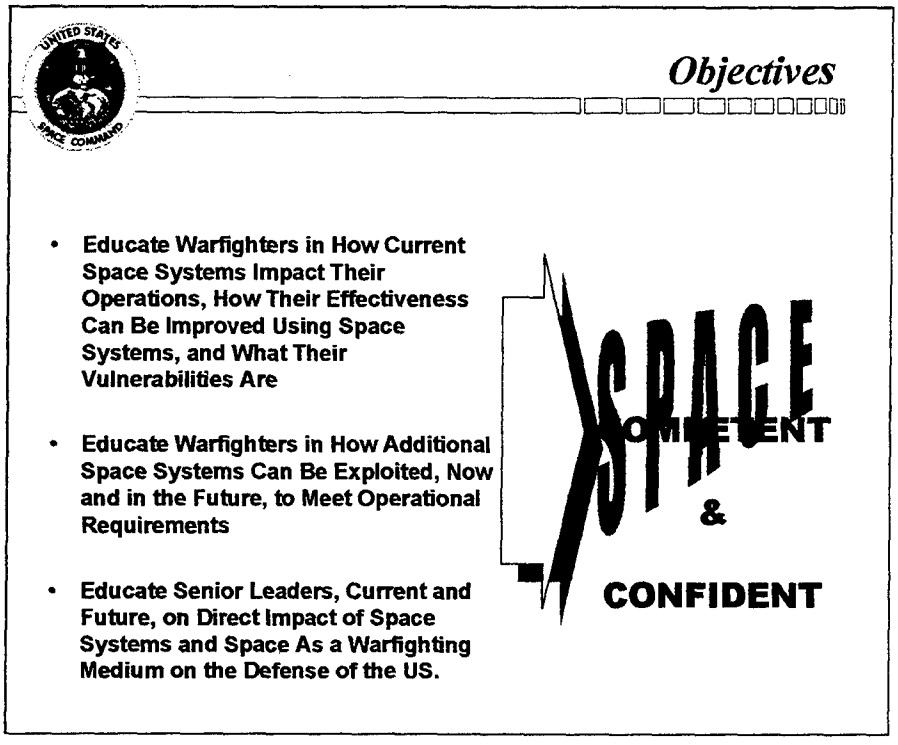
Again, not the understanding of the technical part of the system, but at least enough understanding of the technology to know how it applies and how it enhances what you are doing operationally in your campaign plan.



We are attacking the problem in two ways.

The first is why I am here today. We feel that it is extremely important to build the doctrinal foundation of space literacy, and the application of JV 2010 technologies, through professional military education.

We are also trying to build an experience level with space capabilities with our participation in exercises, over 55 exercises and wargames this fiscal year. Our efforts include the services' futures wargames such as Army After Next, Global, and Global Engagement. These, however, touch relatively few people, compared to the education process that reaches a broad based population.



We break our space education goal into three objectives.

They are understanding of current capabilities, limitations, and vulnerabilities;

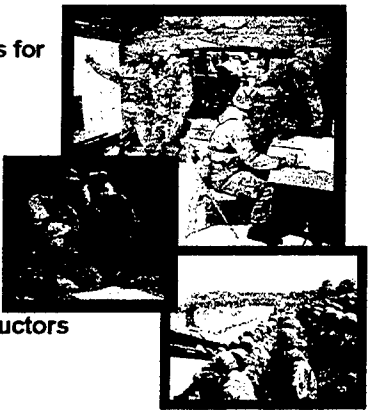
understanding of technological advances that can enhance warfighting today and in the future (JV 2010);

and understanding of the ramifications of the warfight in space on the defense of the U.S.

The most recent Space Architect vision for space operations recommended that we develop and teach doctrinal concepts for space integration. That translates into what resources are there, what can the warfighter task, and what can the warfighter expect. That's what we have to teach.

Execution

- Establish Specific Learning Objectives for Respective Schools
- Build Space Body of Knowledge
- Train Current Resident Instructors
- Leverage information Technologies
  - CD ROM
  - Homepage/Internet
- Interim Instructor Teams
- Assign Resident Space Qualified Instructors
- Provide Briefings and Demos
- Participate in Wargames



CINCSPACE PROVIDES GUIDANCE AND ASSISTANCE

We at SPACECOM are not in the position to be directly involved in the education process. We do feel however that we should try to influence education policy, provide space education requirements, and guidance in the form of specific learning objectives, and reference materials, we're calling it a space body of knowledge. We can also provide training for instructors, JSSTs as interim instructors, with the eventual goal of assignment of space smart instructors to schools. We will of course continue to provide briefings and participate in school wargames, as we do today.

Conclusions

SPACE MUST BE INTEGRATED INTO PME CORE CURRICULA NOW

TO ACHIEVE JV 2010, WARFIGHTERS MUST BE EDUCATED ON APPLICATIONS OF TECHNOLOGY TO WARFIGHTING



TO DEVELOP **"SKILLED, CAPABLE MEN AND WOMEN LEVERAGING FUTURE TECHNOLOGIES"**

We have concluded that we must integrate space into PME now, to enhance current warfighting capabilities and build understanding of future space applications.

On a broader scale, it seems clear to me that the same logic applies to future technologies in general; we must teach their applications in our schools.

MAJOR GENERAL RODNEY P. KELLY, USAF
Director of Operations, J-3, Headquarters U.S. Space Command
Peterson Air Force Base, CO

Biography under revision - promoted August 1, 1997 - reassigned as director of operations, J-3, Headquarters U.S. Space Command, Peterson Air Force Base, Colo.

Brigadier General Rodney P. Kelly is director of plans, Headquarters North American Aerospace Defense Command, Peterson Air Force Base, Colo. He is responsible for planning for the safeguarding of the air sovereignty of North America (Canada, Alaska and the continental United States); originating joint and binational plans and agreements to accomplish surveillance, warning, aerospace control and counterdrug missions; and programming the development, employment and sustainment of Canadian, U.S. Air Force, U.S. Navy and Marine Corps forces at contingency and wartime bases.

The general was commissioned as a distinguished graduate through the Reserve Officer Training Corps program at Southern Illinois University, Carbondale, in December 1967. He is a command pilot with more than 4,000 flying hours to include combat.

His 30-year career has included assignments in Europe and Asia. His most recent responsibilities have been as assistant for air defense, NATO policy, Office of the Secretary of Defense, international security policy, the Pentagon, Washington, D.C.; Commander, 3rd Wing, Elmendorf Air Force Base, Alaska; Pacific Air Forces assistant director of operations, Headquarters Pacific Air Forces, Hickam Air Force Base, Hawaii; director of plans, Headquarters Pacific Air Forces, Hickam Air Force Base, Hawaii; and director of plans, Headquarters North American Aerospace Defense Command, Peterson Air Force Base, Colorado.

General Kelly received a Bachelor of Science degree in agriculture, and a Master's degree in business administration from Southern Illinois University. He is a graduate of Squadron Officer School, Air Command and Staff College, and Air War College.

Among his awards and decorations are the Defense Superior Service Medal, Legion of Merit, Meritorious Service Medal with three oak leaf clusters, Air Medal, Air Force Commendation Medal with oak leaf cluster, Air Force Outstanding Unit Award with "V" device, Combat Readiness Medal, National Defense Service Medal with bronze service star, Armed Forces Expeditionary Medal, Small Arms Expert Marksmanship Ribbon with bronze star, and the Republic of Vietnam Gallantry Cross with Palm.

General Kelly is married to the former Mary Ann Missavage of Royalton, IL. They have two sons, Chase and Chad.

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Presentation by
Brig Gen Ralph Pasini, USAF
Vice Director, Operational Plans and Interoperability Directorate
Deputy Director for Military Education

BRIGADIER GENERAL RALPH PASINI, USAF
Vice Director, Operational Plans and Interoperability Directorate
Deputy Director for Military Education

Brigadier General Ralph Pasini serves on the Joint staff as Vice Director, Operational Plans and Interoperability Directorate, and Deputy Director for Military Education. He is responsible for a staff that coordinates conventional war plans; develops joint doctrine and implements Joint Vision 2010; monitors joint training and exercises; coordinates joint professional military education, and evaluates and analyzes joint exercises.

Born and raised in Monongahela, Pennsylvania, General Pasini earned a Bachelor of Arts degree from West Virginia University, and a Master of Arts degree from Southern Illinois University. He entered the Air Force in 1970 and was initially assigned as a biomedical scientist, Wilford Hall Medical Center, Lackland AFB, TX, He then served as Team Chief, 3415th Special Training Group, Air Training Command, Lowry AFB, CO.

After completion of pilot training at Vance AFB, OK, he served as co-pilot, pilot and flight commander, 46th Bomb Squadron, Grand Forks AFB, ND. He completed Squadron Officer School in 1976 and subsequently served as a section and squadron commander at the Squadron Officer School. In 1981 he attended the Combined Air Warfare Course and Air Command and Staff College.

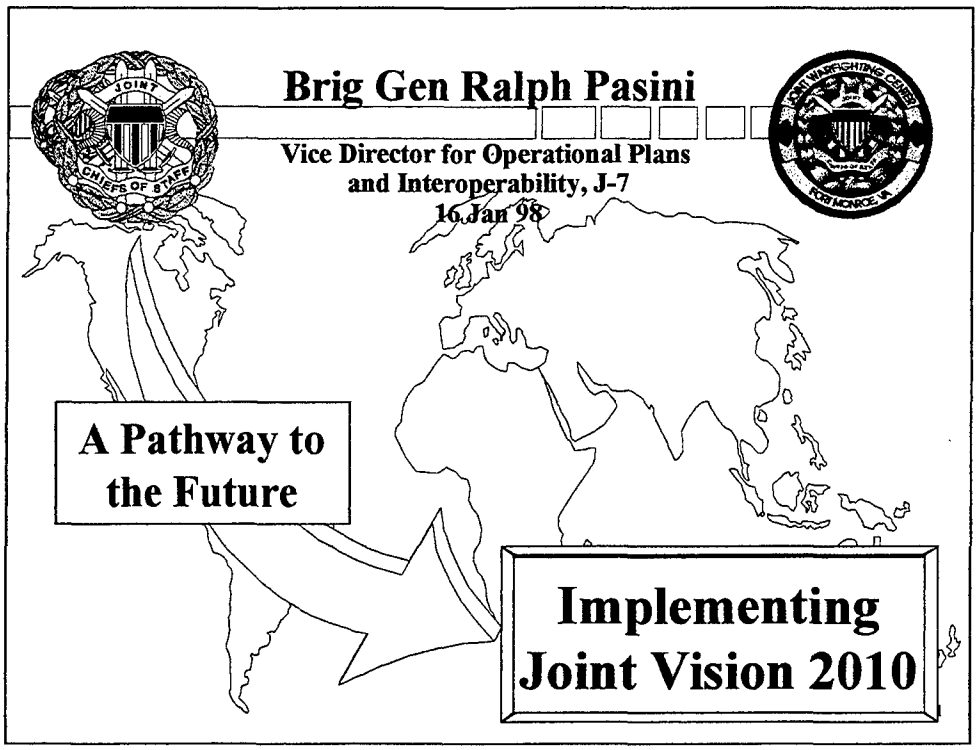
From June 1982 to May 1986, he served as aircraft commander, flight commander, operations officer and commander, 668th Bomb Squadron, Griffiss AFB. In 1987 he attended Air War College, and subsequently served in succession as Chief, Research and Analysis Division; Chief, Philippine Bases Relocation Study; and Chief, Policy and Strategy Division, United States Pacific Command at Camp H.M. Smith, HI. Promoted to the rank of Colonel in July 1988, he was assigned as a Senior Controller, Strategic Air Command Underground Command Center, Offutt AFB, NE.

From September 1990 until August 1993, be served as Assistant Deputy Commander for Maintenance, 96th Bomb Wing; Commander, 96th Operations Group; and Vice Commander, 96th Wing, Dyess AFB, TX. From August 1993 to August 1995, he was the Commander, 5th Bomb Wing, Minot AFB, ND. He was subsequently assigned as the Deputy Director, Allied Command Europe Rapid Reaction Force Air Staff, Kalkar, Germany.

General Pasini is a command pilot with more than 6,750 military and civilian flying hours including time in various models of T-39, B-52, B-1 and KC-135 aircraft.

In addition to numerous unit awards, General Pasini wears the Defense Superior Service Medal, the Legion of Merit, the Meritorious Service Medal with two oak leaf clusters, and the Air Force Commendation Medal with oak leaf cluster.

General Pasini and his wife, Dolores (Dolly), both Pennsylvanians, are parents of three children: Nina, Michael, and Dolores Marie.



Good morning everybody. Before I get started, I'd like to thank the Naval Postgraduate School for having us out here. They did a tremendous job getting us in here and getting us set up -- except for one small thing that happened to me. As I got to my room the first night and put my key in the door, the door would not open. I assumed that I had a technical problem and started banging - - this was at 0200 mind you -- and shaking the door, as most bomber pilots would. I beat the hell out of it, and it wouldn't open.

So I went and got my able assistant (Colonel) Mac McLean, and he came up thinking there was a technical deficiency in the operator. He inserted the card and it still would not open, he finally went and got some assistance. About 2:45 in the morning, I was finally able to get into my room - - or rather, I found out they had given me another room. And that's a good thing, because the next morning, I found out that there was a young female in the room I was trying to get into. The headlines flashed before my eyes, "Another Air Force Brigadier General Commits Crime."

So I'm happy to be here, and I'm happy to be able to talk to you about a subject that I've been totally immersed in over the last four months, and that's JV 2010.

... on Introducing Change

And it ought to be remembered that there is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things. Because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new. The coolness arises partly from fear of the opponents, who have the laws on their side, and partly from the incredulity of men, who do not readily believe in the new things until they have had a long experience of them.

Thus, it happens that whenever those who are hostile have the opportunity to attack they do it like partisans, whilst the others defend lukewarmly . . .

The Prince, 1513

There are a lot of people doing a lot of good things with JV 2010. I'm here to tell you that JV 2010 will not fail due to lack of support from the Chairman of the Joint Chiefs of Staff, the vice chairman or the director. This was General Shali's program, and it is now General Shelton's program. It could fail because we do not have the technical capability to do JV 2010, but I doubt that very much. It would be a great shame if it failed because of a lack of information, or misinformation, or disinformation.

So, I'm here today to try to clear up some of the concepts of JV 2010, and to give you my cut on it as a new guy to the program. I've only been at the Joint Staff four months, and I believe my cup is about half-full. As I said, many, many people are working very hard on this program.

I received a calendar in the mail, as I'm sure some of you also did the other day, from Rand Corporation, and I hung it on the wall in my bathroom. I was looking at it one day, and I said, "What's on this calender is a good segue into what I'm going to talk about at the Naval Postgraduate School."

The calendar talks about change. JV 2010 represents a significant change in the way we are going to do business in the Department of Defense over the next few years. We are not indifferent to change. We've been going through a lot of change over the last few years. But, again, it would be a shame if change were the reason that people didn't get a clear idea what JV 2010 is all about.

Purpose

Provide information on the implementation of JV 2010

- **JV 2010**
- **Implementation Process**
- **Assessment Roadmaps**
- **Progress to Date**
- **The "Road Ahead"**



3

I'm going to try to cover the basic road map of where we are right now and where we're going in the implementation process. Some of you already know that my boss, Major General George Close, Jr., U.S. Army is the executive agent for JV 2010. Obviously, also the Joint Warfighting Center and J- 7 are involved as the implementers of JV 2010 in that process. And there are a lot of other folks out there who are involved in this process.

We are joined at the hip with the J- 8 folks who work with Vince Roske. Like any potato- sack race where you have a three- legged vehicle, people occasionally stumble and fall. We're working very hard to fix that.

Joint Vision 2010



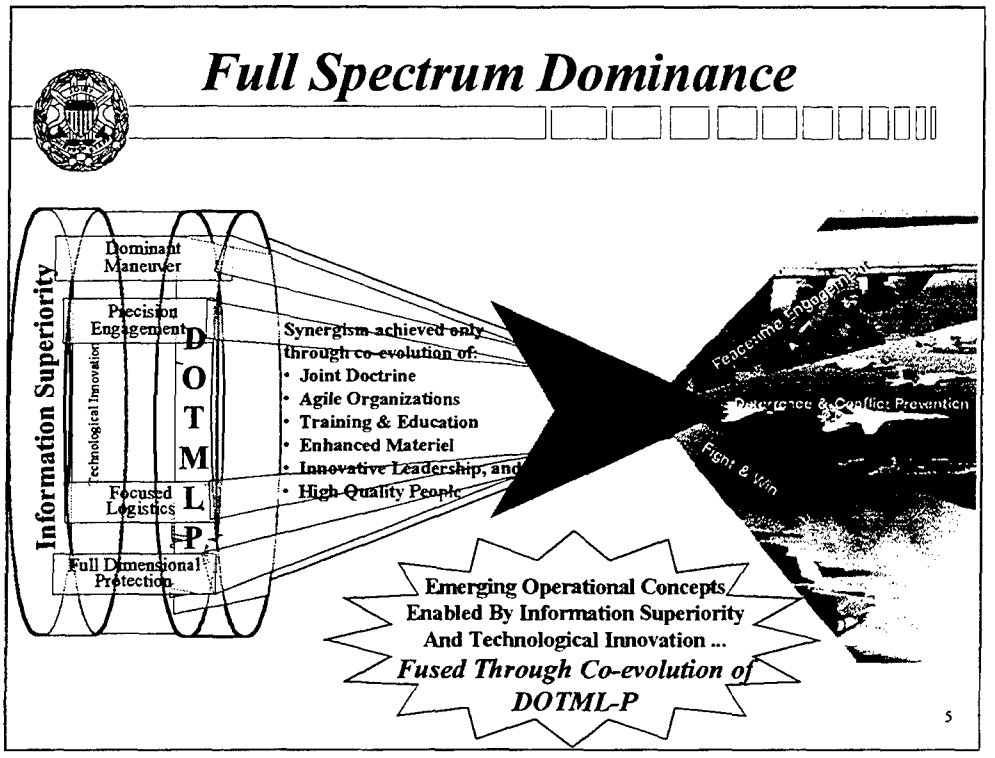
- **America's Military Preparing for Tomorrow: Quality People, Trained, Equipped, and Ready for Joint Operations**
  - **Persuasive in Peace**
  - **Decisive in War**
  - ***Preeminent in any Form of Conflict***

- **The vision is a conceptual template that provides a common direction and framework for our Services to develop their unique capabilities as they prepare to meet an uncertain and challenging future.**

A Pathway to the Future...
Today's Vision ...Tomorrow's Armed Forces

When you all came in the auditorium door, you probably noticed that we had some propaganda to hand out to you -- which were these two items. Most of the stuff I'm going to talk about are in these two books. If you have an opportunity to read those, I think they will capture the words of General Shali and General Shelton about what JV 2010 is all about.

Intentionally Blank



Yesterday Vince Roske put this slide up, and here we're talking primarily about what's on the right- hand side -- about full- spectrum dominance. Everything in JV 2010 is geared towards full- spectrum dominance in the U.S. military in the year 2010, plain and simple. However, it starts at a rather low level. It starts with peace- support, peace- keeping, and peace- enforcement operations. On the upper end are humanitarian operations -- things like we're doing in Haiti right now; things like our troops are doing in Macedonia and on the Golan Heights, as well as in Bosnia. These are all the way through the middle range -- small brush- fire-type things we might be required to do. Now look all the way at the bottom, where we've got to do major warfare in two theaters and/or nuclear operations.

The operations are all encompassing, and that's really nothing new, is it? We're pretty used to doing those kinds of things. On the left- hand side of the diagram, you'll notice our four key parameters: dominant maneuver, precision engagement, focused logistics, and full- dimensional protection.

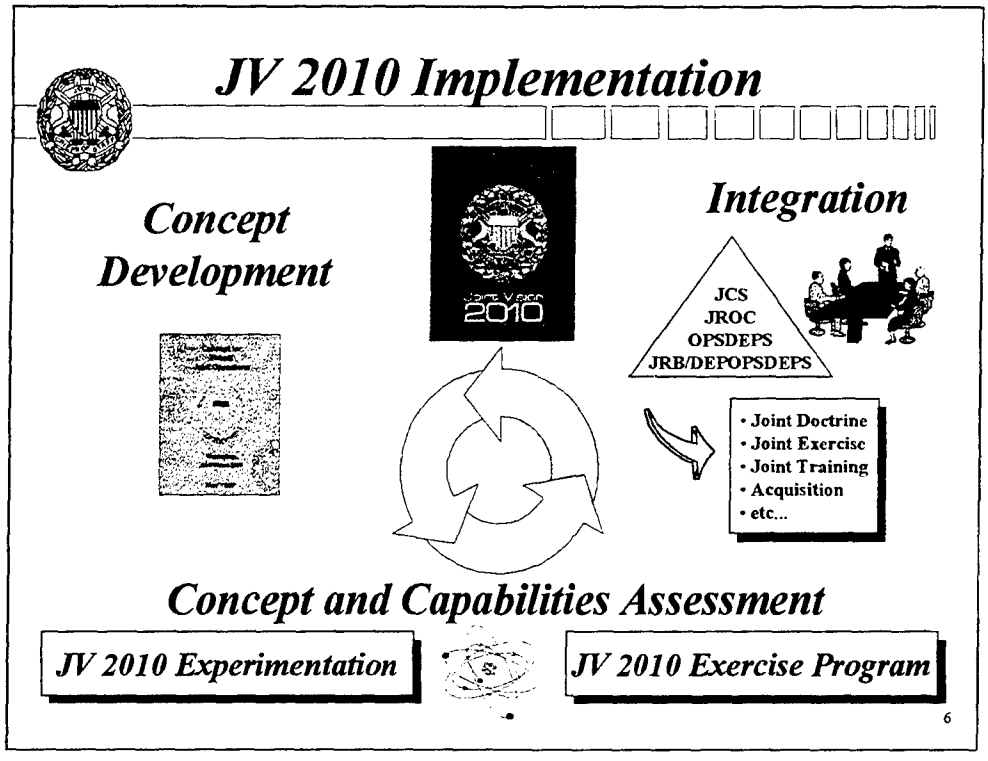
You've probably heard those words before. There's not a lot of change in them. But in the ideas, in the concepts of what they mean internally, there is a significant change, because we're going to bring all forces to bear to accomplish these four goals. As someone said the other day, those on the left are two hoops that we've got to jump through to get to full- spectrum dominance. I like to characterize them as lenses that, again, focus things on full- spectrum dominance. The first lens on the far right- hand side represents two of our enablers, and those are information superiority and technological innovation.

As General Steele said several weeks ago, "If we do not get the information superiority part of this thing right up front, we are doomed to failure." I think everyone agrees with that. The technological innovation will come. And as my boss, Admiral Blair often says, "If Rip Van Winkle were to go away for the next thirteen years and suddenly show up on the battlefield in 2010, he would recognize it immediately. There would be M1 tanks and M2 Bradleys. In the air, we'd see F-15 and F-16 fighters, and maybe some new F-22s. At sea, we'd see carrier battlegroups. There wouldn't be a whole lot of change in terms of what we'd see, would there? But there would be a significant change in the information, and in the ability to communicate information, to bring all these wonderful things we have in space and on the ground into focus. So, that's the really tough part of this equation: information superiority. And we need to pay a lot of attention to it.

In the second lens we have what's called DOTML-P. If you we're a green uniform out there, you'd probably understand that pretty clearly. If you wear a blue uniform, or you're in the Navy, you probably have a less better understanding of what DOTML-P is all about.

We're talking about joint doctrine, and I think that pretty much speaks for itself. We're talking about agile organizations, the ability of organizations to flex as they grow. And we're talking about training and education, which is the key part of this thing, which we haven't really attacked very hard so far. This is something I think we should all listen to very carefully over the next few hours in this room, and certainly over the next few weeks, as General Shelton makes some pronouncements about the role of education in this DOTML-P process.

Enhanced material will come. We've heard a lot about innovator leadership today because you play a key role in developing that. And high-quality people are the single most important part of this equation. So, I'm going to refer to this as DOTML-P.



Up at the top, we have Joint Vision 2010 -- the purple book you should all have a copy of. We think it's important that you read this 33-page document. It came about when, several years ago, General Shali brought General Wes Clark down to his office and said, "I need you to put together some ideas. The Cold War is over. We were triumphant in Desert Storm. It's time for us to look ahead about how we're going to fight and win on the prairie in 2010."

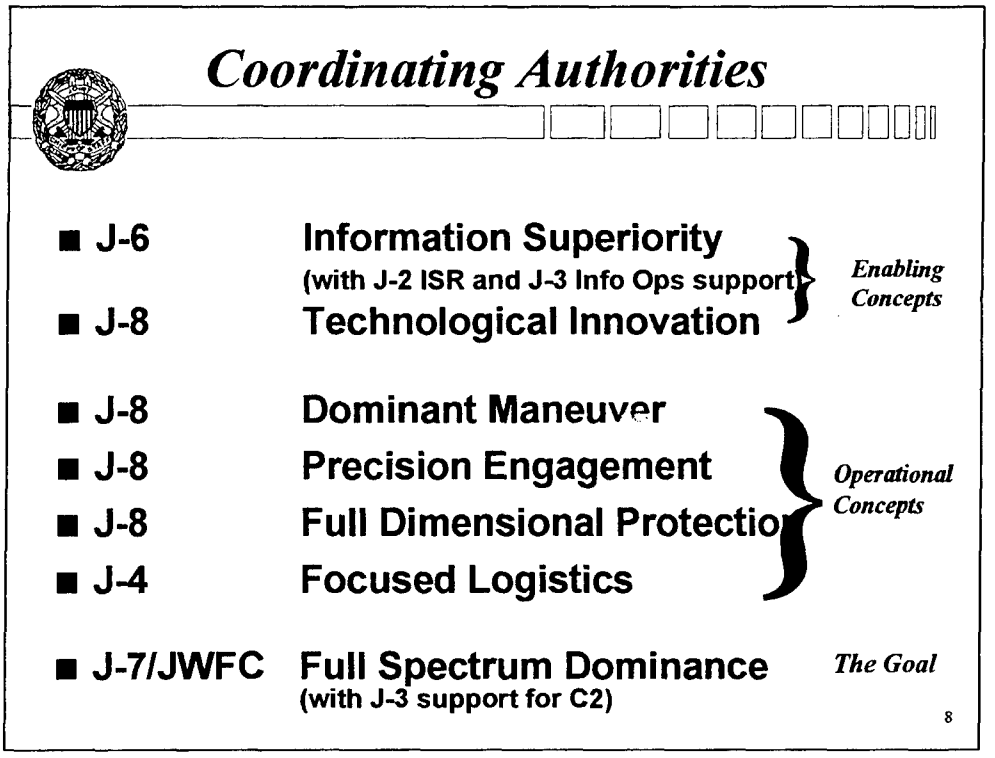
The second part in this equation was published in May 1997. It's called the Concept for Future Joint Operations. It steps further down the road from what's in the purple book. It lays out how we're going to go about getting through the four concepts, establishing the five or six challenges that are under each of those concepts, and the desired operational capabilities that will result from that process.

So, this is also a key part of what we're doing. It's good reading -- about 90 pages. Yet, frankly, you have to read it several times until what we're trying to do here settles in. We're trying to take desired operational capabilities we have today and translate those into required operational capabilities (ROCs) for the 2010 battlefield. We're going to do that with JV 2010 experimentation and exercise programs. We've already started some of this with things that the Army and the Navy have been doing, some of which you've already heard about from previous speakers at this conference.

What we have to do though, is integrate all this information and get it up to the decision-makers -- up through the JRB, and the DEPOPS DEPs, the OPS DEPs, the JROC, an the JCS -- for full integration, so that the DOTML-P piece can be changed by the services and by the CINCs. We think we've started that process.

Terminology

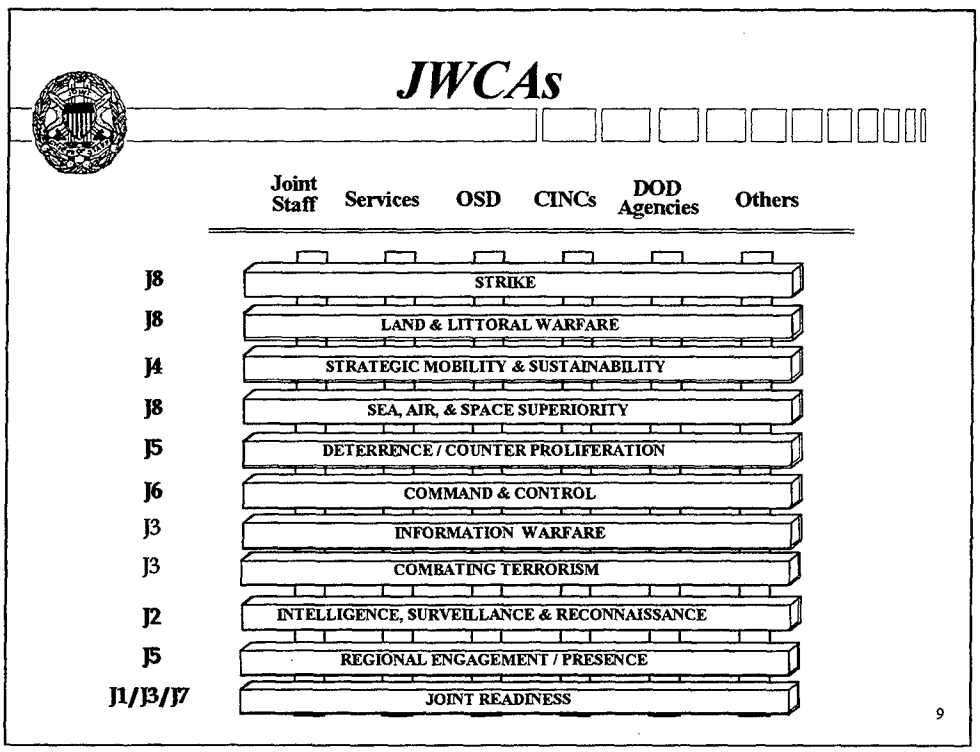
- Coordinating Authority (CA) -- An individual assigned responsibility for coordinating specific Joint Vision functions or activities. Authority to require consultation, but not to compel agreement. Refers unresolved matters to the Chairman, Joint Chiefs of Staff. Each individual has latitude to task organize and develop appropriate relationships unique to each functional area.
- 21st Century Challenge -- A security challenge relevant to the future environment which serves as compelling rationale for investigating desired operational capabilities. A "Linchpin Challenge" is the most leveraging and demanding 21st Century Challenge(s) within a coordinating authority's area.
- Core Tasks -- Describes what the Joint Force Commander must be able to accomplish. Consists of a logical grouping of Desired Operational Capabilities.
- Desired Operational Capability (DOC) -- A concept-based statement of the ways and means to satisfy the Joint Force Commander's Core Tasks. Stated in terms of subordinate tasks, conditions, and criteria for measurement.
- Postulate -- An "if-then" statement that relates core tasks and desired operational capabilities to 21st Century Challenges.



The Chairman recently assigned coordinating authorities -- Joint Staff directors at the three- star level – for each of these particular concepts. One of the recent changes is that the J- 7 and the Joint Warfighting Center have picked up the full- spectrum dominance part.

Full- dimensional protection has moved from the J- 3 down to the J- 8. The C2 part also has moved from information superiority down to full- spectrum dominance. (None of this is hard and fast, by the way -- it can all change as time goes by). Is C2 now in the right place? I don't know. Will it stay there? It may, or it may not. We thought it cut across all the items in the model, so that's why we put it down there for now.

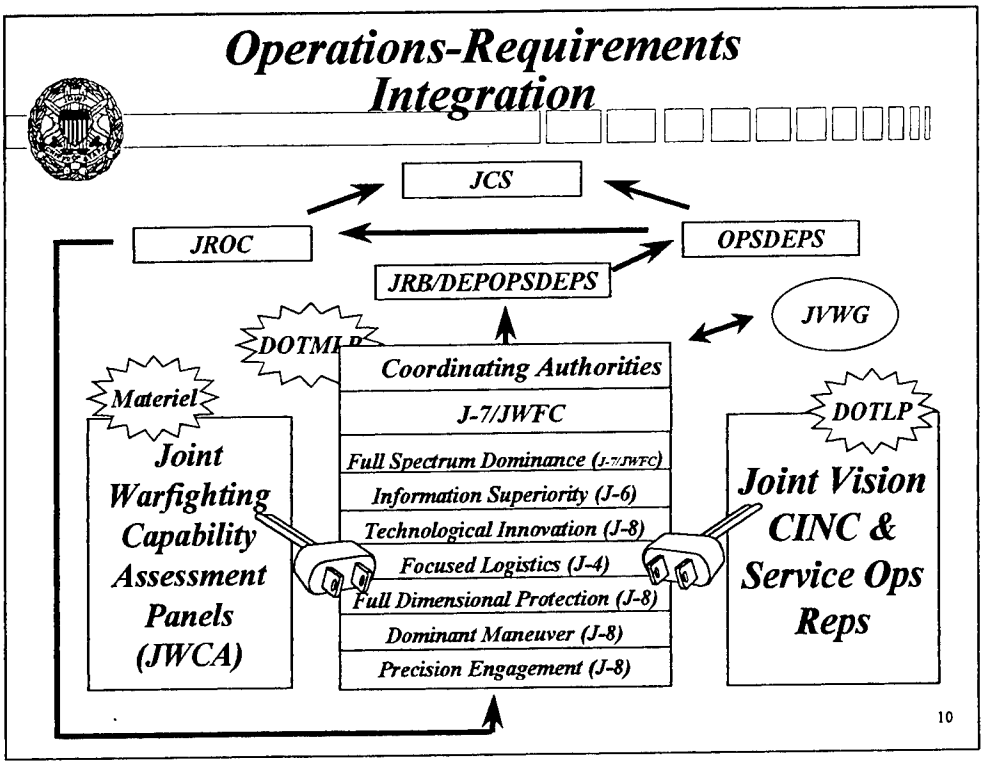
When the Chairman assigned these coordinating authorities, he also assigned them the responsibility for putting together the teams that would interact with the services, the CINCs, OSD, and all the other agencies involved in bringing JV 2010 together.



I'm going to be talking about JWCAs here. There are currently 12. J-8 does JWCAs for the for the CINCs in response to shortfalls or seams in weapon systems. But the CINCs have asked for more.

One example of a JWCA that's being worked fairly heavily is anti- personal land mines. Brigadier General Jim Grazioplane, USA, is working that real hard. And there are other examples. I recently went on a JWCA road show for two weeks, where we visited the CinCs – a very interesting process. Just recently, the Chairman approved the use of the JWCAs for this particular process that we're involved in with JV 2010.

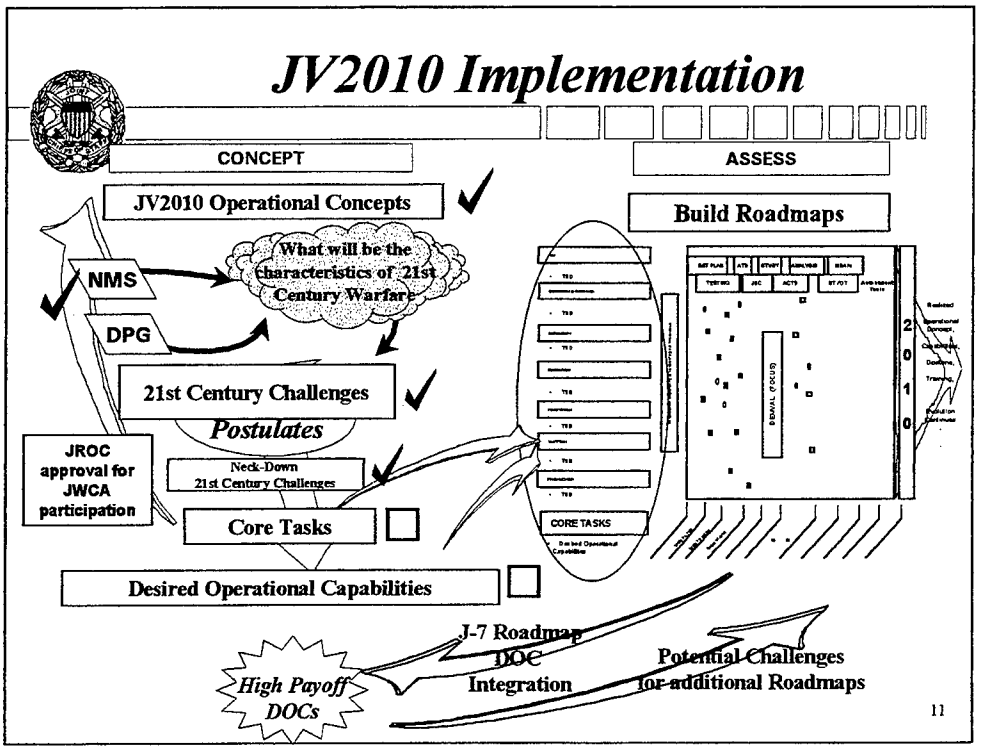
So, one of the key elements of JV 2010 is the co-evaluation of this DOTML- P process.



We're trying to marginalize, remove or eliminate the old stovepipes that used to exist between the left and right- hand sides of these charts -- between the materiel side on the left- hand side, represented by the JWCAs, and the DOTML- P represented on the right- hand side -- what the services and CINCs are trying to do.

In the middle are the key areas that require coordination by my boss, General Close, the J- 7. Major General Hal Hornburg, who runs the Joint Warfighting Center, is working there as the integrator. The coordinating authorities work with the Joint Vision Working Group, a two- star level board, and continually pass information back and forth to make sure that each agency knows what's going on. The board finally reports to the JRB and DEPOPS DEPs, two different sets of people up through the OP steps to JCS, to JROC, keeping that information loop going all the time.

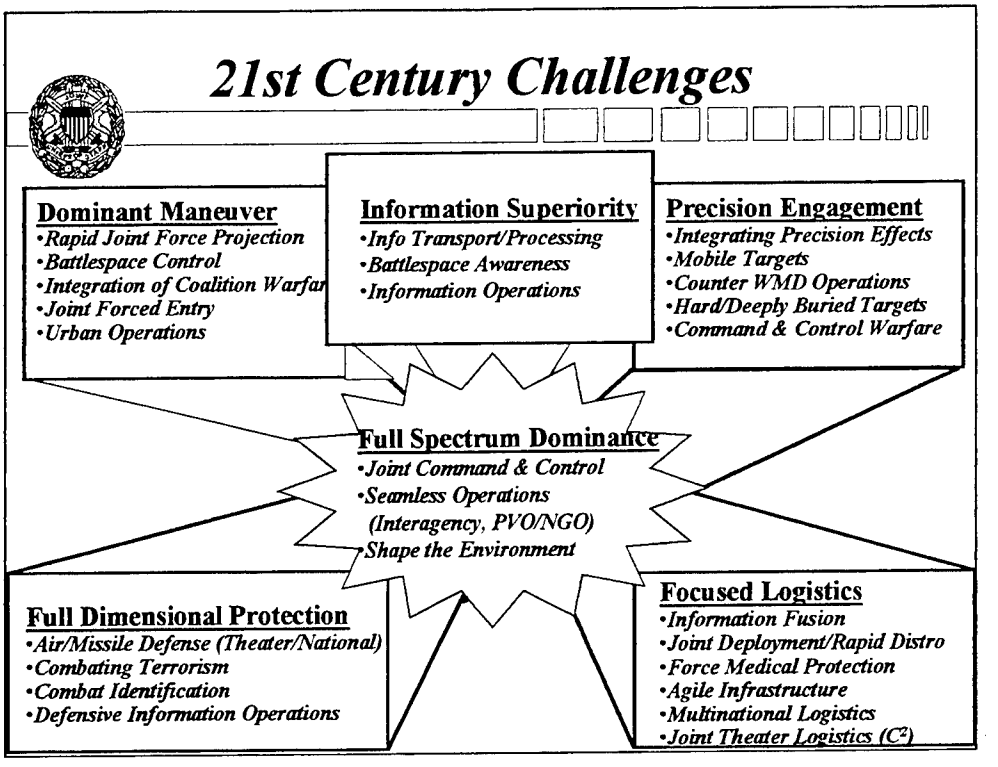
We're trying to keep this process plugged into the JWCA process, and what we're doing right now with JV 2010.



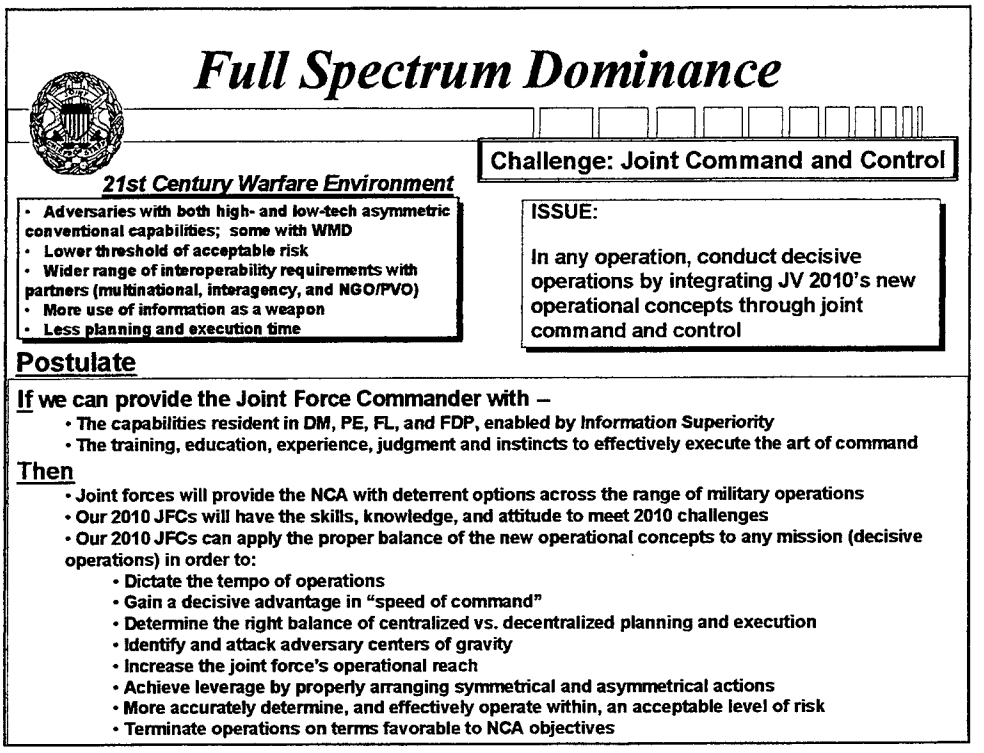
The first time I saw this slide, I was totally confused. You may be as well. Let me try to keep this really simple. We have four JV 2010 operational concepts. So, what will be the characteristics of 21st Century warfare? We get the input from the National Military Strategy and the Defense Planning Guidance.

By the way, we had our first meeting on the Defense Planning Guidance day before yesterday. It's going to come out in the year 2000. There's a significant change in the way this is going to be operated. It's going to be written; we're going to have it done by about the 31st of March; and it's going to be internally organized according to dominant maneuver, precision engagement, and so on. That's a significant change from the way it's written, and is something for you to pay attention to.

So we come through the DPG, and we come down to 21st Century challenges. We think there are probably a number of challenges and some four or five sub-bullets for each one of those. We've established some postulates: "If this happens, then that should happen." And we have necked those 21st Century down to some core tasks, which are on the vertical scale of the diagram on the right- hand side. And we're trying to identify desired operational capabilities, of which there are probably thousands.

