1981 Presentation, Command and Control Systems Adequacy

Upon retiring in 1978 I became a consultant in management and in the organization and operational methods of military forces in theaters of operation. An early client was the Mitre Corporation whose area of concern was command and control systems.

I soon began an association with Dr. Anthony G. Oettinger, the Chairman of the Program on Information Resources Policy, which was a joint program of Harvard University and the Center for Information Policy Research. Dr. Oettinger was the center's director.

Dr. Oettinger interpreted "information resources" widely, to include libraries, computers, signal systems -- and the command and control systems of military forces. Dr. Oettinger took me on as a research affiliate to his Program on Information Resources Policy.

In the spring of 1981 Dr. Oettinger conducted a "Seminar on Command, Control, Communications, and Intelligence." I was invited to make a presentation on C3i and the Commander: Responsibility and Accountability.

Following is the seminar transcript.

JHC

INCIDENTAL PAPER

Seminar on Command, Control, Communications, and Intelligence

C^3I and the Commander: Responsibility and Accountability
John H. Cushman

Guest Presentations, Spring 1981
William O. Baker; John H. Cushman; Richard D. DeLauer; B. R. Inman; James M. Osborne; David C. Richardson; Charles Rose; Charles W. Snodgrass

December 1981

Program on Information Resources Policy

Center for Information Policy Research

Harvard University

The Program on Information Resources Policy is jointly sponsored by Harvard University and the Center for Information Policy Research.

Chairman
Anthony G. Oettinger

Managing Director
John C. B. LeGates

E-mail: pirp@deas.harvard.edu URL: http://www.pirp.harvard.edu
I-81-9

C³I AND THE COMMANDER: RESPONSIBILITY AND ACCOUNTABILITY

John H. Cushman

Lieutenant General, U.S. Army (Ret.)

Management Consultant

We have been hearing of technological miracles, and of the need to straighten out the administrative and procurement processes. General Cushman has spent his career as a commander and staff officer, culminating in major commands in Vietnam and Korea, as well as stateside command of the Army's Combined Arms Center and a tour as Commandant of the Command and General Staff College. He tells us what C³I looks like from the viewpoint of the hierarchy responsible for doing the job to which those technological and operational miracles are intended to contribute.

Cushman. What I have to say amounts to a distillation of the basic viewpoints I have arrived at, in my experience, thought and study, about the processes by which command and control systems are actually put in the hands of the field commander. I have had experience as a commander using these systems. I have also had a fair amount of exposure to the system for developing and fielding them.

I will start off with a very sober assessment. These are convictions of mine. Our performance has been and is gravely deficient. The sad story is that the command and control systems that are in the hands of the deployed US field forces, and of the Allies alongside whom we will no doubt have to fight, are barely marginal for conditions short of war. I'm satisfied that any realistic audit will show that they are, and will be, seriously inadequate for war.

To be specific, they are not well tied together from top to bottom. They are not being exercised realistically under the expected conditions of war. Great sections of them will probably not survive the attack against them that is sure to come in war. For the major operational commander, Allied or US, whose forces must use these systems (I'm talking about theater of operations command) they are largely unplanned, spliced-together, ill-fitting components which have been delivered to his forces by relatively independent parties, far away, who have coordinated adequately neither with him and his staff nor with each other. They do not exploit the present capabilities of technology, nor does the system for their development adequately provide that future systems will. That's essentially my indictment.

That's the bad news. The good news is that there is a way out of this, which I'm now going to explain to you. Let me hasten to say that the situation I have described primarily reflects, not on those who are laboring in the command and control system field, but rather on the conditions under which they labor, which present them virtually insurmountable obstacles. The obstacles are not financial — in fact billions of dollars which have been provided have been wasted — but are primarily organizational and institutional. I will discuss them in some detail.

Frankly, ladies and gentlemen, I am reminded of Pearl Harbor. I say that if, in the months before Pearl Harbor, someone had realistically evaluated the US forces' command and control system in the Pacific, as I think I have just realistically evaluated present systems, and if responsible authorities had acted, elementary preventive action could have been taken to avert the catastrophe of December 7, 1941. We are in an equivalent situation today. The catastrophe is waiting to happen. The problem today, as it was in the days of Pearl Harbor, is elementary. It lies simply in the institutional failure to assign proper responsibility and accountability to major operational commanders. That is the subject of my lecture — responsibility and accountability.