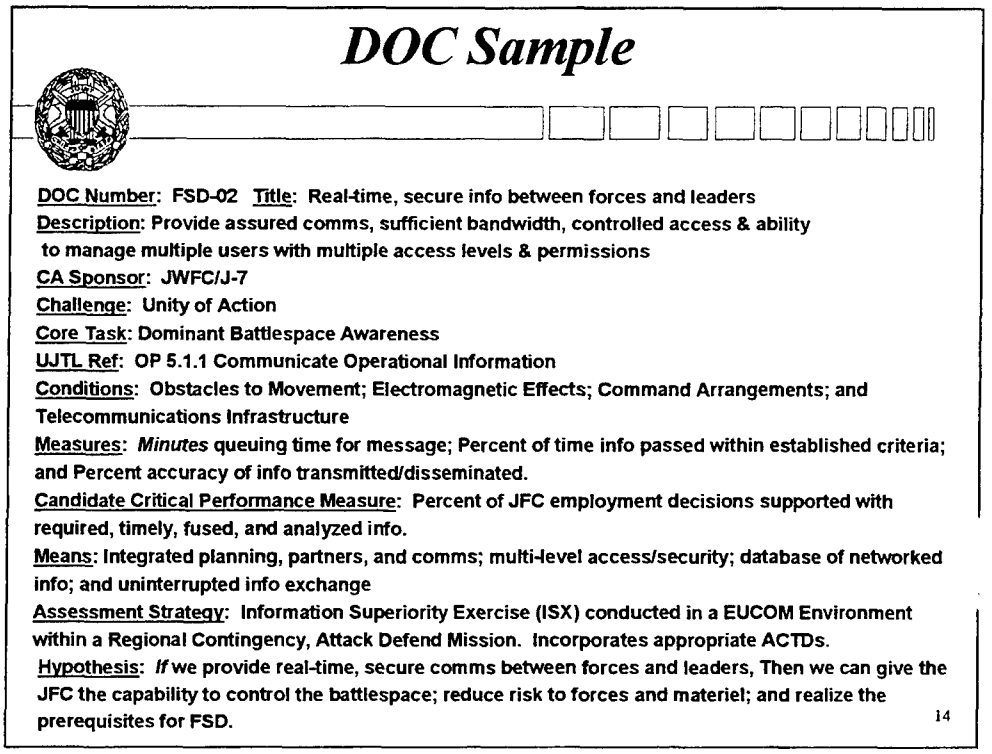


These are the 21st Century challenges. We think there should probably be only about four or five challenges for each of these specific areas. And, by the way, these challenges change regularly. In fact, right before I left, I had to change a slide because one of the challenges had changed just as I walked out the door -- and that was "seamless operations" in our agency, PBOs, NGOs. There are also others on the slide that are changing. We're going to take a look at one of these.



When we take a look at full spectrum dominance, the one challenge that stands out is joint command and control. This is to show you the process we're using as we go through each of these challenges.

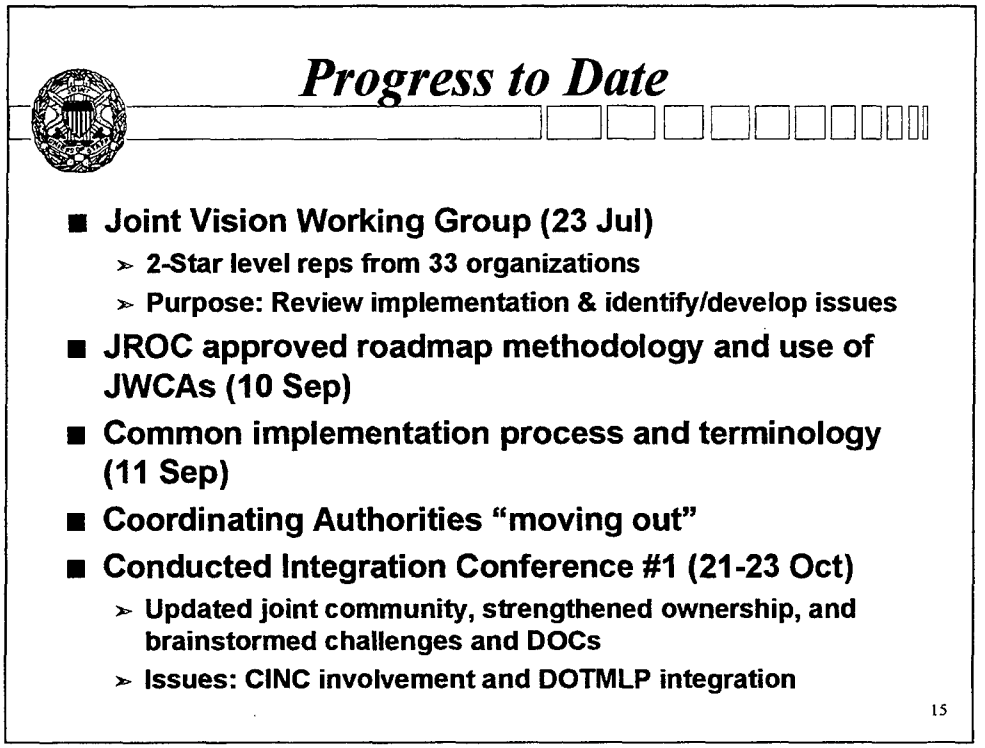
What's the issue? What will be the characteristics of 21st Century warfare? The if- then postulate is at the bottom, with the detail required to pull this off.



We now move to one of the small areas from the previous slide -- a desired operational capability -- and you can see the level of detail all the way down to what part of the UJTL this thing refers to, and further down to the bottom of the hypothesis. We're going to be doing this for many, many different issues, with those seven or eight areas I've already briefed to you.

Information not pictured here but also included in the template is:

- Other affected CAs who might be interested in participating in the assessment of this DOC or the results of assessment;
- Once a catalogue match is found (from the JV 2010 Catalogue of Assessment Events), the template will indicate whether or not the event sponsor (Service, CINC, Agency, etc.) has agreed to give JV 2010 access or whether coordination must still be completed.
- CA and sponsor administrative information.



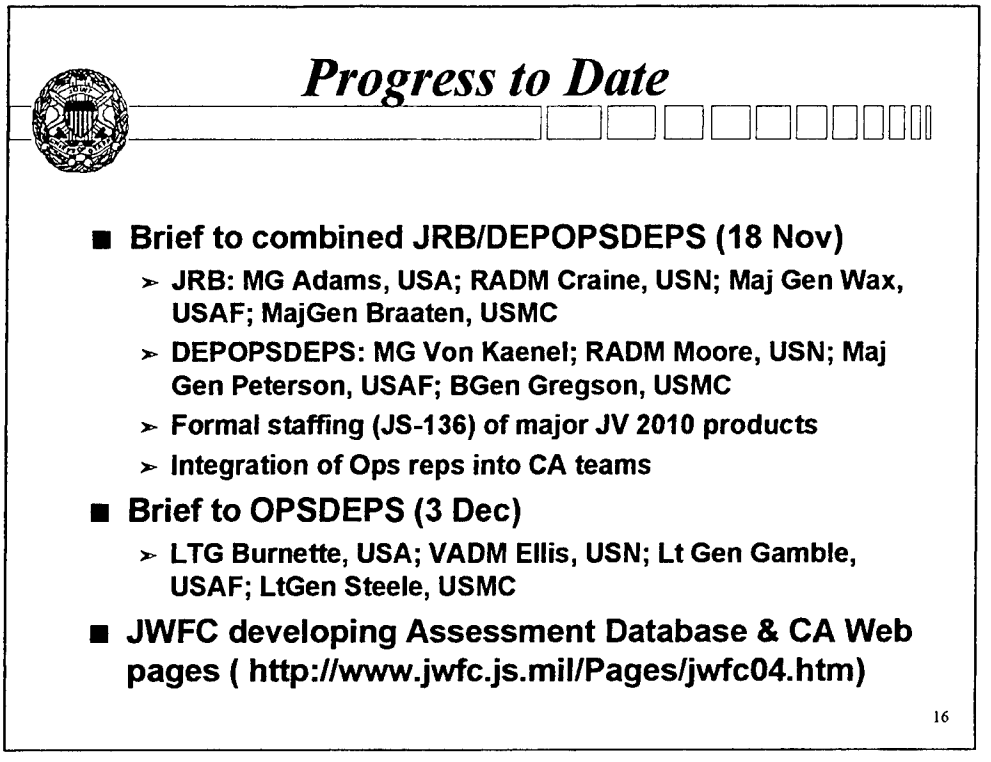
What's our progress to date? How are we doing? Some people would tell you that we're doing very well. If you talk to people outside the beltway, they will ask you, "Where's the beef?" -- if you remember the old Burger King commercial years ago.

At this point, I'll tell you that the beef is in the role of the joint staff, the CINCs and services that produce a lot of the material, and circulate that information. I think we're doing a reasonably good job at that. The responsibility of the folks on the outside is to read the materials we pass out, and I think we're having difficulty getting them to do that. That's the reason General Close and I are spending so much time on the road recently talking to audiences like you, trying to spread the word on what we're doing and to get some feedback -- some good, honest feedback -- so we can make our course corrections.

We had a Joint Vision Working Group on 23 July, and we had another one the other day -- at the two- star level and representing 33 organizations. We went over the same kind of things we went over today, in significantly more detail. We got their feedback, and made our modifications.

I've already told you that the JROC approved the use of the JWCAs. That took place as a result of that first meeting. We developed a common implementation process, of how we're going to write the road maps between all the services, the CINCs and the Joint Staff.

The coordinating authorities are moving out, and they're moving out very rapidly. They've made a lot of progress. There are a lot of people working many, many hours on this JV 2010 process, and it doesn't all just focus on that Wednesday morning meeting with Admiral Blair. It focuses on working with the folks down at Joint Warfighting Center, who are really doing yeoman work, the people down at ACOM, and all over various CINCdoms.

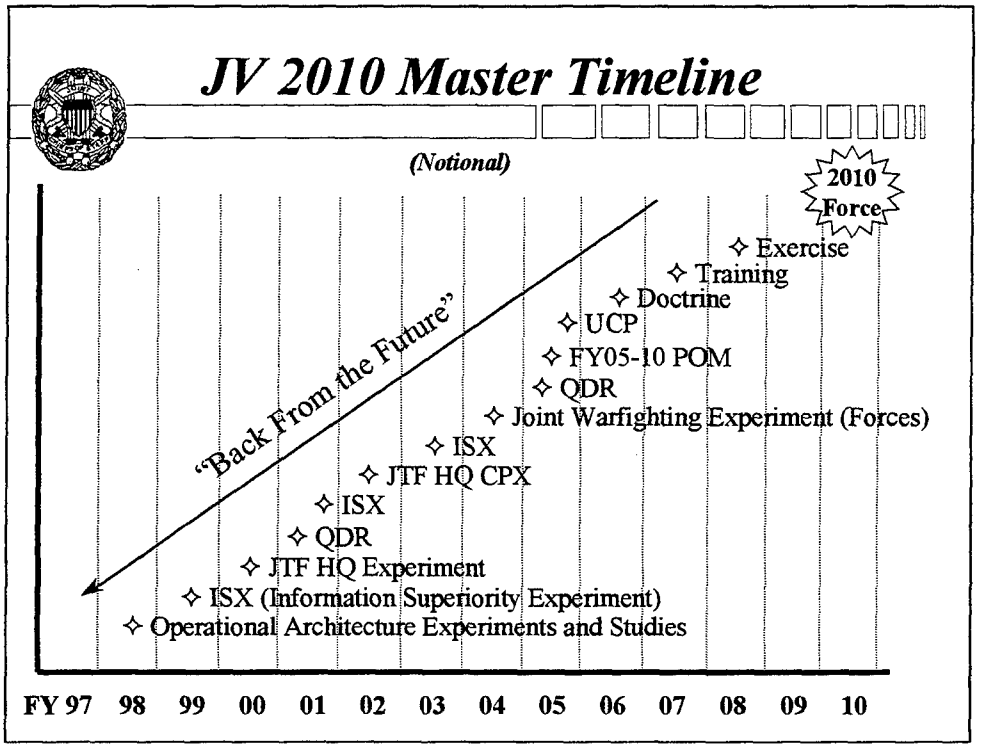


We conducted our first integration conference on October 21-23, 1997. At it, the CINCs said, "We want more involvement in the process. We want to have action officers assigned permanently. And we really want to be kept plugged into what's going on."

We briefly combined JRB and DEPOPSDEPs on the 18th of November. These are the individuals who attended. The basic results of that meeting were similar. They said, "We want a chop on what comes out of these meetings. We want to be kept informed. We want you to take our ideas." We agreed to do that, not only for the services and the CINCs. That process is ongoing as we speak.

We briefed the OPSDEPs on the third of December, with similar results. Down at the Joint Warfighting Center, they have a page on the web, as listed here. If you want to know the current status of where we are in JV 2010, it's there in tremendous detail.

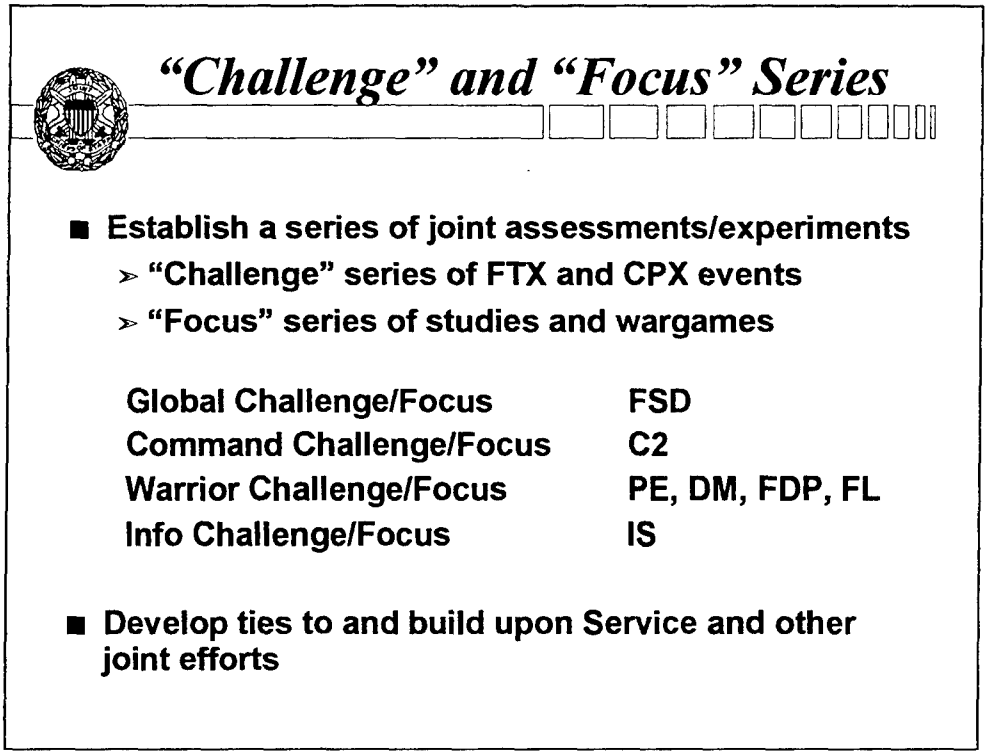
I'd recommend it to any of you, particularly those of you who are students. If you have a chance, take a look at that. If you're writing a paper that has anything to do with JV 2010, it is a great source of information.



Starting at the upper right- hand corner, if we're going to field that 2010 force to take on all comers, we've got to get some things working backwards. We've got to have those forces exercised -- and that's not just part of the force. That's not just a small exercise done by the Air Force, Army, Navy, Marines, Coast Guard. That's one by all the forces prepared to fight in 2010.

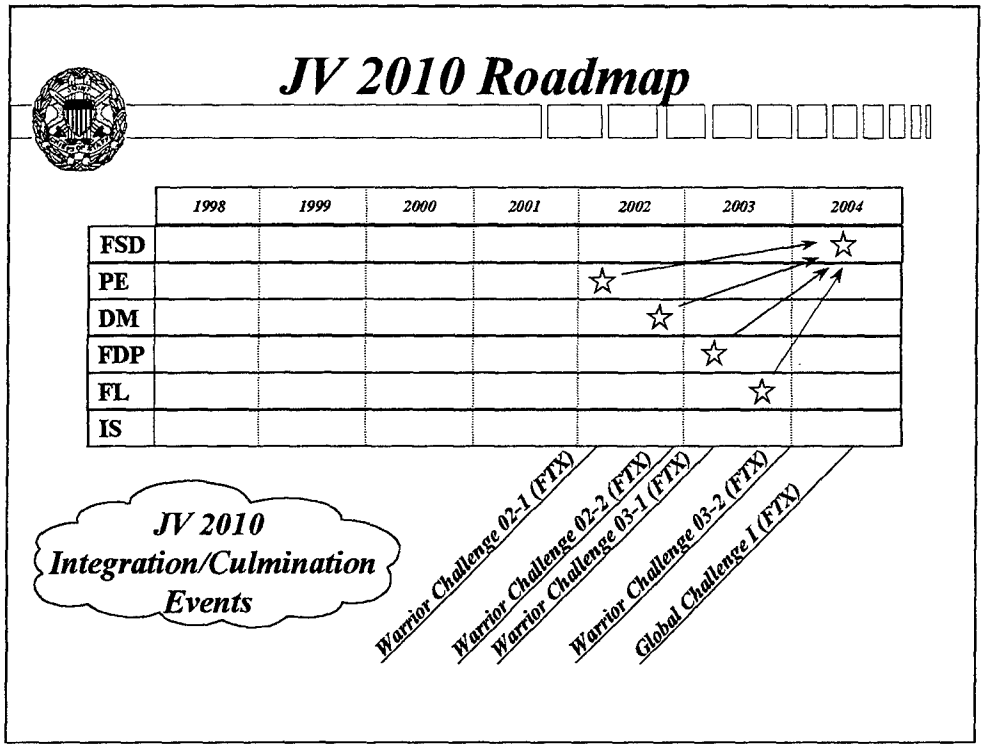
Before we do that, of course, the doctrine folks Admiral Blair is responsible for have to write understandable, clearly discernible doctrine. That's not easy to do, I can tell you. We may have to change the UCP as a result of what we're trying to do here. You heard General Sheehan talk about that yesterday, and other people have other suggestions. We're going to have to work the POM and QDR very hard. We want to have what we call a Superbowl event -- a joint warfighting experiment.

We really do not know - - and we're really just in the formative stages here - - what it's going to look like. We don't know if ACOM is going to do that. We don't know if the services are going to do that. It'll probably be a combination of all of them. But that Superbowl event will be designed to prove the theories we're putting together on JV 2010.

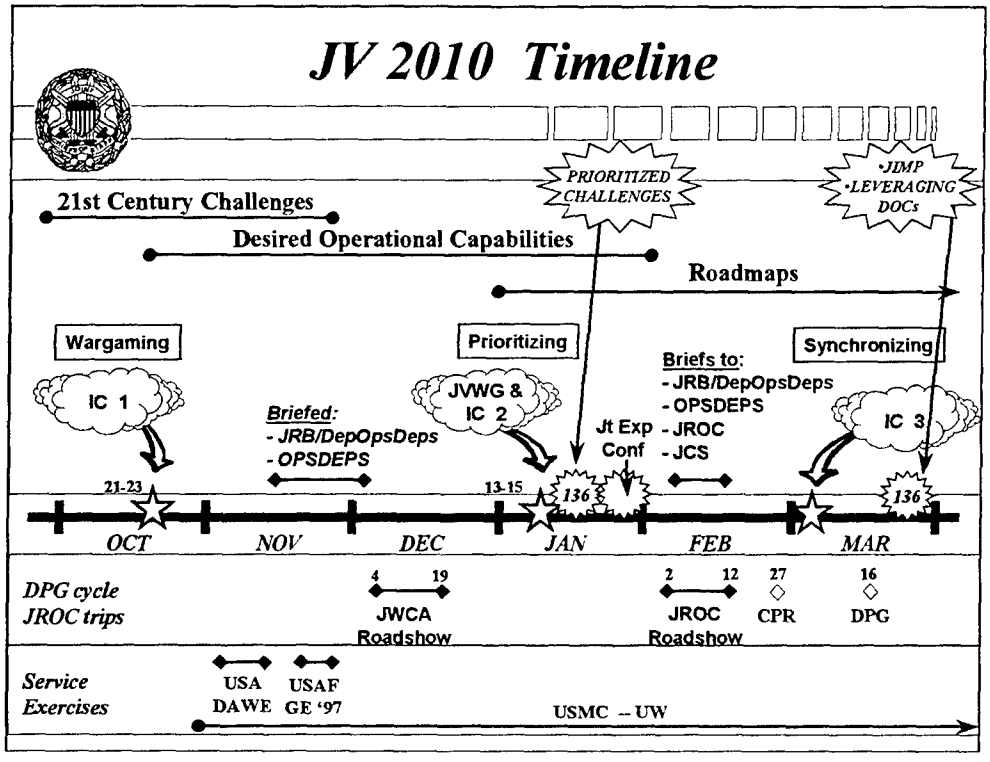


A "challenge and focus" series is what we think they're going to be called if it's approved by the chairman. We'll have a challenge series that focuses on FTX and CPXs, a focus series on studies and war games, a global challenge focus, a man challenge focus, and so on.

These will be the advance we build, develop, exercise, and train to determine whether or not we can do what we say we're trying to do.

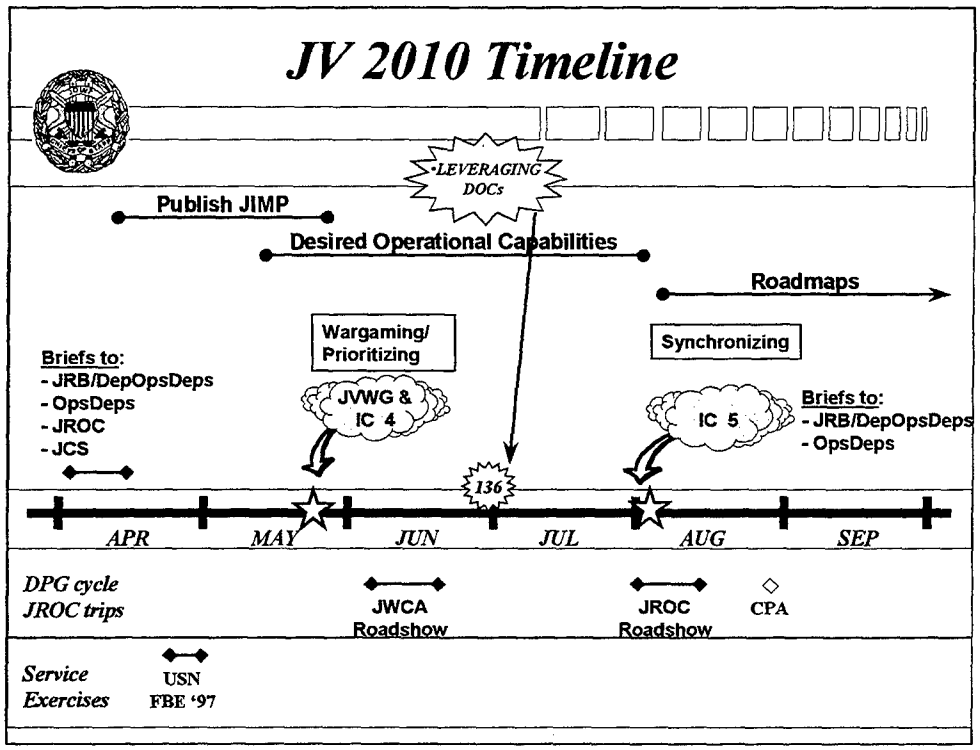


Here is a roadmap that shows when we envision subsequent exercises will fall out.



This is the JV 2010 timeline. As we go across the road, we have planned about a year ahead. We're now working two to three years out, to try to plan exactly how we're going to do this. You can see that in December we briefed the JRB, DEPOPS DEPs, and OPS DEPs. Right now, as we speak, we're probably winding up the second integrating conference at the Joint Warfighting Center on prioritizing. I understand that the Joint Vision Working Group, which kicked off the first day with senior flag officers, went extremely well, and that it was a great exchange of information. Some key problems were identified for additional study. Coming out of that conference, the Joint Staff will put together a "136" that will go out to the CINCs and services for coordination and feedback.

Integrating conference number three will be up in March, on exact synchronizing between the services, the CINCs and the Joint Staff -- on how we're going to go about putting this JV 2010 master plan together.



The key item up is publishing the JV 2010 implementation master plan (JMP) sitting on my desk right now. If you read nothing else, if you have a chance to read the JMP, do it; because it really lays out JV 2010, and what we know, and how we think we're going to proceed on this. We'll do more integrating conferences down the road, and will hopefully get feedback from the key people involved in this process.

I was given the opportunity, as I told you, to go on the road show with J- 8. On the first of February, my boss, General Close, will be going on a JROC road show to do the same thing -- to talk and get feedback from the CINCs, and the general and flag officers that represent them.

That's about it. Thank you for your attention.

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NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Remarks by
RADM Wayne E. Meyer, USN (Ret.)
Former Ordnance Officer of the Navy;
Former Deputy Commander for Weapons and Combat Systems,
Naval Sea Systems, Naval Sea Systems Command

I've been wondering how to reflect to you in the ten minutes we have remaining, and I can't help but notice that, whenever the subject turns to technology, the audience starts to thin. I feel a little bit like Red Barber, who was fond of quoting one of his cousins who always said, "As you get older, do a little plowing every day, because if you stop, you're a goner." After having spent over half a century in the Navy, reflecting on what I view as the needs of officers in the future, I feel constrained to look a little bit backwards.

First, I want to say that this is an important conference. The subjects covered are important ones -- important to the nation, and are certainly important to the profession in which we work. But there are a number of other aspects I would like to discuss -- to give you something to think about and to create a little bit of balance. So, please don't translate this as my being against anything. I'm certainly not against Joint Vision 2010, for example. But I couldn't help but take note of the general's expression. It did hurt my head a little bit when he mentioned it.

I take the position on 2010 that Admiral Rickover used to take repeatedly when I testified with him. When we got asked a question about a gun or a launcher, he always said, "Mr. Congressman, you have to ask someone else. That's not my field of expertise. My field of expertise is nuclear power."

Now, I come from the Sixth Congressional District in Missouri, which is north of the river. I was born in the "gumbo" (the muddy bottom) of the river -- in a town a bit further down-river from where Ike (Skelton) was born. The folks from Ike's side of the river have a different accent than we have on my side. We're a lot easier to understand, I think, most days. I want to say something about my own life. It's easy to go on forever about it, but I want to talk about it in the context of why I think that education needs balancing. I'll also discuss the importance of this very institution in which we sit.

About a year and a half ago, Secretary John Douglas came alongside me at a social and said, "Wayne, we're creating an Acquisition Hall of Fame for the Navy, and we're going to have a display in the Pentagon." And then he said, "You're going to be my first pioneer." I took note of that and said, "Okay, got it." And I

heard nothing more about it for months.

Last April, though, Lieutenant Commander Patty Van Belle called me up on Saturday morning at home. She said, "Admiral, we're setting up this Hall of Fame in which you're a pioneer. We're going to have an affair on the 18th of April, and we'd like for you be present." I told her that I planned to be in California on a gig, and asked whether she could make it another time.

"Well, no," she said. "It's already pretty well locked in and all the others are set up." After a pause she said, "You know, there are seven pioneers."

I said "Oh, I didn't know that! I got the feeling from the Secretary that I was *the* pioneer."

"Well," she said, "the reason we have seven is that it got to be too hard."

"Oh," I said. "I understand that, because you're very democratic and politically correct back there in that structure."

By then my curiosity was up, so I said, "By the way, who *are* the other pioneers?"

"Well," she said, "We can't tell you that until that day. But, you'll know some of them." Then she added, "But most of them are dead."

And I said, "I'll *be* there."

So, I went traipsing over to this affair, which was held in the Pentagon's E-ring. Secretary Kaminski came, and the Secretary of the Navy, and a number of other people. It was a very, very fine affair.

It started with the naming of John Ericsson as a pioneer. Now, John Erickson designed the USS Monitor, but, more importantly, he also invented the screw propeller. So, that's going back a little bit.

The next pioneer named was Admiral Moffett. Admiral Moffett, who has an airfield named after him here in California, was the Chief of the Bureau of Aeronautics and a great officer. Popularly, he is sometimes thought of as the father of modern carrier aviation.

The next one was Marine Corps General Moses. General Moses, in the late '30s, was the officer who oversaw and supervised the designs and experimental construction of the various landing craft, which became popularly known as LCACs. Thousands were manufactured during World War II, and excellently so.

The next one was Admiral Hyman Rickover -- the first person whose widow

was present to accept the award.

Next was Admiral Smith, of the Polaris program, whose widow was likewise present to accept the award.

Then they finally got down to me -- I was the first *living* one to accept it.

The final one out of the seven was Admiral Walt Locke, who had been the Tomahawk project manager, and was the director of the infamous JCMPO, the Joint Cruise Missile Project Office, in the era of Dr. Bill Barry.

When it was all finished, we had a social. Captain Mike Cassidy, now retired, who was not always respectful of older people, walked up to me and said, "You know," he said. "I've noticed something interesting about this. Three of the seven pioneers were *fired* by Secretary John Lehman."

Well, I couldn't wait to rush up and tell Mr. Douglas this important fact. I pointed out to him that Meyer, Rickover, and Locke were all fired by Secretary of the Navy John Lehman. This really took him by surprise. He'd never thought about this -- I mean, it drew him up. He paused, maybe 30 seconds, and said, "That *tells* you something. I don't know *what* it tells you, but it does."

That's the end of that sea story. My point is that, insofar as I know, not one of those great people who had something to do with really shaping the Navy ever attended a war college. They did not have the advantage of Goldwater-Nichols. And I don't believe a single one of them ever set foot in Fort Belvior to study acquisition reform, or any of those other movements. They were all able to achieve something great without having had the benefit of that.

Also look at their careers. I can't say this for John Ericsson, specifically, but if you look at the others, all of them were significant *operators*. They had *practiced* the art of naval ships, and each had technical education of some kind or another.

My point is, every one of them had advanced education, which they achieved inside the naval structure. I think that's important. I want to rail on that in the two or three minutes I have left. It seems to me that one of the stars we must be guided by is naval design, and, for that matter, any military weaponry. Two questions have to be posed repeatedly: "What's the price of failure?" and "What are you willing to accept for failure?"

You can make things really cheap. You can reduce your manning to nothing. You can make your craft unattended -- use UAVs, for example. When I was an ensign *50 years ago*, UAVs were "just around the corner," and they're *still* "just around the corner."

The big storm today in the Northeast, in Canada and New England, tells us

something. You've all seen those pathetic pictures of the collapse of all the power lines. If you looked at CNN this morning, you saw hundreds and hundreds of irate people, having been in the shelters for many days by now, in the cold, deprived of electricity and all the amazing wonders that go with electricity. Now, that's something we *cannot* tolerate in the military. *That*'s how you're going to lose the battle. We cannot tolerate designs that produce those kinds of problems.

Yet when most of you officers who are still active recently put to sea, you went assuming your gear was sound, that it was ready to go -- just as we'll leave here today and get in an automobile, or get on board an airplane and make some incredible assumptions about its availability, its safety, and the mission it should fulfill.

Here in this assembly are a number of former battlegroup commanders, all of whom who, at one time or another, have had some remark to make to me about gear performance. I can start Admiral Denny Blair, and I see Jerry Smith and Admiral Quast. All of them learned repeatedly that they'd better have some cohesive, coherent structure that knows how the hell to make their gear work. Because, as Admiral Jim Doyle is fond of saying, "The Navy is its ships, its airplanes, and it's submarines; and the way the Navy fights or exercises is through its people." And the expression of that is its ordnance.

Now, ordnance comes in a lot of flavors: missiles, bombs, electronics, radio signals, and so forth. And I mean ordnance in its broader context because, while command and control has a mandatory requirement to be able to exercise, it has another very important requirement, and that is to serve. It must be focused on the employment of weapons because, in the end, landing and taking and occupying territory is what keeps you from being vanquished -- sets you apart as the victor.

For this, ordnance in particular is critical. My God, what incredible assumptions we make about our ordnance. We have missiles now that cost several million dollars each, with millions of electronic parts in them. We have convinced ourselves that we can design a test that will guarantee that they will work -- that, through some statistical process, we can have assurance that a whole batch of them will work. Yet, they're put together by thousands of people throughout the land who do not even know what the whole round looks like -- but every one is constructed that way. And you're completely dependent that someone did not make an error in a details, because ordnance works on details, not generalities.

One of Admiral Rickover's favorite sayings was, "The devil is in the details, and *everything* we do in the military is a detail."

Why am I harping on that? There's not been very much said at this meeting, and I think appropriately so, about one really serious thing that we're confronted with in our country, from both a theoretical and also from a homeland viewpoint.

And that's defending ourselves against missile attack. Someone alluded yesterday -- and correctly so -- that you don't have to be much of a country now to come by ballistic missile capability. That's fact. Most of our leaders tell us that there are as many as 35 or 40 countries with such capability.

I've now been been serving on a task force for several months called the Ballistic Missile Defense Task Force for testing, where we've been tasked by Department of Defense officials on the technique of hit-to-kill. Because National Missile Defense, Patriot Three, standard missile three in the Navy, and the THAAD missile in the Army, are all based on the principle of hit-to-kill. The record to date isn't much. I tell you, what really bothers me, is that I cannot find the officer leadership in place within that structure, in any service. It has fallen. The development of operationally experienced, technically-adept leaders has fallen, and our "weaponeering" process is floundering as a result.

This institution (NPS) and others like it are in great danger, not by active attack, but by neglect. So I urge you, when you consider your further deliberations after this conference, do not forget how important education to produce operationally experienced, technically-adept officers is, too.

There are three papers I'd like to see in the conference proceedings. The first is a distillation from Admiral Arleigh Burke's action reports during the war about what is important in battle, and what is important in leadership. I bring this up because Tom (Marfiak) mentioned earlier that Nimitz himself was technically dexterous; so was Admiral Burke, who was an ordnance engineer.

The second is paper, written by MIT mathematics professor Gian-Carlo Rota, provides some food for thought about education in general. There are lessons in it for all who consider themselves part of the PME establishment.

The third is the 1995-1996 academic year report of Dr. Charles M. Vest, the President of MIT. It talks about the very subjects discussed here yesterday, about boldness, and the complacency that has set in on us technologically.

All these people believed in strong sub-technical educations, and in the importance of basics. So I would urge us all to review them again, because I think you can become uncomfortable really quick as a commanding officer or battlegroup commander if you, or those close to you, do not have an adequate understanding of the laws of thermodynamics and electrical engineering.

Thank you for your attention.

Editor's Note: Dr. Vest's report is used with permission from the MIT News Office. Dr. Rota's article is used with permission from the author.

REAR ADMIRAL WAYNE E. MEYER, USN (Ret.)

Rear Admiral Wayne E. Meyer, a native of Brunswick, Missouri, retired in 1985 as the Deputy Commander for Weapons and Combat Systems, Naval Sea Systems, Naval Sea Systems Command and Ordnance Officer of the Navy. His career began in 1943 as an apprentice seaman. He was commissioned Ensign, U.S. Naval Reserve, in 1946 and was transferred to regular Navy in 1948.

Rear Admiral Meyer holds a B.S. degree in Electrical Engineering from the University of Kansas, a B.S. in Electrical Engineering, and a M.S. in Astronautics and Aeronautics from the MIT, and a B.S. in Electrical Engineering from the Naval Postgraduate School.

His first sea duty in GOODRICH (DDR-831) was followed by sea tours in SPRINGFIELD (CL-66), SIERRA (AD-18), and STRICKLAND (DER-333). He served on the Staff Commander, Destroyer Force, Atlantic. He also served on the TALOS cruiser GALVESTON (CLC-3) as Fire Control and subsequently Weapons Officer. He then reported to the Secretary of the Navy's Special Task Force for Surface Missile Systems in Washington, D.C. He transferred to the Naval Ordnance Engineering Corps in 1965.

In 1967, he reported as Director of Engineering at the Naval Ship Missile Systems Engineering Station, Port Hueneme, CA. In 1970, he was assigned to the Naval Ordnance Systems Command, as Manager, AEGIS Weapons System. He was named Project Manager for Surface Missile Systems in 1972 and in 1974, he was named the first Director of Surface Warfare, Naval Sea Systems Command. In 1975, he assumed duties as Project Manager, AEGIS Shipbuilding. In 1983, he assumed duties as Deputy Commander, Weapons and Combat Systems Naval Sea Systems Command.

Rear Admiral Meyer's personal decorations and service medals include: Distinguished Service Medal, Legion of Merit, Meritorious Service Medal, Navy Meritorious Unit Commendation Ribbon with Bronze Star, China Service Medal, American Campaign Medal, World War II Victory Medal, Navy Occupation Service Medal, National Defense Medal with Bronze Star, Armed Forces Expeditionary Medal, Vietnam Service Medal, Republic of Vietnam Gallantry Cross with Palm Unit Citation, and Republic of Vietnam Civil Actions Unit Citation. He holds the American Society of Naval Engineers Gold Medal (1970), Silver Medal from the Old Crow Electronics Countermeasure Association, the Distinguished Engineer Alumni Award from the University of Kansas, and the Missile Systems Award from the American Institute of Aeronautics and Astronautics. In 1985 he received the Navy League's RADM William Parsons Award, and the Harold E. Sanders Award from the American Society of Naval Engineers. In 1988, the National Security Industrial Association recognized him with its Admiral J.H. Sides Award. In 1997 he was designated a Pioneer in the U.S. Navy's newly-created Acquisition Hall of Fame in the Pentagon.

Rear Admiral Meyer is widower to the former Margaret Garvey of Dorchester, Massachusetts. He lives in Falls Church. Virginia and has three grown children. He presently operates a consultancy in Arlington, Virginia.

A SUMMARY OF ADMIRAL ARLIEGH BURKE'S AFTER BATTLE REPORTS

In July and August 1945, then-Commodore Arleigh A. Burke, USN, dictated a series of "After-Battle Reports"[1] that outlined his experiences both as a destroyer squadron commander in the Solomons and as Chief of Staff to Admiral Mitscher's fast carrier task forces in 1944 and 1945. Totaling about 140 pages, these reports are more than just fascinating historical documents. They contain observations based on an exceptional breadth and depth of combat experience and, as such, include many lessons that are applicable to combat afloat today as well. This paper tries to summarize these lessons through appropriate quotes. Admiral Burke reviewed an earlier draft of these notes and offered many useful suggestions.

Linton Wells II
October, 1983

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[1] Naval Records Library films, numbers 411 (Recorded 31 July 1945), 411-1 (Recorded 31 July 1945), 411-2 (Recorded 1 August 1945), 411-3 (Recorded 8 August 1945), 417 (Recorded 20 August 1945), 417-1 (Recorded 20 August 1945), 417-2 (Recorded 21 August 1945), and 417-3 (Recorded 21 August 1945). Originally classified SECRET. Declassified 25 April 1962.

Admiral Burke's comments can be divided into eight categories: (I) General conditions of combat, (2) command, (3) staff, (4) planning and coordination, (5) logistics, (6) training, (7) tactics, and (8) miscellaneous observations. The admiral's remarks are not all-encompassing. They were not meant to be a definitive treatise on war at sea, but they do represent valuable insights from a perspective not available to most of us who joined the fleet in the years after World War II.

GENERAL CONDITIONS OF COMBAT

TIME CRITICALITY

"Time is all-important." (411, p. 5) "(It) is the only commodity which you can never regain. An attack right now may mean much more than an attack a minute from now." (411-1, p. 13)

UNCERTAINTY

"Nothing in a battle (is) ever going to go right, but nobody ever realizes it until he gets into a battle." (411, p. 5)

FATIGUE

"There was no possibility of getting any sleep at night while we were under air attack by the enemy, and there wasn't very much chance of getting sleep during the daytime because of...all the (actions needed) to keep a task group, no matter how small, moving." (411-1, p. 14) "We were tired, sleepy and needed rest,... (but)... there is never any time that you cannot be alert, (you) must always have someone ready." (411-1, p. 14)

SHORTAGES

"Fuel in destroyers was always a problem." (417, p. 6)

"The Little Beavers went hungry a couple of times because we didn't have supplies, because we had to choose between replenishment and getting up on the firing line. We always chose the firing line." (417, p. 2)

"The ships slowly wore out. We never had time to make the minor repairs which,...if not corrected, would soon develop into a serious deficiency." (417-2, p. 23)

COMMAND

LEADERSHIP

Concern For Personnel: "One of the most important things for any commander is to watch out for his personnel.... Fleets are just like destroyers... . They're fought with people.... There are many ways men can be affected. One of the principal ones is if they feel their top commander is paying complete attention to his people. Admiral Mitscher had this quality to an extreme condition. Consequently, his pilots worshiped him. He went to great efforts to perfect the air-sea rescue system.... Another thing that the Admiral watched out for in handling his personnel was the operational conditions. He did not operate his people when the conditions were too hazardous and when the payoff was not great enough. He never willingly expended a pilot, as is sometimes thought of in peacetime.... If a ship were damaged, he invariably tried to get it back to port. He never abandoned a ship." (411-3, p. 1,2)

How far to push: "It was always hurry, hurry, hurry, and it was very difficult for me (COMDESRON 23) to keep my mouth shut and not heckle the captains to hurry just a little bit more. I knew this wasn't necessary because they were doing everything possible." (4112, p. 1) Admiral Mitscher agreed that "You could drive (the men) as long as they wanted to be driven.... As long as they felt they were accomplishing something, the men would go until they dropped." (411-2, p. 16) "At the same time, experience indicated that people's capacity increases under strain."

"Before we had made contact, people were tired; they were groggy; their tempers were short. Yet, just as soon as contact was made, everyone threw everything he had into it, working all night long at hard, dirty work." (411-2, p. 13)

FATIGUE

Despite the increase in a person's capacity under stress, there are limits. "Everyone that was fighting got tired. But the pilots ... felt the effects of combat fatigue sooner than the rest...." (and Admiral Mitscher was very careful to watch this.). "There are very few people who suffer from combat fatigue who realize it, or who realize its importance. They will try harder, they will try to do more, and the harder they work, the more tired they get and the less they can do.... They'll land in the sea; they'll wash themselves out; they'll risk their men and not understand why -- not know they're just so tired they can't think clearly. This happens to high command, too, and all the way down to the lowest, newest seaman." (417-3, p. 2)

"... It behooves officers to check very carefully information received from tired people." (411-1, p. 7)

DECISIONS

Time: "... You're never going to have everything perfect, you're never going to be sure that you know what you should do, or what the enemy is doing, or that you know where your forces are. You must take your reports and act quickly. Time is all-important.... I had to accept the reports that people gave me. I could try beforehand to get those reports as accurately as possible, but in the midst of battle, I could not ask 'was he sure?' He was giving me what he saw, and it was up to me to make up my mind, make up my decision, an do something now!" (411, p. 5).

Instinct/Training: "In the heat of battle, you don't remember very much, you don't think very fast. You act by instinct, which is actually training. So that you've got to be trained for battle, and you will react just exactly the way you do in training." (411, p. 5)

Change: "... Usually changes (to plans) made under stress are not good. Consequently, the lesson ... was not to try to change the plans in the heat of battle unless I thought it was extremely important.... Minor changes should not be made because the making of (such changes) would cause more confusion

than the results you would obtain.... A major change should be made only when the outcome of the battle will be made surer, rather than to change from one possibly good solution to another possibly good solution." (411, p.5)

Strain: "... without the stress, and the strain, and the limit on time, nobody can actually duplicate the strain a commander is under in making a decision. ... it's a brave man, or an incautious one, who criticizes another man for the action he took in battle unless it is obviously an error caused by lack of character." (411-3, p. 15)

CONTROL BY DELEGATION

"Delegation of authority is always hard, and, under such circumstances as a battle when such delegation of authority may result in disastrous consequences if a subordinate makes an error, it requires more than is usually meant by confidence --it requires an act of faith.... Yet, past actions in this and other wars indicate successful action resulted from the exercise of initiative by well-indoctrinated subordinates." (411, p. 11)

"Communications channels are always crowded in actions. So the squadron commander notified his boss every time he did anything, but he notified him *as he was doing it*. He did not ask permission to do something, and he never asked permission to attack...." (411-1, p. 13)

"It is probable that the enemy is manning our circuits, just as we man theirs, with the added advantage to the enemy of having interpreters available who understood our language." (411, p. 11).

UNITY OF COMMAND

"... In spite of the complete cooperation that the Army was willing to give, and the complete cooperation that the Navy was willing to give, (the landings on Hollandia) exhibited once again (that) in any attack, in any operation, there must be one man in charge.... There cannot be two commanders." (417, p. 3)

THE PERFECT OPERATIONAL DISPATCH

"... We received the perfect operational dispatch from COMSOPAC as follows: '31-knot Burke, get aboard the Buka-Rabaul evacuation line about 35 miles west of Buka. If no enemy contacts by 0300(L) the 25th, come south to refuel, same place. If enemy contacted, you know what to do.' Such orders are ideal. They were plenty flexible. They gave us all the information we needed, and how we did the job was entirely up to us." (411-2, p.2)

STAFF

SIZE/FUNCTION

"The Communications Officer on my staff -- the entire staff he was -- used to catch me in an unguarded moment and ask me for the information on which to send a contact report now. If I couldn't rattle it off, he would break out the book and read it to me again. This embarrassment lasted for about a week, after which I could send a contact report in my sleep." (411-2, p. 13).

"Admiral Mitscher insisted on a small staff. There was always the temptation to increase the size of the staff in order to obtain an officer of peculiar qualification.... A small staff can coordinate its work easier. There are fewer people who have to know things and, although those few people have to work much harder,...the total overall work done by a too-small staff is more than the total overall work done by a too-big staff. And certainly the work will all be headed in the same direction." (417-3, p. 4)

CLASSIFICATION

"In all probability, most things were over-classified." (417-3, p.7)

INTELLIGENCE/INFORMATION

"There is never enough digested information available." (417-3, p. 2) "The people who were responsible for delivering information to an attacking force usually got that information out just prior to the time that they thought the attacking force was going to need it...Consequently, (the force) has no time to study the charts, no time to evaluate the information, no time to correct anything that happens to be wrong.... (Thus), we recommended...that there always be a combat information officer who coordinates all the information for all services which are going to use it." (417, p. 5)

"Information that is most desired, that is most needed, is current information, which is awfully difficult to get. In order to obtain this information, (Admiral Mitscher) interviewed returning pilots...(and) obtained quick reports from other task group commanders." (417-3, p. 2)

PLANNING AND COORDINATION

PLANS

Simplicity: "Plans must be kept simple. And by simple, I mean *very* simple, not just so that an educated man can read them quickly and understand them, but so that a tired, harassed man can read them and understand them and carry them out." (417-3, p. 3) "It was evident a lot of people would read and study a simple plan, where there were very few people who would ever bother to read a complicated plan, regardless of whether or not somebody at a desk assumed that he should read it... The desk plan was very likely to take care of all contingencies. It was likely to be complete, with every probability taken care of...but it doesn't work, because you can't plan for all contingencies, and when (you do), you usually let the contingencies run away with it.... Mostly, those things weren't read, or if they were read, they weren't remembered." (417, p. 9)

Standardization: "So it became evident that we had to have something standard. Lots of things, such as methods of flying CAP, ... methods of resupply, (etc.) could go into a set of standard instructions.... The boys could read those standard instructions with the expectation that they would last the period of several operations. Consequently, they would study those..., but even they had to be short. One of the most important results was that it reduced the size of the OPORDERS and OPLANS to a point where they could be read in a short while...and understood in the time they were read." (417, p. 10)

Structure. "In order to use (complicated OPORDERS), work sheets had to be worked out, schedules had to be made from the plans and coordinated.... We decided that, as long as this had to be done, it might as well be done only once on the flagship, and consequently, we would print the work sheets and deliver them.... This meant a great deal more staff work on our part...but the coordination paid off.... This type of OPORDER was a usable work sheet. It was necessary to create an outline which was not voluminous, which was not repetitive, but which gave all the information which was not included in the other plans, and tell where information included in the other plans could be found.... Operation plans should be measured by the value they produce, not by the pound. It was necessary that the plans be made so that pilots or ship's crews or anybody else could be briefed directly from the plan. It worked." (417-3, pp. 3-4)

COOPERATION AND CONFERENCES

Cooperation: "It is absolutely necessary that all hands learn to cooperate.... Everybody remarks that this is a truism, but there are times when there is very little cooperation. In order to cooperate with a man, you've got to have conferences with him; you've got to know what he is thinking; you've got to give when he expects you to give, and you don't want to ask for things that you feel he cannot spare. You've got to study his problems, and he has to study your problems, so that both of you head in the same direction at the same time...It's essential that the top people bend their utmost efforts to do the job, because if they do not, their lack of cooperation will be intensified in the lower echelons." (411-2, p. 21)

Conferences: "During the time we were in port, we held frequent conferences,...not only with the Task Force Commander and the cruiser captains, but daily we also had a destroyer conference.... Everybody

must know as much as he possibly can." (411-1, p. 14-15) "Post operation conferences also were held, even though everyone was tired. At these, we decided what we had done wrong, and what we would do again under the same circumstances,...and all the things that come up and are fresh immediately after a cruise, but which people forget so quickly within two days." (417-1, p. 19)

Cross-pollinization: At several points, the narrative cites the value of cross-pollinization through conferences between aviators and destroyermen, Navy and Marine pilots, Army and Navy planners, etc.

LOGISTICS

Admiral Burke gives considerable attention to logistics, logistic forces, and the forward area repair of damaged ships. "We could see in the future that this logistics business was going to be very important." (417, p. 2) Most of his comments dealt with the process of bringing support forward from rear areas directly to the fleet. Without doubt, this is the key to sustained combat operations afloat, and most of the concepts discussed have become so ingrained in our present day procedures that it is hard to realize just how revolutionary they were in World War II. These lessons have been reaffirmed in Korea, Vietnam, and the Falklands. Unfortunately, our present and programmed support ship levels may no longer be able to meet our wartime UNREP needs.

INDIVIDUAL UNIT TRAINING

"...There was no panacea which would ensure success in battle.... The best that could be done was to train individual ships for battle, and place them in the positions where they would most probably be effective, and then aggressively fight the battle under competent leadership." (411, p. 9)

PERSONAL REATIONS

"You had to train properly. You had to know what you wanted to do before-hand; you had to know what your people were going to do, and you had to expect exactly the same performance in battle that you would get in a drill -- no better, no worse." (411, p. 4)

DAMAGE CONTROL

"One example of a well-taught damage control ship was the ENTERPRISE.... She had battle rations at every station. All of her crew wore flash-proof clothing, and they wore it all the time. They had fresh water all over the ship in proper water containers. When they dogged down doors, they meant them to stay dogged down. The dogs just weren't haphazardly put over the doors. The doors were really dogged down. There was no other ship that we rode with that was as good as the ENTERPRISE in this respect.... However, there is probably no way of training a crew to be as efficient as the ENTERPRISE without going through the same type of training -- being hit four or five times." (417-2, p. 24)

TACTICS

AGGRESSIVENESS

"Luck usually rides with the bold. It is believed that the chances of success are greater for wholehearted attack at the first opportunity than they are for waiting...No force will ever be ready for attack; neither will the enemy. If our forces could attack and hit first, the prospects for success were good (411, pp. 10-11)

TIME

"In order to attack, to take advantage of surprise, timeliness must be well-known to the commander and to everyone in the force...time is the only commodity which you can never regain. An attack right now may mean much more than an attack a minute from now." (411-1, p. 13) "Be there just as fast as you can possibly get there." (411-1, p. 1)

CONCENTRATION

"It is necessary that the force remain concentrated. There is no other means of identification that is as effective as knowing where your own people are." (411-1, p. 13) The narrative reinforces this point by noting the unreliability of IFF in action, and the delays to decision-making caused by cluttered PPI scopes. Although based on surface actions in the Solomons, the point also applies to AAW, and probably to over-the-horizon missile engagements today. Admiral Burke also recommends that destroyer units be formed well before the action commences, since "the result of attempting to form destroyers after the contact will probably be individual ship attacks and retirements

DOCTRINE

"Attack by a simple doctrine. There is no time in battle to fire orders. People must know what they do before they go into battle. Consequentiy, the doctrine must be simple so they will remember it under very adverse conditions." (411-1, p. I3)

"This doctrine that we had adopted was not new.... The idea was to keep the enemy on two horns of a dilemma so that, no matter which way he went, no matter what he did, somebody would always be able to hit him, and the man who did not hit him was always available to cover the force that was striking.

The division that attacked, attacked with torpedoes at once and from very close range. The other division stood by out of torpedo range, but ready to open up on the enemy with gunfire if the first division were attacked.... The attacking commander had just one thing to think about, nothing else.... The other man looked out for surprise maneuvers from the Japanese, kept track of everything which might affect the organization,...and he was not under the terrific strain of conducting an attack while he was doing it." (411-1, p. 13)

MUTUAL SUPPORT

"...If you have various units attacking the same target, it is always better to have them in mutual support of one another, or if they are not in mutual support, to have very good reasons for not being in such a position. Mutual support is most important -- most people forget it." (417-2, p. 22)

"As a result of a great deal of experience, Admiral Mitscher decided that the fast carrier task group should consist of four carriers, six to eight support ships, and not less than 18 destroyers." (417-2, p. 21)

"Throughout the war, destroyers have been misused...destroyers fight as teams. They fight as units. They are not good single ship fighters. A division of four ships is 10 times as strong against multiple enemy air attack as a section of two ships. It's hard to prove this mathematically. It's not so difficult to prove when you look at the results of the ships sunk." (417-2, p. 22)

FLEXIBILITY

"...We learned that tactics are ever changing.... Tactics that are good today may not be good week from today. For example, sometimes fighter sweeps are very valuable. Other times, they aren't...The enemy changes his tactics, and you must be able to change your pace and change your pace quickly...You must be able to adapt your methods to those of the enemy, or you must be able to force the enemy into adopting your pattern.... You cannot become inflexible." (417-3, p. 4)

AIR ATTACK

We always fishtailed during air attack, so as not to give a setup to any plane."

MITnews
FROM THE ASSOCIATION OF ALUMNI AND ALUMNAE OF MIT APRIL 1997

10 Lessons of an MIT Education

BY GIAN-CARLO ROTA



Gian-Carlo Rota is a professor of mathematics and philosophy at MIT known for his flair as a lecturer. On the strength of that reputation for content delivered with style, he was asked to give a talk at the Alumni Association's Family Weekend last fall on the 10 lessons learned by every MIT undergraduate. The editors of MITnews *think alumni and alumnae from every decade will see aspects of their own experience in Professor Rota's list. We leave it to readers to judge when he is tongue in cheek, and when he is an astute observer, when he approves, when he simply reports.*

LESSON ONE: ***You can and will work at a desk for seven hours straight, routinely.***

For several years, I have been teaching 18.03, differential equations, the largest mathematics course at MIT, with more than 300 students. The lectures have been good training in dealing with mass behavior. Every sentence must be perfectly enunciated, preferably twice. Examples on the board must be relevant, if not downright fascinating. Every 15 minutes or so, the lecturer is expected to come up with an interesting aside, joke, historical anecdote, or unusual application of the concept at hand. When a lecturer fails to conform to these inexorable requirements, the students will signify their displeasure by picking up their books and leaving the classroom.

Despite the lecturer's best efforts, however, it becomes more difficult to hold the attention of the students as the term wears on, and they start falling asleep in class. I believe that observing students asleep in class under those circumstances should be a source of satisfaction for a teacher, since it confirms that they have been doing their jobs. These students have been up half the night—maybe all night—finishing problem sets and preparing for their midterm exams.

Four courses in science and engineering each term is a heavy workload for anyone; very few students fail to learn, first and foremost, the discipline of intensive and constant work.

LESSON TWO: ***You learn what you don't know you are learning.***

The second lesson is demonstrated, among other places, in 18.313, a course I teach in advanced probability theory. It is a difficult course, one that compresses the material typically taught in a year into one term, and it includes weekly problem sets that are hard, even by the standards of professional mathematicians. (How hard is that? Well, every few years a student taking the course discovers a new solution to a probability problem that merits publication as a research paper in a refereed journal.)

Students join forces on the problem sets, and some students benefit more than others from these weekly collective efforts. The most brilliant students will invariably work out all the problems and let other students copy, and I pretend to be annoyed when I

PHOTO: MIT NEWS OFFICE

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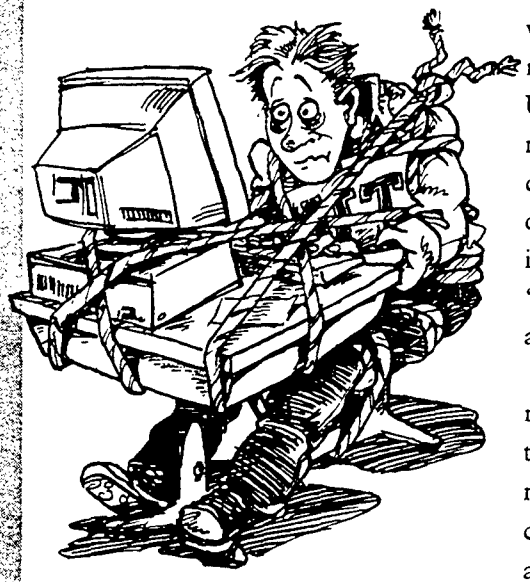
MIT Connections of a Mensch

Former U.S. Senator Paul Tsongas, who succumbed to cancer in January, had a notable number of MIT connections. He took time from a weekend with his family to address an alumni symposium on water resources on Cape Cod in 1987. He was the Commencement speaker in 1989 and the enthusiastically received keynote speaker for a forum on K–12 education sponsored by the Class of '62 during its 30th reunion. Tsongas also had been a member of the Board of Directors of the Whitehead Institute since 1987, and its chair since 1993. Only months before his death, in failing health, Tsongas hosted the dedication of the Whitehead's new research wing. He was a politician, a profession distinguished more by its cynicism and opportunism, but he was willing to take unpopular stands and held to his principles. A mensch, and the country is poorer for his passing.

—SUSAN LEWIS

10 Lessons

continued



learn that this has happened. But I know that by making the effort to understand the solution of a truly difficult problem discovered by one of their peers, students learn more than they would by working out some less demanding exercise.

LESSON THREE: ***By and large, "knowing how" matters more than "knowing what."***

Half a century ago, the philosopher Gilbert Ryle discussed the difference between "knowing how" and "knowing what." "Knowing how" courses are those in mathematics, the exact sciences, engineering, playing a musical instrument, even sports. "Knowing what" courses are those in the social sciences, the creative arts, the humanities, and those aspects of a discipline that are described as having social value.

At the beginning of each term, students meet with their advisors to decide on the courses each will study, and much of the discussion is likely to revolve around whether a student should lighten a heavy load by substituting one or two "knowing what" courses in place of some stiff "knowing how" courses.

To be sure, the content of "knowing what" courses is often the most memorable. A serious study of the history of the United States Constitution or *King Lear* may well leave a stronger imprint on a student's character than a course in thermodynamics. Nevertheless, at MIT, "knowing how" is held in higher esteem than "knowing what" by faculty and students alike. Why?

It is my theory that "knowing how" is revered because it can be tested. One can test whether a student can apply quantum mechanics, communicate in French, or clone a gene. It is much more difficult to assess an interpretation of a poem, the negotiation of a complex technical compromise, or grasp of the social dynamics of a small, diverse working group. Where you can test, you can set a high standard of proficiency on which everyone is agreed; where you cannot test precisely, proficiency becomes something of a judgment call.

At certain liberal arts colleges, sports appear to be more important than classroom subjects, and with good reason. A sport may be the only training in "knowing how"—in demonstrating certifiable proficiency—that a student undertakes at those colleges. At MIT, sports are a hobby (however passionately pursued) rather than a central focus because we offer a wide range of absorbing "knowing how" activities.

LESSON FOUR: ***In science and engineering, you can fool very few of the people very little of the time.***

Most of the sweeping generalizations one hears about MIT undergraduates are too outrageous to be taken seriously. The claim that MIT students are naive, however, has struck me as being true, at least in a statistical sense.

Last year, for example, one of our

ILLUSTRATIONS: JON McINTOSH

mathematics majors, who had accepted a lucrative offer of employment from a Wall Street firm, telephoned to complain that the politics in his office was "like a soap opera." More than a few MIT graduates are shocked by their first contact with the professional world after graduation. There is a wide gap between the realities of business, medicine, law, or applied enginering, for example, and the universe of scientific objectivity and theoretical constructs that is MIT.

An education in engineering and science is an education in intellectual honesty. Students cannot avoid learning to acknowledge whether or not they have really learned. Once they have taken their first quiz, all MIT undergraduates know how dearly they will pay if they fool themselves into believing they know more than is the case.

On campus, they have been accustomed to people being blunt to a fault about their own limitations—or skills—and those of others. Unfortunately, this intellectual honesty is sometimes interpreted as naivete.

LESSON FIVE: ***You don't have to be a genius to do creative work.***

The idea of genius elaborated during the Romantic Age (late 18th and 19th centuries) has done harm to education. It is demoralizing to give a young person role models of Beethoven, Einstein, and Feynman, presented as saintly figures who moved from insight to insight without a misstep. Scientific biographies often fail to give a realistic description of personality, and thereby create a false idea of scientific work.

Young people will correct any fantasies they have about genius, however, after they come to MIT. As they start doing research with their professors, as many MIT undergraduates do, they learn another healthy lesson, namely, a professor may well behave like a fumbling idiot.

The drive for excellence and achievement that one finds everywhere at MIT has the democratic effect of placing teachers and students on the same level, where competence is appreciated irrespective of its provenance. Students learn that some of the best ideas arise in groups of scientists and engineers working together, and the source of these ideas can seldom be pinned on specific individuals. The MIT model of scientific work is closer to the communion of artists that was found in the large shops of the Renaissance than to the image of the lonely Romantic genius.

LESSON SIX: ***You must measure up to a very high level of performance.***

I can imagine a propective student or parent asking, "Why should I (or my child) take calculus at MIT rather than at Oshkosh College? Isn't the material practically identical, no matter where it is taught, while the cost varies a great deal?"

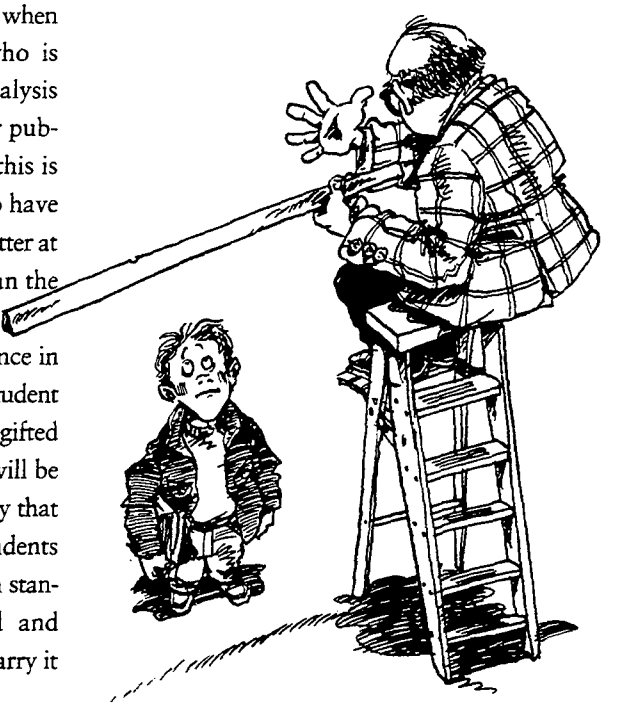
One answer to this question would be the following: One learns a lot more when taking calculus from someone who is doing research in mathematical analysis than from someone who has never published a word on the subject. But this is not the answer; some teachers who have never done any research are much better at conveying the ideas of calculus than the most brilliant mathematicians.

What matters most is the ambiance in which the course is taught; a gifted student will thrive in the company of other gifted students. An MIT undergraduate will be challenged by the level of proficiency that is expected of everyone at MIT, students and faculty. The expectation of high standards is unconsciously absorbed and adopted by the students, and they carry it with them for life.

LESSON SEVEN: ***The world and your career are unpredictable, so you are better off learning subjects of permanent value.***

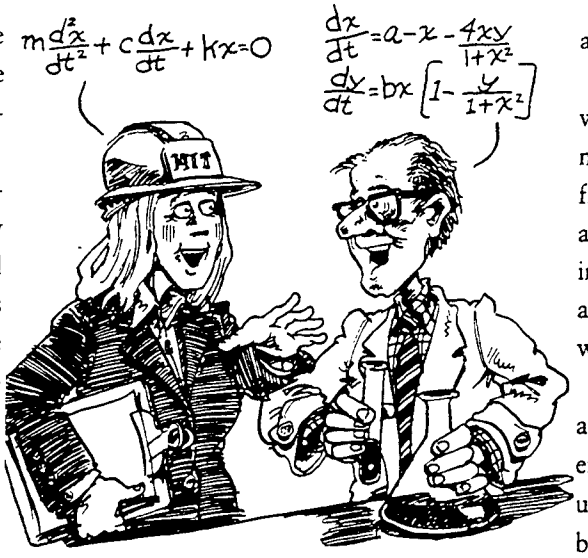
Some students arrive at MIT with a career plan, many don't, but it actually doesn't matter very much either way. Some of the foremost computer scientists of our day received their doctorates in mathematical logic, a branch of mathematics that was once considered farthest removed from applications but that turned out instead to be the key to the development of present-day software. A number of the leading figures in experimental molecular biology received their doctorates in physics. Dramatic career shifts that only a few years ago were the exception are becoming common.

Our students will have a harder time finding rewarding jobs than I had when I graduated in the fifties. The skills the market demands, both in research and industry, are subject to capricious shifts. New professions will be created, and old profes-



sions will become obsolete with the span of a few years. Today's college students have good cause to be apprehensive about the future.

The curriculum that most undergraduates at MIT choose to follow focuses less on current occupational skills than on those fundamental areas of science and engineering that are least likely to be affected by technological changes.



LESSON EIGHT: ***You are never going to catch up, and neither is anyone else.***

MIT students often complain of being overworked, and they are right. When I look at the schedules of courses my advisees propose at the beginning of each term, I wonder how they can contemplate that much work. My workload was nothing like that when I was an undergraduate.

The platitudes about the disappearance of leisure are, unfortunately, true, and faculty members at MIT are as heavily burdened as students. There is some satisfaction, however, for a faculty member in encountering a recent graduate who marvels at the light work load they carry in medical school or law school, relative to the gruelin- schedule they had to maintain during t ar years at MIT.

LESSON NINE: ***The future belongs to the computer-literate-squared.***

Much has been said about computer literacy, and I suspect you would prefer not to hear more on the subject. Instead, I would like to propose the concept computer-literacy-squared, in other words, computer literacy to the second degree.

A large fraction of MIT undergraduates major in computer science or at least acquire extensive computer skills that are applicable in other fields. In their second year, they catch on to the fact that their required courses in computer science do not provide the whole story. Not because of deficiencies in the syllabus; quite the opposite. The undergraduate curriculum in computer science at MIT is probably the most progressive and advanced such curriculum anywhere. Rather, the students learn that side by side with required courses there is another, hidden curriculum consisting of new ideas just coming into use, new techniques and tools that seem to come from nowhere and that spread like wildfire, opening up unsuspected applications that will eventually be adopted into the official curriculum.

Keeping up with this hidden curriculum is what will enable a computer scientist to stay ahead in the field. Those who do not become computer scientists to the second degree risk turning into programmers who will only implement the ideas of others.

LESSON TEN: ***Mathematics is still the queen of the sciences.***

Having tried in lessons one through nine to take an unbiased look at the big MIT picture, I'd like to conclude with a plug for my own field, mathematics.

When an undergraduate asks me whether he or she should major in mathematics rather than in another field that I will simply call X, my answer is the following: "If you major in mathematics, you can switch to X anytime you want to, but not the other way around."

Alumni who return to visit invariably complain of not having taken enough math courses while they were undergraduates. It is a fact, confirmed by the history of science since Galileo and Newton, that the more theoretical and removed from immediate applications a scientific topic appears to be, the more likely it is to eventually find the most striking practical applications. Consider number theory, which only 20 years ago was believed to be the most useless chapter of mathematics and is today the core of computer security. The efficient factorization of integers into prime numbers, a topic of seemingly breathtaking obscurity, is now cultivated with equal passion by software designers and code breakers.

I am often asked why there are so few applied mathematicians in the department at MIT. The reason is that all of MIT is one huge applied mathematics department; you can find applied mathematicians in practicially every department at MIT *except* mathematics. ■

Alumni and alumnae who would like to read more of Professor Rota's observations may refer to his new book of essays, Indiscrete Thoughts, *published recently by Birkhauser, Boston. Rota was honored with the Killian Faculty Achievement Award for 1996-97 by his colleagues and was scheduled to give a lecture open to the entire community on March 5.*

Massachusetts Institute of Technology

REPORT OF THE PRESIDENT

for the Academic Year 1995-96

IN THIS AGE, IN THIS COUNTRY, THERE IS AN OPPORTUNITY FOR THE DEVELOPMENT OF [HUMANKIND'S] INTELLECTUAL, CULTURAL, AND SPIRITUAL POTENTIALITIES THAT HAS NEVER EXISTED BEFORE IN THE HISTORY OF OUR SPECIES. I MEAN NOT SIMPLY AN OPPORTUNITY FOR GREATNESS FOR A FEW, BUT AN OPPORTUNITY FOR GREATNESS FOR THE MANY. ——*Edwin H. Land*

In 1957, nearly 40 years ago, Edwin Land, the founder of Polaroid, gave the Arthur Dehon Little Memorial Lecture at MIT.[1] His address was entitled *Generation of Greatness: The Idea of a University in an Age of Science.* In it, he set forth his conviction that everyone is born with the potential for greatness and that we must be far bolder in our vision and commitment to develop the full creative powers of our young.

His proposal for how universities might meet this challenge was to create within each university small communities of faculty and students who would work together as colleagues in scholarship and research . . . where learning would become, once again, an exciting adventure. This proposal led to the establishment in the 1960s of the Undergraduate Research Opportunities Program at MIT – still one of the strongest features of an MIT education.

But the point here is not that Land had a major influence on education at MIT, but that he had a vision of greatness and a boldness of spirit that were embraced by others. Certainly his influence can be attributed to the power of his intellect and his dream. But perhaps it also had something to do with the times, the dawn of the 1960s, when the country was ready to dream of greatness and to take bold action, and did so in many domains – in science and technology, in education, in civil rights.

IS BOLDNESS A THING OF THE PAST?

Today – in 1996 – we live in an age that seems to reject bold thought and bold action. This is true in America, and it is true in Europe. Why is this? Does boldness come with a price tag we can no longer afford? Does it imply excess or waste or impracticality? Are we too cynical to embrace visionary new ideas? Have we turned from boldness because such vision and action usually call for shared commitment . . . and we only care for what affects us personally and immediately? Is this a natural outcome of our maturation as a nation and as a society? Perhaps all of the above. Or perhaps, at century's end, we have become so concerned with eliminating the budget deficit in order to protect future generations from economic grief that we are blind to the equal importance of making the investments necessary to assure the vitality and quality of their lives.

I do not believe, however, that for most Americans, or for most people around the world for that matter, such limited vision is a conscious choice. We have slipped into complacency and self interest, but we need not, and cannot, remain there. As a society we must once again believe that we can envision and generate greatness in our time, and build the foundation for future generations of greatness.

SCIENCE AND TECHNOLOGY – GREAT EXPECTATIONS?

I am not alone in this belief or desire. Take science and technology, for example.

A new national survey[2] finds that the vast majority of Americans want this country to be the world leader in scientific and technological progress as we

enter the next century. They believe that public policy and federal investment should encourage education, research, and careers in science and technology – in order to build a better future for the nation as a whole and for the everyday lives of individual citizens.

And yet, we do not seem to have the will to stay on this course.

Superconducting Supercollider

One major scientific project illustrates the point. A decade ago the United States committed itself to constructing the Superconducting Supercollider (SSC), a huge new particle accelerator that would have helped us to answer critical questions in particle physics and perhaps discover another force of nature. The frontier technology required to build this project also could have led to important technological innovations of practical benefit to the general society. We invested over $2 billion and got construction well underway. Then we simply changed our mind, walked away, and left a rusting hulk in the arid Texas desert – too expensive.

But more than just expense was involved. We – the science community and the federal government – knew that this was an expensive undertaking when it was conceived and given the go-ahead. It could have been a truly international project, but it was supported in part in order to do it all ourselves, in a nationalistic spirit. Yes, the Japanese were invited to help fund it, but only after the concepts and designs were completed and construction was underway – hardly a true international undertaking.

Then there was the matter of location. The SSC was vigorously supported by the Congress and by the public in several parts of the country – until it was sited. Not surprisingly, it is more attractive to support an activity in one's state or district than if it is located thousands of miles away. Yet, in reality, facilities like the SSC would be shared by researchers – faculty and graduate students from all around the nation and the world.

My purpose here is not to argue that the SSC should have been built; many good people disagreed about that. My point is to ask why we cannot conceive and carry through such bold ventures – why our commitments have no staying power.

The Magnetic Fusion Program

Other science and technology programs also illustrate the point. Take, for example, our nation's magnetic fusion program. As the trauma of the 1970s' oil embargo and other "wakeup calls" regarding worldwide energy needs have receded in our memories, we have ceased to think much about the future of energy supplies and utilization. The most conservative analyses indicate that we will need at least to double worldwide energy production by 2050 if nations around the world are going to have the opportunity to become industrialized and improve their standards of living. At the same time, doing this in a way that does not degrade the earth's atmosphere to an intolerable extent represents a major challenge. Just consider one country, China, with a population of 1.2 billion people, which is developing its industrial base and meeting its heating needs primarily by burning coal. Meeting the demand for energy throughout the world will require new technologies for large-scale generation of heat and electricity that are relatively environmentally benign and that utilize readily available fuels. It is difficult, if not impossible, to construct a scenario that does not involve substantial use of thermonuclear fusion reactors for this purpose. They offer the potential of using essentially inexhaustible fuel, producing very little radioactivity, and releasing no carbon dioxide into the atmosphere.

The problem is that fusion science and technology are very complex and the state of the art must be advanced considerably over the next few decades. A great deal has been learned, but much remains to be done. In 1995, the US magnetic fusion program was funded at a level of $375 million and scheduled to increase substantially in the years ahead, in large part to meet our obligations to the International Thermonuclear Experimental Reactor (ITER) project. ITER is a large joint undertaking of the United States, Europe, Russia, and Japan. In 1996, however, funding for the US magnetic fusion program has been cut to $244 million – and is headed toward a still lower level in 1997. In order to maintain a viable program in the most essential basic fusion science and technology, the US likely will need to drop its commitment to ITER. Reducing our overall fusion program to such levels decreases the probability that our companies will be major players in the provision of power generation plants in the expanding world markets as we approach the middle of the next century. Furthermore, we greatly increase the risk that no acceptable means of meeting world energy needs will be available.

Now let us turn to two bold ventures that, in fact, appear to be moving toward realization: The Space Station and the Human Genome Project.

The Space Station

The Space Station is primarily a technology, rather than a science, project. To a far greater extent, however, it is about humans in space. I believe that reaching beyond the boundaries of earth has an intrinsic value – it is as surely a part of the ongoing human adventure as Hillary and Norgay's ascent of Mount Everest, the Lewis and Clark expedition, the sixteenth-century explorations of Vasco da Gama, or the

fifth-century Polynesian expeditions across 2,300 miles of open ocean to Hawaii.

Some of the most wondrous and important explorations of space have been made remotely, by spacecraft with no crews aboard: the Hubble Telescope's observations of the Shoemaker-Levy Comet collision with the planet Jupiter, or the Galileo Space Probe's magnificent exploration of Europa, Ganymede, and other Jovian moons. Remote exploration through technology should continue to expand our understanding and sense of wonder about the universe.

Still, the human presence in space captures the imagination of most people. The realization that in the entire sweep of human history, my generation was the first to go beyond the bounds of the earth is both a marvel and an inspiration. Children, in particular, remain entranced by this adventure – always a sure sign that something is worthwhile.

Now, fundamentally, the Space Station can do only two things that cannot be done in other ways. It can put humans into a microgravity environment for very long periods of time, and it can put very massive objects into orbit for very long periods of time. Why should we want to do this? For one thing, we will be able to perform empirical medical studies that are necessary preludes to future interplanetary flights.

And while the Space Station is basically a technology project, the ability to place massive objects in orbit for sustained periods of time appears to be leading to an important, though initially unintended, role for the Station in fundamental science. The Alpha Magnetic Spectrometer, conceived by MIT/CERN physicist Samuel Ting, will be placed on the Station. There the device, which will weigh two tons and be about a meter high and a meter in diameter, will allow us to study the properties and origin of cosmic particles and nuclei, including antimatter and dark matter. Discovering the presence of either material will increase our understanding of the early universe and could potentially lead to a clearer understanding of the actual origin of the universe and to the discovery of antimatter stars and galaxies.

Just as we cannot saddle the coming generations with our financial debt, neither can we saddle them with our societal debt through lack of investment in the future.

The Space Station, whose history and congressional support is checkered, to say the least, appears to be moving toward reality for two reasons. First, it is an international project that overtly became a tool of US foreign policy. Second, there is broad public enthusiasm for human space travel.

The Human Genome Project

The Human Genome Project is the one bold, high-profile, large-scale science project that appears to be moving at a direct, determined pace toward its intended goal. The idea is to tap our newly discovered knowledge of the structure of genes and chromosomes in order to improve our understanding of the physical structure of human life, and, ultimately, to make possible dramatic advances in medical science and health care. Originally, it was thought that a map of the entire human genome could be completed by 1998. In fact, this program has been so successful that the mapping was completed in 1996, and work has now begun on the vastly larger task of sequencing the human genome.

The pace of success has been so rapid because project leaders such as Eric Lander and his team at MIT/Whitehead Institute recognized early on that this was not a task for thousands of biologists and technicians working ploddingly with micropipettes. Rather, it was a problem to be solved through the creative and careful application of combinatorial mathematics, computer science, and robotic automation. Technological innovation, combined with human imagination, made the difference.

In addition, this project has been able to proceed on course because Congress and the public understand that the medical advances so important to all of us spring from such basic biomedical research. They are willing to support the necessary investment in this area because they share the vision and can understand the potential for dramatic returns – in the form of better health and improved quality of life.

It is much more difficult, however, to generate such shared vision for basic research that does not hold such immediately recognizable benefits. We have a quandary. Most Americans, when asked, say that they expect science and technology to solve some or most of the problems faced by our society, and that in order for that to happen, we should invest in research and put more emphasis

on science in our schools. But at the moment, at least as far as the long-term prospects for research funding go, we seem to be moving in the opposite direction.

Somehow, as a nation we are unable or unwilling to make the sustained investment or have the confidence that will ensure the kind of future we want – a future made brighter by cures for cancer and mental illness; by clean, renewable energy; by sustainable industrial development; by broadly accessible transportation and information systems; by affordable food and shelter; and by expanded horizons.

There is legitimate concern about how much we can afford to do. We need to balance the national budget so that future generations will not be burdened with our debt. Fair enough. But we need to distinguish between spending for the moment and investing in the future. Just as we cannot saddle the coming generations with our financial debt, neither can we saddle them with our societal debt through lack of concern for the future. We must invest in that future—through education, through research, and through attaining common purpose.

Education – Pass, Fail, or Excel?

The American educational system certainly developed through a series of bold assertions and actions. It is an essential part of our national heritage. What assertion could have been more bold in the eighteenth and nineteenth centuries than the belief that for a democracy to function and a nation to thrive, education must be the universal right of our young? What action could have been more bold than the passage of the Morrill Act, providing a large grant of land to each state to enable the establishment of universities that would provide higher education to vast numbers of young men and women, mostly of modest means? And, in our own century, what step could have been more dramatic, or have better provided for our future, than the establishment of the GI Bill? This is the stuff of greatness, nation building, and empowerment.

To be effective, this nation must match boldness with staying power.

Today, however, we have evolved into a truly paradoxical situation. We have, by a huge margin, the greatest and most effective system of higher education in the world – in terms of quality, accessibility, and creation of new knowledge. At the same time, we have a system of primary and secondary education that is a national shame, one that is a surefire determinant of national decline if it is not corrected.

Repeatedly we have set national goals to be met by our schools by the year 2000 – just four years hence: goals that call for our students to be first in the world in science and mathematics achievement, and for every school to be free of drugs and violence. But few seem serious about accomplishing such goals. Too ambitious.

Our schools, especially in large cities, have had thrust upon them social ills with which they are not prepared to deal – parental indifference, students with low expectations, outmoded and decaying infrastructure, political infighting, misplaced ideology, meaningless bureaucracies, and insufficient financial support. But these are symptoms. They are symptoms of a loss of national will and vision, uncertain or nonexistent values, and lack of respect for our most important profession – the profession of teaching our children.

I do not profess to know the answer to improving America's public schools, but it must begin with a bold reassertion that nothing is more important than preparing our young to face the future.

To do that, I suggest that we must give our students the ability to live, act, and contribute meaningfully in a world that is ever changing. This will require far more than simple mastery over a body of knowledge. We need to prepare our students with a solid foundation in the sciences, social sciences and the humanities to appreciate what they encounter, and we need to do so in ways that will provide them with the skills to negotiate the unknown. To be prepared for the future, our students must be intellectually adventurous.

This is not the place to lay out a set of educational goals for our schools, but I would suggest that there is much to be learned from a set of national standards for science education recently developed by the National Research Council.[3] These standards are based on principles that could apply to many fields. They are based on studying the changing needs of our populace, the changing nature of science itself, and successful educational practices. The standards promote science as discovery, rather than science as a collection of facts to be memorized and accepted. Students are encouraged to develop skills of analysis and synthesis and perspective. Our educators should explore these standards as well as the associated pedagogical techniques. If they were to be adopted, we would see some fundamental changes in

the way we assess the progress and preparation of our students. There is much to be learned that could inspire a whole new generation of students and teachers.

Setting ambitious educational goals is one thing. But we will not attain them unless there is broad societal recognition of the importance of the teaching profession. We must support our committed teachers, and we must create a new generation of teachers who are well educated, future-oriented, technologically literate, willing to be accountable, and excited to explore new ways of teaching and learning.

This is only the necessary condition, however; it is far from sufficient. These teachers must be supported by our citizenry of all ages, by government at all levels, by the mass media and the entertainment industry, by sports figures, by the criminal justice system, and, above all, by the parents and guardians of the young. They must be provided with the tools, the resources, the financial rewards, and the respect to do the job that must be done.

There is progress on at least one of these fronts. There appears to be enthusiasm and action at both federal and state levels, and within the private sector, for connecting all of our schools to the Internet by the end of the decade. This is a bold move, and it is appropriate. But the technical and financial requirements and capabilities must be thought through with great care, though expeditiously. Then the real question must be addressed: How can this new technology enhance learning?

First, of course, teachers must have the necessary understanding of and access to computers and information systems. But beyond that, the community of educators must become a learning and sharing organization. Herein lies the promise: There must be ways of sharing and learning from each other's experiences. The theory and practice of *learning organizations* must be tapped for techniques applicable to our educational system in the large.

The use of the World Wide Web and related tools holds huge promise for sharing learning resources. In the hands of skilled educators networked across the country, one school can produce a small, effective video, text, or other segment on, say, basic cell biology. Another school can produce brief segments about elementary algebra, another can address instruction in Spanish, and yet another may develop an exciting history unit. Individual teachers can then pull different units together to form coherent learning tools for the use of each class or student. By making all of these units available through the World Wide Web, it will be possible to share expertise, and achieve savings, on an unprecedented scale. There is no reason that this kind of collaboration need be restricted to the United States. The opportunities to share and work in education across national boundaries should be seriously explored; they will serve future generations well.

ARE WE STILL A LAND OF OPPORTUNITY?

When we think of the future, scientific and technological innovations often come to mind. But the quality of our future will have even more to do with human relations than it does with science and technology. If this nation is to thrive – economically, socially, politically – we must do all we can to ensure that all of our citizens are able to reach their full potential. Only then will we realize the full benefits to be found in a society peopled with different cultures, races, and nationalities.

RACE AND SOCIETY – ONE NATION OR MANY?

In the 1950s and 1960s, we as a nation determined that we would build a racially integrated, nondiscriminatory society, and we recognized that various interim commitments and corrective actions would be required until we reached that goal. Full attainment of that goal has proved more elusive than most anticipated. We now seem to be backing off in many ways – too ideological; too uncomfortable; too difficult.

Educational institutions have had central roles in both the action and debate throughout this period. Fundamentally, this is because of our special responsibility to prepare young people to take their full place in our society. Indeed, America's course in these matters was largely set by the 1954 Supreme Court decision in *Brown* v. *Board of Education* that laid the foundation for the affirmative action initiatives of the 1960s by ordering racial integration of public schools with all deliberate speed.

Today, more than 40 years after *Brown* v. *Board of Education*, we still find ourselves at the center of discussion, evaluation, and legal decisions about race and diversity. Largely because of explicit actions to increase access to our colleges and universities, most have become much more diverse racially, culturally, and economically. The presence and role of women on our campuses have improved dramatically. Still, most campuses cannot be judged to be broadly representative of the makeup of contemporary America. Statistics regarding most measures of academic success and access of young people to career, professional, and leadership tracks tell us that the goals set in the 1950s and 1960s have not yet been achieved. My sense is that we are losing will, ignoring realities, falling into political partisanship, and, not infrequently,

introducing mean-spiritedness into the national debate on these matters.

Effectively addressing issues of race and diversity is too essential to the future of the United States to allow it to be dissipated in partisan rhetoric. Maintaining our momentum is too urgent to allow it to be defined away through narrow, technical judicial decisions. Reinvigorating a national commitment is too demanding to allow it to drown in a sea of red tape. We need both idealism and pragmatism, but we cannot, through what Father Theodore Hesburgh refers to as "combat fatigue," enter the next century without making real progress toward broad equality.

It astounds me how frequently the issue of diversity is addressed as if it were an abstract concept. Racial diversity is a *reality* of American life in 1996, and we know with certainty that it will be an even more dominant reality in, say, 2015, when the children being born this year are of college age. In 2015, the college-age population of the US will be 16-percent African-American and 19-percent Hispanic-American, and the mix of new immigrants to our shores, especially from Asia and Southeast Asia, also will contribute more substantially to the makeup of our citizenry.

By the year 2015, the work force will be one-third white male, one-third white female, and one-third people of color. All these workers will be toiling to support not only themselves, but all of us who, as retirees, will be dependent upon them – and they will constitute a much smaller proportion of our population. (In 2015, there will be only half as many people working and supporting the retired population as there were in 1960.) If they do not form a cohesive, productive society, the future will indeed be bleak. This prognostication is truly daunting, especially when combined with the fact that we will need to compete in a marketplace and economy that will be even more globalized and integrated than today.

Thus, even if we are willing to ignore the historical imperative and noble goal of equality and true integration, we must be problem solvers and set a sound course for our rapidly changing nation.

It is sorely tempting to declare victory and turn our back on affirmative action and related processes in America. How pleased I would be if we could legitimately assume that all of our citizens have reached a sufficient state of actual equality of opportunity and access that we could adopt simple, race-blind approaches to all that we do. That, of course, is the goal. But is it an honest evaluation of the situation today? One need only peruse the extensive tabulations of national statistics regarding wages, crime, education, health, and many other parameters in Andrew Hacker's book, *Two Nations: Black and White, Separate, Hostile, Unequal* to know that we have not achieved anything approaching equality across the racial boundaries of our society. If that is not convincing, read the front page of any urban newspaper on any given day.

Yet we are retreating. The federal district court ruling in *Hopwood* v. *University of Texas* has already had repercussions around the country – as organized efforts to end affirmative action continue to grow. The actions of the University of California's Board of Regents are well known; and in Colorado, the governing board of the university system has cut back on affirmative action programs. Other efforts include legislative moves in Pennsylvania and Arizona to outlaw affirmative action, and more than a dozen campaigns to amend the constitutions of various states.