I think that anyone who deals with military matters, civilian or not, in the government or out, but especially in the civilian part of the government, has to understand something about the military man's outlook on responsibility and accountability. If you don't mind, I'm going to quote a few ideas that might convey what I'm talking about.

Responsibility is a very important concept in military life. I suppose it starts with the soldier and his basic training. Before he goes on his first tour of guard duty he is taught, and he memorizes, the general order of the sentinel of the post, which is "to take charge of this post and all government property in view." Army regulations that establish command policy and procedure say the following: "Every commander has two basic responsibilities, in the following priorities: accomplishing the mission, and the care of personnel and property." Notice that accomplishing the mission comes first. The priority is established. Lieutenant General George S. Patton, Jr., in his letter of instructions to the corps and division commanders of the 3rd army in April, 1944, said: "*Full duty.* Each in his appropriate sphere will lead in person. Any commander who fails to obtain his objective and who is not dead or severely wounded has not done his full duty." That's a hard line of work, and those who sign up for command in the military business accept the

fact that they will be held personally responsible and accountable for the accomplishment of their mission. It goes with the command position; the taxpayer expects that from commanders.

I mentioned Pearl Harbor. After Pearl Harbor the Congressional Joint Committee which investigated that disaster arrived at 25 principles they wanted to pass on to the military, and one of these was about command responsibility. Here is what they said — this is the taxpayer's representative speaking: "No consideration should be permitted as an excuse for failure to perform a fundamental task."

Finally, I visited the Eisenhower Museum at Abilene, Kansas. In that museum there is a statement written in General Eisenhower's own hand, and edited by him, which he was prepared to release if the invasion of Normandy had been a failure. It was written about the 5th of June, 1944. Here's what he was prepared to say: "Our landings in the Cherbourg Harbor area have failed to gain a satisfactory foothold, and I have withdrawn the troops. My decision to attack at this time and place was based upon the best information available. The Troops, the Air, and the Navy did all that bravery and devotion to duty could do. If any blame or fault attaches to the attempt, it is mine alone." He was brought up in that hard school of personal responsibility. I wanted to get across some of those ideas and examples of concept before I go further in this talk. I'll come back to responsibility and accountability later, but we'll begin by talking about command and control systems.

Command and control systems, of course, are more than materiel. They include the commander himself. Frequently the greatest improvement in the command and control system has been replacing the commander.

My first point is that a field commander's command and control — his C^2I — is actually a web of systems. It extends from the top all the way down to the bottom of the command. It extends laterally. It's a matrix of systems within systems. It's hierarchically organized. It's laterally organized, and it's "webbed." That's the best word I could think of. The command and control system of one commander is the subsystem of the next higher commander. Any force has many command and control systems, and large forces have countless systems.

Second, the top commander is concerned with the entire web, or should be, from top to bottom. His degree of concern should be complete. He wants to be sure that all of it works because his mission performance depends on it.

Third, command and control systems are a mix of men and man-made systems. The man is inextricably linked with the man-made. He makes the hardware and software of computers, but beyond that man himself is also a component. The man-made component is the mix of hardware and software that provides the communication, the sensing and the data base, speed, precision, automation and all that sort of thing. The human component provides for the leadership, decisions, intelligence, adaptiveness, loyalty, motivation, improvization, decision, action, and common framework. The two components go

together. This characteristic is crucial to understand. It distinguishes command and control systems in kind from the other things we buy to equip our military forces — man is deeply involved.

The fourth point is that, because of this man-machine mix, command and control systems adapt through an evolutionary process. They respond to stimuli, and adapt accordingly much as biological systems do. Those which adapt well survive, and even flourish. Those which adapt poorly, as in the natural world, will confront others that adapt better, and frequently suffer disastrous consequences. It is survival of the fittest for this man-machine mix of command and control systems. We see this everywhere in the business and industrial world. Man works with the computer, the computer serves man. Adaptations compete with other adaptations. Those which do best survive and proliferate. Less suitable adaptations die away, and man and computer move on to ever higher levels of performance. Trial and error, and swift copying of worthy adaptation, characterize this evolution.