In this context, I use the term "affirmative action" rather broadly to refer to programs or actions that specifically foster access or participation of minority groups or women in educational programs or jobs. This breadth seems appropriate in discussing universities in light of recent court decisions. MIT's admissions process is consistent with the Supreme Court's 1978 *Bakke* decision that universities may consider race "as one factor among many" in making admissions decisions. We build our admitted class to bring together students from diverse geographic, economic, cultural, racial, and experiential backgrounds, all of whom have exhibited the intellectual capacity, achievement, and motivation that are needed to succeed and benefit from MIT. Furthermore, our undergraduate financial aid is awarded solely on the basis of demonstrated financial need.

Yet in 1996, in *Hopwood* v. *University of Texas*, the Fifth Circuit Court of Appeals effectively reversed the *Bakke* decision for public institutions in Texas, Mississippi, and Louisiana, by declaring that "*any* consideration of race or ethnicity by the law school for the purpose of achieving a diverse student body is not a compelling interest" and therefore is not permitted.

I do not wish to defend across the board all federal affirmative action laws and set-aside policies, with their attendant red tape, cumbersome bureaucracies, and often artificial metrics. But I do want to defend the core concept that determined, often race-specific consideration and effort are still essential to move us toward the integrated, cohesive society we will need in the years ahead. The society I believe we will need is one in which individuals can realize their potential, and in which we can draw effectively on the individual and collective strengths and talents of our citizens of all colors and ethnicities. We cannot command, decree, or wish into existence such a nation. Rather we must work proactively to build it through the environments and opportunities we create

for learning and working.

The idea that affirmative action programs are unnecessary or even unconstitutional is gaining momentum just at a time when we in science, engineering, and higher education are beginning to see some real results from these programs.

Last summer, the American Council on Education released its study on minorities in higher education,[4] and reported a record number of Ph.D.'s awarded to black graduate students in 1995. And over the past eight years, the National Science Foundation reports,[5] there has been a 75-percent increase in the number of science and engineering doctorates awarded to black graduate students – from 319 in 1987 to 557 in 1995. The media and others have hailed this as a dramatic increase. It is, indeed, real progress; nonetheless, the absolute numbers are stunningly small. Last year, for example, the number of blacks receiving the doctorate in electrical engineering in the US rose 40 percent over the previous year – to 24. Yet this is out of a total of 966 doctorates awarded in that field.

And yet there are arguments over the reasons for this progress. Supporters of affirmative action claim the increase as evidence of the programs' effectiveness, while critics argue that it is the result of increased educational opportunities, and that any benefits of affirmative action are offset by the negative effects of what they regard as preferential treatment of minorities.

Did "affirmative action" play a role in this modest success? It should not be a difficult matter to assess how many of these new Ph.D. graduates were definitively encouraged or enabled to reach this high level of attainment by specific programs or support. It should not be a matter of guesswork; the data should be obtained and affirmative action and outreach programs should be objectively evaluated on the basis of outcomes over time. It should not be a matter of ideology of the left or of the right. We should assess where we are, demonstrate what does and doesn't work, and get on with the job.

Racial and ethnic diversity is not an abstract concept; it is the reality of American life in 1996, and it will be an even more dominant reality in the next century.

In the current legal environment, attorneys are recommending to organizations that were established specifically to promote educational opportunity for minority students that they modify their eligibility criteria to indicate that they will review applications without regard to the applicant's ethnicity. Frankly, this strikes me as a strange and artificial approach.

My own view is that we must hold to our principles if our nation is to benefit from the full range of talent needed to meet the challenges of a changing world. Our journey is not over. Our goal is not attained.

I believe that the time will come when affirmative action programs will no longer be necessary, but for now, we still have a compelling need for proactive efforts, despite calls by some that what is needed instead is simply stronger enforcement of antidiscrimination laws. Indeed, as Tom Wicker put it in his recent book, *Tragic Failure:* "If enforcement of antidiscrimination laws is the alternative to affirmative action, race, sex, and ethnic discrimination will be with us for a long time."

An Open Society – To Whom?

Race is not the only focus of the argument about how open our society should be. These are economically difficult times in America – at least relative to our aspirations and to the post-war boom years. And as times get tight, there is a natural tendency to turn inward. So once again, we hear concerns that we should not be educating so many foreign graduate students. We hear that immigrants are a major cause of our woes. And we keep pulling apart into homogeneous groupings of one sort or another. But just because these are natural or understandable tendencies does not make them right.

America has always been a nation of immigrants and we have always been a land of opportunity. These statements perhaps sound quaint or old fashioned, but they are true, and we must retain their spirit.

Each year, my wife Becky and I host a dinner in our home for the men and women who are retiring from the tenured faculty ranks of MIT. These are always extraordinary assemblages of talented and accomplished colleagues – people who have defined MIT, and who have defined their professional and scholarly fields. No lack of bold thought there!

Yet, as I survey that room each spring, I realize how much MIT and indeed America have benefited from our being open to those from other countries, and

how wise has been our tradition of selecting and advancing people on the basis of their talent and accomplishment rather than their wealth or nationality. Now, some might say that this represents a passing era, that what I am observing has its origins in the intellectual migrations from Europe associated with the turmoil of the World War II era. Or it might even represent the vestiges of the times during which the leading universities in science and engineering were in Germany and England.

No, it is an ongoing fact that the excellence of our institutions is due in very large measure to our openness to international scholars. MIT faculty who have received the Nobel Prize include individuals who were born in Japan, India, Italy, and Mexico. Our provost was born in Israel. We have deans who were born in Canada and Australia. Almost all came to the US as graduate students.

In fact, about one-third of all Ph.D. degrees in science and engineering earned in US universities are awarded to foreign citizens. (In engineering alone, half of the Ph.D.'s are earned by foreign citizens.) Many of these doctoral recipients initially pursue their careers in the US, and about 40 percent of them appear to remain here permanently. What a magnificent resource for our industries, universities, and government laboratories. Openness and meritocracy are what have made our universities great, and we must continue that spirit and philosophy in our national endeavors.

At the same time, we should concentrate on improving both science education and general education in this country's K-12 system in order to increase the number of motivated, well-prepared students entering universities and colleges. We should value more highly intellectual pursuits and celebrate the accomplishments of those who contribute to our health and quality of life by advancing science and technology. This is the way to ensure that, in the long run, our graduate programs have a larger, more stable base of US students.

We must, however, continue to provide access, opportunity, and welcome to the brilliant immigrants who contribute so much to our society – people like Institute Professor Hermann Haus, who received the National Medal of Science this year. Recollecting the call from John Gibbons, the President's Science Advisor, Professor Haus said, "I did not trust my senses, at first. After the news sunk in, the thoughts that came to my mind were that I was grateful to my fate for having come to the US, a victim of the 1945 ethnic cleansing in Yugoslavia; for becoming a citizen; and for the recognition I received on account of work I thoroughly enjoyed and for the privilege of association with outstanding students and colleagues."

I can think of no more eloquent description of what it means for this country to be the land of opportunity. We must retain our commitment to this bold dream.

END NOTE

Boldness and openness are qualities that we as a nation must seek to preserve and advance. We in America's research universities have a particular duty to do so.

Boldness flows from a spirit of adventure and a "can do" attitude long associated with America. These characteristics must again be dominant. To be effective, however, we must remember that boldness must be accompanied by staying power. Staying power is waning. We increasingly are better at starting things than at carrying them through. Contemporary politics demands "change" and new vision at least every two to four years. Our budget cycles cause us to be unreliable international partners as we start and stop projects. Staying power does not mean stagnation, it permits the fulfillment of bold ideas, with plenty of correction, evolution, and adaptation along the way.

Openness flows from a spirit of generosity that has long characterized America, but which today appears to be in peril under the stresses of change, slow economic growth, and increasing uncertainty of the future. We must not allow this to happen, for openness and generosity can only be replaced by narrow expectations and selfishness.

We must, instead, choose to be bold and to be generous of spirit. We must believe in the possibility of greatness, for our society today and for the generations to come.



Charles M. Vest

CHARLES M. VEST
September 1996

1 Edwin H. Land, *Generation of Greatness: The Idea of University in an Age of Science,* Ninth Annual Arthur Dehon Little Memorial Lecture, delivered at the Massachusetts Institute of Technology, Cambridge, Massachusetts, May 22, 1957.

2 National survey on public opinion of science and technology, commissioned by the National Science and Technology Medals Foundation, and conducted in June 1996 by the Roper Center for Public Opinion Research at the University of Connecticut.

3 *National Science Education Standards,* National Academy Press, 1996.

4 Reginald Wilson and Deborah Carter, Minorities *in Higher Education 1995-96: 14th Annual Status Report,* American Council on Education, June 1996.

5 *Selected Data on Science and Engineering Doctorate Awards, 1995,* Division of Science Resource Studies, Directorate for Social, Behavioral and Economic Sciences, National Science Foundation (NSF 96-303).

Readers can find this report (and register their comments) on the Web: <http://web.mit.edu/president/communications/rpt95-96.html>.

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

Presentation by
RADM Thomas F. Marfiak, USN
Commandant, National War College

REAR ADMIRAL THOMAS F. MARFIAK, USN
National War College

A native of Torrington, Connecticut, Rear Admiral Marfiak graduated from the U.S. Naval Academy in 1966 with highest honors in English and French. Immediately upon graduation, he joined USS BRUMBY (DE-1044) to commence a career at sea in frigates, destroyers, and cruisers. He has served at sea in both the Atlantic and Pacific theaters, commanded USS DOYLE (FFG-39), USS BUNKER HILL (CG-52) and the USS KITTY HAWK Battle Group.

While serving in command of USS BUNKER HILL, he acted as Air Warfare Commander for Operation Desert Storm, directing the actions of four carriers and several hundred land and sea-based aircraft while operating in the mined waters of the Persian Gulf. Thirty missile ships from several allied countries were under his operational command. As Commander Cruiser Destroyer Group FIVE/Kitty Hawk Battle Group he directed the training and integration of Air Wing Eleven, several cruisers, destroyers and submarines, and acted as Senior Observer for joint and combined exercises from Korea to Alaska, Florida and New Mexico.

Ashore, Rear Admiral Marfiak has served on the staff of the Chief of Naval Operations in strategy and plans and on the CNO's Executive Panel where he served as Deputy Director. He was also on the immediate staff of the Secretary of the Navy and the Secretary of Defense, serving as Special Assistant to the Secretary. He has also served as a detailing and assignment officer in the Bureau of Naval Personnel.

His first Flag Officer assignment was as Director for Plans, Programs and Budgets for the Surface Warfare Division on the staff of the Chief of Naval Operations from 1992 to 1995. During this period he was directly responsible for surface combatant programs, future fleet plans, including SC-21 and LPD-17 and research and development programs for several advanced weapons systems.

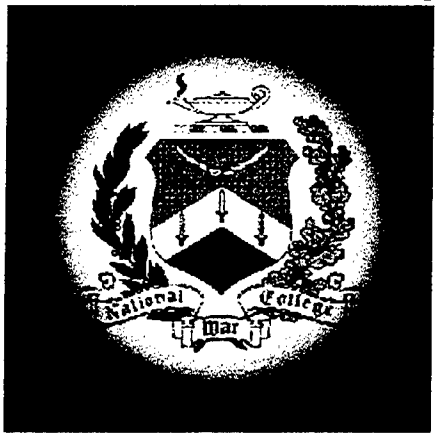
An Olmsted Scholar, he completed studies at the Institut D'Etudes Politiques de Paris, in economics, diplomacy and international law, earning a Master's Degree, and at the Fletcher School of Law and Diplomacy, Tufts University, where he was awarded both the Master of Arts Degree and the Master of Arts in Law and Diplomacy in history, international security issues, economics and international law. Rear Admiral Marfiak also attended the National and International Security Managers seminar at the John F. Kennedy School of Government, Harvard University.

Rear Admiral Marfiak's decorations include the Legion of Merit (five awards and Combat "V"), the Defense Meritorious Service Medal, the Meritorious Service Medal (two awards), the Combat Action Ribbon, Navy Commendation Medal, Navy Achievement Medal and various service and campaign awards.

Rear Admiral Marfiak is married to the former Pat Hurwrey of Torrington, Connecticut. They have three children, Jennifer Garland, Thomas Michael and Sarah, and two super grandchildren, Bryan and Sean Garland.

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EDUCATION FOR 21ST CENTURY WARRIORS



Rear Admiral Thomas F. Marfiak, USN
Commandant, National War College
Fort McNair, Washington DC

I must say this is a daunting prospect. If we succeed today in linking doctrine, technology and strategy with a dash of policy and forethought, we should get tickets to the Super Bowl, or at least an honorable mention in the hereafter.

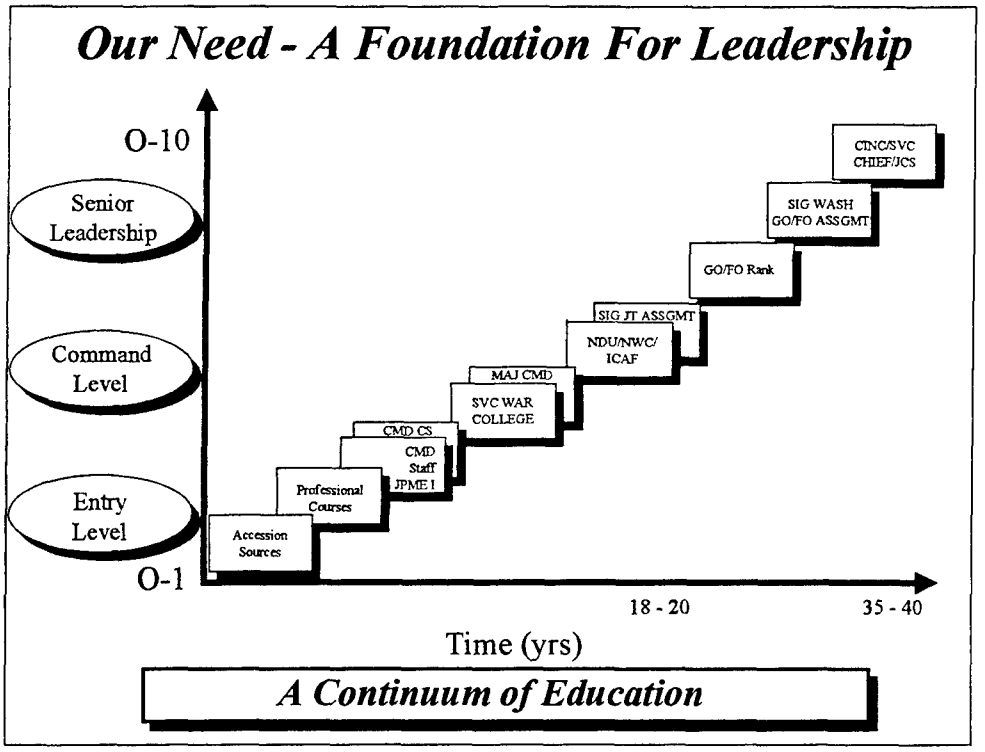
I have been, as many of you know, Commandant of the National War College for just over two months. My experience to this point, in Washington and at sea, has been that of an employer of talent, not exclusively a producer of talent. Now, from the splendid vantage point of Fort McNair, I want to offer you my first impressions of how we can improve a system that has served our nation well over the past decade.

I am talking to you today as someone who has been both a practitioner and user of joint military education and education in general. As an Aegis cruiser skipper, I profited from the education provided by a highly developed system designed to provide the right measure of technical awareness. As a joint planner, I relied on a staff that had been educated in the post-1986 Goldwater-Nichols legislation environment. Today, I want to share my thoughts and perceptions with you as we discuss how best to proceed in a new generation where technology imposes new demands, but where the stakes for military education and strategic insight are higher than they have ever been.

The essence of the question we should be asking ourselves is, "What education is appropriate to which stage of our career growth?" We cannot, or should not, proclaim that there is only one statutory answer that applies to all ranks at all times. We do need officers with advanced technical qualifications. We also need officers with a strategic appreciation that transcends their service and their platform or weapon systems background.

If we agree that such considerations have merit, how best can we provide for the needs of the nation? I submit that the most difficult challenge we face today and in the foreseeable future is how to both gauge and provide technical appreciation for non-technically educated decision-makers. In an environment where career planning is critical, what adjustments should we make to today's system to ensure we have leaders with an adequate technical base who also have the strategic vision needed to lead us into the next century?

Let me elaborate. We are engaged in a time management problem. There is only so much time in an officer's career for formal education. Technical education, for those officers not destined for the acquisition specialty, must be efficiently delivered in an appropriate forum (which, by the way, might not be a resident PME school) and must achieve relevance in decision-making. Propulsion technology, fire control and space-based systems all can be interpreted for the line officer with limited time in a compressed career pattern so as to convey the key elements of the technology in question without requiring an education from the first laws of thermodynamics upwards.



There are basically three stages in an officer's career -- entry qualifications to professional competency, advancement qualifications to command level, and finishing qualification to senior leadership with national and international responsibilities across service lines that requires a refined appreciation of the interaction of politics, diplomacy and strategy. Given the recent changes in legislation, this last phase may last as long as twenty years, during which time an officer may exercise significant responsibilities as a CINC, Chairman, or senior flag or general officer. We can't slight preparing officers for this latter, strategic level phase in favor of providing extensive preparation for the earlier tactical and operational phases, which is made doubly hard by all our Services' compressed patterns. We had best get it right early on.

I have had the honor to serve with officers of all services, educated in the present JPME system. Without exception, they have been exceptional – a joy to work with. To the question whether our present system is adequate, I would say that the system is working. That does not mean it is perfect. There is much we can, and should do, to relieve pressure on those officers as they develop, and to relieve pressure on their Services as they seek to deal with the imperatives of career management.

First and foremost, we should begin a program to provide for the accomplishment of the skills and knowledge-centered portions of the intermediate level of PME through distance learning, to include the educational requirements for qualifying Joint Specialty Officers -- the Program for Joint Education. Put it on CD-ROM and/or make it available through the net -- but let us subtract the months required to complete that from an officers highly charged mid-career timeline.

We may have to evaluate, as a matter of course, the way in which Phase I is presented. Means for qualification and certification will, no doubt, be required. Certainly, as we realize the advantages of a data-based first phase, we may have to recognize that officers who avail themselves of such internet-based training will still need the relationship building that comes from attending a formal course of instruction together.

Next, let us make a pact that officers, before they accede to senior responsibilities, will have the opportunity, through service war colleges or through the joint war colleges, to dialogue with their peers over a demanding course of study. Those peers should include not only officers from their own service, but also, to the maximum extent possible, officers from sister services and senior civilians from the various government agencies engaged in national security matters. And the course of study should be one that will enable them to contemplate major responsibilities from a joint perspective.

Where Should Education Take Place?

I am a strong believer in the theory that education is a continuous process. I have had to learn, in turn, pressure fired boilers, diesel engine plants, 1200-pound steam and gas turbines. In another vein, as many of you have had to do, I graduated, progressively, from duplicating fluid, to Xerox 860's, from Word Processors, to 266 MHz computers and associated software. Today's officers are surpassingly literate in all technologies. Let's give them credit. They will, however, over the course of their careers, likely have to reeducate themselves in at least three generations of technology. How can we help them?

Distance Learning: The Time Has Come

Distance learning can be a powerful tool. We should mobilize our resources to make it into a force multiplier -- teaching preparatory courses, basic qualifications, and certification -- seeking to make every eventual classroom hour count. There are economies to be gained, both financial and time.

Once we have such a system in place and operating, we will be in a position to offer our officers the right mix of technical and non-technical military education, one that will suit them for the responsibilities we expect them to fulfill in the years to come.

Career Planning in the 21st Century

It would be a mistake to place a turning point too early in an officer's career. After all, Chester Nimitz was a diesel engineer early in his career, but we would have been lost had we restricted him to acquisition duties only following his early years. A great question is, how do we provide technical appreciation and awareness to future commanders as they head for command? I submit that the best way to do that is to offer dedicated courses, much as we do now -- through distance learning to the maximum extent possible -- that offer the prospective commander an appreciation of the limits of technology as they apply to his or her platform.

We will always need officers with a deep technical background. Those who choose such a career path will contribute dramatically to our future. But they may not accede to group and fleet command. Instead, their expertise will be applied in determining correct choices for our acquisition programs. In short, we need officers of both technical and non-technical persuasion if we are to maintain our preeminence.

Goldwater-Nichols II

We have now had ten years of experience with the philosophy embodied in the original legislation. Distance learning would not dismantle its original proposition. Rather, it may give us the opportunity to maximize the effectiveness of joint education, timing it in an officer's career so that it occurs at a point when it will have the most positive effect. Let me add that each service has its own imperatives, but that the basic division I have outlined -- initial qualifications, mid-level leadership and senior preparation -- apply to all services with slight variations.

Permit me to add further that this progression should not be a matter of contention between the services and the relevant committees of the Congress. We received the message of the original legislation, and the benefits thereof have been understood without question. How will we progress from here with a shared understanding of the best way to realize our future, a future in which we are all intertwined?

Questions

- Is our present system adequate?
- Where should education take place?
- Can we distinguish education from training?
- Can we leverage distance learning to gain effectiveness?

In conclusion – make no mistake -- I believe technology is crucial to our success. At the same time, an officer is going to reach a point in his or her career when mastery of technology will, in and of itself, not be sufficient. At that point, that officer will, going back to that continuum, be at a point where he or she will make decisions that will affect you and your r children for years to come. We had best be prepared to provide the right mix of education -- a full spectrum of education in strategy, politics, yes, history, economics, all of the pieces that will give them the basis for national decision-making in a world that will continue to be dynamic for decades to come.

The panel this morning has taught you some things about technology -- JV 2010, network centric warfare, and so on. But we have not yet talked about some of the really far, hidden things that will change technology in the future -- that will drive us to different forms of warfare -- as we proceed to a world where national boundaries are no longer as relevant as they have been, where time is of the essence, and where engagements can take place, not in seconds, but in milliseconds.

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PME for the 21st Century Warrior

A Conference Sponsored By





NAVAL POSTGRADUATE SCHOOL
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CONFERENCE ON
MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

Remarks by VADM Jerry O. Tuttle, USN (Ret)
MANTECH Systems Engineering Corporation

Good Afternoon savants, magi, pundits, sapient mahatmas, sages -- you who are blessed to have the minds to think about and appreciate the magic of everyday, ordinary miracles; you who reside intellectually on the other side of Pluto and appreciate the tremendous value of education; ladies and gentlemen.

I am delighted to have the opportunity to again visit this lofty cathedral of wisdom and exchange nirvanas on how best to impart the appropriate knowledge to our marvelous military personnel. This is the site of my most humiliating moments. If the gent that I set by had applied himself, I would have amounted to more in life.

I am awed by the eloquence and brilliance of those whom have preceded me to this platform, and by those whom will follow in my wake. I will skip the pabulum and immerse us immediately and totally into the task at hand. To give credence to my commitment to education, I place in evidence the fact that I spent five years in the fifth grade.

At the outset, I wish to take issue with the stated purpose of this conference, i.e. "Given that technology must be integrated with politics, strategy, and doctrine, what kind of educational processes will produce the cultivated intelligence and mental acuity this nation's military officers will need to dominate the projected operational environments of the 21st century?"

Technology is not to be integrated with anything. It is the other functions and disciplines that need to exploit the wonders that emerging new technologies offer. The search for someone to blame is always successful.

Brilliance in commanding forces inevitably has its roots in the masterful handling of technology. As warfare becomes increasingly a high-technology challenge, our military forces must change doctrine, tactics, strategic thought, operational concepts, organizations, culture, reward systems, training and education. It is essential that our officers are aware of, appreciate and are able to exploit the latest technologies' great potential. If we think education is expensive, we should consider the cost of ignorance.

When the world moves into a new age, technological changes occur approximately two decades before cultural, organizational, operational and, regrettably, educational changes catch up. We unmistakably have entered the Information Age, and although COPERNICUS, IT-21, C4I for the Warrior, the digital battlefield of the 21st century, battlespace dominance, and other perfumed sobriquets are parroted from speakers' platforms and echoed throughout the forces, there remains scant appreciation and less

respect for the Information discipline. There are fewer yet rewards and recognition for those responsible. If you really want to know what our military will look like in the next century, do not listen to the rhetoric. Look at where the money is appropriated. Too little is, regrettably, appropriated for education.

Once, the battlespace was determined by the distance one could sense, detect and identify targets, and the range of one's weapons. The long lance of our arsenal of modern weapons -- whose accuracy is independent of range -- expands the battlespace to global dimensions. Our country's heroes' horizons necessarily have expanded from the next trench to a vast global perspective. There should be a continuum of education, from commissioning to retirement, including interactive education while deployed. This will create a whole new dimension to the meaning of the expression "self paced."

There will be a Global Information System, forged on the anvil of technology and continuously nourished by epic information that will present the world with a miracle the likes of which has not been witnessed since that certain stroll across the Sea of Galilee. This Global Information System will liberate us from the dependence on people, geography and time. It will bring to the living rooms of every American family in living color the atrocities of war. Farmers will have better satellite imagery than nuclear strike pilots had in the recent past. The manner in which conflicts will be planned for and conducted will be necessarily changed drastically.

We are at a rare moment in history, whereby we have an opportunity -- actually an obligation -- to make a major transformation in the world's security posture, composition and profile that will have a profound effect on the entire world. A force that would be more effective, more lethal (while reducing collateral damage), less expensive to build and sustain, and more appropriately tailored for actual threats. The seeds for this badly needed transformation should be sown by our military educational institutions.

Maintaining a ready traditional military force in a democracy over protracted periods of peace is an extraordinarily difficult problem. Once it took the resources of a nation to wage war. Now it only takes the resources of a hacker.

Our challenge is awesome, because success is the enemy of change and the performance of our military has not been merely a magnificent one, -- it has been a legendary one. The door to America's Armed Forces hinges on the leading edge of its successors, and a markedly competitive advantage will favor those who are educated in and exploit technology. Our personnel should be encouraged to not steam midway between the buoys, but dare to be imaginative and explore new horizons. They must be given the freedom to be creative, the guidance to be productive, given the educational opportunities they need, and rewarded for their contributions.

To change a culture, its rewards system must be changed. Sadly, today education often debases an officer's opportunities for promotion. A Navy Lieutenant has a 75% chance of making Lieutenant Commander, unless he is an aviator who attends the Naval Postgraduate School. Then his chances plummet to 60%. During this period of

diminishing defense dollars, we should be investing more, not less in the intellectual capital of our military personnel. Regrettably, the opposite is occurring. Again, we are guilty of mortgaging the future for the present. The Navy's recently announced Permanent Military Professor program will permit it to benefit from the brilliance of those officers who are community drop-outs.

Changes in operational concepts, organizations, educational curricula, and teaching methods must not be made to create the illusion of progress, but to guarantee that we will be able to meet the threats and win the next inevitable conflict. These future conflicts will be manifested in an ever increasing variety, and will be as challenging to our imaginations as to our resources. We prepare to fight the next conflict at great peril if our preparation is based on how the last war was won. And yet, it is folly to rehearse a play differently from what the script and scenario will be for show time. Furthermore, no plan ever survives the initial encounter with the enemy, so our personnel must be educated in such a manner that they will posses the intellectual ability to cope, prosper and prevail in a Proteus battlespace.

As we have observed, information systems make middle managers an endangered species. We will witness dramatic organizational changes, as the demographics of the society from which our armed forces will be recruited change greatly. Within two decades, 80 percent of the jobs in the United States will be cerebral, as opposed to manual. My generation experienced two to three career shifts per lifetime. Today's graduating students will undergo 13 to 14 such career transitions.

Higher education is now the United States' fifth largest export, at $7 billion a year. Nearly 460,000 foreigners, mostly Asians, are enrolled in U.S. colleges, focusing on business, math, science, engineering and computer studies. By comparison, there are only 90,000 U.S. students studying abroad. But this situation is a treat, not a threat. Education will serve as the glue to cement the world into a more holistic one.

If all enrolled college students were to change their majors to computer science, information management, information systems or information technology, there still wouldn't be enough educated personnel to satisfy job-related requirements. This current paucity of personnel skilled in information technologies has enormous implications, both inside and outside the lifelines of DoD. Ever increasingly, industry will find it difficult to deliver these high technology information systems the military needs.

Information technology makes possible virtual classrooms and new military organizations that will permit different functions to be performed by different organizations at different locations, resulting in a revolutionary change in force composition.

The world has been depolarized without open conflict for the first time in the history of mankind. There will be a propensity for us to cling to the romantic past with out-dated educational methods at the very time we should change in order to better exploit the fascinating technologies that have enabled us to enter the Information Age. If we always do what we have always done, we will get what we have always gotten. We can't direct

the wind, but we can adjust our sails. The building of the 21st Century is the task at hand -- not clinging to the 20th.

It was not ships, aircraft, tanks or reusable containers that brought down the wall, but information. Information is the fulcrum on which the lever of victory turns. And, as Archimedes proved, given the right position and a long enough lever, literally worlds can be moved.

We have moved into an age where the equities of the byte age can be combined with the abilities of the divinely given brain to ameliorate ignorance and biases -- and permit a more holistic, safer and peaceful world. This exciting capability will enable us to combat disease, enhance the quality of life, promote commerce and conduct and win wars in a more benevolent manner than ever before. Information should be used as an instrument to preserve the peace and, failing that, as a weapon of war. The public tolerance for casualties, usually unrealistically low, is vanishing, ushered in on the wings of a Global Information System. Our armed forces must be educated on how to leverage this capability.

Forty years ago, when school curriculum was based on the study of classical knowledge, children learned about six simple machines -- the inclined plane, the level, the pulley, the wheel and axle, the wedge, and the screw. These simple machines are basic devices that modify energy, converting limited input forces and motions into the much larger, focused ones required to perform specific work. Today, simple machines continue to play an important technological role in society and in the military, just as they have for thousands of years.

The computer is the seventh simple machine, and the first new machine in several millennia. It is the attribute of the simple machine that makes the computer the harbinger of the Information Age and makes the Information Age so revolutionary. Information Technology is not just a new invention, like the car or electric dynamo. It is a new tool *set*. This simple machine can leverage every activity of human life. The seventh simple machine makes it possible for an artist, engineer, accountant, writer, child -- and warrior -- to integrate dispersed ideas and islands of information and bring to one screen the creativity of their minds.

Collaborative planning, cooperative problem solving, self-directed discovery-based learning, and collective learning are all made possible by information systems, giving a new meaning to the word "synergism." There will be vast repositories of knowledge, containing every imaginable type of information that will be shared with a huge and widely dispersed audience and be immediately accessible from anywhere in the world. We will gather data under conditions of uncertainty and process it into meaningful information; obtain information from widely dispersed domains; analyze, evaluate, and endow it with the knowledge based on experience to create wisdom.

We will amass information from many highly developed minds, critically analyze it in real-time, and impart this knowledge into the minds of the masses. On-line and

interactive long-distance training and embedded knowledge bases and expertise will greatly facilitate problem solving, even in the most complex multi-disciplinary systems. Learning has never been easier. Information has never been more plentiful. Knowledge has never been as accessible.

Modeling and simulation will serve as an usher for, and revolutionize, how we educate our people – as profoundly as the assembly line did the Industrial Age, pushing forward the boundaries of human knowledge to Olympic heights. Modeling and simulation cannot do everything that we want them to do, but they can do anything that we want them to do. They will provide us knowledge not otherwise available or achievable, spanning the spectra from the composition of our universe; deep outer space and beyond to the molecular composition of our bodies. The same process now used for the detection and identification of enemy targets can be applied to digitizing mammograms to fight breast cancer. Modeling and simulation can be applied to any oneiric concept that one can envision.

Ever increasingly, more information will be made public. There will exist digital repositories – a gateway to a vast information universe, a virtual Global Village – for anyone to access. The amount of public information available for anyone with a VISA card, that is not overdrawn like mine, will be staggering. The competitive advantage will return to those with knowledge, because everyone will have access to an unfathomable amount of information. When there are no boundaries to the flow of information, knowledge is limitless.

There will be over thirty countries with Earth Observation/Remote Sensor satellites within the next four years, many with one-meter resolution. Within a decade, they will be able to tell when you need a haircut from space. The expression "nation-state privacy" will have become irrelevant. Military strategic planning will have to be greatly altered. Decision cycle times will plummet. It will be our ability to manage tomes of unstructured information and present it via multi-media in an understandable format that can be rapidly assimilated that will be the enabler.

We will experience the maturity of fuzzy logic not restricted to binary choices, but which can deal with ambiguities. We will have expert systems that can make deductions and actually produce new information. Data mining, through which we will be able to find and extract previously unknown information from existing databases, will open up vast new vistas. Genetic algorithms using Darwinian principles of random mutation will be able to create programs superior to any man can craft alone. Neural networks that emulate our brains' parallel processing structure to derive inductive conclusions, and object-oriented programming are just some of the technologies which will contribute enormously to our ability to better educate our personnel.

Am I Quixote? Hardly! I'm just an incurable optimist. Years of public humiliation have steeled me and thickened my skin, along with my waistline, my arteries and, according to my company, my head. Hopefully, I have been able to intoxicate you with the fantastic opportunities and exciting challenges that await us, and present you an

intellectually sound and persuasive argument for education - education that will provide the competitive advantage to our warriors for the next millennium. We, indeed, are surrounded by fantastic opportunities -- brilliantly disguised as unsolvable problems. Not since Galileo peered through his telescope has the world witnessed as great a sea of opportunities.

You have honored me by your kind attention. May the most that you wish for be the least that you receive, and may your worst tomorrow be better than your best yesterday.

Thank you.

VICE ADMIRAL JERRY O. TUTTLE, USN (Ret.)
President, ManTech Systems Engineering Corporation
Senior Vice President, ManTech International Corporation

Admiral Tuttle joined ManTech International Corporation's executive management team October 18, 1996, as Senior Vice President of ManTech International Corporation and President of ManTech's largest subsidiary, ManTech Systems Engineering Corporation. He is responsible for strategic planning at the international level and total operating responsibility at the subsidiary level of this 3,700 person management and technology firm. Previously, Jerry was with Oracle Government for 33 months, as Vice President, Business Development and Chief Staff Officer. During this period, Oracle Government quadrupled in size and in revenue.

Admiral Tuttle retired from the United States Navy, following a blissful 39-year career. From seaman recruit to Vice Admiral his career included assignments to numerous attack and fighter squadrons. He served as Aide and Flag Lieutenant to the Commander in Chief, U.S. Pacific Fleet. He commanded an attack squadron, an air wing, a replenishment ship, the aircraft carrier USS JOHN F. KENNEDY, and two Battle Groups/Forces. He served as Special Assistant to the Chief of Naval Operations and as Deputy Director for Intelligence, Defense Intelligence Agency. He flew over 220 combat missions over North Vietnam and has more than 1,025 carrier arrested landings. At the time of his retirement, he was Navy's "Grey Eagle" signifying the earliest designated Naval Aviator on active duty.

Jerry is widely regarded as an information technology strategist, having created Navy's C4I Joint Operations Tactical System (JOTS). In 1989, he became Director, Space and Electronic Warfare, an assignment he held until retirement. During this tour he crafted Navy's C4I architecture, Copernicus, and Information Warfare architecture, Sonata. Prior to that he was Director, Command, Control and Communications (C3) Systems, The Joint Staff. From 1985 to 1987, he was Deputy and Chief of Staff for the Commander in Chief, U.S. Atlantic Fleet, following a tour as Naval Inspector General.

His personal decorations include the Defense Distinguished Service Medal (3); Defense Superior Service Medal; Legion of Merit (4); Distinguished Flying Cross (3); Meritorious Service Medal (2); Air Medal (23); Navy Commendation Medal (4); and numerous campaign and special awards. He was inducted into the Government Computer News Information Resource Management Hall of Fame in 1993. In 1995, he was awarded the French "Commandeur de l'Order National du Merite" medal by the President of the Republic of France for his efforts in promoting greater interoperability between the U.S. and French Navies.

Admiral Tuttle received a Communications Engineering Degree from the Naval Postgraduate School in 1962, having attended the undergraduate and postgraduate schools simultaneously. He graduated with honors from the Naval War College, concurrently receiving a master's degree in International Relations from George Washington University in 1969. He has authored myriad articles and speeches.

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PME for the 21st Century Warrior

SESSION NINE

Congressional Panel

Objective: Articulate and discuss the salient issues about military education for the 21st century warrior.

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Congressional Panel

Representatives Ike Skelton and Sam Farr
Senator Jack Reed and Delegate Robert Underwood
Former Representative and NPS Distinguished Visiting Professor Glen Browder

with discussion by

RADM Thomas Marfiak, USN
COL Harry Summers, USA (Ret)
LTG Joseph Redden, USA
LTG Richard Chilcoat, USA
Dr. Arch Barrett

Professor Browder: I am a substitute for Representative John Chapla, who is staff director for the House National Security Division Personnel Subcommittee. Unfortunately, because of an unexpected trip to Bosnia, he could not be here today. He asked that I extend his apology to you. I will speak, not faculty member at NPS or even as a former congressman, but will facilitate the discussion of this panel, which I believe will be a highlight of the conference. I would ask the panel members to make their comments as members of Congress, who have heard some pretty interesting questions raised in the last day and a half. For example, what is the role of congress in PME. We have the experience of the Skelton Panel, which through thorough investigation and analysis, developed a theory and a scheme for PME and then made some very good recommendations to the military. They were very restrained in their use of the legislative power. Another model, is for congress to come in, make a lot of recommendations, and have a very aggressive policy of enforcement. The question before us today is what is the congressional role in PME. Congress is obviously interested in the purposes, definition and the structure of PME. How does it approach those issues. Congress, obviously, will have to take an interest in officer career development, or somebody will. As has been made clear today, the career paths of officers are very limited. And how do you mix all of these concerns into a career. The question of jointness; the reserve component; those are very important things that have to be looked at. I'd like to ask the members of this panel to discuss the issue of support for PME. Finally, I would ask the panelists to comment on where the congressional and military establishments should go from here with PME. I will now turn the program over to Congressman Sam Farr, who will make some remarks and then introduce other panel members.

Rep. Farr: Thank you very much, Glen (Browder). It's a delight to have a former member of Congress on the NPS faculty. I'd like to welcome my colleagues in Congress to Monterey. As I indicated in the opening session, this is where California government began.

We've attracted a lot of institutions to this area, not only military institutions like the Naval Postgraduate School and the Defense Language Institute, but also civilian schools. It's interesting to note that the Navy, through this session, has been able to organize Congress like no one else. You've got the largest concentration I've seen here of former members of Congress, some of who are sitting in the audience today: Beverly Byron, the former Congresswoman from Maryland and Peter Smith, president of the new university at Fort Ord. His school has 1,500 active students and projects growth to about 10,000 students, on the site of the largest military base closing in the United States. Glen Browder is here, and Leon Panetta joined us the other night. So the former members are heavily present.

The conference has also attracted the president of the Monterey Institute of International Studies, General Bob Gard. For those of you that might be interested, a lot of federal money that Congress appropriated has been put into MIIS's Center for Non-Proliferation. The lead story in today's paper describes what that center is doing, and a copy of it is on your seats.

I think that this panel has two roles -- one is to discuss the academic issues of military education. Having the "journeymen" here, the people who are on the dias in Congress making the decisions, the other is to discuss how the military better lobby Congress to get this done? I think we can share some of our experiences with you on how the PME community might be able to do that. The value in this is really that it's a panel discussion. All of us sit on the dias in Washington. We listen to testimony and are given one or two minutes to ask a question, and that's it. There are 50 members on the panel, and you don't get to come back. So, rarely do you have a chance to have a dialogue among members and people who may want to ask questions. I think we can do that today.

The unique thing about these panelists is that they are highly educated members of Congress. You've got Jack Reed -- a West Point graduate who went on to get a Master's degree in Public Policy from Harvard's John F. Kennedy School of Government and then a law degree from the Harvard Law School. From there, he went into private practice, served in the Rhode Island State Legislature, served in the House of Representatives, and now serves as a United States Senator from Rhode Island. He has had a really distinguished career in human resources. He's on those committees and this is his specialty. He's done a lot in crime prevention, a lot in dealing in legislation, dealing with development of the human potential. He is certainly as well-educated and also well-traveled as any member of Congress. I think he has visiting many of the very issues that we're talking about in the new global world. He has been to Haiti, Somalia and Yugoslavia on peace-keeping missions.

As a former Peace Corps Volunteer, I've always felt that there needs to be some discussion about soldiers that are somewhere between warriors and Peace Corps volunteers, soldiers we are increasingly calling on to provide a peace-keeping infrastructure.

Also on our panel is Bob Underwood, a delegate from Guam, who has all the roles in Congress that the rest of us do. Born and raised in Guam, his mother was a teacher and his father worked for the U. S. Post Office. He got a master's degree and went on to become a school teacher, a school administrator, and a curriculum writer. Bob is involved as an instructor in the Bilingual-Bicultural Training Program. He was a Dean and Academic Vice President at the College of Education. He's been very active in Congress in those roles that require his expertise. And he's one of the leaders in talking about government structures.

Guam is in a struggle for its self-determination, and Bob has led the discussion on creating Guam as a commonwealth. It's also interesting to note that Guam was probably harder hit than any other piece of real estate America is interested in by the recent typhoon in the South Pacific. The island, as you know, is almost totally devastated. The recovery from that disaster will be much like the recovery from a military conflict. And so I think that he has a great deal to add to this discussion, both as an educator and as a politician.

Also on our panel is someone who is very dear to me because, when I first walked onto the floor of the U.S. House of Representatives, one of the first persons I met was Ike Skelton. Ike became my 'father.' I parachuted in when Leon Panetta went to the White House. They had a special election. I was like the kid who shows up in class in the middle of the year and nobody knows who they are. They really haven't developed any friends. Ike is one of my favorite members because he reached out and took me under his wing. I was on the Armed Services Committee -- I got on his subcommittee on personnel -- and I learned more in six months under the wing of Ike Skelton than I have under any other member of Congress.

Ike Skelton is like many of us, but he has a district that's much bigger. All of our districts are based on population. His represents 23 counties. That's 23 crises every single day that he has to resolve. He's a graduate of the Wentworth Military Academy and the University of Missouri at Columbia, where he got his law degree, was a Phi Beta Kappa, and was on the Law Review. He's a senior member of the National Security Committee. He's been Chair of the Subcommittee on Military Personnel and the ranking member on Military Procurement. Ike Skelton has military installations in his district, as the rest of us do -- Fort Leonard Wood and Whiteman Air Force Base. His district is a lot like this area, with a lot of small towns and farming communities. He was an Eagle Scout, and he is the father of three sons.

So, I think what you see on this panel is people who have been in the positions of responsibility that a lot of this conference is about. And I think that the challenge we have is to decide how we can best use our role in the United States Congress, which must not only set policy but then put money behind that policy, to advance PME.

And, lastly, before I sit down, I'll throw in my two-cents worth, which is essentially what I think Ike Skelton said this morning – that leadership is absolutely necessary to get things done on the Hill. We like the saying in politics, "The squeaky wheel gets the grease." If, indeed, military education is going to receive the attention it should receive, it's got to squeak a lot louder.

The example this year that hit this school is that two Senate staff members reduced the education appropriation. That affected this School. When the Navy was asked to respond, they didn't respond. And I have to say, if that's where the status of education is on the Hill – that staff members are deciding what's important and what's not important – then we need to speak a lot louder, and we have to become much more politically involved.

I'm also very interested in the dialogue on collaboration. In this area, we have the Monterey Institute of International Studies and its Center for Non-proliferation – a civilian school which the Federal Government is putting a lot of military dollars into. The reason for that is that it has such expertise as a language school – it teaches about every language that's spoken on the globe that's essential to know. Smart students there, by just reading unclassified civilian material, have been able to track the flow of dangerous supplies and equipment, and deduce who has the capability of building weapons of mass destruction. That's not CIA work; that's not military work; that is a civilian school that's doing work that people are very interested in. And the capability there is, frankly, incredible. It's a civilian community with a lot of students who've lived overseas and have come home to get an education here in Monterey.

So collaboration between the NPS and MIIS is absolutely essential. We have more meteorologists here in the civilian community than any place except Washington, D.C. Collaboration with the Fleet Numerical weather station is also absolutely essential.

So, what I'm very interested in – as a politician who sees a downsizing of all budgets, not just the military budget, is how to we get more out of our resources? I think the answer to that is we have to do a better job of collaborating when possible – when there's excess capacity in military (like NPS and DLI) and civilian schools (like MIIS), and there's a willingness of the school superintendent to allow a civilian to sit in that classroom because it won't hurt the mission. We ought to allow them to do that.

But with the current military process, there has to be a cost-reimbursable basis, and nobody can afford to pay $22,000 a year to send people to the Defense Language Institute. If there were an exchange between the University of California and the California State University system, you'd just exchange credits -- you'd send a student over here this year who gets six, seven, twelve units of credit, and you'd send one there next year or the year thereafter. We ought to be banking that. We need to find better tools to meet the mission that we've outlined here through better collaborations. So I'd like to have that part of the discussion as well.

I'd like to call on my colleagues -- each has a point to make -- in this order, and then, hopefully, Glen Browder will be able to engage in some dialogue. First of all, I'd like to call on Senator Reed. He's got more seniority than any of us, because he's in the Senate. When I got to the House, someone said, "Sam, you've got to realize that the Republicans are the opposition, but the Senate's the enemy." So, we in the House always appreciate it when a former House member gets elected to the Senate, because we think he'll be more appreciative of the House. Then I'll call on Bob Underwood to make a statement; and lastly, as cleanup batter, Ike Skelton. So, take it away, Senator Reed.

Senator Reed: Thank you very much, Sam. As a junior senator from Rhode Island, it's wonderful to be here in Monterey -- the Newport of the West. I listened very closely to Sam's introduction and was very flattered when he said I was highly educated. But then I was alarmed, in this crowd, when it was disclosed that I graduated from West Point. We tend to undercut that, but I hope I'll demonstrate or prove his point.

We all understand that we're in the midst of a tremendous revolution in technology -- information technology in particular. This is an intellectual idea that we can all grasp. But when you go out and visit some of the more exciting places around here, particularly Hewlett-Packard Laboratories, and all the companies I have been going to in the last few days, you realize how profound this is -- the behavior of these companies, these institutions. You realize what they're doing is investing dramatically in the education of their work force. In fact, their whole approach to the future is investing in the human capital of their employees. It's transcended any other resource that they command as business leaders.

In the same sense, the military has to do that. The military has to recognize that the future, even though it will be shaped profoundly by technology, will be managed and mastered by individuals. And to do that, they have to be extremely well-educated.

Now, as we look around, the core value that we must continue to emphasize in the military is the capacity to be a warfighter. There's no assuming otherwise. Warfighting will continue to be the essential mission of a military officer. But I believe we also have to recognize that, at the core of that challenge and mission, is an ethical and moral commitment as much as an intellectual one -- that the dedication to country, service and sacrifice that is at the heart of being a warfighter.

This is something that we have to maintain, recognize, and promote as much as any intellectual skill we may teach.

If we do that, I think we will have a sound basis to build, and continue to build, a strong military force. But we have to recognize today, perhaps more than years or decades ago, that we have to compliment that core value -- that warfighter knowledge -- with much more sophisticated knowledge, and a whole range of intellectual activities. We have to develop officers and leaders who understand technology, who understand information systems, who understand the history and culture of the country they may operate in, and who understand and are able to deal with ambiguity and uncertainty.

If we do these things, I think we will produce a leadership corps within the military, because I believe we recognize that leadership extends not just through the officer ranks, but also into our noncommissioned officer ranks as well. If we do these things, I think we will be well-prepared to meet the challenges of the next several years, and of the next several decades.

I returned from Bosnia just about a week ago. While there, I had the chance to go out and visit some some of our soldiers. They are living proof of the value and the success of the military, but are also a good example of the typical challenges that the military forces face today.

I went up to Outpost Demi, which is in our sector near Tuzla, and met with troops from the Second Squad and Second Army Calvary. There was a young lieutenant colonel there -- and I've reached the point in life where lieutenant colonels are young -- operating in a multi-dimensional mission. Not only is he primarily responsible for force protection -- doing the traditional military tasks of outposting associated with conducting patrols, and insuring the protection of his forces -- but he acts in some respects as a surrogate mayor for the towns around him. He is coordinating and collaborating with multi-national political officials. He is integrating, at the very lowest level, the intelligence that's coming in from all different sources. He's also operating in a situation where media and public perceptions are very, very important. All of these are skills that are not taught, or were not taught, when I was going through Fort Benning and other places, and that have to be taught to soldiers today.

The other thing that stood out as an example of the situation there was that the level of responsibility and authority has been pushed down dramatically. When you send out a patrol led by an E-5, that individual has to be a little bit sensitive -- I would say a lot sensitive -- to culture, to history, to technology, and to his or her role in dealing with a very complicated situation. So, in effect, one of the other challenges we have in military education is to educate a generation of educators -- not just trainers, but educators -- who can take their broad, interdisciplinary skills and translate them down to the very lowest ranks of those he or she commands.

Another aspect I think is important -- and I don't know if it fits in very neatly -- is that we have to ensure that those professional military officers who are pledged and sworn to protect our country actually *understand* our country. I think for many years we took that for granted, because we had a huge influx each year, through the draft and through ROTC, of individuals who did not plan to spend 20 or 30 years in the military. Their orientation was military, but it was also one of going back home -- of being part of the great American culture.

That has changed significantly as we've moved dramatically to an all-volunteer force. I think that we have to recognize that one of the challenges we have is to ensure that our leaders understand how our system works, understand the values we fight about in Washington all the time, understand these elements in a much more pronounced way, and keep a strong connection to the American culture as they develop these other technical skills.

As we go forward, we are going to have to prepare soldiers for a vast array of different tasks. We are going to have to ensure that they are technically capable and, as I've tried to suggest, but are also committed to that fundamental element of military service.

Another important aspect we all have to recognize is the proliferation of joint service -- of joint experiences. One of the things we have to do very consciously -- and it is a question of where we do it in the military education structure -- is to harmonize the different cultures within the Department of Defense. We have to recognize that, just because everyone wears a uniform, everyone might not have the same sense of prospective or proportion on a different issue.

For instance, I was startled to read, in the wake of the Kelly Flynn episode, that the services have different standards for what is and what is not permissible in terms of contacts between the genders. That struck me as odd. You would think that fundamental-level policies like that should be uniform. In fact, it strikes people outside the military, civilians, as being sort of odd also -- perhaps undercutting of the legitimacy of the rules that you have, if you can't agree on a baseline for something that's very important. That's just one anecdotal example of the type of standardization that I think we have to do to proceed forward, and a lot of that has to be done in the context of military education.

The bottom line is what everyone has talked about today -- the world we face will be dominated by those who are the best educated. It applies in business, it applies in military, and it applies across the board. We have to develop, sustain and expand a system of professional development that will carry all of our leaders from their indoctrination into the service all the way to the end of their careers. They must participate in a constant cycle of learning, and a constant cycle of teaching to those who follow, to their subordinates. If we do that, I think we'll be able to integrate and to master all the new technologies. If we don't do that, we'll be the servants of these new technologies, and I don't think we'd be serving the best interests of the country. Thank you.

Representative Farr: Thank you, Senator Reed. Representative Underwood.

Delegate Underwood: Thank you, Sam. Happy day to all of you. At an event of this nature, I always wonder what the role of Congressional panels are. I think that, sometimes, they are to demonstrate the ignorance of members of Congress, so all the people in attendance can feel good about themselves and what they know. I don't think the others in this panel will do that, but perhaps I will.

As a former academic -- and I think of myself primarily as an educator -- I come to this issue by looking at it and making comparisons to governments and the operations of institutions of higher education. I find it interesting that so many of the buzz words and discussion points are quite similar to those used in civilian education.

I have no military experience. And so I'm trying to figure out, as a member of the National Security Committee, how I can be useful to the kinds of prescriptions you've given in the course of this conference, and to the kind of ideas and theoretical perspectives that have been shared.

The theoretical issue I find interesting is the role of technology in education -- whether it is inherently transforming, or whether it is simply another element that we must take into c nsideration; and how that affects -- how that impacts the basic training of military personnel?

Many people are typecast as curmudgeons, who hold technology off at the edges of their existence. They are seen as impediments to the reformulation of the essence of the professional military officer in today's world -- people who appeal to tradition and history as the basis for PME. I tend to share the perspectives of those who see historical examples as having particular life and usefulness today. I don't see myself as being an advocate of technology, if people see technology as inherently reformulating the enterprise of anything that we do.

I think of technology as very useful, very important and very critical. I just don't see it as inherently transforming. And if we do see it that way, then I think we have let the tool influence the enterprise of what we do in life in a way that is unacceptable.

Let me refer to some of the examples given by Jack (Reed), of military officers now being required to function as surrogate mayors -- the idea of military officers being required to do a whole range of activities that were not done in the past. The capacity of these military officers to learn new technologies and gain new expertise in very short periods of time indicates to me only that there is a need to make sure that our officers are educated in a way that produces flexibility and knowledge -- knowledge about what brought their profession to this point in human history, and flexibility to deal with the challenges they must confront. So flexibility and leadership in the professional military field, I think, are critical, as they are in almost all professions in life.

Yet there's something a little bit disconcerting -- or perhaps, I would say, something I don't quite understand yet -- compared to what companies do, to what professionals who work in the private sector and the professionals who work in universities do. In University Life, one of the stories that's often repeated to dramatize the separateness of being a member of a university faculty is that, when General Eisenhower was President of Columbia University -- and I assume General Eisenhower came out of the industrial organizational model -- during one meeting he addressed the faculty of Columbia as *employees* of Columbia University.

As soon as he was done, one of the faculty members stood up and said, "General Eisenhower, we are *not* employees of the University. We *are* the University." And that's a very different sense of what it means to be an academic.

In a sense, academics are involved in a world in which they do the kinds of things referred to in last night's presentation, where they articulate their mission sometimes "out of nothing." Academics are good at that. So, sometimes they can look at the world and chart their course, and the whole notion of participatory involvement in the shaping of missions, goals and objectives quite fits the university model.

To some extent, even though companies are certainly admonished to watch their bottom line and to make a profit, some are able to shape their image in the community by saying, "Well, while we make money, we want to be known as a helpful company, or we want to be known as an environmentally sensitive enterprise."

It seems to me that, while those elements are useful, I don't know that the military is quite that free. In the Constitution there's the basic mission of the military, and there's civilian control,. So what we're trying to do, it seems to me, is to adapt the processes utilized by organizations that are freer, in the sense of being able to develop their essence, into an organizational structure which is not that free.

At times that might seem very inviting. At other times, it might lead to a lot of frustration down the line, and might not lead to the kinds of things we hope to accomplish as a result. I could see the sense of frustration in some of the presentations, and in some of the discussions that I've heard.

As an organization engaged in the defense of the country, I think the high sense of purpose the military has in relation to the life of this nation is very different in scope and mission than certainly anything that a university is, or does, and certainly anything that private enterprise does.

I throw that out as an item to consider; because, unless we are quick to acquire processes from other organizations, if you acquire processes without clearly understanding the end point, the process defines your end point, rather than your doing so. Sometimes, that's a very big danger, and I see that all the time.

Glen Browder was telling me before we went on, that the blessing of this particular presentation -- we have no slides, so we're technologically challenged -- is that the 21st Century Warrior will not hear the three words he fears the most, and those are "Next slide, please." I credit that to Glen.

It seems to me there's an inherent contradiction in how we manage the organization in order to develop and understand the competencies necessary to be a fully-functioning officer in the 21st Century. I find I'm in sympathy with much of what I've heard in terms of the importance of having a historical base for providing that education, because education is a process that allows you to frame new events. Education is not a process that leads to you certain conclusions as you confront new events -- that's training. Training is getting you to behave in an automatic way to a new situation. Only education can allow you to frame and make autonomous decisions, and you can only do that with awareness. If you don't have awareness of the frame of your profession, and the unique nature of it as an organization, then I think we are all the worse for it.

In terms of clarifying and making an impact on Congress -- certainly almost every member here will agree -- unless people in the Pentagon themselves make a big fuss about the need for education, it's not really very productive to tell us in this setting. It has to come from the organization itself.

One of the ironies that's very clear to me is that, with the intensity and feeling that's given to discussing and describing the information revolution, it's just barely a "pop" when it comes to giving resources in order to be able to train people and educate people to deal with this revolution. I mean, if indeed these changes are revolutionary and transformational in scope, where are the concomitant resources to deal with that?

So it does no good for a bunch of people in uniform with many, many stars to constantly talk about the information revolution and the need to transform the military organization, but not have the concomitant resources to develop the professional coterie you need in order to manage that information.

Thank you very much.

Representative Farr: Dear friend, Ike Skelton.

Representative Skelton: Thanks, Sam. After the learned discussions by my friends Sam and Jack and Bob, I feel like saying, "Me, too" and going on to the questions. I appreciate your comments very, very much.

It was a pleasure a number of years ago to head up the Panel on Military Education. We've discussed it a little bit today. It's the only time Congress has ever tackled the institution of military education. We had a lot of excellent members of Congress working on it. Archie Barrett, whom I spoke of earlier today, had his heart and soul in it. He made us all look good.

Another reason for this success was the fact that there was a group I call the "Dawn Patrol," based on the four members of the cast in that 1935 movie, which maybe some of you have seen. That "Dawn Patrol" consisted of an Air Force lieutenant colonel, who was promoted during our tenure; an Army colonel; a Navy commander, who was also promoted during our tenure; and a retired Air Force colonel. We have 50 percent of that "Dawn Patrol" with us here today. So much of the work and effort was due to them -- Colonel Mark Smith, Retired, and Major General Don Cook. They allowed us to have the 28 hearings, hear from many witnesses, and interview well over a hundred people. They allowed us to pass the information back to their respective services, so they knew what was going on. That turned out to be a major success for Congress and for the military, and I feel that I should praise them, as well as our friend Arch Barrett, for their phenomenal work.

The question is, "Where do we go from here?" In looking at this, I am convinced that, regarding military education, it is really an individual thing.

On a personal level, I've had two hobbies since I was a boy. One was reading all that I could on how to try lawsuits -- reading about the great trial lawyers, how they cross-examine. Getting old books -- Daniel Webster's closing argument in a murder case -- as well as the new ones. My second hobby was reading military history. And, as a result of all of these, I was able to ask the right questions on various hearings in the Congress of the United States. General Al Gray, a few years ago before he retired, put out a reading list for every rank of officers in the United States Marine Corps. They were quite good -- the books in each of the categories. And, if officers took this seriously, they would be all the more educated.

That's why I think it is an individual thing, to begin with. Using my readings on how to try lawsuits, I got the very first conviction in our county on manslaughter by automobile -- tremendous closing argument. In my second case as a young prosecuting attorney, my closing argument was an excellent variation of Daniel Webster's in a murder case. You learn these things individually. And military people, by reading and studying individually, need to do the same thing.

But it's more than that. If there's a basis within the individual -- a love of history, a love of understanding of how battles are won, how battles are lost, how battles are avoided -- then the Professional Military Education System comes into play. All the better. That's what this is all about.

The question was raised as to the support for military education. I mentioned earlier, in response to a question, that the service chiefs and the secretaries are going to have to make this a priority. Remember this last year, Bob (Underwood), in our committee -- and, I don't know, Jack (Reed), over in the Senate -- the Air Force was doing everything but falling on its sword for the F-22. If you put that type of priority on military education, our country would be far better off. But we're going to have to urge them to do this. It won't be easy because of the higher priority of weapon systems and other things.

If you're going to win battles, or you're going to avoid conflicts, those who wear the uniform of the United States have to have instinctive knowledge. This leads to another support of military education matter, but it goes deeper than that. It goes, Sam (Farr), to the support of the military in general. Jack (Reed) hit upon it when he said that, "People in uniform must understand our country." I'm convinced there's a growing gap between those of you in uniform and the Americans you are sworn to protect under our Constitution.

There are two aspects to this. The first aspect is reflected quite accurately in Tom Rick's book, Making the Corps. Maybe some of you have read it. I recommend it to you. It speaks about young Marines going through boot camp, which is tough at best, returning home and seeing the peers they left -- couch potatoes with long hair and the like. They realize that there's a great gap between the values they've acquired through their recent experience and those held by their buddies back home. If they stay in the Marine Corps -- and this is true with the other services as well -- there will be a gap between those who defend and those who are to be defended.

There's another aspect to this, and this gets to the support element. The gap of which I speak is the gap that is reflected by the lack of numbers of young men and women coming from American homes into the military. Growing up as a boy in World War II, I saw so many older brothers and young men I admired who left high school and went into the military. Most families were touched, one way or the other, when their son, daughter, nephew, or grandson went into the military.

The end of the draft and the continued shrinking of the military resulted in fewer and fewer homes from which young people join the services. Even further than that, you will find very, very few sons or grandsons or granddaughters or daughters from those families in the boardrooms of large corporations across the country. So there is a sociological gap as well.

During the days of the draft and during the war, a beer truck driver could be in a foxhole with the son of a Wall Street banker. I don't think you'll find too much of that today. So there is a growing gap and because fewer people are in uniform, fewer families are affected.

What's the result of this? The result of this is that we in Congress, on the House and the Senate side, get fewer and fewer letters urging us to take care of the sons and daughters who are at Parris Island, or aboard the USS THEODORE ROOSEVELT, or elsewhere. As a result, it's almost a "out of sight, out of mind" attitude. This is the growing gap. How can it be fixed?

I think it's primarily up to the military, but it's also a challenge for our veterans' organizations -- to cause the American public to appreciate those in uniform a bit more.

It can't be applied everywhere, because you don't have posts, or bases uniformly across America. But young men and women in command positions, whether they be company, battalion or post commanders, should have a block on their performance or fitness reports on how well they do in relating to, and working with, the community or communities around. Some do well, and some don't.

There has to be an increased awareness among the American people if you want them, in their talks with us and letters to us, to support the military more strongly. I see this as a major challenge. And I hope that both the veterans' organizations and the military can take heed of them. If that happens, the support for the military will increase, and part of that support, of course, would be for Professional Military Education.

Representative Farr: I opened with some remarks about collaboration. Senator Reed talked about broad skill development. Representative Underwood stressed that questioning authority is essential to creative leadership thinking -- to not accepting the outmoded. And Representative Skelton has outlined, I think very clearly, that there has to be individual drive for education, and support in general for the military -- not only support from the civilian community for the military, but military understanding and support of the civilian community as well.

Does anyone on the panel want to ask questions of other panelists? If not, we'll go into questions and answers with the audience. Does anyone have any questions for the four members of Congress who are here? Remember -- squeaky wheels get the grease. You'd better squeak.

RADM Marfiak, National War College: Good afternoon, sir. It's an honor to be here with you. I must say, Representative Underwood, your prediction did not come true. We were all very impressed with your comments. We have all been very intensely immersed in this issue for a couple of days now. This has been very interesting and revealing for me because, as I noted this morning, for the last couple of years I've been more or less operationally involved. I haven't had a chance to become deeply involved in the issues Representative Skelton raised today -- the history of PME.

One thing that I have not experienced in any other recent conference is the issue Senator Reed brought up and that Representative Skelton just spoke to; that is the increasing alienation, or separation, between the military and the people of the United States. It may be that, in Tom Ricks' book, having the right "esprit de combat" and so on -- is highlighted as an issue for some young people.

But, I must say, I have not honestly seen (evidence of the civilian-military gap) at the higher levels of command, and I wonder if we could, in the remaining minutes available to us, perhaps have a conversation about that, and how the people here in the audience feel about it. Because I think it goes to the core of the all-volunteer force. The kind of professional military operation we have here in the United States is very, very good.

We have the "911" force in the Gulf. The American people expect that it will be able to show up quickly and be competent -- that it will arrive and that everything will be highly organized and function accordingly. We in the military are very good at conveying those expectations, but if we lose contact with the people from whence we spring who are ultimately our customers, then we didn't do it right. So, I'd appreciate it if we could dialogue on that today.

Representative Farr: I think you hit on a key point. I grew up in this community, and we've had a large presence of military here, with Fort Ord as a Army training base; with the Defense Language Institute, which is a multi-service trainer for languages; and with the Naval Postgraduate School. I served in local government, in the state legislature, and now in Congress.

Yet, until I got elected to Congress, I didn't really know what the mission of these schools were. Frankly, they have gates around them and you have to work go through them. I have to say, I think the public's understanding of the military is, essentially, little more than the recruiting messages they see during Super Bowl or NFL games -- the ones that say, "Be all you can be," and like that.

I think there needs to be more breaking down of the barriers between military installations and the communities around them. The military retired community is very supportive, of course. It gets access to the commissaries and things like that. You can see there's a vested interest in it, but there's got to be a better understanding of the role by the general public.

There are a couple things I've observed along these lines that have been really interesting. We host the Special Olympics here. The Defense Language Institute brings down platoons of students there. It's the first time that the public can see the incredible diversity in the military, learning all these exotic languages you don't expect. They do a kind of cultural cross-over. They're down helping with the Special Olympics or the coastal clean up. I think that the men and women in uniform who are told they have to do this do a tremendous job. When we need a lot of hands, they're there. But the rest of the time, there's still a lot of mystery.

That's why I think the educational process needs a collaboration, where we can, on space-available basis, bring civilian students in to military courses. Let's have some dialogue in the classroom; and, in exchange, put the person in uniform into the civilian school, where it's appropriate. We don't need to duplicate, and have two standalone stovepipe systems of education, when what is being taught is mutually beneficial to one another.

COL Harry Summers, USA (Ret), L.A. Times: Professor of Philosophy, Gene Urstein, in the last issue of The New Republic, commented on the loss of authority in the United States. He was commenting on the civilian population, going back to de Tocqueville and his comments in 1831 about the relationship between authority and liberty. He said that the serious decline of social authority in this country threatens the existence of liberty, on the civilian side. I commented that our military

is older than the republic. The great irony now is that the military is being criticized primarily for being too virtuous. That is, the media was astonished that the military would actually take the Seventh Commandment *seriously*. I mean, my God, that was *unheard* of.

As we came out of Vietnam in disarray, one of the things the Army came up with was the slogan "The Army wants to join you." It was an absolute disaster. We joined the civilian 60s and 70s generations, and it damn near destroyed the institution. Finally, we moved back to basics, back to fundamentals, back to a realization that authority in the military is an absolute. You can't have a military without it.

One of the great reviews of Tom Rick's book was by Amy Waldman, who's a reporter for The New York Times. She concludes her observations with -- and there's certainly a wake up call involved, but to some degree it's a wake up call for civilian society as well -- that the schools and the classes have to begin again paying attention to such things as discipline, correct behavior, and all the rest -- if we're going to have a society worth a damn.

I think it is not so much that the military has diverged from American society, but that American society has diverged from the military. Certainly the attributes that Ricks talks about in the Marine Corps for an entry level officer are essential in the battlefield. We saw what happened when we lost that kind of authority in the closing days of the Vietnam War. And I don't think any of us want to go through that again. I just would say that there's another dimension of this civil-military business that needs to be addressed as well. Thank you.

LtGen Redden, Air University: If you haven't had the opportunity to do so, I would commend that all the members sitting here go to a hard-core, inter-city school and visit a Junior ROTC detachment -- one of the programs under our purview at Air University. It's supported by all the services, and reaches out to thousands of young people who like discipline and structure in their lives. It is a leadership program, working with strong support from retired military volunteers. It is not aimed at recruiting young men and women for the armed forces of the United States and it is tremendously successful.

I have visited with school administrators, many of whom are anti-military and/ or have expressed to me sentiments that were predominately anti-military -- from Hawaii, and across the breadth of the United States of America, mainly the United States. Yet they find JROTC to be a tremendous addition and greatly appreciate the study focus, discipline and pride it brings to their young people. I have had a number of principals in very tough schools tell me that the day that the young men and women in Junior ROTC wear their uniforms to class are the days that they have the fewest problem in those schools.

So I disagree that we are disconnected with society in many ways. I think we reflect society. And I think the bulk of society reflects a lot of the values that are represented by all of the individuals in this room. We have an undercurrent though, that we are seeing in our junior officers, and I would reference the Flynn case. There is a certain belief that our very leadership neither reflects nor respects society's values. When all the dust settled out of the Flynn case, it wasn't about gender -- that was about officership and integrity, and about someone who essentially violated the trust in the chain of command.

I was very pleased to see a number of journalists, who had been on the opposite side of that fence, revise their views as all the facts came out over time. It's an issue that we need to be aware of. We become a little bit bewildered when we find ourselves set upon by the very civilian authority that we serve, and appearing to get a mixed signal from that authority.

I think we all very strongly believe that those values that represent the integrity of the military are essential to us, and we don't want to sacrifice them. I think you would find, if you visited some of those JROTC programs, that we've got a heck of a lot of people out there making great civilian contact at a great grass-roots level and contributing a lot to the citizenship development of young people in this nation.

Senator Reed: I think it's an interesting point. The Flynn case is a good prism through which to analyze how the military reacted, versus the civilian community at large. To the civilian community, this was a sexual harassment case. Just like IBM, just like General Foods, they thought some executive was doing something wrong. And, frankly, as I suggested in my remarks, they got more puzzled when they realized it was a penalty in one service and not a penalty in another service.

Those who have been in the military understand, I think intuitively as you do, that the case was a question of leadership -- of a military officer exploiting a subordinate. It reflected a violation of that basic core value of leadership and service and self-sacrifice to the institution. But civilians looking at this, and military looking at this, saw it in different ways. That might illustrate the point I think Congressman Skelton made, and I also tried to make, that there are different perspectives out there. The military must understand how the civilian world reacts to this, and why there was such a hullabaloo, if you will, both in the Congress and around the country.

I think, in a way, we all have to get the message out to the civilian world that this was not just an issue, like in General Motors or some big company -- of sexual harassment. This was an issue of leadership, and of something that an officer has to do that was not done, apparently. This whole dialogue is a very important one.

One other point I'd like to make is that the military is very different, as we recognize, in other aspects of American life. The military is structured hierarchically, and authoritarian; and it should be.

We have to understand where the differences are; and we have to understand where the common values are. I sense, in an institutional way, that this is more of a challenging subject today because, as an institution, the military doesn't get the huge push-through of people coming in that it used to. It's a smaller institution. There's no draft. There's no requirement to bring in a large category of second lieutenants or ensigns each year, who go through and bring with them a lot of civilian attitudes and ideas that keep refreshing, in all sense, the entire military. We have to understand that. Thank you.

Delegate Underwood: If I could just add to that. I'm being educated as I hear people discuss this issue, because I understood the issue of the gap between the civilian and the military as really just a function of demographics. You don't have as many people in the military anymore, so you don't have very many intermediaries explaining the conditions that exist inside the military as an institution.

As a consequence, that places special responsibility on the military to *explain itself* -- not to join society, or to engage in some new marketing plan to beef up its image. It didn't seem to me that it was a question of a critique of anything necessarily going on in the military. It just seems that the demographics of the situation are such that you don't have as many intermediaries explaining the military as you once had. That places special responsibility on the military to explain its unique circumstances as an institution. Indeed, even Junior ROTC programs are fine ways to do that. But I think the bottom line is that that's insufficient.

The broader question of what to do about the issue of authority again comes up as people talk about the growth of knowledge and networking. I was joking with someone outside. I said, "Well, what do you do if you have increasingly flat structures of information? What do you do with the chain of command? Do you have a chain of networks? What does that do in terms of the hierarchical structure that once existed?"

In any situation, civilian society included, if you increase the autonomy of individuals, individuals are going to have it naturally in their grasp. That means that they have to listen less to each other, and such things as authority, and a pronounced sense of authority goes out with it. If you add into that mix an increasingly changing population undergoing various cultural trends, and good old American individualism, you have a very difficult mix to deal with.

The issue of the growing gap between the civilians' and the military's understanding of the military is simply a function of demographics. I don't think it's necessarily a function of a critique of what's going on in the military.

Professor Browder: If I could, as moderator, I'd like to exercise one of my prerogatives to lead us into our last few minutes by saying that we have, on this stage, what I consider to be a very good representation of what we have in the United States Congress. We have people who have a varied background. Congressman Farr represents this institution and other military institutions, and has

proven himself champion of our issues. Let's take, for example, one of the ones he was just talking about -- the education issue. He was just the lead on one of those issues in Congress, this past year, and his efforts resulted in progress.

We have Congressman Underwood, who is an educator but who sat with me on the Armed Services Committee and has demonstrated his leadership on that issue.

We have Senator Reed, who has not only the career background, but the Constitutional responsibilites, to address this issue.

And right here we have the Statesman of PME -- I was going to say the Founding Father, but I won't go that far -- Ike Skelton.

Yesterday we had a representative from the new generation of leadership -- Congressmen Buyer. The military education community has got to work with these people and to communicate to them our concerns, especially as we see the shifting, the devolution, of these responsibilities among younger leaders in Congress.

Let me remind you that following this panel, after a break, we'll have a recapitulation of what has been going on here, followed by a discussion of where we go from here. But in these last few remaining minutes, let me offer you, and again remind you, that we have an opportunity for you to ask the questions, knowing the other panelists.

We've have a lot of questions, and I could look around and see by the faces that there were some other questions that people wanted to ask but did not get to ask. Let me tell you, you've got an audience up here today that will provide an excellent opportunity for you to ask those questions. So in the few, last minutes we have, if you have any questions about Professional Military Education, come to one of the mikes and get it off your chest. I see Arch Barrett going to the mike.

Dr. Barrett: When Goldwater-Nichols was passed, it was because the Congress had challenged the Pentagon to no avail, and Congress had a Constitutional responsibility to reprioritize things in the Pentagon to increase joint influence. Goldwater-Nichols had some provisions that told the Pentagon, the Secretary of Defense, and the Chairman of Joint Chiefs to adjust military education so that the education of officers would now reflect a new joint interest.

Nothing was done for two years. That became the genesis of the Skelton Panel. My point is that there are things in the Pentagon, and things in the services, that don't receive the priorities that perhaps the civilians who control the military should insist upon. I'm not asking for legislation -- I was an Army official for the last three years and I went to see Mr. Skelton and, very sincerely, told him that I didn't think Congress should interfere in this particular issue. I looked him straight in the eye as I said that, and he broke out laughing. After all, he said, "You drafted the most micro-managing legislation that's ever been passed on the Pentagon."

I'm not asking for legislation, but I am suggesting that, in this area of education, that Congress really needs to show interest in what's going on.

As a senior Army official, I sat on the Army's Resource Support Board, the next highest board to the secretary, and made recommendations to the secretary. And in three years, I don't recall one Professional Military Education resource allocation issue reaching that level.

So, I would just urge Congress to pay attention, because one of the finest things in our civil-military relation is that the civil part is able to readjust the priorities of the military part -- most of the time in the right direction, in my view. That's my point number one.

I'd like to speak for a moment now on a point number two. This conference has looked at traditional military education -- Professional Military Education -- and that, to me, has a value that has been amply defended. Strategy and the study of military history are aspects the war colleges teach about. Another aspect that we haven't talked very much about is the whole civil-military relationship -- how the military fits together in the Pentagon, how resource allocation is done in a democracy, etc.

A third thing that's studied at these schools is how to apply the forces that officers and the services have at the present time, or that the officers may encounter in the future -- theater warfare, operational art, etc. It's difficult, I think, to say that none of these things are valuable, or shouldn't be a component of an officer's education.

On the other hand, we've heard eloquent statements about how we need to face other aspects of the evolving situation. Technology has received the most attention, but there have been myriad things that PME should do, if you believe this conference, that, it seems to me, are almost impossible. It's impossible because we've also accepted one assumption. We've accepted the assumption that we're in the box of 20 to 22 years to qualify to be competitive for Flag or general officer. There's just not enough time to do all of these things.

It is really counterproductive for the technologist and the traditional PME people to be arguing. It's unfortunate, but they see it as a zero-sum game. It doesn't have to be that way, in my view. Also, because we've been focusing on education, we haven't really thought about what officers are required to do.

Education is important. But, as the Skelton Panel pointed out, in order to be an adequate joint officer, you have to *first* be a service officer. And that means not just having a service education, but, in the Army, serving as a platoon commander, a company commander, a battalion XO, a battalion commander, or a brigade commander; and in the Navy as a ship or squadron department head, XO, or CO and perhaps group commander. Those things take time, and if you put them all together, there's just not enough time to do them all.

I would ask you to look at increasing the time. The reason we only have 20 to 23 years is because of a lesson we learned in World War II, where we had to fire a whole generation of superannuated officers, not only Guard but active, in order to get the vigorous Eisenhowers, and Bradleys, and people like that who won the war. The lesson learned from that was, we are always going to have a young, vigorous force, and that means 20 years to Flag and then almost 35 years to retirement. I don't think that assumption holds anymore. Just look around at the leaders today. A fifty-five-year-old general officer is every bit as vigorous as a 45-year-old was 30 years ago. So, if we changed the box and think about what we need, as a government, out of our military officers, I think we would expand that box to a longer career. I've already said that I think the downside of that is almost zero. The upside is tremendous.

First of all, we would get the experience we need in young officers as they come up. They could serve longer in positions. There would be time for joint duty, which Congress has demanded. There would be time in the Army to have young Army officers serve with the Guard and the reserves, and overcome that schism -- and I don't know any other way to overcome that cultural schism.

We would get our money's worth. The government, after all, invests a tremendous amount of money in these officers, who we say, most of them, will serve 20 or 22 years. The most discouraging statement I heard in this whole conference was a young officer who got up this morning and said, "After one or two years in the Navy, the young Navy officer starts to consider what he's going to do after the Navy." Can you imagine the distortion in careers that comes from thinking about what you're going to have to do in your second career? Whereas we talk about the military as a profession. I think it should be studied and practiced and developed throughout a lifetime, if you're going to be successful. I'm not suggesting doing away with "up or out." I am suggesting, though, lengthening the time.

Representative Farr: Arch (Barrett), can I have one question of you? You've been in a unique position. You've been a staff member to Congress on the Armed Services Committee, and then you served in the Pentagon. In the squeaky-wheel issue, is it that the Congress is not responding to the issue of more financial resources, or is the problem that the Pentagon isn't asking?

Dr. Barrett: Sir, I think it's a combination of both, on military education. As someone pointed out, the dollars are so small that they really don't get above the noise level to the leadership.

There is a structural problem, also, with respect to joint education. The Army calls Fort McNair an Army installation -- it passed up joint education at the National War College. The Army thinks it's bankrupt already, and yet it has to fund the Army War College. You can imagine how joint education stacks up in that way. The Armed Forces Staff College is on a Navy installation with the same sorts of problems, so these are things that can be changed.

You can fund those schools through joint staff, although there are structural problems to overcome. I'm not suggesting legislation. I'm just suggesting that you need to pay attention to this very important area.

LTG Chilcoat, National Defense University: I want to say something about civil-military relations. Your comment about the connection, or lack of connection, between the military and our society is way up on the screen of our senior service college students. They are wrestling with this. That's the good news in all of this. We all know that there are a lot of issues there. Dick Kohn and I had a conversation about it. I don't always agree with what he has to say on the subject, but he keeps the civil-military relations issue up on the radar screen for all of us. For example, last year, the Army War College made that a special theme.

In just the last week, Gerry Galloway (Dean of Students at ICAF) and General Walt Ulmer, USA (Ret) were talking about an enterprise which would look at this issue in the context of today's and tomorrow's military culture. So the good news is, while it's an issue, it's going to be looked at carefully, studied, worked, and, at least at the war-college level, wrestled with.

Arch's comments are always thoughtful and cause me to reflect. And, with reference to the young commander's comments this morning, I had a great conversation with him.

When I went to the Military Academy at West Point in 1960, I went for one reason: I wanted a great education. I was going to leave the service and go do my second career. I stuck around for about eight to ten years, and then I said, "I'm going to the business school at Harvard, get me an MBA, and then I'm going to get out and make me a bunch of money." So it's not just his generation, or Generation X, which has hedged its bets.

But what happens is, there's some magic in this profession. It's in all of the military services, and it's because we are a values-based organization. What happens is, we *do* learn about selfless service. It takes over, and so I don't worry a lot about today's generation having a little bit of self-interest because I know, as they grow and mature and assimilate the values of the profession in which they serve, all of that will tend to mellow.

A couple quick comments on the role of Congress -- I agree with Arch. But dialogue with us. You have been great about that. Your attendance and your willingness to take the time to come out here and do this is more than just noted. And continue to support us.

Where do we go from here? I had the privilege of speaking to the group last night. I'm not interested in reforming the current system. As I argued last night, it has served us well. What I'm interested in is evolving the system now into a new future. We've had lots of ideas about how to do that. I say, we need to take the time, and I think we in the PME community have to help shape it. But we need to

formulate a new vision for JPME. We have to ensure that that vision is codified into the larger vision of the Armed Forces of the United States, and we need to resource it. And we need to keep it robust. I am very much heartened by your attendance, especially with the Director of the Joint Staff here.

Some comments about leadership. I've worked very closely with two Army Chiefs of Staff over the last three years, and I know of General Shalikashvilli's and of General Shelton's commitment to PME. While they deal with the Bosnias, Iraqs and Irans and a whole host of operational questions, they deeply value Professional Military Education. So I think we in the community just need to make sure that we help keep it on their radar screens, as well.

Professor Browder: Let's give a round of applause to these panelists. This session is concluded.

THE HONORABLE SAM FARR
17th Congressional District, California

Sam Farr, a Democrat, represents the 17th Congressional District of California, which includes all of Monterey County, San Benito County and a large portion of Santa Cruz County. Agriculture, tourism, education, and commercial fishing form the economic underpinnings of the District.

Congressman Farr serves on two key House committees: Agriculture and Resources. Since taking office, he has made economic revival and the creation of new jobs in the 17th District his top priority. So far, Sam Farr has provided an economic stimulus by obtaining $44 million in defense conversion funds to start a new California State University at Fort Ord and a federal commitment to hire hundreds of employees for a new Defense Department finance center to be located at the base's closed hospital. Congressman Farr also saved 300 jobs by stopping the closure of the Social Security Administration's Salinas Data Operations Center. Sam Farr has been recognized as an "Environmental Hero" by the League of Conservation Voters, garnering a perfect voting record in its 1996 ratings, and has been given perfect voting scores by the Center for Marine Conservation and Children's Defense Fund. He was named 1996 Legislator of the Year by the American Planning Association.

Before coming to the House of Representatives, Sam Farr served 12 and one-half years in the California State Assembly, being re-elected six times with overwhelming majorities. As a member of the Assembly, Sam Farr chaired the Assembly Local Government Committee as well as the Committee on Economic Development and New Technologies and was a member of the standing committees on Education, Natural Resources and Finance and Insurance. He is recognized as a leader in legislative efforts for educational excellence, environmental protection, economic development, and new technologies. His accomplishments include passage of laws to expand and develop the State Park system, to stop offshore oil drilling and hold polluters fully financially responsible for oil spill damages, to give businesses incentives to develop new technologies for environmental cleanup, to place computers in public school classrooms and to study the impacts of defense conversion on the state's economy. Sam Farr has been named Legislator of the Year nine times.

Sam Farr began his career in public service in 1964 with a two-year commitment in the Peace Corps in Colombia, South America. Sam Farr graduated from Willamette University in Salem, Oregon with a Bachelor of Science degree in Biology in 1963 and attended the Monterey Institute of International Studies and the University of Santa Clara. He is fluent in Spanish.

A fifth-generation Californian, Sam Farr was born on the 4th of July, 1941. He is a long-time resident of Carmel, California and is married to Shary Baldwin Farr. The Farrs have one grown daughter, Jessica.

GLEN BROWDER
Naval Postgraduate School

Glen Browder has bridged the gap between classroom political science and real-world government. As Professor of Political Science at Jacksonville State University (Alabama) for 16 years, Dr. Browder taught thousands of college students the important principles of American democracy. Then, as an Alabama State Legislator, Secretary of State, and U.S. Congressman, he played a key role in the governmental process. Now, as Distinguished Visiting Professor of National Security Affairs at the Naval Postgraduate School in Monterey, California, Glen Browder is putting his academic and practical experience to work for our country's national security.

Browder's extensive experience and expertise have been directed over the years toward political reform and America's adjustment to a changing world. He has won recognition as a positive and effective public servant throughout his career.

Browder was born in Sumter, South Carolina, and attended Presbyterian College (B.A. in History) and Emory University (M.A. and Ph.D. in Political Science). His occupational background includes work as an investigator with the U.S. Civil Service Commission, sportswriter of the *Atlanta Journal*, and public relations assistant for Presbyterian College. He came to Jacksonville State University directly from graduate school and has been a member of that institution since 1971 (he is currently on leave of absence without pay from JSU).

Browder, a Democrat, served one term in the Alabama House of Representatives (1982-86) before being elected statewide as Alabama's Secretary of State (1986). He won a special election to the U.S. House of Representatives in 1989 and served in Congress (1989-96) as a member of the House National Security and Budget Committee. After an unsuccessful run for the U.S. Senate in 1996, he was appointed Distinguished Visiting Professor of National Security Affairs at NPS.

Browser, 54, and his wife, Becky, have been married for 30 years, and they are the proud parents of Jenny Rebecca.

THE HONORABLE IKE SKELTON
Fourth Congressional District, Missouri

U.S. Rep. Ike Skelton (D-MO) has represented Missouri's Fourth Congressional District in the U.S. House of Representatives since 1977. His district includes 23 counties stretching from Blue Springs, to Missouri's state capital, Jefferson City, to the Ozark region of the state.

Skelton, a native of Lexington, is a graduate of Wentworth Military Academy and the University of Missouri at Columbia where he received A.B. and L.L.B. degrees. He was named as a member of Phi Beta Kappa and the Law Review. Prior to his election to Congress, Skelton served as Lafayette County Prosecuting Attorney and as a Missouri State Senator.

A leader in the House on defense issues, Skelton is a senior member of the National Security Committee, currently serving as ranking minority member of the Subcommittee on Military Procurement. He is also a member of the Subcommittee on Military Personnel. Skelton also serves on the House Permanent Select Committee on Intelligence. Skelton's district is home to two military installations -- Fort Leonard Wood and Whiteman Air Force Base. Skelton was instrumental in bringing the Army Engineer School to Fort Leonard Wood and the B-2 Stealth bomber to Whiteman.

As most of the Fourth Congressional District is comprised of small towns and farming communities, Skelton looks after the needs of rural America. He is a former chairman of the Small Business Subcommittee on Procurement, Tourism and Rural Development and the Congressional Rural Caucus.

Skelton is an Eagle Scout, a member of Sigma Chi social fraternity, a Lions Club member, and vice chairman of the Board of Trustees of the Harry S. Truman Scholarship Foundation. Skelton is an elder of the First Christian Church in Lexington. He and his wife Susie have three sons.

THE HONORABLE JACK REED
Senator, Rhode Island

Senator Reed was born in Providence, Rhode Island in 1949. After graduating from LaSalle Academy in Providence, he received a Bachelor of Science from the United States Military Academy at West Point in 1971. Reed received a Masters of Public Policy from Harvard's John F. Kennedy School of Government in 1973. From 1973 to 1977, Reed served as Infantry Platoon leader, Company Commander, and Battalion Staff Officer in the 82nd Airborne Division at Fort Bragg, North Carolina. He then returned to West Point as an Associate Professor in the Department of Social Sciences.

Reed left the Army in 1979 to attend Harvard Law School. He graduated in 1982 and spent one year with the Washington D.C. law firm of Sutherland, Asbill, and Brennan before returning to Rhode Island. There he joined Edwards and Angell, a law firm in Providence. In 1984, Reed was elected to the Rhode Island State Senate and served three terms where he gained statewide recognition for his leadership on childcare and housing issues. Reed represented Rhode Island's 2nd Congressional District in the U.S. House of Representatives from 1991 to 1997. In January 1997, he was sworn in as Rhode Island's 47th U.S. Senator.

Senator Reed has made education one of his top priorities and has actively worked for passage of the GOALS 2000 Act and reauthorization of the Higher Education Act as a member of the House Education and Labor Committee. He supports efforts to improve access to health care coverage for all Americans, particularly the uninsured children of working families. Upon his arrival in the Senate, Reed was appointed to the Senate Committee on Labor and Human Resources to continue his role as a Congressional leader on education and health care issues.