Fifth, the specific process of adaptation generally takes place through constructive dialogue between the providers and the users of computer systems. We are largely in the field of information technology. Computers and information technology are not necessarily synonymous. Command and control amount to much more than computers, though they are frequently referred to as adapting to the computer. In the business world the providers are the developers, the generators of new ideas, the creators. They make computers or their components. They work in the universities, the software houses, the research institutions. They are thinking of new things to do. The users in this evolutionary process are out there in the banks and bakeries, the refineries and business institutions of our land and around the world. They are doing the world's work, and they need computers to survive. The providers give the users ideas, the users keep the providers from being impractical, and the ultimate measure of merit for the computer is its utility in the contest of advantage. Users' influence governs.

As a management consultant, I'm working right now on a study of how users are adapting to computers. Citibank is doing a very good job adapting to the computer, and I just read a briefing given by a developer of computer systems in that banking organization. This was his approach: "First, study the users. Second, understand the interoffice relationships and what the users are actually doing. Third, design a tool that performs today's function. Fourth, make it usable." Of course you must provide for growth as you make it usable (because the user is going to want to make it better) and implement it, get it going and let it grow.

My sixth point is: in the business and military worlds evolution is incredibly swift today. Nothing like this has ever been seen. Even conservative people who don't like to use the word evolution, say, "I hate to say it, but this is a revolution, because the machine part of the man-machine mix is just doubling and tripling every few years in what it can do — computing power, data base for man-information transfer, and so forth."

Student. You have spoken of evolution. I think it has to be recognized that in business some companies can dominate other companies and force evolution down certain paths, which aren't necessarily better ways for society to go. If you look at video discs, for

example, a small competitor might have the dominant technology, the one that does better things, but a Kodak can actually force the market to accept its technology instead. I suppose that could happen with computers as well. So it isn't just that the best will eventually evolve — there's business influence; it isn't just a Darwinian matter of survival of the fittest.

Cushman. Maybe so. I'm trying to figure out how to reply to that and I have to think how to fit it into evolution.

Oettinger. Well, you have described an ideal model, which seems to me a rosy picture of business. Let's go back to your example of Citibank. There are demonstrable problems. Where did the fellow you talked to work, which side of Citibank? The domestic people don't necessary talk to the international people, and what the data processing shops actually do in their relationships with their ultimate clients inside the bank is not as rosy as their declaration of principles would make it appear. If you're holding that up as a yardstick against which to judge performance, I'm not sure that even the business world quite measures up to it.

Cushman. I'm saying, and it's fairly significant to my point, that adaptation takes place in the user's environment in the final analysis. I don't know how to rank Citibank's performance in adapting to the computer. I don't know whether it's perfect, but I think its pretty good. I'm a Citibank depositor, I've got the Citibank card that I think they're the first on the market with. It's very easy to get money out of a Citibank mechanical teller — it's a lot harder to get it out of Marine Midland Bank's teller! I think that Citibank is on to something, investigating distributed networking of desktop computers for their executives; I give them at least a passing grade, and maybe a little better than that, in their adaptation to the computer.

Oettinger. Concerning adaptation, there's a story about a fellow who tried to hold up one of the automated tellers. Instead of his card, he shoved a little note inside the slot that said, "Hand over the money". And when the machine did nothing, he shot it.

Cushman. That's like the cavalry officer who knew everything about horses but nothing about women, and when his wife broke her leg he shot her. You've got to watch out for people with single-minded approaches to life.

Student. I'd like to make a comment, and then ask a question. The comment is about Citibank, and relates to what has been said about the abilities of large companies. I agree with you that Citibank has a very user-oriented approach, illustrated by the fact that they're the only bank in the country which has developed its own automatic terminals. That's why they work better than other peoples'. They decided to look at their customer needs and develop their own rather than rely on computer manufacturers to do it.

Cushman. All I know about Citibank is what I have seen as a customer. I was impressed with the attitude. I think if you went to the users and asked, "Are they talking to you?" they'd say, "This guy's just blowing smoke, he isn't really coming to us." But at least his intentions are clear. I would establish it as a very important principle that effective adaptation only takes place in the user's environment. That's the point I am really making. There have been some very poor adaptations, I am sure, in the user's environment, but I don't think, from my own experience, that there have been any really first-rate adaptations that did not take place there. That was going to be my next point.

Student. The one thing that bothers me, though, is the situation you described at the beginning, the dismal situation of C^3I in the military. To me it sounds like a result of exactly what you're proposing, which is evolutionary development. Weak links not tied together, uneven delivery — to me that's evolutionary.