As a leader in the effort to fight crime, Reed worked in the House Judiciary Committee to make streets safer and protect our nation's police officers. Reed advocated passage of the 1994 Crime Bill and the Brady Bill, and he fought efforts to repeal the assault weapons ban. In addition, Reed has worked to ban "cop-killer" bullets and introduced legislation in the House to ban Saturday Night Specials, or "junk guns". He joined a bipartisan group of Senators to reintroduce the bill to ban junk guns this year.

Reed has also developed expertise on international affairs and defense issues. A graduate of West Point and a former Army Ranger, Reed served on the House Select Intelligence Committee and has traveled to Haiti, Somalia, and the former Yugoslavia to evaluate U.S. peacekeeping missions.

In addition to the Labor and Human Resources Committee, Reed serves on the Senate Committee on Banking, Housing, and Urban Affairs, and the Special Committee on Aging. Democratic Leader Tom Daschle also appointed Reed to serve as Eastern Regional Chair of the Democratic Policy Committee.

ROBERT ANACLETUS UNDERWOOD
Guam's Delegate to the United States Congress

Congressman Robert A. Underwood was born in 1948 in Tamuning, Guam. He earned a Bachelor of Arts degree in History and a Master's degree from California State University at Los Angeles. In 1972, he joined the faculty of George Washington High School, Guam's oldest public secondary school. After working as a teacher, school administrator and curriculum writer, Mr. Underwood left the Department of Education and joined the faculty of the University of Guam as an instructor in the Bilingual-Bicultural Training Program in 1976. In 1988, after receiving a Doctorate of Education from the University of Southern California, Mr. Underwood was named dean of UOG's College of Education. In 1990, he became the university's academic vice president.

Mr. Underwood was elected to the Territorial Board of Education in 1978 and was appointed to the National Advisory Council on Bilingual Education by the U.S. Secretary of Health, Education and Welfare in 1979. He was appointed to the Chamorro Language Commission in 1977 and served as its Chairman for more than 12 years, until 1991. He was also a member of the Guam Historic Preservation Review Board from 1977 until 1990. Robert was a founding member of PARA'-PADA, a coalition of language rights and political rights activists opposed to a proposed Guam Constitution in 1975. In 1981, he was named to the Guam Commission on Self-Determination's Task Force on Free Association/Independence, to research and present to the public its findings on the advantages and the disadvantages of those two political status options.

Robert also was a founding member of OPI-R, the Organization of People for Indigenous Rights, which advocated the formal recognition and eventual exercise of the Chamorro people's right to political self-determination. OPI-R remained actively involved throughout the political status plebiscite of 1982 and the subsequent drafting of the Guam Commonwealth Act, which was accepted by the people of Guam and introduced in Congress for the first time in 1987. One of Robert's first acts as Guam's delegate to Washington in 1993 was to re-introduce the Guam Commonwealth Act in the 103rd Congress.

Robert retired as UOG's academic vice president in 1992, to make a bid for the Washington Delegate's seat, which was authorized by Congress in 1972. He won the 1992 election and became Guam's third delegate to Washington. He serves on the Committee on National Security and the Committee on Resources.

Congressman Robert A. Underwood and his wife, the former Lorraine Aguilar, are the proud parents of five children.

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PME for the 21st Century Warrior

SESSION TEN

Conference Recapitulation

by

RADM Paul Gaffney, USN

Objective: Summarize key points discussed and insights identified during the conference.

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21ST CENTURY WARRIOR

Remarks by
RADM Paul G. Gaffney, II, USN
Chief of Naval Research

I'll try to keep it light and pretty fast. And I'm not going to bother to recapitulate what the members of Congress just said. Their convictions were quite clear, and their words quite recent. We've intensely covered a great deal of territory over a considerable number of working hours during the past two days. The true leaders on this subject convened here and stayed engaged throughout. Both the Office of Naval Research and the Naval Postgraduate School congratulate you for that.

Some things that happened over the past two days: We wired up the National Defense University and shared its vision over dinner and dessert last night. We qualified Wayne Meyer as a polite attendant. We had a football lesson from Professor Kohn, and a wake-up call from him on the American civil-military relationship. We had a Remington Ranger in wing tips teach us how to make the perfect backstroke and then pointedly articulate the over-constrained nature of Professional Military Education when it bumps up against a military career.

We had a Mark Twain-speaking, hundred-dollar-tie-wearing speaker with a rapier wit and a folksy delivery who punctuated -- or who punctured -- his way into our self-satisfaction with PME - General Kelly. A terrorist wanted poster was reissued. At lunch today we learned about space-based haircuts. Some feathers flew up here on this stage and some henhouse cleaning ensued. We had thoughtful, well-prepared people deliver persuasive arguments that would make a debate or drama coach at any first-class university in America envious. And we learned the difference between vision and hallucination.

Some common themes came out, some differing opinions came out. Mostly they weren't divisive, but some were. Some interesting outsider issues were presented, and some topics were not addressed -- not fully, in any case.

I'll organize this summary according to those categories. I won't scratch every itch. My remarks will probably be one sigma from the center. They won't get every outrider. And they will not only reflect my opinion, but try to be a fair opinion among a number of people who took notes over the last two days. My notes here are a living document; the ink on some of these pages is still quite wet.

Here are the common themes, in no priority order, but this first one is probably a priority. We need thinkers whom the system does not suppress. We cannot afford to disincentivize risky but responsible thinkers. And if you think about the way that Congressman Skelton pronounced the word "thinker" every time he gave his speech this morning, you know it was almost with reverence. That, I am sure, is the kind of emphasis that he intended.

Next, resources for this critical investment are obviously insufficient. And they are directly related to the commitment of our leaders. The cost of ignorance greatly outweighs the cost of education. And we, perhaps, lag industry in our investment.

PME insertion into the career of an officer is already, and probably always has been, an over-constrained problem. Organizational slack -- as we heard this morning -- is literally gone. And innovation, if we're not careful, will be a victim. PME needs to be continual, not episodic.

Quality was an issue -- degrees of quality -- but all agree it could and should be improved.

Technology, which became more of our focus in the last part of the conference, is obviously a challenge to teach. The speed of technological change is undeniable. We've left the Industrial Age. We've entered the Information Age. We're not yet settled on how much one teaches in the technological area. We are all certain, I believe, that is a necessity; although it may not be sufficient, on its own. And we also, I think, all believe that there will continuously be a tug-of-war.

Throughout the conference, information technology and the word technology were used interchangeably and, in my opinion, that's an error. Information technology is, has become, a foundation discipline on its own, and is an underpinning for every other discipliine; but there are many others that brought us Stealth, and lasers from space, and many other of the technologies that we live with and will live with tomorrow.

Trust, we found throughout the two days, is important to gain, is important not to lose, and, if we do lose it, we must recapture it quickly because it is key to our military culture. It is key to team survivability and absolutely necessary for innovation.

We probably suffer from inflexibility of our personnel system. Maybe it's an outdated system as well. It has hamstrung us in detailing students to PME assignments, and has not helped the quality of our military professors. It has not allowed us to realize the full potential of our civilian faculty.

Goldwater-Nichols and its derivative, the Skelton Panel, were good, were right, and spurred us on to get to where we are today in PME. But some

unintended consequences and new opportunities are seen ten years later. As a matter of fact, we know that technology has changed enormously since the first meetings of those two groups.

Technological tools for education offer certain hope for solving continuum, time, geographic, outreach, nonresidency, and JPME-2 gap challenges. But when to buy in, and how often to buy in to keep that technology current, is an issue that was brought up several times. We do not have a lock on that problem. It is a problem that the entire armed forces deals with every day -- when to buy in for new information technology.

There was a surge here at the end, perhaps designed by the people that paid for this conference, on the technological aspects of PME, punctuated by Admiral Tuttle's lyrical remarks at lunch today. The possibilities for, and potentials of, technology impact us in every way, and will impact the changing face of war. That's been emphasized.

Several presentations inherently argued for technological skill and for it to be continually updated. We started off talking about a comfort factor, and then confidence, and then competence. And I think since the beginning of the conference, while comfort with technology was probably at the high end of the teeter-totter, by the end of today it swung back the other way -- that we're a little bit more concerned about competence, and not just comfort. Sometimes it may even be good to be uncomfortable with technology so you use it with respect.

We decided we can't measure the output of education within the wavelength of the typical decision-maker's fitness report reporting period. One has to believe in education as an investment. It's a pay-me-now, or pay-me-later -- or even pay-me-more-later issue.

The Reserve in the Guard need to be reached with PME, especially as its stock rises as a full-fledged partner with each of our services.

An extension of PME to our civilian partners was also mentioned several times, in a positive way. We ought to know why we exist, and where we are going as a military, and ensure that the PME system we design matches up with that.

Faculty quality was discussed many times, and several options were presented for correcting and guaranteeing quality. But in every case, faculty quality was judged as critical.

It will be helpful, I think we all agree from dinner last night, to have a shared vision so that we can stand together to make progress. Because we can be divided. We've demonstrated that in vignettes over the last two days. Divided we will not succeed.

And, finally, on common thoughts. I think we can all agree that we still do not know what the speed of dark is. We don't know what was better before sliced bread. And we don't know when to tune a bagpipe. There were some divided themes. How good are we absolutely, and how good are we relative to one another?

All agree that improvements could be made, but some thought we are doing absolutely the best we could with the resources we have, and we continue to make improvements. Others were less charitable, for sure. Who should attend PME was an issue, as well. Some said all; some said only the best. Some said only the warriors; some said the support folks as well.

Do we do PME as a group, and socialize, harmonize and develop peers? Or do we do it separately? Is using IT alone good enough? Should PME and JPME create interchangeable officers -- homeogenity? Or should we use PME, and maybe some of the tools available to us now, to ensure diversity of skill and match those up in the right way? And what about diversity in the more popular sense, that relates to the heritage, race, linguistic, and national capabilities of our work force in America?

JPME-2 was a hot button early on. The Armed Forces Staff College's utility was questioned by some. Some proposed that the maturation of the PME process in the service schools was good enough now to carry the whole burden. Others argued about the gap between PME-1 and PME-2, and the effect that has on the CINCs. There was no real consensus there.

Congressmen Buyer argued that there should be a crucible that generates our entry force of officers. He argued for the academies and the military colleges and felt that ROTC should be down-sized. Others asked for a much a wider expansion of the ROTC program.

Are we the envy of American business and industry, or are we diverging from the American civilian culture, our client? These are different questions, really, but they beg whether we as an officer corps and as members of the military force are admired, or increasingly rejected. PME might be central to the resolution of that issue.

We're split on the correct balance between technological and social skills. Everyone agrees, however, that it is inevitably a tug-of-war. Mr. Skelton threw a very tight spiral to the Navy to think about a paradigm shift in its PME. This also has geographic implications. Nobody brought that up when the Senator from Rhode Island and the Congressman from Monterey were in the same room.

Several things were not really addressed. Are we teaching the right things once we sort of get a balance? Do we have the priority straight so that we can -- those who are professionals at designing curricula -- design the correct PME curriculum? Right now we lack a priority list of which things to fix first, assuming

that we're not going to get more resources, or even assuming we do get more resources, although such a prioritization may come in the proceedings.

There's some evidence we talked right by the character of Generation X. There was a glancing blow by a bright young student this morning. They are the targets of future PME. They are also the targets of today's PME, at some levels. Are we doing what they desire? Are we doing what they will accept?

Some have said that some Generation Xers out there have already surpassed the grand plan for the National Defense University. We haven't -- people of my age -- but maybe there are some lieutenant commanders and captains out there that already have. You have to keep that in mind. Their acceptance, I think, will have a direct relation to retention and motivation and innovation in our military force.

And, much like the relationship between PME and careers, the schedule for this conference was over constrained -- there was not enough time for the audience to get into the mode of asking questions and to give the people on the stand a chance to answer them or to defend their position. That is a function not of the skill of the people in the room, but purely of time, and I don't think we could have stretched or squeezed any more into the time that we did here.

The whole concept of formal graduate education, technical or social, PME or not, at this Naval Postgraduate School or in civilian institutions, wasn't addressed until the very last moments when two fellows from Missouri and one from Texas brought it up -- Congressman Skelton, Admiral Meyer, and Admiral Tuttle. The NPS existence within the demise of the armed forces -- and of the Air Force Institute of Technology -- were not mentioned at all, except by those three people near the end.

There are some outriders. These are not themes that either congealed or dispersed the community here, but interesting thoughts worthy of mention -- worthy of being recorded.

The first one was interesting and it initially came from a Naval officer and a woman who talked about physical capabilities and which echoed many times after that. Strength, agility, endurance, good health.

Recruiting quality as a national problem was brought up. And it's part of the calculus of addressing quality and time in PME. There was even talk of requiring entry level master's degrees of unrestricted line officers in the Navy.

PME for the NCO was brought up several times. A study that the Naval Research Advisory Committee did this past year on logistics support for the small, dispersed Marine Corps unit was quite interesting. Their assessment was that the young Marine was vastly underrated in his ability to absorb training and education, especially in information technology. So we may be underestimating the

capabilities of our enlisted people all the way around, and PME ought to be considered for them.

The notion that an unsophisticated enemy is capable of affording today's technologies, to create cheap kills that will be seen on the six o'clock news, was brought up. This is something to be kept in mind when you're deciding how much of the program should be technological in nature.

The whole notion of getting really serious about PME was brought up by several people. Concepts like applying for the program, taking qualifying exams, mid-career competency exams, assignments based on performance, and standards for professors were all brought up. They bring shivers to many people on the faculty and in the student body. Nonetheless, these were serious proposals and should become more serious.

Professional Military Education for our coalition partners in the context of continual cuts to the IMET budget was also brought up. Somebody mentioned that we were 10 to 15 years ahead of our international military counterparts in this field. Well, that's great if your international counterpart is an enemy. It's bad news if your international counterpart is fighting a coalition war with you. It may even be worse if your coalition partner is coming to get PME so that he can go back and better serve the clients, civilian leadership, and civilian peers back in his country.

A very interesting thought based on some pretty rigorous research was, should we even touch the enduring character of the officer? Should we at all address skills like risk-taking, multiple-task juggling and intellectual vigor? Or do we just recruit those people, like the NBA does, and focus most of our energy on occupational and domain knowledge? I think that's a pretty serious question.

That's my report. It's a compilation of the notes I took over the last couple days. I leave it now to the Postgraduate School to record this in a more thoughtful, better organized, and better prioritized way -- hopefully for the record.

We'll ask Lieutenant General Holder to write the exam for all of you. And I leave it next to Admiral Blair to set our course as our capstone speaker. For the Postgraduate School and ONR, let me say that we are terribly worried about what might be a shamefully small investment in research and education for our future. And we are buoyed to know that you share that concern with us, this powerful organization.

For Mr. Skelton, we thank you for inspiring this conference; Mr. Browder, for designing it; and the Naval Postgraduate School for pulling it off. Thank you for this inspiring and unusually candid event concerning a topic that affects all of us and all our tomorrows.

REAR ADMIRAL PAUL G. GAFFNEY, II, USN
Chief of Naval Research

Rear Admiral Paul G. Gaffney, II, became the 19th Chief of Naval Research, commanding the Office of Naval Research (ONR), on July 12, 1996.

As the Chief of Naval Research, RADM Gaffney manages the science and technology programs of the Navy and Marine Corps from basic research through manufacturing technologies. ONR's annual budget of approximately $1.3 billion is allocated for research and development programs conducted by universities, Navy laboratories, and industry.

His distinguished military career has spanned nearly three decades and includes duty at sea, overseas, and ashore in executive and command positions. His duties have included tours as: Operations officer in USS WHIPPOORWILL, a minesweeper homeported in Sasebo, Japan; Advisor to the Vietnamese Navy Combat Hydrographic Survey Team; Executive Assistant to the Oceanographer of the Navy, Washington, DC; Commanding Officer of the Naval Oceanography Command Facility, Jacksonville, Florida; Assistant Chief of Naval Research in Washington, DC. Commanding Officer, Naval Research Laboratory, Washington, D.C.; and Commander, Naval Meteorology and Oceanography Command.

He is a 1968 graduate of the U.S. Naval Academy, was selected for immediate graduate education and received a master's degree in Ocean Engineering from Catholic University of America in Washington, DC. He completed a year as a student and advanced research fellow at the Naval War College graduating with highest distinction. He completed an MBA at Jacksonville University.

He and his wife, Linda, call the Mississippi Gulf Coast their home. They have one daughter, Crista, who is a student at the University of South Carolina.

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PME for the 21st Century Warrior

CONCLUDING REMARKS

by

VADM Dennis Blair, USN

Question: Where do we go from here?

NAVAL POSTGRADUATE SCHOOL
and
OFFICE OF NAVAL RESEARCH
CONFERENCE ON
MILITARY EDUCATION FOR THE 21st CENTURY WARRIOR

Remarks by
VADM Dennis C. Blair, USN
Director, Joint Staff

Ladies and gentlemen, today what I'd like to do with my time is to think out a little bit into the future on this subject of Professional Military Education. I'm thinking first about the joint education of future officers, which is my current concern. What changes in officer education will strengthen the planning and execution of joint operations as we know them today? And how should that education anticipate and adapt to make our joint officers even more effective in the future than they are in the present?

Most of what I say is going to be pretty "meat and potatoes". My current job is trying to take visions and turn them into programs that we can execute to get things done and make things better. Most of what I have to say I've heard touched on today and referred to yesterday, so little of it will be new. But let me try to put it together in a way that sketches out a way forward.

I think our point of departure here must be the war-fighting effectiveness of the joint force. How do we educate -- not train but *educate* -- the commanders and their staffs for the maximum combat effectiveness of the force?

In order to answer that, you have to know what the primary ingredient of a successful joint task force is. What makes the great ones, and what makes the not-so-great ones? Above all, in my observation, it is the attitude set by the commander, and even more, the attitudes set by his component commanders. If those commanders are actively looking for common solutions, offering support and assistance across component lines, showing impatience with "that's not my responsibility" thinking, and reading joint doctrine pubs to adapt them to find new ways to cooperate, then the effectiveness of that joint task force will be greater than the sum of its parts.

If the reverse is true, that is if the joint task force commander and especially his component commanders are reading joint doctrine in order to find out what they don't have to do, or are using it to assert their authority against other component commanders, or if they are just keeping score to see which component is ahead, then the combat effectiveness of that joint task force will be less than the sum of its parts and certainly less than we owe the American people.

Now, Joint Professional Military Education on its own cannot instill this joint attitude, this pride in the joint team and officers who attend it. It's more a matter of leadership and example. But I believe that joint education should contribute directly to joint attitudes, which are at the heart of joint combat effectiveness.

As I review the Officer Professional Military Education Policy, the OPMEP -- the instruction that governs our joint education -- I find objectives which express this idea, which I believe lies at the heart of successful joint operations, both now and in the future.

For the Industrial College of the Armed Forces, we find the following learning objective: Internalize a thoroughly joint and interagency prospective as an element of personal and professional development. And, for the course at the Armed Forces Staff College, the following: Demonstrate a thoroughly joint perspective and comprehension of the increased power available to commanders through joint effort and teamwork.

Now, these two objectives, I believe, get at what is the essence of jointness: *teamwork*. Taking as much pride in the accomplishments of the joint team as in one's individual service.

So what concrete steps can education take to build this teamwork? I believe that the personal contact among officers of the different services is a large part of it. Joint tours, in my experience, do build joint understanding and joint appreciation. It's impossible to walk away from a joint tour without recognizing the quality, education, dedication, and contribution of the officers of the different armed forces. It's hard to keep single-service prejudices.

Currently, we mix our students up in JPME Phase 2 at the Armed Forces Staff College, at NDU and ICAF, of course, and at Capstone. And at our service schools, there are small proportions of officers from the other services.

We should continue mixing up these student bodies at least to the current level and perhaps increase it. Why not make half the students at the Air War College Air Force, a quarter Navy, and a quarter Army? Would the service emphasis suffer? Would the Army and Navy students move from token representatives to contributing participants in a joint learning experience? I think we can do more here.

There are additional objectives which I believe we could undertake in Joint Professional Military Education to foster this sense of joint teamwork, which will characterize the great, as opposed to the average, joint task force of the future.

I don't believe that in our current system anywhere we really teach the unique essence of each service to the other. For example, the essence of the Navy is teams of people making big machines perform -- from firing guns, to

launching missiles, to replenishment at sea.

The Navy gets its job done through operating big, complicated pieces of machinery in the very unforgiving environment of saltwater, on steel ships that are rolling, pitching and flexing. Because a battlegroup contains relatively small numbers of these big machines, the Navy does not develop, nor need, rigid detailed doctrine. Commanders can, and do, adapt during operations and still carry out their intent. Navy logistics involves getting shiploads of equipment and supplies to other ships, and they don't change that much from peace to war. They just get larger in scale.

Now, the essence of the Army, on the other hand, is quite different. The essence of the Army is controlling formations of large numbers of people and small machines. Because of these large numbers and because formations who may have not trained together may be thrown together in the course of campaigns, Army officers must develop, learn, and apply doctrine.

In the Army, the movement of logistics is an incredibly diverse, complicated business -- quite different in war from what it is in peace, and a dominating factor in their operations.

I have found, in my experience, that the proclivity of officers to look down their noses at other services is pretty much in direct proportion to their ignorance of what drives the other services.

A major part of our joint education should be to break down this ignorance -- and I'm not talking here about junior officer orientation visits to other services, to take a look at and spend a few days with another service. I am talking about taking mature, experienced officers in their own professions who know what their service can do, and teaching them what makes other services tick so that they can operate more effectively together by taking advantages of the strengths and minimizing the weaknesses of the other service in forming the the joint team.

I think we go too quickly to the higher level of integrated operations, that we don't teach the essence of the other services in order to get the team working together. For instance, how would I design a course that would teach Naval officers or Air Force officers about the Army? I would start with a few key books like We Were Soldiers Once And Young, which gripped me and which my Army friends tell me gives the truest picture of what a small unit infantry battle is like.

I would play for these officers the taped reconstruction of the 73 East Wing Battle in the Gulf War, with its interactive presentation of what the battlefield looked like from an individual tank, and with the sound of the radio circuit on which that battalion commander controlled the engagement. I would include Steve Ambrose's book, Citizen Soldiers, giving the soldier's viewpoint in the European Theater in World War II, which still has large effect and a large legacy in the Army today. And

I would assign these Naval officers, these Air Force officers, a detailed research project on a detailed tactical aspect of the Vietnam War, or the war in the desert, and have them present it to an Army officer for his critique.

The objective of such a course would be for officers to understand how their colleagues in other services really think, what they worry about, what they aim to accomplish, what the characteristics of their environment are, and what mission drives them to do things one way and not another way.

I believe that, at the same time, officers would learn more about the unique essence of their own service, just as one learns more about one's own language when one learns a foreign language. And, to me, this kind of understanding and educattion would make far more effective joint officers than, perhaps, that extra test on joint doctrine or survey of national security classics.

So, in summary, I would offer two changes to joint education to enhance joint teamwork, which I think is the key criteria: 1) increased mixing of officers of the different services, and 2) courses in which mature officers really learn the essence of their sister services.

Now, let me turn to the 'how' of joint education and make a couple of recommendations. I endorse completely General Chilcoat's call for electrically linking the resources of all service and joint educational institutions, and I see a double advantage in doing this. Certainly, it will give the student officers access to a huge range of learning resources, literally at their finger tips.

But, in addition -- and we've referred to this several times in this conference -- these officers will learn how to use distant databases, how to interact electronically with other colleagues spread across the country and the world, and this will help them become masters of this information technology, which will make the difference in warfare in the future.

They will learn its purposes; they will learn to bend it to their purposes; they will learn its strengths and it's limitations. And, with this full electronic connectivity among our service schools, and then to you, we can increase the interaction through distant joint war games for all students as an integral part of their education, rather than taking a few and doing a single war game at the end of the course.

Second, I believe that we should put greater emphasis on the case study and war gaming of our recent operations, specifically those since the end of the Cold War. It's been my observation that officers who have served in these joint operations -- Somalia, Haiti, Bosnia, and a host of smaller ones that we've undertaken -- come back enthusiastic about what joint operations can be, anxious to apply what they learned, to learn more, and to make improvements. These are the inspired joint officers that we want to encourage. These are the ones who can

develop ideas for future joint operations. And for those officers who don't happen to have served in these operations, who've been at a distance from them, I think the study of them in case histories is the best way to build this enthusiasm and the knowledge that we will need in the future.

In truth, from where I sit, since the Berlin Wall came down, we are really learning on the run now, as we define these new roles for military forces in this new era. So let's acknowledge it, capitalize on it, and learn that way.

Now, let me turn to educating. Everything I've talked about will make greater joint officers in the present. Let me try to think out a bit into the future, and see what will be different. And what can we do in Joint Professional Military Education to make those joint task forces even better in the future than they are today?

I think we must emphasize two areas which are evolving in our thinking about military force. And in the interest of even treatment, one will be a bull subject and the other will be a liar's subject, for those of you who went to the Navy Academy. And this is not training; we have not sorted out these areas well enough to teach 'plug-and-chug' solutions. This is education -- teaching principles, asking questions, encouraging new thinking.

The first area has to do with the contingencies the joint task forces perform below the level of major theater wars. We have to maintain our core competency in joint and combined butt kicking. We will continue to do so, and we are far ahead of the rest of the world. What we have not really worked out is what military force can do, and should do, when it's committed, for example, to restore order in failed states or disrupted, disintegrating societies.

We know very well how to overcome, overhaul, neutralize or destroy other military or paramilitary forces. What I find that we really haven't figured out yet is how we in the armed forces, the joint task forces, can, or should, support police forces, support unbiased local print and broadcast media, support economic recovery, work with fledgling civilian governments, and so on.

Right now, I will tell you that the military role in these essential tasks is decided at very high levels in this government by very senior officers. And they base their recommendation to the National Command Authority, and they make decisions based on seasoned judgment and their own experience.

When my boss, General Shelton, decides what to recommend to the Secretary of Defense and the President concerning Bosnia, he harkens back to his Haiti experience as the most vivid example on top of many years of military experience and common sense.

For General Shalikashvili, it was the same, particularly in operation Provide Comfort, which he was involved in. But those of us on his staff doing the work for

him, we in the armed forces who support those operations, do not have a body of thought, doctrine, or refined experience to draw on to provide the staff work for the chairman.

At the other end of the scale, we've heard description of the battalion commander out in Bosnia who's doing the same thing, making it up as he goes. Facing his situation with good tools, smart people, common sense, and a lot of diverse training, he makes the decisions as he goes.

I think that in our Joint Professional Military Education and our Professional Military Education, we need to work on this problem, to develop the ways of thinking about it. What works? What doesn't work? What can be done at various levels? What are the risks? What is the same about some of these contingencies we've been involved in, and what's different? How can we apply them in new situations in the future?

And, again, I do not see this area of nontraditional military tasks as weakening our core ability for combined arms coalition warfare. I see it as part of the versatility of joint task forces, which will enable them to satisfy and do a range of jobs across the future.

The second area, and perhaps more important, is education and information technology. I agree with those who believe that taking advantage of -- exploiting -- information technology is the single key to transforming warfare, both for the services and certainly for joint warfare and joint operations. Doing so will make a joint task force commander more effective across the board if his component commanders are looking at the same real-time operational picture and are able to communicate freely at all levels in the chain of command when questions arise and issues come up.

When I was a Naval component commander a couple of years ago in Exercise Tandem Thrust in the Pacific, in the early going we had a real tussle with the joint special operations task force commander as we tried deconflict the use of water space. The JSOTF commander was running special forces in boats and submarines in and out of the objective area amd, as the Naval component commander, I was running submarines and surface ships in the same area.

We were not looking at the same operational picture. We couldn't, because we didn't have the gear, we didn't have the connectivity, and we weren't communicating very well. There was danger, there was confusion, and there was a loss of combat effectiveness. The more we can pass this real-time operational information around the joint task force, the more effective we'll be.

But communications and displays are really just the starting point. These future joint task force commanders and their staffs have to develop a feeling for what information technology can do for them, in the same way that those of us

who've grown up for the past 30 years in the armed forces had a feeling for what VHF radars and UHF radars and grease pencils can do.

We need to harness this information technology to develop the C4 systems that will enable the intricate, high-tempo joint operations which will be the breakthrough warfare of the future.

But there's another dimension of information technology that I believe requires education -- thought questions and doctrinal development. How will this information technology transform in a very fundamental way the conduct of warfare and military operations?

If we can know in near real time what's going on on the enemy's side of the battleline -- which we may or may not be able to do -- and if we can know what's going on our side of the battleline, including the location and status of all of our forces -- which we certainly can do but which we don't do now, then we can fight wars in ways which we have not been able to do before. Commanders could then confidently commit forces to attacks that today would be considered foolhardy. With this kind of information, the average commander of tomorrow can look like the Napoleon of today. And the exceptional commander of tomorrow can go off into the stratosphere.

I think this is the key. But from where I sit, if we are to realize its potential, we have to control this information technology and not allow it to control us. Already it is badly fraying the traditional three-level thinking which we all grew up with -- tactical, operational and strategic.

After all, this hierarchy was partly built on communications limitations. It was physically impossible to know the tactical situation in time, at a distance. So higher-echelon commanders were content with issuing guidance and waiting for summary reports.

Now, higher-level authorities can watch CNN or look at your relayed tactical picture. If you are a lucky subordinate, all you will be asked for are quicker explanations for your actions. If you're an unlucky subordinate, you will be given detailed orders by the boss looking over your shoulder at the same tactical picture that you're looking at.

Perhaps, in serious combined-arms warfare, the level of activity will be so great that higher-echelon commanders will be overwhelmed and fall back to higher-level direction in reporting and leave lower-echelon commanders to operate within their areas of responsibility. But right now, I think we all agree, we are learning a lot of very bad lessons with three or more levels of the chain of command all worrying about the same tactical decisions.

This is leading to the imposition of higher-level rhythms on lower-level

commanders -- simple things like commanders in Asia having to wait until Washington awakens and focuses. But more troubling is the more insidious trend that higher levels know better, and the mother-may-I attitude that builds on the part of lower commanders. Or, conversely, when you've had enough "Mother, may I?" the trend toward a "Screw 'em, I'm just going to do it!" attitude, which is probably equally bad.

While the communications have improved, I don't believe that the human span of control has increased. Higher-level leaders can only channel surf around their subordinates, to a certain point, effectively. The question is: how do we master this information technology so that it preserves the things that we know are important in conducting joint operations, and doesn't hamstring us by clogging the decision sequence and decreasing our combat effectiveness?

How do we develop higher-level leaders who will exercise self-restraint, and lower-level leaders who will push the vital information up so that all levels can take advantage of the capabilities future information technology will offer, without tripping over each other?

'm convinced that the solution to mastering information technology lies in the education of our officers and, particularly, our joint officers. We have to teach principles, not road solutions, because we haven't figured out the road solutions yet. And this is the essence of education.

And then we have to put these solutions into practice by officers who are knowledgeable about the basics, clear on the mission, and can put both together to get the job done. This must be done for us to maintain our combat edge, which the armed forces of the United States currently have and which we are going to have to work hard to maintain in the future.

So, let me sum up my recommendations for taking Professional Military Education, and especially Joint Professional Military Education, into the future.

First, we must specifically direct education to build a sense of joint teamwork in officers by intensifying their personal interaction within our schools during that part of their careers. And we must explicitly teach the essence of each of the services to the officers of other services.

Secondly, we need to link our military educational institutions together so that students at any one of them can draw on the resources of all. We need to do that to make these resources available and to teach them to learn to use information technology to get the job done.

Third, we need to study the question of the military's role in operations to restore failed states and disrupted societies, and these other complicated jobs that we are being called on to do. What can military force do? What shouldn't military

force do?

Fourth, we need to study and educate more people on information technology, which will be that single, greatest technology in transforming warfare in the future.

I certainly look forward to the aftermath of this conference, which I think has identified a tremendous number of issues which we need to work out, those of us in the Professional Military Education community. I don't think there's any more important job we have in the future than getting this thing right, and I certainly look forward to working with all of you as we do so.

Thank you very much.

VICE ADMIRAL DENNIS CUTLER BLAIR, USN
USN Director, Joint Staff

Vice Admiral Blair assumed duties as the Director, Joint Staff, on Sept. 13, 1996.

Admiral Blair served on guided missile destroyers in both the Atlantic and Pacific fleets. He commanded USS Cochrane (DDG 21), homeported in Yokosuka, Japan, from 1984 to 1986 and commanded the Kitty Hawk Battlegroup from 1993 to 1995.

Ashore, Admiral Blair commanded Naval Station Pearl Harbor from 1989 to 1990. He served as Associate Director of Central Intelligence for Military Support from 1995 to 1996. He has also served on the staffs of the National Security Council, the Chairman of the Joint Chiefs of Staff, the Secretary of the Navy, the Chief of Naval Operations, and the Commander in Chief, U.S. Pacific Fleet.

His personal decorations include the Defense Distinguished Service Medal with Oak Leaf Cluster, the Defense Superior Service Medal, the Legion of Merit with three gold stars, and the National Intelligence Distinguished Service Medal.

Vice Admiral Blair is a graduate of the U.S. Naval Academy and attended Oxford University as a Rhodes Scholar. He has served as a White House Fellow and a Chief of Naval Operations Fellow in the Strategic Studies Group.

Admiral Blair and his wife, Diane, reside in Washington, D.C. Their son, Duncan, is a Navy officer and their daughter, Pamela, is a college student.

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Aitken, George G. "Air Force Noncommissioned Officer Professional Military Education - A Blueprint for the Future." Research report. Maxwell AFB, AL: Air War College, May 1986. 42p.
Abstract: This report seeks to evaluate the evolution of Air Force Noncommissioned Officer professional military education. To do so, the report briefly examines officer professional education from the Prussian Kriegsakademie up to a description of the present Air Force officer professional military education system. The paper more fully reviews how noncommissioned military education has evolved--given this historical background. Finally, the author offers some thoughts on how Air Force noncommissioned officer professional military education could be modified to better serve its long term goal of educating men and women of the United States Air Force in the profession of arms.
ACCESSION NUMBER: AD-A177740

Antenen, James L. "Effects of Attendance at Initial Professional Military Education on the Personal Values of United States Air Force Officers." Student report. Maxwell AFB, AL: Air Command and Staff College, April 1986. 122p.
Abstract: The primarily purpose of this research study was to determine if initial professional military education has any effect on personal values. More specifically, it was to determine if attendance at Squadron Officer School changes the personal values of Junior Air Force officers to make them more congruent with the personal values of successful Air Force officers (students at Air War College). Two widely used instruments were used to obtain the data, the Allport, Vernon and Lindzey Study of Values, and the Rokeach Value Survey. Multivariate analyses of variance (MANOVAs) and one-way analyses of variance (ANOVAs) were used to analyze the data. The conclusions were that Junior Air Force officers' personal values were in fact different from the personal values of successful Air Force officers, and attendance at Squadron Officer School changes the personal values of Junior officers to make them more congruent with the personal values of successful officers.
ACCESSION NUMBER: AD-A168435

Arnold, Edwin J., Jr. "Professional Military Education: Its Historical Development and Future Challenges. Study project. Carlisle Barracks, PA: Army War College, 3 April 1993. 53p.
Abstract: The United States Army's Professional Military Education System had its beginnings in the post-Civil War era. Using the great Prussian education system as a model, early military educators developed a system to meet the specific needs of the United States. Through the years the system has undergone repeated reforms to match the changing nature of warfare and increasing technology. The system reached its current state in the early 1990s when it incorporated changes to meet increased requirements for joint education. Pressures for change and other challenges continue to confront the system as the Army adjusts to the end of the Cold War. After a discussion of the system's historical development, this study addresses those pressures and challenges. It proposes five criteria which can be used to identify shortcomings or to establish the continued viability of the system in a time of significant change. The study

concludes by offering possible adjustments that the system can make to prepare itself to meet the needs of the Army into the twenty-first century.
ACCESSION NUMBER: AD-A263673

Arnott, Gail L. "Senior Service School Teaching Methods." Maxwell AFB, AL: Air War College, May 1989. 67p.
Abstract: The five senior service schools in the United States use a variety of teaching methods. This study reviews the teaching methods used at the war colleges, considers their method selection criteria, discusses the various techniques for evaluating instructional method, and reaches the following conclusion: teaching method is not an important variable in predicting subsequent student performance. More important predictors include instructor and student background and expertise, what worked well in the past, the content of the curriculum, and even the time of year. Quality presentations and the use of a variety of techniques are more important that the particular method used.
ACCESSION NUMBER: AD-A217282

Bangs, Daniel P. "Survey of Studies on Factors Affecting Air Force Professional Military Education." Student report. Maxwell AFB, AL: Air Command and Staff College, April 1986. 32p.
Abstract: There have been many studies done on USAF Professional Military Education (PME) since its inception in the mid 1940s, and it is anticipated that many more studies will be done in the future. This report examines what studies ▪ been done in four recurring areas of PME: structure, eligibility requirements, timing of attendance, and target ▪ ▪ce. It is meant to be a reference source that can save many hours of research to people doing future studies. This re▪ devotes a chapter to each of these areas and presents a brief chronological synopsis of studies from 1946 to 1985 that examined these areas.
ACCESSION NUMBER: AD-A166675

Baruck ▪erry M. "Enlisted Professional Milit▪ry Education Curriculum Validation Project. Final r▪ ▪t. Randolph AFB, TX: Air Force Occupational Measurement Center, March 1980. 44p.
Abstra▪. Three separate survey booklets were administered to separate random samples of enlisted personnel in all paygrades and career fields between November 1978 and March 1979. Survey results are based on data collected from 10,449 respondents. The survey data showed that enlisted personnel have relatively little involvement with leadership, management, or communicative tasks prior to paygrade E-5. A dramatic increase in performance of supervisory-oriented tasks occurs among E-5s, and general involvement with leadership, management, and communicative tasks increases greatly through paygrade E-8. Only a slight increase occurs from E-8 to E-9. The present enlisted PME (Professional Military Education) system, offering a greater amount of material in each PME phase, seems to fit this general pattern of involvement. In a series of curriculum workshops, PME representatives used survey data to identify the optimum PME phase point at which to introduce the particular skill or knowledge area relevant to each task. These data enabled them to validate or revise most of the PME curriculum goals and objectives outlined in AFR 50-39. The validation effort showed that the leadership, management, and communicative tasks performed by each paygrade group are generally being addressed by the corresponding phase of PME.
ACCESSION NUMBER: AD-A084 972

Beddingfield, R.E., T.M. Imphong and K.L. Mcelvain. "Senior Service College Comparison." Study project. Carlisle Barracks, PA: Army War College, 5 June 1985. 129p.
Abstract: A comparison of the five United States senior service colleges must be approached within an awareness that they all have as a common objective the preparation of senior military officers and civilian officials for future roles as responsible executives in the decision making bodies of the armed forces and other government agencies. In addition, the direction that each has taken over the past decade has been based to a large extent on the Clements Commission Report of Senior Service College Curriculum Study published in 1975. Against this background the differences between the schools can be seen primarily as ones of emphasis, focus, or structure rather than ones of significant content or directional divergence. This study presents analyses of those areas within the senior service colleges that the authors believed would best demonstrate both the similarities and differences between these five uniformly excellent institutions. Individual reports on each college have been included for the benefit of those readers

who may have an interest in a more detailed description of the program at a particular school. If a conclusion is to be drawn from this study, it is that all five colleges are successfully meeting their objectives by providing the leadership cadre of the military services and many government agencies with a graduate level course of instruction with a major in national security, strategy and policy, and a minor in the preparation and execution of military activities in support of that policy.

ACCESSION NUMBER: AD-A159935

Bolinger, M., G.H. Bristol, K.M. Kelly and R.L. Kilroy. "Improving Officer Career and Intermediate Level Education." Washington, DC: Marine Corps, 1 April 1991. 40p.

Abstract: Although career and intermediate level schools are adequately educating officers for future command and staff billets within a MAGTF, they are not modern professional educational institutions. The schools, as a whole, exhibit significant weaknesses in the areas of faculty and pedagogy - - cornerstones of a quality professional military education system.

ACCESSION NUMBER: AD-A239883

Boggs, Kevin G. et al. "The Goldwater-Nichols Department of Defense Reorganization Act of 1986: An Analysis of Air Force Implementation of Title IV and its Impact on The Air Force Officer Corps." Maxwell AFB, AL: Air Command and Staff College, May 1995. 68p.

Abstract: In 1986, Congress enacted the Department of Defense Reorganization Act directing how Services manage joint officers, in an effort to improve the quality of joint officers and operations. This research paper analyzes AF legislation compliance in: promotions, assignments, education and joint specialty officer (JSO) designations for field grade officers. The research analyzes the initial law and subsequent amendments to establish a compliance baseline and examines AF, Joint Staff and Secretary of Defense records to assess conformity. After the compliance review, the research examines programs, policies and laws affecting compliance, followed by a study of the integration of Title IV concepts in the OPD Program. There were two non-compliance areas- promotions and JSO guidelines. First despite a multitude of initiatives involving promotion board processes and assignments, AF failed 41 or 46 promotion categories, although significant improvement was noted. Second, there were no established JSO career guidelines and there were negative perceptions regarding joint duty in OPD. To improve compliance, this paper recommends better integration of joint concepts in OPD; the establishment of JSO guidelines; and an aggressive media effort to enhance perceptions of joint. Further, it advocates the inclusion of OPD counseling during mandatory perceptions of joint. Further, it advocates the inclusion of OPD counseling during mandatory performance feedback, and the implementation of existing legislation affecting JPMIS outplacement. Last, it recommends revitalizing cross-flow' assignments between Air and Joint Staffs, and establishing a comprehensive data-base to enable more extensive analysis of joint management initiatives. Modifications or enhancements,' AF should be in full compliance.

ACCESSION NUMBER: AD-A328040

Brooks, Vincent K. "Knowledge is the Key: Educating, Training and Developing Operational Artists for the 21st Century." Monograph AY 1991-1992. Fort Leavenworth, KS: Army Command and General Staff College, School of Advanced Military Studies, 12 May 1992. 76p.

Abstract: Warfare in the era will be joint. However, the Armed Forces have been slow to make requisite changes. The Goldwater-Nichols Department of Defense Reorganization Act of 1986 forced change by legislating reforms and ending the internecine quarrels which had impeded progress for decades. Joint warfare is the desired effect of the Goldwater-Nichols Act and the Armed Forces are making progress in the ability to conduct joint warfare. More progress is needed, however, before joint warfare becomes routine. Practicing joint warfare requires a new way of educating officers. The House of Representatives Committee on the Armed Services Panel on Military Education (known as the Skelton Panel after its chairman, Representative Ike Skelton) explored the professional military education system and recommended ways of providing the type of education necessary to meet the spirit of the Goldwater-Nichols Act. The panel was particularly concerned with ensuring the education system provided the link between producing competent Service officers and competent joint officers.

ACCESSION NUMBER: AD-A254124

Bruns, James W. and Lawrence A. Eichhorn. "Comparison of Non-Performance Characteristics with United States Air Force Officer Promotions." Master's thesis. Wright-Patterson AFB, OH: Air Force Institute of Technology, School of Logistics and Acquisition Management, September 1993. 42p.

Abstract: The question of which non-performance factors influence the promotion of officers to major, lieutenant colonel, and colonel within the Air Force for Promotion Boards held in 1992 is the focus of this thesis. The thesis statistically examines the impact of the variables commissioning source, prior enlistment, age, aeronautical rating, graduate education level obtained and source of education, Professional Military Education courses taken and method of completion, distinguished graduate status from commissioning source and Professional Military Education courses for in-the-zone promotions. Multivariate logistics regression techniques are used to analyze and identify those variables significant to promotion. Odds-ratios are used to determine the sensitivity of each variable. Each of the variables is found to be significant in some of the promotion models.

ACCESSION NUMBER: AD-A273967

Bunn, Leslie and Ricahrd J. Steppic. "A Study of the Methods by Which the United States Air Force Can Provide Professional Military Education for Senior Foreign Officers." Master's thesis. Wright Patterson AFB: OH: Air Force Institute of Technology, School of Systems and Logistics, January 1974. 207p

Abstract: The study identifies methods that can be used by the United States Air Force to provide professional military education for senior officers from allied, friendly and nonaligned nations. Extensive interviews conducted with senior officials currently involved in professional military education provide the primary source of data. The study concludes that five methods are available to provide an increased program, and that the most feasible method is to establish a separate college for senior foreign officers co-located with other USAF professional colleges and schools at Maxwell AFB, Alabama.

ACCESSION NUMBER: AD-776784

Callard, James R. "Changing Nature of American Democracy Consequences for the Military." Final report. Newport, RI: Naval War College, 14 June 1996. 161p.

Abstract: This paper provides a philosophical and ethical framework to evaluate changes in democracy that affect the relationship between the public and the military profession. Changes in communication technology have allowed the media and public to play a more influential role in the information of national security strategy. Use of propaganda to market war in the past has been problematic and contrary to American democratic principles. Applying a strong professional military ethic grounded in institutional and constitutional values will insure that senior military leadership understand the ramifications of applying knowledge strategies in the future. Adding ethics and civil-military affairs courses to joint professional military education is major recommendation.

ACCESSION NUMBER: AD-A311167

Clark, Edward S. "Comparative Analysis of Intermediate Service College (ISC). Phase 1. Joint Professional Military Education (JPME)." Master's thesis. Monterey, CA: Naval Postgraduate School, March 1990. 120p.

Abstract: This thesis compares the four Intermediate Service Colleges (ISC) and the Defense Intelligence College (DIC) Phase I Joint Professional Military Education (JPME) curricula and student and faculty mixes. It asks the question, 'Is it feasible to offer a Phase I JPME curriculum at the Naval Postgraduate School.' The results clearly show that a Phase I JPME program is feasible if established within the National Security Affairs/Intelligence (NSA/I) and the Joint Command, Control and Communications (C3) curricula. In these curricula, the student and faculty mixes can be easily attained and the curriculum can be established with minimum disruption to the graduate education mission of the Naval Postgraduate School. Additionally, with six core courses established as Phase I JPME, students from other curricula may be tracked into Phase I by detailers on a case-by-case basis. Ultimately, this would increase the number of Navy Phase I JPME graduates by 69 percent. These graduates would then be available for Phase II and further on Joint Duty Assignments (JDAs).

ACCESSION NUMBER: AD-A220077

"Combined Arms Sufficiency Study (CASS) Update." Fort Leavenworth, KS: Army Combined Arms Center, April 1983. 175p.

Abstract: The intent of the Combined Arms Sufficiency Study as originally conducted, was to obtain a snapshot of the status of Combined Arms instruction at the time and provide commandants comparative data with which they could make an educated estimate of the effectiveness of their combined arms instruction. The original intent is still applicable. The purpose of the current update is to build on the original study, refine the Combined Arms Sufficiency data, and through a systematic process, identify courses of action to continue to enhance Combined Arms instruction in company level professional development courses. This update is intended to develop Combined Arms Sufficiency data to a credible confidence level so that decisions can be made on tradeoffs and accommodations, with a clear understanding of what the costs are in terms of specialty and Combined Arms understanding. The objectives of the present Combined Arms Sufficiency update are to: identify all Combined Arms subjects and develop an updated list; identify Combined Arms subjects which should be taught in Officer Basic and Advanced Courses, and to what level of sufficiency; enhance Combined Arms instruction by better defining personnel and other resource requirements; and facilitate the infusion of Combined Arms subjects into the OJTA process.

ACCESSION NUMBER: AD-A133316

Defense Manpower Commission Staff Studies and Supporting Papers. Volume IV. "Developing and Utilizing the Total Force and Shaping the Future Military Career Force." Washington, DC: Defense Manpower Commission, May 1976. 1060p.

See also Volume 5, AD-A029 953.

Abstract: Contents: The Defense Officer Personnel Management System (DOPMS); Reserve Component Officer Career Force Grade Authorization; Pre-Commissioning Programs; The Uniformed services University of the Health Sciences and Alternative methods of Procuring and Retaining Military Physicians; Professional Military Education; Professional Military Education for the Reserve Components; Officer Graduate Education; Funding of Education Programs; Flight Training; Overseas Rotation and Tour Lengths; Minority Participation in the Department of Defense; Women in the Defense Establishment; The Development and Utilization of women in the Department of Defense; The role of the DOD Civilian in the Total Force Structure; Limitations on Managers Brought about by Restrictions of the Civil Service System; The Air Force Institute of Technology and the Naval Postgraduate School; The G.I. Bill today; and The Career Force of the Future.

ACCESSION NUMBER: AD-A029952

DeGraff, Dennis J. et al. "Senior Service School Timing for Air Force Officers: A Cultural Change." Maxwell AFB, AL: Air Command and Staff College, April 1996. 64p.

Abstract: Initial study of the relationship of in-residence Air War College (AWC) completion to promotion success was accomplished in 1975, and subsequently updated in 1984. The focus of this study is to revalidate the promotion trend cited in the 1984 study and to examine the importance of attendance timing for Air forces officers to Senior Service School (SSS). Sources used in preparation of this study includes officer cohort and promotion files for 1984-1995, as well as a review of officer utilization policy from the Air force Personnel Center (AFPC), Headquarters USAF, the Office for Colonel Matters, and AWC. Personnel interviews and surveys were used to glean current issues, concerns, and recommendations from senior leaders and major command (MAJCOM) personnel officers throughout the Air Force. Analysis of promotion statistics concludes that while the promotion rates among the Senior Service schools are not at parity, they have leveled somewhat from the analysis done in the 1984 study. Additionally, this study discusses the current trend of sending more junior lieutenant colonels to SSS shortly after ISS completion and before they have had the opportunity to gain valuable leadership experience. These officers, their classmates, and the air force would be better served by modifying the SSS selection process to facilitate in-residence attendance later in an officer's career without negatively affecting promotion opportunities. The study recommends changes to the selection process and strives to foster a cultural change within the Air Force to ensure SSS is viewed as a tool for developing future leaders and not as a square to be filled for promotion to colonel. The study has a direct impact on the management of senior officer development and utilization in the Air Force for the remainder of the century.

ACCESSION NUMBER: AD-A331576

Faller, Craig S. "The Navy and Jointness: No Longer Reluctant Partners?" Master's thesis. Monterey, CA: Naval Postgraduate School, December 1991. 189p.

Abstract: This thesis examines the intention and effectiveness of the changes initiated by the Goldwater-Nichols Department of Defense Reorganization Act of 1986 (GNA) with emphasis on the United States Navy. This assessment considers the implications for future national security of present trends in the balance of power between the joint and service institutions within the Department of Defense (DOD). Interviews conducted by the author with key individuals involved in the writing and implementation of GNA legislation, coupled with a review of the literature, provide the basis for understanding the intent behind the GNA and its provisions. In assessing the effectiveness of GNA this thesis focuses on three areas: operations, plans, and people and how the key change mechanisms implemented by GNA are impacting these areas. The author forwards policy recommendations, for both DOD and the Navy aimed at making jointness more relevant and meaningful.

ACCESSION NUMBER: AD-A246441

Flaningam, M.R. and J.N. Joyner. "Feasibility of Individualized Instruction for USMC Professional Military Education Programs. Phase I. Implementation at Instructional Management School." Interim report. February-June 81. Alexandria, VA: Human Resources Research Organization, March 1983. 23p.

Abstract: This report describes the implementation of individualized instruction at a USMC Instructional Management School (IMS), which trains instructors of professional military education courses. The IMS instructor course was converted from fixed-entry, lock-step and lecture-base to variable-entry, self-paced, application-base. Course materials were modularized so that training could be tailored to individual needs.

NPRDC-SR-83-19

ACCESSION NUMBER: AD-A126455

Fox, Daniel B. "Conceptual Design for a Model to Meet the War-Gaming Needs of the Major Commands of the United States Air Force." Maxwell AFB, AL: Air University, Airpower Research Institute, July 1985. 77p.

Abstract: The 1975 Clements Blue Ribbon Panel Report on Excellence in Professional Military Education (PME) and the August 1976 Air Force chief of staff constant readiness tasking called for the development of intensive courses and innovative methods to instruct students in war fighting. In response, the United States Air Force has embarked upon a multiphase project to establish a comprehensive, computerized, war-gaming capability. This project, known as the Command Readiness Exercise System (CRES), is located at Maxwell Air Force Base, Alabama. The CRES development is under the operational control of Air University's Center for Aerospace Doctrine, Research, and Education (CADRE) and will be housed in the newly created Air Force Wargaming Center (AFWC). The purpose of this research is to explore the positive and negative features of war games and to examine how these features relate to potential applications of phase three of the CRES.

AU-ARI-848

ACCESSION NUMBER: AD-A215909

Gorrie,Robert G. "Joint Battle Staff Training." Newport, RI: Naval War College, Department of Operations, 11 February 1991. 28p.

Abstract: History shows that the success of modern military operations is directly dependent on the effectiveness of the commander and battle staff team. Crises in the new world environment requiring the use of military force will see the employment of multi-service Joint Task Forces (JTF). Trained command and joint battle staff teams will be needed to lead them. Impromptu staffs for JTFs are not cohesive teams. They are not as adept as trained and drilled staffs at time-sensitive planning and execution. Current training and exercises for joint battle staffs is deficient. A training program, based on the Army's Battle Command Training Program, is needed to fill the void.

ACCESSION NUMBER: AD-A236279

Gottlieb, Aryea. "The Role of SOF Across the Range of Military Operations." Washington, DC: Department of the Air Force, 16 October 1996. 5 p.

Abstract: Since the creation of the United States Special Operations Command (USSOCOM), Special Operations Forces (SOF) personnel have been working hard to tear down the walls of secrecy which have led to years of misunderstanding between conventional and special operations forces. Both USSOCOM and the Services are actively integrating SOF curriculum into the Service's professional military education schools to educate future military leaders on the role of SOF across the range of military operations (war and military operations other than war). The end of the Cold War has dramatically changed the international security environment. The US now faces a world marked by numerous regional and transnational uncertainties. The opportunity to employ SOF to meet these challenges is as great today as it has ever been. With its unique capabilities and specialized equipment, SOF can support a wide range of operations from humanitarian assistance in a benign environment, to combat operations during war. The purpose of this article is to explain how SOF can be integrated into joint operations across the range of military operations. Just as each Service team brings certain capabilities to the theater of operations, SOF similarly offer unique capabilities to the Joint Force Commander (JFC). In addition to their primary special operations missions, (direct action, special reconnaissance, unconventional warfare, foreign internal defense, counterterrorist operations, psychological operations, and support to counterproliferation operations), SOF are also suited to conduct certain collateral activities. Some of their more common collateral activities include humanitarian assistance, counterdrug operations, combat serach and rescue (CSAR), and coalition warfare.

ACCESSION NUMBER: AD-A32474

Grissett, J.M. "China's Military Professionalism." Student report. Maxwell AFB, AL: Air Command and Staff College, April 1985. 59p.

Abstract: The People's Liberation Army (PLA) in the People's Republic of China (PRC) modernized its forces from 1949-1984 and developed its military professionalism. Since 1978 tremendous progress has been made in this professionalization. The PLA supports and maintains an extensive professional military education program to train its officer corps. The current leadership of the PRC supports the professionalism of the PLA officer corps will continue into the 1990's.

ACCESSION NUMBER: AD-A156120

Handy, Gurnie H., Jr. and Ronald L. McCool. "An Educational Methodology for Enhancing Familiarity with United States Air Force Combat Logistics." Master's thesis. Wright-Patterson AFB, OH: Air Force Institute of Technology, School of Systems and Logistics, September 1983. 303p

Abstract: Certain developments since the end of the Vietnam War have given Air Force leaders cause for concern over a potential weakening of the war-fighting ability of the service. The authors offer evidence of that problem, then focus specifically on logistics war-fighting issues. After substantiating dual needs to continually relate logistics to war-fighting and also to avoid functional specialization, the authors suggest creating a combat logistics body of knowledge to address those needs. The primary research objectives include establishing a system for determining relevant combat logistics topics and proposing a Professional Continuing Education course syllabus on the subject. HQ USAF and AFLC provided over 80 suggested topics which the authors analyze with a matrix system. The matrix results show that qualifying topics are distributed fairly evenly among five major logistics functions, except for acquisition. Consequently, the authors recommend further research on that area, and in transportation. The authors conclude by reviewing problems with peacetime analytical thinking and by recommending the combat logistics course as a positive step toward building a war-fighting and readiness orientation.

ACCESSION NUMBER: AD-A134 402

Hardesty, Michael J. "Training for Peace: The U.S. Army's Post-Cold War Strategy." Research paper. Carlisle Barracks, PA: Army War College, 4 April 1996. 74p.

Abstract: With the collapse of the Soviet Union, the U.S. national military strategy had to go through dramatic change. This paper traces the policy and doctrinal evolution of this change and the corresponding adjustments to the Army's training strategy. A case is made that because operations other than war are significantly different from war itself, an expanded training approach is necessary. How the U.S. Army has responded to this need is examined in detail

by evaluating the innovations occurring within the professional military education system as well as pre-deployment unit training. Considerable attention is devoted to documenting training enhancements made over the past several years. Where shortfalls exist, recommendations for improvement are made. The paper concludes with a problematic question resulting from an increasing operational tempo and a decline in real defense expenditures.
ACCESSION NUMBER: AD-A311157

Harrold, James A. "Historical Analysis of Basic Air Force Doctrine Education within the United States Air Force Air Command and Staff College, 1947-1987." Master's thesis. Wright-Patterson AFB, OH: Air Force Institute of Technology, School of Systems and Logistics, September 1987. 161p.

Abstract: The purpose of this study was to examine the historical treatment of Air Force basic doctrine within the Air Force Professional Military Education System. The curricula of one specific component of this system, namely the Air Command and Staff College, was located and analyzed. The reason this research was undertaken was to answer the criticisms of several authors who have contended that the Air Force has historically not conducted education in its basic doctrine. This failure has led, maintain the critics, to poor performance in war. The study had three objectives. The first was to determine if the Air Force had conducted doctrinal education. The second was to examine the context in which this education had taken place. The third objective was to determine the existence of historical trends in the area of doctrinal.
ACCESSION NUMBER: AD-A187184

Hester, Paul V. "Does CGSC Prepare the Air Force Officer for His Follow on Assignment?" Master's thesis. Fort Leavenworth, KS: Army Command and General Staff College, June 1980. 59p.

Abstract: This study attempts to determine if CGSC prepares the Air Force officer for the responsibilities and tasks he will encounter in his next assignment. The investigation focuses on an analysis of the curriculums of CGSC and ACSC; impressions of the 1979-80 Air Force students; and a survey of the experiences of the two previous classes of the Air Force students. The investigation revealed that the answer is not a clear cut yes or no. But instead one that is dependent upon a variety of factors. The officers surveyed offered numerous suggestions for curriculum changes to improve the Air Force officer's education at CGSC. These were consolidated and presented as recommendations.
ACCESSION NUMBER: AD-A093086

Hollingsworth, Stephen L. "The War Colleges: The Joint Alternative." Maxwell AFB, AL: Air War College, April 1990. 62p.

Abstract: This paper examines the recommendations of the Skelton Panel as they apply to joint education at the senior service colleges. It reviews the historical basis and development of the senior service colleges to determine the impact previous studies and proposed changes have had on the education of senior American military leaders. It also reviews the recent reaction of senior military leaders and civilian writers to the Skelton Panel findings. The paper concludes that the Skelton Panel's recommendations are a step in the right direction. It contends that the Panel did not go far enough in correcting the historical impediment to a functional joint education system – individual service prerogatives. The paper recommends the formation of a strengthened National Defense University system under the control of the Joint Chiefs of Staff. All senior service college students would initially attend either an air, land or sea senior service college composed of a balanced faculty and student body (e.g. equal service representation). The curriculum would be developed and overseen by the Joint Chiefs of Staff rather than the individual services. Selected students would attend a second year at the National Defense University to address issues of national military strategy.
ACCESSION NUMBER: AD-A241056

Johnson, William C. "Analysis of Current Attitudes of Company Grade and Field Grade Air Force Officers Regarding Air Force Officer Professional Development Initiatives." Master's thesis. Wright-Patterson AFB, OH: Air Force Institute of Technology, School of Systems and Logistics, September 1989. 132p.

Abstract: The OPD survey was designed to obtain responses from participating officers regarding several OPD initiatives and policy changes including: Professional Military Education (PME), the AF Form 90, commander involvement in the assignment process, the Officer Evaluation System (OES), Join Spouse progress, ASTRA, Regular Appointment, below-the-zone promotions (BPZ), captains' service commitment, and senior officer involvement in 'by name' assignment requests. Analysis of the survey found that officers generally agree with the various issues and initiatives. However, some disagreement was noted in officer attitudes regarding PME, the Join Spouse program, and the OES evaluation and promotion system.

ACCESSION NUMBER: AD-A215833

Joyner, John N. et al. "Instruction Systems for USMC Professional Military Education: Exploratory Development." Final report. March 1980-August 1984. Alexandria, VA: Human Resources Research Organization, September 1984. 60p.

Abstract: Phases I and II of this effort to increase the efficiency and effectiveness of Marine Corps professional military education (PME) addressed resident PME; and Phase III, nonresident PME. An individualized instruction and evaluation system implemented in Phase I at the Instructional and Management school trained students faster and more effectively than the previous lock-step course. Evaluation of an individualized portion of a subcourse at the Command Staff College in Phase II suggests that the quality of the instructional segment may affect students more than the presentation mode. Phase III compared several delivery media for nonresident PME and tested one medium, teleconferencing. The official participants reacted favorably to teleconferencing, considered it to be a good instructional technique, liked its ability to bring diverse groups together without having to travel to a central location, but preferred the interactions possible in a face-to-face group discussion.

ACCESSION NUMBER: AD-A174897

Joyner, John N., R. Vineberg and M.R. Flaningam. "Handbook for Individualized Instruction." Interim report no. 2. Alexandria, VA: Human Resources Research Organization, July 1983. 181p. See also Report no. NPRDC-SR-83-19, AD-A126 455.

Abstract: A handbook and associated study guide and test forms were developed to assist instructors in individualizing courses. The handbook is designed primarily for use at formal school settings and for professional military education courses, but may have potential applications to other training settings.

NPRDC-SR-83-45

ACCESSION NUMBER: AD-A139146

Jubeck, Cornelius Neil. "Test and Evaluation and Graduate Education Needs." Master's thesis. Monterey, CA: Naval Postgraduate School, June 1981. 75p.

Abstract: The hypothesis is advanced that testing and evaluation (T and E) of complex weapons systems requires unique skills, that testing and evaluation of weapons systems has evolved into a recognizable engineering discipline, and that professional technical personnel in the Department of Defense Test and Evaluation community should be considered as unique assets and supported by the establishment of a postgraduate curriculum in T and E engineering. The evolution of DOD T and E is traced and analyzed with particular attention to capability requirements of personnel. The general conclusion is reached that the hypothesis can not now be universally supported. Reasons for this position are given and recommendations made for improving capabilities of T and E personnel.

ACCESSION NUMBER: AD-A105879

Karschnia, P.T. "Education, The War Colleges and Professional Military Development." Washington, DC: National War College, Strategic Research Group, May 1975. 16p.

Abstract: Professional military education resides in difficult circumstances. While external challenges from the Congress and the administration appear to constitute the most serious problems, the gravest concerns emanate from within the military establishment. Military education tends to vocationalize and specialize professional development rather than convey broad understanding. The political environment faced by the military generalist is not adequately confronted in the educational system nor is the indeterminacy of future strategic design.

ACCESSION NUMBER: AD-A008 945

Kelley, Jay W. "SPACECAST 2020, Volume 1." Final report. Maxwell AFB, AL: Air University, June 1992. 486p.

Abstract: SPACECAST 2020 was a Chief of Staff of the Air Force (CSAF)-directed space study, challenged to identify and conceptually develop high-leverage space technologies and systems that will best support the warfighter in the twenty-first century. The study produced a series of white papers which have been assembled into clusters of concern for future space capabilities. Volume I consists of 11 unclassified white papers: Leveraging the Infosphere: Surveillance and Reconnaissance in 2020; Space Traffic Control: The Culmination of Improved Spave Operations; 21st Century Weather Support Architecture; Space-Based Solar Monitoring and Alert Satellite System; Space Weather Support for Communications; Spacelift: Suborbital, Earth to Orbit, and On Orbit; Unconventional Spacelift; Rapid Space Force Reconstitution (RASEOR); Space Modular Systems; Professional Military Education (PME) in 2020; and Preparing for Planetary Defense: Detection and Interception of Asteroids on Collision Course with Earth. The Volume also contains an Operational Analysis and listings of Project Contributors and Project Participants.

ACCESSION NUMBER: AD-A295142

Kelly, James P. "Theater Strategy Training for Senior Leaders." Maxwell AFB, AL" Air War College. April 1987. 47p.

Abstract: Remarks on the declining combat experience of the active military force introduce a discussion on the importance of capturing the lessons of previous wars in training and education programs for future senior Air Force leaders. A discussion follows comparing Air Force and Army terminology concerning the operational level of war and operational art to set the basis for a look at current training and education programs. The author presents his views on the need for emphasis in training and educating future senior combat leaders for the operational level of war, that area where national strategy is focused into theater and campaign strategy and linked to battlefield tactics. This need for training and education goes beyond the study of history and procedural knowledge into the area of enhancing intuition, instinct and judgement in the face of uncertain knowledge of the enemy. The senior service schools are offered as the forum for developing a foundation for these mental skills.

ACCESSION NUMBER: AD-A186663

Koran, John G., III. "Manpower Management for Joint Specialty Officers: A Comparative Analysis." Master's thesis. Monterey, CA: Naval Postgraduate School, December 1990. 148p.

Abstract: This thesis investigates the development of Title IV of the Goldwater-Nichols Department of Defense Reorganization Act of 1986 and the Joint Specialty Officer (JSO) management policies mandated by the law. Individual service manpower management procedures for the nomination/selection for Joint Professional Military Education (JPME) and Joint Specialty Officer designation are presented and analyzed. The size and composition of the Joint Duty Assignment List (JDAL) is also presented and analyzed. The results indicate significant progress has been made towards fulfilling the Title IV requirements regarding JPME, JSO designation, and improving the quality and stability of officers assigned to Joint Duty Assignments.

ACCESSION NUMBER: AD-A246209

Lacki, Michael J. "Soviet Officer: A Credible Adversary." Research report. Maxwell AFB, AL: Air War College, April 1986. 47p.

Abstract: The intent of this report is to present a review of the training and indoctrination of Soviet officers. The report traces the elements of the communist system which influence the officers' beliefs. Aspects of civilian and professional military education are reviewed. Some elements of the officer's life-style serve to provide another perspective of his life. A summary of the strengths and weaknesses of the Soviet officer corps concludes the remarks.

ACCESSION NUMBER: AD-A177736

Leidich, R.G. "The Marine Corps Professional Military Education Selection System." Student essay. Carlisle Barracks, PA: Army War College, April 1982. 31p.

Abstract: The essay describes the Marine Corps method of selecting officers to attend Professional Military Education courses of instruction prior to 1977. It then researches the new selection technique that developed into a 'system' and describes the reasons for change and gives the details of the revised system.

ACCESSION NUMBER: AD-A116230

Lopez, Kevin W. "Impact of AFSC Regulation 36-5 on the 27XX Career Field." Master's thesis. Wright-Patterson AFB, OH: Air Force Institute of Technology, School of Systems and Logistics, September 1987. 99p.

Abstract: The objective of this research study was to assess the potential implications of AFSC Regulation 36-5 on the 27XX career field. This analysis was accomplished by comparing the attitudes of Junior (AFSC 2724) and senior (AFSC 2716) officers in relation to the requirements outlined in the regulation. Using this approach, this study established that both test samples of officers proposed a positive relationship between career development and the following variables: 1) specialty training, 2) professional military education, 3) academic background, 4) operational experience, and 5) different acquisition-related experiences. In addition to these findings, this study determined that the attitudes of both Junior and senior officers relative to career development are very similar. With the exception of those individual training, and professional military education programs oriented towards either Junior or senior officers, the general attitudes of these test samples of officers were comparable.

ACCESSION NUMBER: AD-A186913

Mansfield, M. "Air Force Lieutenants: An Analysis of Perceptions Surveyed During the Lieutenants Professional Development Program." Final report. Maxwell AFB, AL: Leadership and Management Development Center, January 1984. 66p.

Abstract: It is essential that Air Force lieutenants develop proper leadership and management skills early on in their careers so that they may meet the greater challenge inherent in their progression in rank and responsibility, This paper attempts to paint a picture of today's Air Force lieutenants using information and data derived from two sources: the Leadership and Management Development Center's Lieutenants' Professional Development Program and Organizational Assessment Package survey. The information and data show primarily that, among other things, lieutenants are perceived to be lacking good supervisory and managerial skills. Subordinates of lieutenants are experiencing many of the same problems as lieutenants themselves. Herein lies the valuable potential of the LPDP. This problem is designed to help lieutenants, especially managerial skills and supervisory role. Since professional military education is generally offered at about the three year point, and then only to a small percentage, a program such as the LPDP is needed for this large segment of Air Force leadership. The data clearly indicate the need for additional training.

ACCESSION NUMBER: AD-A138786

Mansfield, M. "Air Force Lieutenants: An Analysis of Perceptions Surveyed During the Lieutenants Professional Development Program." Final report. Maxwell AFB, AL: Leadership and Management Development Center, January 1984. 66p. Supersedes AD-A138 786.

Abstract: It is essential that Air Force lieutenants develop proper leadership and management skills early on in their careers so that they may meet the greater challenge inherent in their progression in rank and responsibility. This paper

attempts to paint a picture of today's Air Force lieutenants using information and data derived from two sources: the Leadership and Management Development Center's Lieutenants' Professional Development Program and Organizational Assessment Package survey. The information and data show primarily that, among other things, lieutenants are perceived to be lacking good supervisory and managerial skills. Subordinates of lieutenants are experiencing many of the same problems as lieutenants themselves. Herein lies the valuable potential of the LPDP. This program is designed to help lieutenants, especially those who are supervisors, gain pragmatic insight into how to develop and fulfill their managerial skills and supervisory role. Since professional military education is generally offered at about the three year point, and then only to a small percentage, a program such as the LPDP is needed for this large segment of Air Force leadership. The data clearly indicate the need for additional training.

ACCESSION NUMBER: AD-A142529

Mansfield, M. "Impact of Various Levels of Professional Military Education and Formal Education on Selected Supervisory Dimensions." Final report. Maxwell AFB, AL: Leadership and Management Development Center, August 1983. 64p.

Abstract: Officers need training and education in order to perform assigned duties. Problem: How much of what type of education and/or training does an Air Force officer need. This paper analyzes how an officer's level of professional military and academic education influence subordinate perceptions of managerial/supervisory issues. An analysis of covariance (ANCOVA) is performed using 2x4 factorial design (level of college degree x level of PME). The data show that officer professional military and graduate education positively influence the perceptions of subordinates on key supervisory measures. To determine how the Air Force compares to industry, information was collected from four defense related corporations. These industries place as much or more emphasis on the professional education of employees than the Air Force. In the area of advanced education, what may appear costly in the present should reap enormous benefits in the future.

ACCESSION NUMBER: AD-A133076

McConnell, Reed J. "Impact of Air Force Systems Command Regulation 36-5 on the 27XX Career Field." Master's thesis. Wright-Patterson AFB, OH: Air Force Institute of Technology, September 1988. 98p.

Abstract: The purpose of this research was to determine if the attitudes of acquisition managers have changed over the past year, with respect to the Acquisition Manager Career Development Program, set forth by Air Force Systems Command Regulation (AFSCR) 36-5. A survey approach was used to compare the attitudes of Juneior (Air Force Specialty Code 2724) and senior (Air Force Specialty Code 2716) officers in relation to the criteria specified in the regulation. The results were then compared to the results of a previous survey to measure changes over time. Both surveys found generally a positive relationship between the attitudes of acquisition management personnel and career development in all areas investigated. These areas include: 1) specialty training, 2) academic background, 3) professional military education, 4) operational experience, and 5) different types of acquisition management experience. Not only were the responses from the previous survey to the current survey similar, the attitudes of Juneior and senior personnel were also comparable.

ACCESSION NUMBER: AD-A201516

Miller, Roger M. "Air National Guard Full-Time Support." Student report. Maxwell AFB, AL: Air Command and Staff College, 1988. 31p.

Abstract: Full-time support for the Air National Guard is federally funded and subject to federal law and rules for its administration. Retirement benefits are a positive motivator for a career force, but also require clear rules for members to believe they can reach retirement. The purpose of this report is to establish the need to revise Air National Guard (ANG) regulations controlling Active Guard Reserve (AGR) members and to provide a history of full-time support in the National Guard. ANGR 35-03 Military Personnel Management needs to be revised to conform to federal laws concerning reservists on active duty. Promotion, professional military education, and active mission support should be centrally managed to use military duty members.

ACCESSION NUMBER: AD-A192520

Miller, Stephen J. "Joint Education: Where It Really Should Begin." Study project report. Carlisle Barracks, PA: Army War College, 5 April 1993. 38p.

Abstract: The 1986 Goldwater-Nichols Department of Defense Reorganization Act mandated sweeping reforms to the professional military education system. In particular, the law called for the creation of joint specialty officers, and gave the Chairman, Joint Chiefs of Staff, authority to formulate policy in the military education system in order to produce officers competent in joint matters. Thus far, the focus of the changes have been at the intermediate and senior service schools. The Chairman has issued clear objectives for joint education curricula, and each of the programs must be periodically accredited. However, very little guidance has been given to the precommissioning schools, and their joint programs are not formally reviewed by the JCS. As a result, the variety and depth of joint curricula varies considerably between the service academies and ROTC units. In the author's opinion, officers are graduating with differing perspectives and levels of understanding about joint matters. However, the military is changing and young officers are being exposed to the joint environment earlier in their careers through consolidation of DoD organizations, training exercises and real world contingencies. This paper presents several arguments why joint education should be improved for officer candidates, and recommends that precommissioning schools become full fledged partners in the joint education process by implementing common learning objectives and submitting their curricula to periodic JCS review.

ACCESSION NUMBER: AD-A264041

Morsh, Joseph E. "Survey of Air Force Officer Management Activities and Evaluation of Professional Military Education Requirements." Lackland AFB, TX: Air Force Human Resources Laboratory, Personnel Research Division, December 1969. 93p.

Abstract: The main purpose of the officer management survey was to identify functions which all officers perform as distinct from work specific to a particular specialty and to determine the relationships of managerial responsibility to grade, career area, or other variables. A further aim was to obtain an evaluation of topics of professional military education requirements in terms of job performance or as contributory to an effective Air Force career.

AFHRL-TR-69-38

ACCESSION NUMBER: AD-705574

Moskos, Charles C. "Sociology of the Army Reserves: A Comparative Assessment." Interim report. December 1987-November 1988. Evanston, IL: Northwestern University, Dept. of Sociology, July 1990. 32p.

Abstract: This report highlights the core characteristics of the American Reserve System with a comparative analysis of reserve forces in the Federal Republic of Germany, the United Kingdom, and Israel. The analysis adopts a case-based approach and uses qualitative binary methodology. The following are the core elements of the social organization of American reserve components: (1) No other reserve system requires as much training time for its members; (2) no other reserve system relies on reservists for basic full-time support; (3) no other reserve system has a well developed career path (with a corresponding professional military education system) leading to senior command and staff positions; and (4) in no other reserve system do reservists have such limited real vacation time. The effect of these conditions is that the American reserves, in comparison with those in other Western countries, are characterized by greater conflict between reserve duties and family obligations and, most especially, between reserve duties and civilian employment responsibilities. Long-term policy changes to improve reserve force must take this into account.

ACCESSION NUMBER: AD-A226717

"Noncommissioned Officer Education and Professional Development Study." Fort Monroe, VA: Continental Army Command, 1971. 62p.

Abstract: The following are among this study's recommendations: Retain the present Noncommissioned Officer Education System (NCOES) as the Army's program for noncommissioned officer education and professional development and implement it fully as rapidly as possible; Examine the NCOES and make modification to insure that every soldier in every military occupational specialty has a career path through NCOES to noncommissioned officer rank; Develop, insofar as possible, programs of instruction within NCOES which will include all MOS, consolidating instruction to insure flexibility in accommodating all MOS within programmed classes at each service school

regardless of variations in ACMF and MOS training; Continue to analyze service school courses to eliminate duplication between NCOES and specialized and functional courses; Terminate the Skill Development Base Program as rapidly as possible, by 30 June 1972, or earlier, in favor of earlier expansion of NCOES; Retain the present organization of noncommissioned officer academies for the foreseeable future; and Develop on NCOES student procurement system to replace current solicitation procedures for procurement of best-qualified students, by establishment of mandatory quota requirements, which must be met, based on distribution of personnel within major organizations by MOS and rank.

ACCESSION NUMBER: AD-A089270

Orlansky, Jesse. et al. "Joint Warfare Analysis Program." Final report. October 1994-June 1995. Alexandria, VA: Institute for Defense Analyses, June 1996. 54p.

Abstract: This paper examines the need for a program of Joint Warfare Analysis as an option in Joint Professional Military Education, Phase I, for intermediate level officers. The findings are based on structured interviews with 50 senior flag officers on whose staffs graduates would serve. Graduates of such a program are considered important on Joint and Service Command staffs, and half the respondents consider them essential and would trade off a current billet for such a graduate. The curriculum should include studies campaign analysis, simulation and joint exercise evaluation. It is estimated that 30 to 40 graduates would be needed each year to fill 90 to 130 billets on Joint and major Service command staffs.

ACCESSION NUMBER: AD-A311927

Palmer, George E. "A Discriminative Study of the Senior Service College Selection System as it Relates to the Army War College." Research paper. Carlisle Barracks, PA: Army War College, January 1972. 40p.

Abstract: The major thrust of this study is to analyze the Army Senior Service College Selection System with a view of determining the merits of the system and its relationship to the US Army War College (AWC). The basic question is whether or not the student body of the Army War College has been and remains a reputable product of the selection system. In addition, have any noticeable trends been established in using this selection system over an extended period and is the formulation of a War College student profile feasible. Data was gathered using a literature research of appropriate civilian publications and statistical information compiled at the AWC and Department of the Army. A twenty-two year survey of the student body attending the AWC was conducted. The analysis of the student body at the AWC indicates that the Senior Service College Selection System is accomplishing its goal of selecting the best qualified for attendance to the Senior Service Colleges. The students nominated appear to meet the selection criteria as related to rank, professional skills, educational standards, and time in service. Minor variations in each class composition are noted. These variations may be prevalent in each of the Senior Service Schools due to the random selection of students and the suspected desire to more closely integrate the educational process of the senior officers from all services.

ACCESSION NUMBER: AD-A026935

Park, S.H. "Evaluation of Graduate Education of the Military Professionals and Assessment of Their Need." Master's thesis. Monterey, CA: Naval Postgraduate School, December 1983. 101p.

Abstract: The military services have been aware of the importance of advanced, formal education since the Korean War (1950-1953). During the past three decades, however, with the philosophy of the fortification of self - defense power; the modernization of the military equipment, and the development of defense - industry, there has been a great increase in the need for officers with education at the baccalaureate level and graduate level to prepare them for a extreme variety of roles beyond the traditional professional officer's combat mold. In this regard, this thesis is concerned with whether or not the needs for graduate education were inflated; whether officers so educated were used adequately in positions identified as requiring graduate education; and how we measure the value of graduate education in military officers.

ACCESSION NUMBER: AD-A140626

Payne, Rodney M. "Common Sense Approach to Strategy." Research report. Maxwell AFB, AL: Air War College, May 1987. 41p.

Abstract: Professional military education at all levels emphasizes the necessity for military commanders to study, understand and, in turn, properly apply the classic strategies and principles of war. Using the Civil War career of Lieutenant General Nathan Bedford Forrest as a case study, this paper points out that even though he was uneducated and had no prior military experience, Forrest was a genius in the strategies and principles of war. An analytical discussion of several of Forrest's campaigns is used to support this thesis. Given the fact that Forrest could not have read or been taught the classic strategies and principles, he undoubtedly adhered to some form of strategy formulation framework which intuitively led him to make the correct military decisions. The author postulates that framework as a basis for the analysis of Forrest's achievements and suggests that the same framework could prove beneficial at all levels of command ad a quick reference back-up for contemporary battlefield strategy decisions.

ACCESSION NUMBER: AD-A187008

Peacock, W.R., Jr. "Soviets - How Much Do We Know." Research report. Maxwell AFB, AL: Air War College, April 1985. 55p.

Abstract: Initial discussion of both the historical and current reasons for knowing the United States' primarily adversary, the Union of Soviet Socialist Republics (USSR), leads to further examination of the specific categories of knowledge the professional military officer should have regarding his enemy. History, society, economy, political system and geography are discussed along with the implications each has in contributing to the senior professional's required knowledge. Next, the results of a questionnaire on the Soviet system administered to the Air War College USAF students in the class of 1985 lead to the conclusion that lieutenant colonels and colonels in the Air Force have only superficial knowledge of the USSR in the five categories of knowledge previously mentioned. General observations on the American educational system, media, and professional military education programs at Squadron Officer School, Air Command and Staff College, and Air War College point to a need to start the Soviet education process earlier in the individual's career, increase the exposure at all USAF professional military education schools and establish some type of additional mandatory training. Suggestions as to the specifics of implementing such a program are offered with the hope of providing a starting point for fixing the problem.

ACCESSION NUMBER: AD-A159277

Peterson, James R. "Tactical Deception--Vital Then, Vital Now." Student report. Maxwell AFB, AL: Air Command and Staff College, April 1987. 30p.

Abstract: Tactical Deception is the force multiplier that can be the difference between victory and defeat. Since Biblical times, Deception has played a vital role in warfare. The advances in technology, change in our society, and expanded military role have not reduced Deception's value. In addition, Soviet's reliance on Deception throughout its military dictates increased United States military emphasis in the study and use of Deceptive measures. The study examines the types of Deception, key factors for success, and examples throughout history on how Deception, has been vital. By increasing the emphasis of Deception in routine exercises, evaluations, and Professional Military Education, the United States military can fully utilize this vital tool.

ACCESSION NUMBER: AD-A200583

Powers, James F., Jr. "National Assistance and Civil-Military Operations: The Gap in Professional Military Education." Research report. Carlisle Barracks, PA: Army War College, March 1996. 35p.

Abstract: The Department of Defense (DoD) is not properly preparing the U.S. Armed Forces to execute Civil-Military Operations (CMO) as a supporting, mission activity of Nation Assistance. Furthermore, the DoD appears to be unaware of this shortcoming and thus incapable of solving the problem due to a general lack of education and awareness regarding Nation Assistance and its component activities. This argumentative paper evaluates the national security policy area of Nation Assistance and one of the stated component activities, CMO. It traces the genesis of CMO from the President's National Security Strategy through the Secretary of Defense (SECDEF) and Chairman, Joint Chiefs of Staff (CJCS) National Military Strategy to a break in the linkage at Service level. Civil-Military Operations are defined as the complex of activities in support of military operations embracing the interaction between the military force and civilian authorities fostering the development of favorable emotions, attitudes, and behavior in neutral, friendly, or hostile groups. The methodology used in this evaluation is the U.S. Army War College (USAWC) Ends,

Ways, and Means model for developing National Strategy; i.e., Ends being the objectives, Ways the concepts, and Means the resources available. The term CMO comprises five mission activities: populace and resources control, foreign nation support, humanitarian assistance, military civic action, and civil defense.
ACCESSION NUMBER: AD-A309111

Powers, Marcella V. "Survey of Studies Addressing Graduate Education in the United States Air Force." Research report. Maxwell AFB, AL: Air War College, April 1987. 63p.

Abstract: The purpose of this report is to establish the basic structure for the education of Army (including Army Air Forces) officers. The charter of the board covered commissioned officers only. The military leadership emerging from World War II recognized that the United States would play a major role in world affairs. The military officers of the United States needed to be educated to assume military leadership under more complex situations and using more sophisticated technology than had been the case before that time. The bulk of this study, chaired by Lieutenant General Leonard T. Gerow, deals with professional military education. Annex 10 (which addresses Army Air Forces) includes the requirement for the Air Institute of Technology. At this early stage of the development of modern-day military education, no specific reference is made to graduate education. The board established the mission of the Air Institute of Technology as assuring scientific technological development of Army Air Forces equipment and efficient operation of procurement, supply, maintenance, and service responsibilities assigned to the Army Air Forces. (p. 75) It would be heavily science-and-research oriented. Instruction would be provided in those subjects to prepare officers to serve in the Air Technical Service Command and tactical operating units. Provisions called for Reserve and National Guard officers to attend an associate, condensed course and for the Air Institute of Technology to provide a correspondence course for officers on inactive status.
ACCESSION NUMBER: AD-A186843

"Professional Military Education - Officer AFPT 90-XXX-522." Special report. Randolph AFB, TX: Air Force Occupational Measurement Center, October 1984. 56p.

Abstract: This report presents the results of an Air Force occupational survey of the leadership, management, and communicative tasks performed by Air Force officers. This survey was requested by HQ Air University to help validate and revise the curricula of officer precommissioning and postcommissioning professional military education (PME) courses.
ACCESSION NUMBER: AD-A147387

Redmond, Kimberly, Joe Sheppard, Marlene Humphrey and Lee Stacy. "CD-ROM Applications in Professional Military Education (PME)." Final report. September 1991-May 1992. Arlington, VA: Eagle Technology, Inc., October 1992. 99p.

Abstract: This effort was conducted to identify the most cost-effective and efficient utilization of Compact Disk-read Only Memory (CD-ROM) within the Marine Corps Professional Military Education (PME) schools at the Marine Corps University (MCU). CD-ROM, Professional Military Education (PME).
ACCESSION NUMBER: AD-A256662

Reed, D.D. "Future Technologies Needs Analysis." An Air University Staff Report. 1986. 75p. Paper presented at the Annual Meeting of the Mid-South Educational Research Association (15th, Memphis, TN, November 19-21, 1986).

Abstract: This report summarizes the findings of a survey of all permanently assigned personnel at the Air University at Maxwell Air Force Base (Alabama) to determine what future workplace technologies will be needed to support the university's two major programs, Professional Military Education (PME) and Professional Continuing Education (PCE). The objectives of the study were to determine exactly what personnel perceived their needs to be for a local area network; for future technologies for presenting PME and PCE curricula; and for achieving the necessary staff work of support organizations. There were 1,211 respondents who provided information on: (1) their willingness to accept technology advances; (2) potential workload savings by automation; and (3) specific equipment and software requirements. The survey data were also designed to permit future mapping of external and internal data flow at the Air University. The text is supplemented by seven figures and six tables, and four appendices include a copy of the survey

questionnaire and analyses of the data for individual questions. A descriptive analysis of future technological needs in a military university based on this study is attached.

ACCESSION NUMBER: ED290443

Reed, Ronald D. "Perspective on Commissioning and Education -- Total Quality, Total Force." Final report. Maxwell AFB, AL: Air War College, April 1993. 60p.

Abstract: Internal and external pressures drive leaders, planners, and senior decision makers to evaluate educational programs for efficiency, effectiveness and long-term benefits. This paper focuses on such issues with respect to Department of Defense (DOD) commissioning programs. Meshed with older educational concerns for development and reform, a growing emphasis on Total Quality Management (TQM) offers opportunities and challenges in meeting such pressures and in supporting evaluation. TQM areas of particular importance in tailoring TQM to commissioning programs are customer and product identification, quality definition and measurement, leadership and teamwork in organizational culture, and benchmarking. Data is needed to support decision making and program improvement at all levels. Several metrics of comparative quality are available, with one being surveys of supervisors for newly commissioned officers. A case is made that better coordination of evaluative data and commissioning programs is needed. Ultimately, this coordination should extend within each service, across the joint services, and through career-long professional military education.

ACCESSION NUMBER: AD-A283215

Reely, Robert Harold, Jr. "An Analysis of the Relationships between Job Satisfaction/Enrichment Factors and Demographic Variables for United States Air Force Professional Military Education Faculty." Doctoral thesis. Wright Patterson AFB, OH: Air Force Institute of Technology, August 1976. 131p.