Cushman. No, that's not the cause. Of course a monster can develop as a result of evolution. That's most unfortunate. Usually, though, in a contest, those monsters are not going to survive, because they won't measure up to the environment they've been put into. Yes, the things that have been delivered are evolutionary. Yes, it is an evolutionary process — it's taking place in the manner of evolution. The Army's tactical communication system is an evolutionary tactical communication system. The Marines, the Navy and the Air Force — they're all evolutionary. The only problem is that they don't fit together, as I said earlier here in my indictment.

I think this is an extraordinarily important point to pause at, and see whether I'm coming across clearly with what I'm saying. Let's review. First, I've said that command and control systems are a web. They're linked out there — irrespective of the service that's fighting. The Army links with the Air Force, the artillery links with the infantry, the commander links with his staff, the subordinate commanders to tactical air and air commander to the ground commander. It's a web of systems. Second, that the commander's interest is, or should be, in the entire web — top to bottom — because his mission accomplishment depends upon it. Third, it's a mix of man and the man-made system, and in this it is unique. It's not like a truck — it is a unique mix. And because man is involved in it, it evolves in a kind of evolutionary process. But I'm not saying that it is identical to biological evolution among animals.

McLaughlin. Let me interrupt at this point, because beginning with the fourth chapter of your paper you discuss that subject — evolution of organizations. I have some acute qualms there, because — in business at least, ignoring the military — it seems very possible that there really is a pattern, that the successful business overevolves to concentrate on whatever makes it successful. And this makes it less adaptable to the next wave of innovation. There are very few corporate bodies in this country, for example, that are more than 100 years old. You could say that's because the major corporations didn't start till the 1800s, but it almost seems that the larger and more successful a corporation was in its heyday, the less likely is that it's around today. That point intrigues me in view of your discussion of organizations' adaptation by an evolutionary process.

Oettinger. Might I intervene? It seems to me that the discussion is beating the metaphor to death, and metaphors are limited. It seems to me that General Cushman's central point is that the ultimate test in all of this is effectiveness to the user. The real distinction is that in the business situation, on a fairly frequent basis, there is a test of the effectiveness of the process. The organization may have turned out to be overadapted in McLaughlin's sense or it may not, but at least you find out very quickly, so the overadaptations disappear. The crucial difference in the military is that, unless you're unlucky enough to get into a war, your overadapted system may remain unused, untested — and by the time you do get around to using it, you've got a problem. That's the crux of the matter.

Cushman. Now, that's right. I'm going to assert (and if you don't believe this is evolutionary, you're not going to believe much of the rest of what I'm going to say here) that the graveyards of industry are littered with companies that failed to survive the contest in the real business world — Maxwell, Packard, Reo, Studebaker and so on and on. They are nice mementoes in ancient museums of automobiles, but for one reason or other they're not around today. And this is a feature of life — it's a feature of individual life, it's a feature of social life. Probably it's something we have to accept — the survival of the fittest. There are ways to postpone that, one way or another, but eventually it comes along and gets you, financially if in no other way.

Student. I think Professor Oettinger's point was that this process that's whittling down the things that don't work is equivalent to businesses being at war all the time. To the degree that the Army is not at war, evolution in the Army takes the form of building something for a peacetime army.

Cushman. That's very right. I would like to get to that in a little while — if I don't hit that adequately to your satisfaction I would like you to bring it up again, because the environment against which all this takes place is of great importance. I have been talking about the business world up to now, but it's also an evolutionary process of adaptation in the military world, in the command and control system.

The point that I'm going to make right now is that we are in an unprecedented situation today, because of the onrush of technology, the exponential climb of what technology can do for us. You need only plot against time the various advances in communication. It wasn't until the 19th century that the electron was even used at all. In Caesar's, Alexander's, Hannibal's and up to Napoleon's time they ran aides around a battlefield with messages, they used flags, signal lights and drums and that sort of thing; it was all done with humans essentially. And here we are today. We have telegraph, and then we have telephone very quickly after that; and radio, and walkie-talkie, and microwave, and we got all the way through the Vietnam War with a command and control system that essentially had evolved generation by generation as new generations fought new wars. Now we have available to us, already showing up on the scene and being deployed with troops, things that are bring about a completely new kind of communication — with the computer, with the extremely rapid bit rates of data transmission, with ways to do things

that before were unheard of. If we're going to adapt at all to this, take advantage of it, we have to do it in a single generation. In fact, the very same people have to make the adaptation. So the evolution of systems before was really rather leisurely. Now it's honestly an extraordinarily rapid process — under great pressure.

I have said that the adaptation that's successful in the business world takes place in the environment of the user. And that brings me to my point about the military adaptation. The military C^2 adaptation must therefore take place in the user's environment too. The key point, though, is that the user is NOT the military Service. The users are the fighting formations of the military Service under unified or Allied command. That's an extraordinarily important distinction. The user is the major, the operational commander. And the institutional anomaly, the institutional block that's caused the deficiencies I listed in my indictment at the start of this talk, is that the way the Services are organized disregards this.

When I say that the Services are the providers, not the users, and that the users are the fighting formations of the Services under unified or allied command, I'm not just giving you some idea that I have, I'm actually quoting the law to you. That's the statute that's been in effect since 1958. In the 1958 Department of Defense Reorganization Act, the only responsibility the Services retain is that of providing. The act set up the concept of combatant command, either unified or specified. It didn't set up the idea of allied command, but it implied that. But, notwithstanding the law, many of the practices have remained much as before. The command and control system requirements have been generated primarily by the Services, who still think of themselves as the users.

Now then, you can do that quite possibly with a tank. The Service can be a user of a fighter aircraft or even a destroyer, as long as you don't get too much into the communications that link them with the other allied fighter aircraft and destroyers. Those do pretty much the same task; in all they have the same air speed, ground speed and weaponry, whether they're under Service or joint command. But that's not so with command and control systems. Because, in NATO, the electrons of Germany's air force — the Luftwaffe — mingle with those of the US Army, the British RAF, and all the rest of them. If you need to figure out anything — for example, identification of friend and foe so you don't shoot down your own aircraft with an air defense missile — you have to look at the user's way of operating and deal with the procedures of the user in the field, because the right procedure is going to simplify the electronics problem and the right electronics are going to permit different procedures. You have to have trial and error out there where the users are, just as you have to at Citibank or J.C. Penney or TRW.

Student. Could you give us an example of what you mean? Is it a question of the Services imposing doctrine on a commander? Is that the problem?

Cushman. A good example is this. The Marines have developed, and in due time will field, a system for controlling artillery fire and tactical air, called MIFASS. The Army for some time has had a system for calculating the direction of artillery fire — TACFIRE. They will not work together if the present trend of development continues. If we ever have

to fight Marines alongside Army artillery, the Marines will not be able to participate and use TACFIRE, and the Army won't be able to use MIFASS. That's an example of what I am talking about.

Student. That seems to be an incompatibility of standards that stems from the grassroots development of the systems.

Cushman. Because a Service doesn't think about the fact that it will have to fight with some other Service. They think about fighting all by themselves. They figure that if another Service fights with them it will have to use their methods.

Oettinger. I think you may have missed General Cushman's point. By saying "grassroots" you are saying grassroots of the Service. That may be the grassroots of the provider, but it's not the grassroots of the user. The problem arises if the same warm body acts in both capacities — acts principally as a provider without thinking of himself as a user, or of the circumstances under which he'd be a user, which would be under joint command.

Student. Then the Marines should never develop a system, because they're not a theater command. That's the conclusion from that, I guess.

Cushman. Well, I think it would be pretty sorry if we had the Marines armed with nothing but cutlasses.

Student. I'm not saying that, but they shouldn't develop their own systems. It all should be done by TRI-TAC or some program like that.

Cushman. I'm not going so far as to say that. I think it's the responsibility of the managers of the Department of Defense not to let the Marines develop a system that won't let them operate the way they will probably fight under unified command. The way that's done is to bring the unified commander into the act before the Marines go to work developing a system. It's just as easy to develop a single system that the Army and Marines can both use; the problem is not that difficult.

Student. Maybe some of those commanders don't actually exist. At least they don't have the responsibilities they would if the timely system were put into operation.

Cushman. True; that's why we have to assign responsibility to the institutions, to the unified command as an institution, which I'm getting to. To work out these things is not simple, but it's not impossible. It's straightforward, but it requires trial and error, experimentation, a search for simplicity, and doing things out there where the forces are, or would be.

Consider tactical warfare, which is theater of operations combat. If we fight in Europe or in Korea it will be in an allied battle, in an air-land battle, and as an entity. You have to

allow the actual operators of that entity, working with experts in the field of communication, computers, command and control, to combine their talents and their expertise and solve their own problems in the field where the problem is. I'll have something to say later about how you do that.