Abstract: This study has focused upon an application of job motivation/satisfaction theory to the faculty of the United States Air Force Air University. The study was limited to the three major college faculties within Air University. Two hundred and twenty subjects were measured with the Air University Faculty Motivation Survey. The instrument presented and defined 15 job factors. Scales were included to measure both an individual's satisfaction with and perceived importance of each factor. Six job enrichment factors and selected demographic variables were also measured.

ACCESSION NUMBER: AD-A031821

"A Review of Education and Training for Officers (RETO)." Volume 2. Career Progression. Washington, DC: Office of the Chief of Staff (Army), June 1978. 638p.

Abstract: Partial Contents: (C). Precommissioning. The Precommissioning Screening System. The ROTC Program. The ROTC Scholarship Program. (D). Officer Education, Training and Military Qualification Standards, Precommissioning through 10 Years AFCS. Military Qualification Standards. Notional Model of MQS I. Notional Model of MQS II, Specialty 11. Notional Model of MQS II, Specialty 35. Notional Model of MQS II, Specialty 81. Notional Model of MQS III, Specialty 11. Notional Model of MQS III, Specialty 35. Notional Model of MQS III, Specialty 81. Professional Military Education Components at MQS I, II and III. The Advanced Course Analysis. Transition to War. (E). Training and Education for Field Grade Officer Development. Preparing Field Grade Officers. Skills and Knowledge Common to All Majors and Lieutenant Colonels. Combined Arms and Services Staff School (CAS3). U.S. Army Command and General Staff College. Expansion for War: USACGSC and CAS3. Specialty/Assignment--Relevant Training and Education. (F). Senior Officer Education and Training. Senior Service Colleges. Battalion and Brigade Precommand Courses. Continuing Education and Training for General Officers. Transition to War.

ACCESSION NUMBER: AD-A080159

"A Review of Education and Training for Officers (RETO)." Volume 4. Rank-Independent Issue. Washington, DC: Office of the Chief of Staff (Army), June 1978. 367p.

Abstracts: Partial Contents: (M) Commitment, (N) Officership—The Army Environment and Its Impact on Officership, (O) Assessment Concept in Support of Officer Education and Training System--Assessment Concept for

Mid-Career Development; Executive Development Laboratory for Newly Selected Brigadier Generals; (P) Professional Military Education for Army Officers--Future Requirements in Professional Military Education, Graduate Level Education of Army Officers, Foreign Languages and U.S. Army Officers, Professional Ethics, Military History , (Q) Reserve Components--Reserve Components Officer Professional Development, (R) Management of Officers--Promotion by Specialty Floors, Commander Management, OPMS Specialties - DA Proponency and Specialty Primacy, Specialists and Generalists: A Look at the Army Officer Corps; (S) Aviation Program.

ACCESSION NUMBER: AD-A080161

Richardson, F.G. "Law of War and the Operational Commander." Final report. Newport, RI: Naval War College, Dept. of Operations, 8 February 1994. 36p.

Abstract: Every member of the military is bound by oath to discharge his or her duties in accordance with the law of war. This paper examines the influence of the law of war on the operational commander and includes legal planning considerations for campaigns. It does not list all laws of armed conflict or the provisions of applicable conventions concerning warfare. Operational law, based on the principles of military necessity, unnecessary suffering, and proportionality enables the operational commander to plan and execute legal, successful operations. Command criminal responsibility assumes an operational commander does not issue illegal orders or in some way personally directs or supervises a prohibited activity. Selected cases in military history clearly indicate that operational commanders who have adhered to the law of war emerged victorious in their respective campaigns. Analysis of these cases and current law supports the premise that the operational commander must obey the law of war, and has no authority to violate or selectively enforce the law. To ensure operations are conducted within the spirit and intent of the law of war, training programs need to be instituted at all levels of professional military education.

ACCESSION NUMBER: AD-A279705

Rose, M. Richard and Andrew J Dougherty. "Educating the American Military Officer. The System and Its Challenges: An Overview." Washington, DC: National War College, Strategic Research Group, November 1975. 32p.

Abstract: Over the years there has developed within the Department of Defense perhaps the most elaborate and successful system dedicated to the intellectual and professional development of officers of the Armed Forces to be found in any institution in the world. An examination of this process, its components and its genesis, reveals a composite of separate programs developed and adapted over the years to satisfy specific needs. That the programs so developed have been successful in the aggregate cannot be denied. We need only to look at the officer corps of the Armed Forces, as they now exist, to be persuaded of the effectiveness of these programs as instruments for the development of professionalism and expertise. The nation and the Armed Forces have just completed the longest, most divisive and difficult war in our national history. In the course of that war, the overall performance of the Armed Forces, as it reflects officership, was superb. The dedication and professionalism exemplified by the American prisoners-of-war, as representative products of the system, during their long incarceration and their subsequent return to our nation with their honor intact, attests to this quality and substance of these programs.

ACCESSION NUMBER: AD-A024215

Roth, Brenda F. "Student Outcomes Assessment of Air Command and Staff College: An Evaluative Study." Doctoral thesis. Wright-Patterson AFB, OH: Air Force Institute of Technology, April 97. 244p.

Abstract: In the mid-1980s, the assessment movement began to spread throughout academia as colleges and universities created programs to address the issues of accountability and program improvement. A multitude of comprehensive institution-wide assessment programs emerged from the movement which brought about change on many campuses. The purpose of this study was to develop a comprehensive assessment program at an Air Force professional military education institution, Air Command and Staff College (ACSC), based on the perceptions of recent Air Force officer graduates of the program. Graduates (n=395) were asked to rate the quality of program elements (teaching methods and program activities) and to disclose their perceived competence on outcome variables. Based on the data from a 90-item questionnaire titled, 'Student Perceptions of Program Effectiveness Questionnaire,' the researcher analyzed student perceptions on three types of variables--inputs (demographics and student expectations), environment (teaching methods and program activities), and outcomes (program goals). Information from returned

questionnaires was collected and analyzed using descriptive (means, standard deviations, and percentages), correlational (cross-tabulations and Pearson 'r's), predictive (multiple regression) statistics, and qualitative analysis. The results of the correlational and predictive analyses show that ACSC graduates generally perceived their competencies on outcome variables and the quality of environmental variables as high. The most important results emerged from the predictive analysis. After controlling for the effects of inputs, which accounted from three percent of the variance in Command and Leadership to nine percent in Critical Thinking outcome Leadership to fifteen percent in Joint Campaign outcome variables.

ACCESSION NUMBER: AD-A323627

Rupinski, Timothy E. "Selection Criteria for Professional Military Education." Final report. Alexandria, VA: Center for Naval Analyses, Marine Corps Operations Analysis Group, 10 August 1987. 61p.

Abstract: The Marine Corps provides Professional Military Education (PME) for its noncommissioned officers. Each level of training is designed to provide the leadership skills necessary for advancement in rank. This research memorandum shows that prior performance, time in grade, length to end of active service, and operational commitments affect the selection of eligible Marines into some of the resident courses.

CRM-87-148

ACCESSION NUMBER: AD-A187693

Shaw, Chris. "Professional Military Education: An Alternative Approach." Research report. August 1991-April 1992. Washington, DC: Industrial College of the Armed Forces, April 1992. 32p.

Abstract: The national imperatives of our economy reflect directly on military budget austerity and manpower drawdowns, yet the education of officers must not and should not suffer. The history and evolution of PME and a different approach can provide the answers to the where and how the PME system should proceed. What results from this prescribed alternative approach is an educated officer versed in the various levels of war, capable of participating directly in the formulation of national security policy.

ACCESSION NUMBER: AD-A262081

Siegel, Adam B. "A Brave New Curriculum for a Brave New World?" Alexandria, VA: Center for Naval Analyses, March 1991. 28p.

Abstract: The Naval War College, like all other defense institutions, is reeling from the rapid changes in the security outlook. From the crumbling of the Soviet empire to the crumbling domestic support for military outlays, the U.S. defense establishment faces challenges to many of the basic defense planning assumptions of the past decade. As Capt. John H. Heidt of the Naval War College commented, the threat is no longer the Russians. The threat is uncertainty. Adjusting to the rapidly changing environment is a challenge that has to be met if the safe future for the nation is to be secured – adapting the education and training of the nation's future military leaders to the changing environment is one means to ensure appropriate defense policies in the future. One is forced to wonder whether the nation's war colleges require brave new curricula for the brave new world of the coming decades.

ACCESSION NUMBER: AD-A234351

Smariga, Linda K. "Reactions and Attitudes Displayed by Air Force Officers to the Combat Support Doctrine." Master's thesis. Wright-Patterson AFB, OH: Air Force Institute of Technology, School of Systems and Logistics, September 1987. 112p.

Abstract: The purpose of this study was to determine a group of officers, reactions and attitudes towards AFM 2-15, the Combat Support Doctrine. Specifically, the study attempted to find if (1) The Combat Support Doctrine was understandable and meaningful to these officers; and to determine (2) If the doctrine was not understandable and meaningful to these same officers, was the problem the actual doctrine itself, or was the problem related more to the institution; the Air Force. That is, was the problem related more to the fact that the Air Force does not emphasize the study of doctrine. The data was collected by a survey developed for this study. The research found that the Combat Support Doctrine was understandable to these officers, but that it was not equally as meaningful to these same officers. There was no conclusive evidence that the doctrine itself was at fault, but the research did show that the Air Force does

not emphasize the study of doctrine on a regular basis. Doctrine is only presented, usually in a brief format, at commissioning sources, and more in depth at professional military education schools, in residence.
ACCESSION NUMBER: AD-A186539

Smith, B.G. "USAF Security Police Officer Leadership: Effectiveness, Agreement, and the Effects of Education and Experience." Master's thesis. Wright-Patterson AFB, OH: Air Force Institute of Technology, 1984. 97p.
Abstract: The effects of education and experience on leadership are disputed. In the USAF both are viewed as methods of creating effective leaders. Professional military education teaches leadership theory while experience is believed to increase an officer's ability to lead. This study asked four questions concerning: (1) the leadership effectiveness of security police officers; (2) the level of agreement between the officers, their subordinates and/or superiors, on the officer's behavior in given leadership situations; (3) the relationship between professional military education and leadership effectiveness; and (4) the relationship between experience and leadership effectiveness.
ACCESSION NUMBER: AD-A145371

Smith, Linda L. "Skelton: A Strategy for Air War College." Research report. Maxwell AFB, AL: Air War College, April 1990. 57p.
Abstract: No abstract available.
ACCESSION NUMBER: AD-A229941

Talbert, Gene E., John P. Hourigan, and James L. Hoyt. "An Analysis of the System for Determining and Validating Air Force Professional Education Requirements. Final report. 13 Jul 70-13 Feb 71. Santa Monica, CA: Systems Development Corporation, April 1971. 116p.
Abstract: The study of the Air Force professional education system describes and examines the procedures used for determining, validating, and meeting requirements for the development of career officers via the formal programs and courses of Air University. A descriptive model is developed which displays the current processing procedures, information flows, and interrelationships among the agencies, programs, and structures which together comprise the educational system and its embedding environment. The findings from an analysis of the current system and from an examination of alternative procedures are presented together with suggested procedural modifications. It is concluded that the system in its present form does function as a system; that benefits from 'ready solutions' to particular problems may be more apparent than real when considered from the overall system's point of view; and that the principal values of the current study may lie in its descriptive rather than its prescriptive aspects. It is suggested that sustained and concentrated efforts on a number of fronts are needed to develop a comprehensive and valid set of prescriptive measures. Principal issues to be resolved and approaches to be considered are discussed.
AFHRL-TR-71-3
ACCESSION NUMBER: AD-738300

Taylor, Robert L. and Deonn M. Wall. "Air Force Professional Military Education and Executive Leadership and Management Development - A Summary and Annotated Bibliography." Final report. Colorado Springs, CO: Air Force Academy, January 1980. 84p.
Abstract: Professional Military Education (PME) has, historically, been the process employed by a nation's armed services to train and develop officers for future responsibility and the conduct of war. Over the years, substance and pedagogy have changed, but objectives remain the same. The importance of PME cannot be understated as it is the framework for professional development in an officer corps.
USAFA-TR-80-1
ACCESSION NUMBER: AD-A080552

Toner, S.C. "George Washington, America's First Strategic Leader." Research report. Carlisle Barracks, PA: Army War College, April 1996. 26p.

Abstract: American military officers are educated via a formal professional military development program, for more than twenty years in pursuit of mastery of the strategic art. Much of that developmental program emphasizes the concepts of war and military genius advocated by Carl Von Clausewitz in his nineteenth century classic, On War. This study examines the strategic thought and actions of General George Washington in the American Revolution, which preceded Clausewitz's work by more than thirty years. It shows that, despite the lack of any formal military professional education, Washington made skillful use of the ways and means available to him to construct a strategy capable of achieving the desired ends. The author concludes that, whether judged against Clausewitz's concepts or modern definitions of the strategic art, Washington deserves to be recognized as a master of the strategic art and America's first strategic leader.

ACCESSION NUMBER: AD-A309270

Trotter, Jesse J., Jr. "International Military Education and Training Program: Building Bridges Toward a New World Order." Study project. Carlisle Barracks, PA: Army War College, 29 May 1992. 25p.

Abstract: The publication of the August, 1991 version of the National-Security Strategy of the United States marked a watershed in the evolution of American defense planning by migrating from a forty year policy of containment to one emphasizing regional interests and threats. As DOD considers competing programs to support this regionally-based strategy, the International Military Education and Training Program (IMETP), which provides professional military education and technical training to foreign military personnel, is offered as a possible solution if the program is strengthened and expanded. This study places the IMETP into proper context with the other, larger components of the U.S. security assistance program, examines the dynamics that are currently affecting the program and proposes possible solutions to allow it to make a greater contribution. The study is based on primarily source materials as well as interviews with current and retired security assistance officials and key Congressional staff personnel.

ACCESSION NUMBER: AD-A252931

United States General Accounting Office. "Air Force: Status of Recommendations on Officers' Professional Military Education." Washington, DC: National Security and International Affairs Division, March 1991. 45p. Briefing Report to the Chairman, Panel on Military Education, Committee on Armed Services, House of Representatives.

Abstract: We focused on recommendations concerning Phase I professional military education and selected the recommendations for which the schools are either directly responsible or play a significant supporting role in their implementation. We interviewed appropriate officials at both schools and asked them to characterize the status of each recommendation, and examined pertinent supporting documents. In each case where we were told that the schools had implemented or partially implemented a recommendation, we reviewed and analyzed the supporting documentation used in determining their characterization. In addition, we examined their methodology used to produce supporting data. Where additional action was still required, we met with school officials to discuss future plans. We obtained written documents to support those plans whenever possible. In those cases where school officials told us that they had not taken any action in response to a Panel recommendation, we interviewed appropriate officials to obtain their reasons for non-implementation.

GAO/NSIAD-91-122BR
ACCESSION NUMBER: AD-A253626

U.S. General Accounting Office. "Army: Status of Recommendations on Officers' Professional Military Education." Washington, DC: National Security and International Affairs Division, 21 March 1991. 48p. Briefing Report to the Chairman, Panel on Military Education, Committee on Armed Services, House of Representatives.

Abstract: A primarily objective of the Goldwater-Nichols Reorganization Act of 1986 is to strengthen combined and joint operations of the various military services. To fulfill this objective, the House Armed Services Committee established the Panel on Military Education in November 1987 to report its findings and recommendations regarding

the ability of DOD to develop joint specialty officers through its professional military education systems. The Chairman, Joint Chiefs of Staff, established policies, programs, guidelines, and procedures for coordinating, among other things, the joint professional military education of members of the U.S. armed forces. This guidance is contained in the Military Education Policy Document that was issued in May 1990. Military departments are required to incorporate this guidance into their own professional military education systems.

GAO/NSIAD-91-121BR
ACCESSION NUMBER: AD-A253956

U.S. General Accounting Office. Department of Defense: Professional Military Education at the Four Intermediate Service Schools. Washington, DC: National Security and International Affairs Division June 1991. 35p.

Abstract: A primarily objective of the Goldwater-Nichols Reorganization Act of 1986 was to strengthen combined and joint operations of the various military services. To fulfill this objective, the House Armed Services Committee established the Panel on Military Education in November 1987 to report its findings and recommendations regarding DOD's ability to develop joint specialty officers through its PME systems. The Panel's April 1989 report envisioned that joint education would be an integral part of PME and would be implemented in two phases. Phase I would be taught at the intermediate level service schools attended by officers primarily at the rank of major/lieutenant commander or at the senior schools attended by officers at the rank of lieutenant colonel/commander and colonel/captain ranks. Phase II, taught at the Armed Forces Staff College (AFSC) in Norfolk, Virginia, would complement Phase I and officers would usually attend it after completing Phase I.

GAO/NSIAD-91-182
ACCESSION NUMBER: AD-A253959

United States General Accounting Office. "Department of Defense: Professional Military Education at the Three Senior Service Schools." Washington, DC: National Security and International Affairs Division, June 1991. 22p. Report to the Chairman, Panel on Military Education, Committee on Armed Services, House of Representatives.

Abstract: This report compares, analyzes, and discusses the actions of the three senior service schools. The Panel on Military Education report envisioned that joint education would be an integral part of PME. Phase I would be taught at the intermediate level schools attended by officers primarily at the rank of major/lieutenant commander or at the senior level service schools attended by officers at the rank of lieutenant colonel/commander and colonel/captain ranks. Phase II, taught at the Armed Forces Staff College in Norfolk, Virginia, would compliment Phase I. The senior service schools reported that they have taken some positive action on at least 90 percent of the applicable Panel recommendations, but some key and other Panel recommendations concerning faculty and students have not been fully adopted.

GAO/NSIAD-91-202
ACCESSION NUMBER: AD-A253629

United States. General Accounting Office. Marine Corps: Status of Recommendations on Officers' Professional Military Education." Washington, DC: The Office, 1991. 34p. Fact sheet for the Chairman, Panel on Military Education, Committee on Armed Services, House of Representatives.

Abstract: No abstract available.

GAO/NSAID-91-88FS

United States General Accounting Office. "Military Education: Curriculum Changes at the Armed Forces Staff College." Washington, DC: National Security and International Affairs Division, September 1991. 27p. Report to the Chairman, Panel on Military Education, Committee on Armed Services, House of Representatives.

Abstract: No abstract available.

GAO/NSIAD-91-288

ACCESSION NUMBER: AD-A253726

U.S. General Accounting Office. "Military Education: Implementation of Recommendations at the Armed Forces Staff College." Washington, DC: National Security and International Affairs Division, October 1991. 32p.

Abstract: The Goldwater-Nichols Department of Defense Reorganization Act of 1986 seeks to strengthen combined and joint operations of the various military services. In fulfilling this objective, the House Armed Services Committee established the Panel on Military Education in 1987 to report its findings and recommendations about DOD's ability to develop joint specialty officers through its professional military education programs. This report discusses Phase II professional military education programs taught at the Joint and Combined Staff Officer School in Norfolk, Virginia. It continues the series of GAO reports on actions taken by DOD to improve its officer education at the service and joint schools.

GAO/NSAID-92-30

U.S. General Accounting Office. "Military Education: Implementation of Recommendations at the Industrial College of the Armed Forces." Washington, DC: National Security and International Affairs Division, July 1992. 49p.

Abstract: In response to a request, the General Accounting Office has examined various issues relating to the professional military education activities at the joint schools of the National Defense University located at Fort McNair in Washington, D.C. This report addresses the Industrial College of the Armed Forces' implementation of 41 recommendations contained in the April 1989 report of the Panel on Military Education. These recommendations were developed to assist the Department of Defense (DOD) in improving its professional military education programs for officers. This report is the last in a series addressing the nature and extent of actions DOD has taken to improve its officer education at the service and joint schools. (See Related GAO Products at the end of this report.) A primarily objective of the Goldwater-Nichols Reorganization Act of 1986 was to strengthen combined and joint operations of the various military services. To fulfill this objective, the House Armed Services Committee established the Panel on Military Education in November 1987 to report its findings and recommendations regarding DOD's ability to develop joint specialty officers through its professional military education systems. The Chairman, Joint Chiefs of Staff, established policies, programs, guidelines, and procedures concerning joint professional military education. In May 1990, he issued guidance in the Chairman's Memorandum 344-90, Military Education Policy Document. While Panel recommendations are advisory, military education institutions are required to incorporate the Chairman's guidance into their own education systems. The professional military education system of DOD is composed of eight service schools and three joint schools.

GAO/NSIAD-92-221

ACCESSION NUMBER: AD-A298395

U.S. General Accounting Office. "Military Education: Implementation of Recommendations at the National War College." Washington, DC: National Security and International Affairs Division, June 1992. 41p.

Abstract: A main goal of the Goldwater-Nichols Department of Defense Reorganization Act of 1986 was to strengthen joint and combined operations of the military services, in part by training joint specialty officers at professional military schools. Of 41 recommendations made at the National War College in Washington, D.C. 32 have been successfully implemented, including two key recommendations on establishing a professional military education framework and hiring quality faculty. Nine recommendations have been partially implemented, four of which involve letter grades while the others cover areas not fully within the college's control, including (1) student-to-faculty ratios; (2) the completion of a service intermediate school before attendance at a joint school; and (3) officers in professional **categories, like doctors and lawyers, who are assigned to joint duty positions after graduation.**

GAO/NSAID-92-202

U.S. General Accounting Office. "Military Education: Information on Service Academies and Schools." (Briefing Report). Washington, DC: National Security and International Affairs Division, September 1993. 18p.

Abstract: A variety of constraints – physical, financial, and environmental – make it unlikely that military academies, with the exception of the Air Force Academy, will be able to absorb additional professional military education institutions. All three academies are at or over capacity for classroom and dormitory facilities, and both the Army and Navy Academies have very little land on which to build additional facilities. Because the services differ in how they interpret the definition of professional military education as defined in the Military Education policy document, the Joint Chiefs of Staff's guidance for training military service personnel, the Army has ended up with more professional military education schools that could be candidates for consolidation than has the air Force. GAO identified 32 different schools that conduct 60 different courses; during academic year 1992-1993, more than 36,000 students were enrolled at these schools. The cost for providing professional military education in fiscal year 1993 was pegged at about $123 million. This figure includes salaries for instructors and support staff but does not factor in such expenses as student salaries.

GAO/NSAID-93-264BR

United States General Accounting Office. "Navy: Status of Recommendations on Officers' Professional Military Education." Washington, DC: National Security and International Affairs Division, March 1991. 40p. Briefing Report to the Chairman, Panel on Military Education, Committee on Armed Services, House of Representatives.

Abstract: We focused on recommendations concerning Phase I professional military education and selected the recommendations for which the Naval War College is either directly responsible or plays a significant supporting role in their implementation. We interviewed appropriate officials at the College, asked them to characterize the status of each recommendation, and examined pertinent supporting documents. In each case where we were told that officials had implemented or partially implemented a recommendation, we reviewed and analyzed the supporting documentation used in making their characterization. In addition, we examined their methodology used to produce supporting data. Where additional action was still required, we met with College officials to discuss future plans. We obtained documents supporting those plans whenever possible. In the case where officials told us that they had not taken any action in response to a Panel recommendation, we interviewed appropriate officials to obtain their reasons for non-implementation.

GAO/NSIAD-91-124BR
ACCESSION NUMBER: AD-A253627

United States General Accounting Office. Testimony. Professional Military Education by Paul L. Jones, Director of Defense Force Management Issues before the Panel on Military Education, House committee on Armed Services. Washington, DC: National Security and International Affairs Division, 5 February 1991. 13p.

Abstract: GAO testified on its review of Phase I joint professional military education at the four intermediate and three senior service schools. Overall, GAO indicated that the seven service schools have responded very favorably to the recommendations of the Panel on Military Education (part of the House Armed Services Committee), with each school taking positive action on at least 90 percent of the recommendations. Although the schools have taken many positive steps to improve the quality of joint professional military education, concerns exist in curriculum., faculty, and student evaluation areas that warrant the Panel's continuing attention. These areas include in-residence Phase I education, the distinction between the intermediate school and the senior service school curricula (at the Naval War College), prescribed levels of non-host faculty and student mixes and student/faculty ratios, and letter grades (at the Army senior school and the Air Force schools).

GAO/T-NSIAD-91-4
ACCESSION NUMBER: AD-A253939

Walsh, Daniel J. "Joint Professional Military Education and Its Effect on the Unrestricted Line Naval Officer Career." Master's thesis. Monterey, CA: Naval Postgraduate School, March 1997. 162p.

Abstract: The results of this thesis show Joint Professional Military Education (JPME) has four primary impacts on the Unrestricted Line (URL) Naval officer career. First, JPME is an effective retention tool. Second, almost all URL officers completing WME do so between the 10 and 22 year points in their career. Third, a URL officer completing any form of JPME prior to the 0-5 promotion board does not have a significantly better chance of promoting to 0-5; whereas a URL officer completing resident JPME prior to the 0-6 promotion board has a significantly better chance of promoting to 0-6 except in the case of nonresident WME, intermediate level Phase 1/11, and the equivalents (Federal Executive Fellowships or Foreign Service Colleges). For these three forms of JPME, the effect on promotion is insignificant at all levels. Fourth, unlike JPME, a URL officer completing any form of graduate education prior to the 0-5 promotion board has a significantly better chance of promoting to 0-5. In contracts, a URL officer completing graduate education after the 0-5 promotion board does not have a significantly better chance of promoting to 0-6.

ACCESSION NUMBER: AD-A331606

Watson, Donald W. "Are We Teaching Senior Noncommissioned Officers What They Really Need to Know." Student report. Maxwell AFB, AL: Air Command and Staff College, April 1988. 24p.

Abstract: The aim of this project is to determine if the SNCO Academy is meeting its purpose. This determination will be made by an analysis of data supplied by the Air University and the Senior NCO Academy. Senior Noncommissioned Officers have been part of the USAF for about 30 years. These Senior NCOs were and are an extension of the NCO corps and they took a portion of officer positions and responsibilities. Are we educating these individuals to adequately carry out their duties. This report concludes there are two major areas where senior NCO Professional Military Education is falling short; Communicative Skills and Leadership and Management.

ACCESSION NUMBER: AD-A194197

Weiss, Michael R. "Education and Development of Strategic Planners in the Navy." Master's thesis. Monterey, CA: Naval Postgraduate School, December 1990. 188p.

Abstract: This thesis examines the graduate level education and professional military education programs available to U.S. Navy officers who are designated as, or seek to become, Strategic Planners. The programs are reviewed and suggestions are given for interweaving education with billets to provide the career path necessary to expose naval officers to the environment in which the modern strategist must operate. The utilization of officers is also investigated through the results of a survey sent to 449 naval officers with both educational and experience-based Strategic Planning subspecialty codes. Their opinions on the preparation they received, plus their recommendations for improvement are provided.

ACCESSION NUMBER: AD-A247021

Wendt, Richard J. "Space, Wargames and Displays." Student report. Maxwell AFB, AL: Air Command and Staff College, April 1987. 112p.

Abstract: There is a need to enhance the introduction of space systems into the professional military education (PME) system of the Air Force. This study recommends what to incorporate; how to incorporate it; and in particular, how to display it. Displays can help students understand the three dimensional aspects of space activities. Wargames acquaint the students with both the capabilities and limitations of space systems; and wargames can illustrate how much we depend on space systems for the conduct of war on earth. War in space may be on the horizon, and new simulation tools are needed to study the doctrines and strategies required to meet the challenge. This study analyzes the needs of three different audiences in the PME environment; and recommends an approach for the development of wargames and simulation tools for each with an emphasis on displays.

ACCESSION NUMBER: AD-A182124

White, Gregory B. "Artificial Intelligence Concepts and the War Gaming Environment: A Case Study Using the TEMPO War Game." Master's thesis. Wright-Patterson AFB, OH: Air Force Institute of Technology, School of Engineering, March 1986. 157p.

Abstract: With the introduction of computers, war games became increasingly sophisticated yet most current war games are either too slow, not realistic, or use the computer as a referee only and not as a player. An approach is discussed in the context of TEMPO, a force planning war game currently used by the Air Force at its Squadron Officers School. This thesis involved the development of a version of TEMPO in which a computer expert system takes the place of one of the players, and an intelligent computer instruction system that takes the place of the section leader. The system is implemented on a microcomputer allowing its use in professional military education seminar courses.

ACCESSION NUMBER: AD-A172782

Wilson, James R. "Postgraduate Education and Professional Military Development: Are They Compatible?" Master's thesis. Monterey, CA: Naval Postgraduate School, December 1991. 61p.

Abstract: This thesis examines the utilization of graduate education f or graduates of the Naval Postgraduate School, Manpower, Personnel, and Training analysis (MPTA) curriculum, from December 1986 through June 1991. The study focuses on four areas: (1) developing a list and rank structure of billets requiring the xx33P code granted upon completion of the education, (2) tracking the careers of the officers following their graduation from the curriculum, (3) examining the career progression paths to find places where timely utilization could be undertaken, and (4) examining the designator composition of the population. The study determined that utilization for the period December 1986 through June 1991 was 22.2%. Assuming that all officers still in the two-tour Department of Defense utilization window were assigned to utilization billets as their next assignment, the utilization rate would rise to 52.5%. This w: deemed unacceptable, and the recommendation was to require an eighteen month utilization tour immediately following completion of the curriculum. This would cause the utilization rate for MPTA graduates to rise to 97%.

ACCESSION NUMBER: AD-A245988

Woodruff, Steven E. "Analysis of Air Force Acquisition Engineering Officer's Perceptions of the Adequacy of Their Preparation for Management." Master's thesis. Wright-Patterson AFB, OH: Air Force Institute of Technology, School of Systems and Logistics, March 1994. 114p.

Abstract: The purpose of this study was to determine how much time Air Force acquisition engineers spend in performing management functions, how those engineers spend in performing management functions, how those engineers perceive their management training, and which types of training contribute the most to managerial competency. The results from surveys of 215 acquisition engineers assigned to ASC/EN, Wright-Patterson AFB, OH and their supervisors revealed that engineers do indeed spend substantial amounts of time performing management functions. Slightly more than half the engineers reported spending at least 50% of an average workday performing management functions. Over 53% of engineers responding to the survey felt their management training had been either 'excellent' or 'good'. Management skills were rated either 'excellent' or 'good' by 72% of the respondents. In the key area of communication skills, 87% agreed they had the necessary communication skills to be successful in their jobs. The most effective contributors to managerial competency were experience, an aptitude for management, and having a mentor. Items rated least effective in improving management abilities included Professional Military Education courses and the System 100 and System 200 system acquisition classes.

ACCESSION NUMBER: AD-A277972

Web Sites

Vision Statements and Doctrine sites

Joint

Joint Vision 2010 -- http://www.dtic.mil/doctrine/jv2010/
Joint Publications -- http://www.dtic.mil/doctrine/jel/jointpub.htm

Air Force

Global Engagement -- http://www.xp.hq.af.mil/xpx/21/nuvis.htm
Doctrine Documents -- http://www.afmc.wpafb.af.mil/pdl/af/dd.htm

Army

Army Vision 2010 -- http://www.army.mil/2010/
Doctrine Manuals -- http://www-cgsc.army.mil/cdd/doc-lib.htm

Marine Corps

Operational Maneuver From The Sea --
http://www.dtic.mil/doctrine/jv2010/usmc/usmcvpub.htm
Doctrine Manuals -- http://ismo-www1.mqg.usmc.mil/docdiv/manuals.htm

Navy

Forward From The Sea -- http://www.dtic.mil/doctrine/jv2010/navy/navyvpub.htm
Doctrine Publications --
http://ndcdb.navy.mil/ows-bin/owa/ptss_code.disp_prod?ndp_cat=7

Professional Reading Sites

Air Force

Chief of Staff -- http://www.af.mil/lib/csafbook/index.html
Information Warfare Division -- http://www.cdsar.af.mil/cadre/iwac.html

Army

Acquisitions Corps-- http://www.decm.sarda.army.mil/publications/proread/
Engineer School -- http://www.wood.army.mil/DTLE/prlist1.htm

Chairman Joint Chiefs of Staff

http://www.dtic.mil/mil-ed/read_list.html

J-7 Military Education Division Home Page

http://www2.dtic.mil/mil-ed/index.html

Armed Forces Officer Pamphlet -- http://www2.dtic.mil/mil-ed/pamphlet/
Vision for Professional Military Education -- http://www2.dtic.mil/mil-ed/opening.html

Officer Professional Military Education Policy (OPMEP)
http://www.dtic.dla.mil/jcs/j7/me/omep_intro.html

Military Libraries
http://www.dtic.mil/mil-ed/millib.html

Marine Corps University Libraries: Professional Military Education
http://138.156.203.52/www/library/pme.htm

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IN REPLY REFER TO:

5050
Ser 01/024
25 March 1997

From: Provost
To: Conference Participants and Others
Interested in Professional Military Education

Subj: PRELIMINARY SUMMARY ANALYSIS AND CONFERENCE PROCEEDINGS

It is my pleasure to provide you with the Proceedings and a Preliminary Summary Analysis of the recent conference on Professional Military Education for the 21st Century Warrior.

Additional information and updates are available on the Conference website at the following www address:

http://web.nps.navy.mil/FutureWarrior.

Richard S. Elster

RICHARD S. ELSTER

Preliminary Summary Analysis
of the
Conference on Professional Military Education for the 21st Century Warrior
sponsored by the
Naval Postgraduate School and Office of Naval Research

Introduction

On January 15, 1998 the Naval Postgraduate School (NPS) and the Office of Naval Research hosted a historic two-day conference on professional military education (PME). Representatives of virtually the entire PME community met for the first time to examine the most fundamental issues confronting military education as the defense establishment moves into the 21st Century. In addition to senior officers from the PME schools, attendees included several members of Congress and congressional staffs; personnel representing the Secretary of Defense, each military department and service, and the Chairman of the Joint Chiefs of Staff; and a number of defense intellectuals from academe and defense-oriented institutions.

Analysis of this Conference Proceedings reveals a number of insights on the major issues of concern to the conferees. Although the following observations, findings and conclusions are based upon a preliminary analysis of the text of the Proceedings, **not a poll of the participants**, the presentation of each issue attempts to stay within the bounds of the views of the conferees.

Principal Observations, Findings, and Conclusions

A. **Professional military education is important - crucial - if the United States is to continue to develop the world-class professional officer corps required to maintain the nation's preeminent standing among the world's militaries.** Analysis of the Proceedings leaves little doubt about the importance the conferees placed on maintaining a healthy, vigorous regimen of professional military education for the officer corps.

Officer individual development. Professional military education is a key element in the development of individual officers who possess the characteristics needed at the outset of the 21st Century. The Proceedings yield a valuable catalog of the attributes required of the 21st Century officer, a spectrum that includes:

- First and foremost, fundamental competence as a soldier, sailor, airman, or marine;
- Personal qualities that range from dedication to duty to adaptability to changing situations;

- Leadership ability;

- Education in subjects as disparate as military history and the place of the military in a democratic society; and,

- In an era of revolutionary change, an increasingly sophisticated mastery of technology that qualifies officers, among other things, to make decisions about the best technologies to fill operational needs and to use technology in conducting operations.

Officer corps development. Professional military education is critical to developing and maintaining an officer corps throughout the armed forces with collective attributes that make it capable of responding successfully to the challenges of the present and future national security environment. Based on the Proceedings, those attributes can be summarized as follows:

The officer corps should be composed of leaders prepared to meet the challenges of the future. It should contain the requisite number of strategists. It should be prepared to cope with the interactive nature of warfare as a consequence of its knowledge of military history and military art. It should be capable of maintaining the U.S. armed forces' operational and technical superiority over other nations' militaries. It should understand and support the subordinate position of the military with respect to civil authority in a democratic society. It should be linked internally through a network of inter-service personal contacts that foster trust and facilitate coordinated multi-service operations. In sum, it should be an officer corps whose education, training, and experience are force-multipliers in and of themselves.

Learning from "old warriors" is especially important in a period when combat experience of the officer corps in increasingly limited. PME is the principal means of imparting the knowledge and experience of "old warriors" to "young warriors". PME serves as the surrogate to pass on and inculcate crucial combat values, skills, and tactics. It teaches what has worked. And it emphasizes what has failed, including past failures to respond to emerging conditions that led to military disasters: failures to adapt to technology, to recognize the necessity to understand foreign cultures, and to take account of geopolitical, economic, and other factors.

Professional military education can also be a means of fostering **innovative thinking about the future** based on the experiences of the past. Particularly important today, it has the potential to foster thinking about how new technologies affect military operations - how to match doctrine, organizational structure, and weapons development and acquisition.

Professional military education facilitates the **adaptation of large organizations** such as the services and the Department of Defense as a whole to the challenges of the future. Organizations of this size cannot be changed through top-down direction; educating their future leaders about the challenges of the future and the implications of evolving changes in their organization's external environment is the key to making these organizations responsive to change.

Professional military education provides conditions conducive to the **development of inter-service contacts** among officers and the resulting trust that facilitates joint action of the armed forces as a unified team of land, sea, air, and marine forces.

B. The PME community is not in agreement on what Professional Military Education is.

Structural issues. Is PME, as it has been traditionally regarded, confined to the curriculums of the intermediate and senior military schools? Or is it "cradle to grave", extending from ROTC and the academies through the panoply of service training and education courses, including post-graduate studies, undertaken by each officer? Or is it the career-long individual study of military affairs? Should it be focused on a select few officers or should it be made available to as many officers as possible?

Until questions such as these are answered it will be impossible to develop a coherent framework for professional military educational development.

Questions concerning the substance of PME. Is the subject matter of PME properly confined to the study of the history of warfare, strategy, tactics, operations, the international environment, and the U. S. defense establishment or should it include technology, peacetime contingencies, and the cultures of allies and potential adversaries?

Conferees disagreed on these questions, particularly with respect to the study of technology. A few believed that the traditional history-strategy-operations approach remains preferable. At the other end of the spectrum, some conferees believed that technical studies should be considered to be PME and that those studies must be completely independent of the traditional courses. General Sheehan, former ACOM commander, opined that the legacy characteristics of the PME system might be an impediment to providing the education officers need today. Those favoring more emphasis on technology faulted the current approach for its inability to cope with the requirement that all officers today should be technically "literate" and for failing to fulfill the expanding needs for technically skilled officers. Most conferees endorsed the validity of the traditional approach but in varying degrees acknowledged that PME should devote more attention to equipping officers to handle the technological challenges of the revolution in military affairs.

Admiral Blair, the Director of the Joint Staff, suggested that the traditional approach be modified to focus on recent military history (which has been heavily influenced by technological change). Representative Skelton acknowledged the need to devote more attention to technology but disagreed that the treatment of the lessons of military history should be shortened to cover only a few decades of the 20th Century.

Representative Skelton proposed that the Naval Postgraduate School serve as a test bed for developing an intermediate course that combines the traditional approach and a focus on technology into an integrated PME program.

C. **The current officer career development systems are seriously flawed.** The current service systems fail to provide sufficient time for officers to complete the requirements for operational and command experience, joint duty, post-graduate and professional military education, and service staff assignments expected of them.

The Proceedings suggest that a large portion of the conferees believed that the service personnel systems, shaped in and immediately after WWII, need to be changed not only to allow sufficient time for PME but also to make room for other, fundamentally important career experiences. Some participants indicated that the personnel systems hurry officers through assignments too quickly and they fail to obtain the needed command, staff, and operational experience. Admiral Oliver, Chief of Navy Personnel, stated that we don't have the right educational paradigm; for example, officers are forced to obtain their graduate degrees in the narrow career window between six and eleven years of service when they face crucially important career operational demands. Other participants noted that the Goldwater-Nichols Act added requirements for joint PME and a joint duty assignment to already over-crowded careers. At least one conferee suggested that the current officer career systems are developing the wrong kind of human capital for the future.

The conferees suggested a number of approaches to improving the career development system.

With respect to military education, one participant suggested reducing the proportion of officers attending PME schools. Other participants who favored making PME available to as many officers as possible suggested consideration of a "bookend" approach with relatively short in-residence periods at the beginning and end of PME programs. One conferee suggested "frontloading" PME as much as possible to ROTC and academy pre-commissioning programs.

With respect to the career development systems in general, **Admiral Oliver suggested that consideration be given to lengthening careers or allowing a "time-out" (i.e., sabbatical) for post-graduate education.** He also suggested

that more advanced education might be required as a condition of accession. Mr. Harry Thie of the RAND Corporation also emphasized the need to lengthen officer careers. Other suggestions included adopting multiple paths to career development and overpopulating the officer corps to allow time for education and other non-operational career requirements.

D. **The Department of Defense has not established a joint career development program, including provision for PME, for the Reserve Components as envisioned in the Goldwater-Nichols Act.**

E. **In a period of severe cutbacks in the Defense budget, PME is seriously under-funded and over-stretched.**

F. **Senior leadership, military and civilian, service and joint, should become more involved in PME in order to correct its deficiencies.** A vision of what the defense community wants the output of military education to be and a corresponding plan to achieve that vision is needed. Senior leadership should ensure that PME is emphasized appropriately and adequately funded. The unified and specified commanders should become more involved in PME, especially in the schools' exercises and war games.

G. **Additional problems voiced by one or more participants:**

Intermediate and senior PME programs should be more rigorous. All vestiges of the cultural problem of viewing the PME programs as so-called "gentlemen's schools" with loose academic requirements and ample time to lower the golf handicap should be eliminated. Representative Buyer

PME faculties need to be improved. Talented officers who have the potential to be future service leaders should be assigned to the faculties. Today, assignment to a PME faculty can jeopardize a career. One participant suggested board-selecting officers for faculty positions or extending Goldwater-Nichols promotion incentives to PME faculty positions. Another conferee suggested establishing an exchange program for civilian faculties in order to make them more "joint." More investment in faculty education was also recommended.

Performance in PME programs is not linked to career success. General Holder emphasized that if PME is to be valued the reward system must be altered. He suggested tying future assignments and promotions to PME performance. Corollary measures include requiring PME as a prerequisite for promotion to flag/general officer rank and establishing entry requirements for PME schools.

The Armed Forces Staff College Phase II joint PME course does not provide sufficient "value added" to the service Phase I joint courses. This shortcoming is amplified by the scheduling problem that requires many officers to leave their joint assignments for twelve weeks to attend AFSC.

Attrition of academy graduates is far too high. Representative Buyer

There is an overage in the number of ROTC programs that should be corrected. Representative Buyer

One participant suggested that there is **a growing schism between societal ideals and those of the military.** The PME schools, he indicated, should play a key role in eliminating any differences that might undermine the preeminence of civil authorities with respect to the military. The PME schools must stay in touch with the American people. In this context, a conferee also suggested that officers attend civilian universities for graduate education.

Summary

The Conference on Professional Military Education for the 21st Century Warrior was a remarkable event in that it convened representatives of the entire PME community for the first time and facilitated the identification of the issues of major concern to that community. Its Proceedings provide a valuable discussion of the attributes that will be needed in the 21st Century officer corps. The Conference also elucidated the crucial role professional military education must play in developing that officer corps. Finally, the Conference highlighted a number of problems that currently detract from professional military education, not least of which is the absence of an agreed understanding of what constitutes PME.

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19 April 2002

SUBJECT: Distribution Statement Change

RE: "Military Education for the 21st Century Warrior" (ADB 268162)

TO: Larry Downing, Defense Technical Information Center

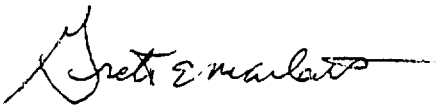
Per your telephone message on 17 April 2002, I am writing this short letter to state the reasons why we feel the document "Military Education for the 21st Century Warrior" (ADB 268162) should be changed from Distribution Statement F to Distribution Statement A.

* We are unsure of the reason why the present limitation was applied in the first place.

* The document does not contain any material to warrant the limitation.

* The document has been available to the public on the Internet since shortly after the conference was completed. Please see enclosure.

Citing these reasons, we request Defense Technical Information Center change the distribution limitation for this document to APPROVED FOR PUBLIC RELEASE.



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