So that's my main thesis concerning responsibility and accountability: our inadequate performance, the deficiencies that I have listed for you, extend directly from our institutional failure to assign proper responsibility and accountability to the user, and to give him the means for meeting that responsibility. The full responsibility of a senior field command is stated very simply. Basically it's to take charge of his command, to make it as fully ready as the means provided allow and to accomplish his mission. I mentioned the congressional hearings on Pearl Harbor; the field manual transmitted those Pearl Harbor committee findings. It became very clear that the commander's fundamental responsibility is to carry out his mission. No excuse or explanations can justify or even temper his failure. We have to take advantage of this attitude. We have to make it clear to the commander that if his command and control system fails, that's his responsibility. Computer failure, bad software, or inadequate linkages won't serve as excuses — they are his responsibility, not someone else's. Command and control systems are inextricably tied into his fundamental responsibility for mission accomplishment. He has to accept that and understand it, and he has to be given the tools to meet the charge. In short, my thesis is that we must hold those who are ultimately responsible for mission accomplishment responsible as well for the readiness of the command and control systems, from top to bottom.

Oettinger. In our discussion last week something like that point came up, but then it ran afoul of the present reality that the rotation of the commanders, in peacetime or wartime, is such that your commander as an individual is not around long enough to exert much of an influence. If you visualize command as an institution, or a slot, regardless of the individual, then you run afoul of another difficulty: the styles of individual commanders differ so widely that, at least in the present circumstances, something tailored to an abstract command slot may not fit any particular real commander.

Cushman. I referred to the Department of Defense reorganization act a few minutes ago. It was a fundamental milestone, in that it established a bi-functional organization for the Department of Defense: providers on the one hand — that's the military departments and the Services within the military departments, that's the language of the law. The Army within the Department of the Army, the Navy and Marines within the Department of the Navy, the Air Force within the Department of the Air Force — that's the provider side. On the other hand the law has established the combatant command, the employer or user, and it has provided for two kinds, the specified and the unified. It didn't define those, incidentally, it just used those words. That law has not been carried out fully because the relative influence in the field of what the forces use is grossly out of proportion. The providers have about a ten-to-one ratio of influence over users. The users use what the providers provide.

This is true speaking of command and control systems too, especially if you consider the full web. The organizational and institutional problem is to redress that balance, to provide countervailing institutions that make up for the inherent disadvantages that unified and overseas commanders have. The providers' advantages are inherent. One is that the operational commands have nothing like the institutional memory of a Service, or the tradition and heritage. They have nothing like the plants for recruiting, training, materiel, school establishment, the "civilian arms" and so on that Services have. They are essentially ghosts compared to the flesh and blood Services, so to speak. It's true that rotation is frequent.

Institutional memories are important, and the institutions are thin out there. The Service has a tapestry of underlying institutions. Even a Service that is new, like the United States Air Force, which has existed as a separate Service for only 30 or 40 years now, has its subordinated institutions, its Surgeon General, its Chaplain, and it's taking care of the families, it has its own personnel management system. So the problem is extraordinarily difficult; but once it is understood, it can be corrected institutionally, by providing countervailing capability to the major commander. I'm going to give you my recipe in a little while, and we'll have time to discuss that; and at the end of it someone is liable to say to me, like Geronimo said to Sitting Bull, "How."

Well, two or three years ago the Department of Defense Science Board set up a task force on command and control systems management under Dr. Buchsbaum of Bell Laboratories. They looked at the subject of command and control systems management. Now, they understood this problem; the Science Board has military membership too, general and flag officers. They said the Department of Defense should do the following: provide means through which each major military command can exercise or evaluate, specify functions for, modernize, and maintain its command and control system to fit the needs of the command. For using commands which deploy, operate, and exercise their command and control systems, it should provide the capability and freedom to modify those systems within specified limits. It should integrate the command users' diverse needs and perspective with the wide range of technical options presented by systems engineering designers. It should strengthen the using commands' capabilities to accomplish the DOD-wide effort to upgrade command and control proficiency. And, finally, it should provide each major military command with funds and manpower sufficient to operate, maintain, modernize and adapt its command and control systems. Within the architectural guidelines and constraints established, this funding should be a significant fraction, perhaps 10% per annum of the invested value system — which is a lot of money. If you calculate it, it is much more than is really required.

That's what they said, and they submitted their report to the Chairman of the Defense Science Board, who in turn sent it to the Secretary of Defense, and action was taken on it. That is to say, it was processed within the Department of Defense and some action came out of it, but the results have been very meager. The concept was revolutionary — the command itself would have money — and it just didn't fare very well. The numbers came to $8.8 million in fiscal year 1981, split among all those functions. The 1982 budget is going to be about $11 million. Very few personnel were provided — hardly any. If you compare that against what the Defense Science Board has in mind, it's a little meager.

Why did that happen? Well, my assessment is that the Services let it happen. Money for the unified commands automatically competes with the money for purely Service interests. Service chiefs are members of the Joint Chiefs of Staff — that's another obstacle. They have a responsibility for Service doctrine which generates Service requirements, and they treasure that. That's another obstacle. They have never institutionally accepted that they are not the users. They refer to themselves continuously as the users. The chief of the Service says "As the user of this, I think such and such." The Army's Training and Doctrine Command says, "As the user of this, such and such." And the Training and Doctrine Command in the Army is at best a disconnected surrogate — not a first-hand user — representing the user, and not always very well. Institutionally, the Services are not interested in increasing the commands' developmental responsibilities.

None of this, on the part of the Services, is reprehensible. They shouldn't be brought into court. There shouldn't be a Congressional investigation of it. What we have to do is provide the field command with countervailing institutions. Now, I'm going to be specific with my recipe for just how to do that.

Here's what the Secretary of Defense can do. He can call in his major operational commanders and have them meet as a group. Not just the US-only CINCS (I think you understand that, by law, there is a US CINC, but in many cases the command will fight not as a US command, but as an Allied Command); but call them in under whatever "hat" is appropriate to their dominant mission. He should specifically include General Wickham, the Commander-in-Chief of the Combined Forces Command in Korea, which is a ROK-US command, not a US-only command, and therefore is actually an Allied CINC, reporting to CINCPAC only as a subordinate US-only unified commander. General Wickham should show up at that meeting making the point that, while he is not a CINC responsible to the Secretary of Defense under the language of the statute, the U.S. Secretary of Defense, working with the Minister of Defense of Korea, shares responsibility for General Wickham's ROK-US mission.

At any rate, he'd tell these men that they are responsible. He wouldn't have to do it quite the way General Patton did, but they would get the message, because that's the way they've been brought up. He'd look them in the eye and say, "I want you gentlemen to understand that you are responsible for the command and control systems of your commands — top to bottom — for their readiness for war, and for conditions short of war." He might say, "I have just read the Pearl Harbor investigation again, and I see that that responsibility was not very clearly assigned by political magistrates of the the United States in December 1941, and I don't want any misunderstandings. You are responsible for the systems' working condition in war and in conditions short of war."

He says, "Now, for the U.S. command, you're responsible to me through the JCS," and that's by DOD directive, and not by statute. The statute establishes that the unified commander is under the Secretary of Defense just like the Service chief. It's very clear in the statute. Allied commands — for example LANTCOM (under NATO) might be a allied

command, or NORAD, and obviously SACEUR is an allied hat. He'd say he intends to get his fellow defense ministers to jointly hold this commander responsible. Then he would say, "I expect you to exercise your command and control system top to bottom — exercise it."

The problem with the military profession is that it does not execute its professional responsibilities day in and day out, but only in war. Except for readiness, its ways of meeting its responsibilities for executing its professional mission are not like those of professions like medicine, law or business, where you're in the environment of success and failure day in and day out. In the military you must find a substitute for war, and execute it realistically, under simulated conditions of war — in field exercises, tests, battle simulations. And the first thing the commander is expected to do is take the practical steps to insure that the essential systems, top to bottom, survive and function effectively for mission performance. That's the point. His first requirement is to see that enough of the present systems survive, and that those that survive will work effectively. In many cases it won't take much, except for procedural changes and modest fixes, to accomplish that. And the Secretary of Defense says, "You have my authority — whatever authority you need — to carry out the necessary procedural measures. It's up to you. You don't need to come see me for the procedural measures that are necessary."

Gentlemen, there is not much of a distinction between procedure and doctrine, and that will very quickly come up. "Do you mean doctrinal measures or do you mean procedural measures?" He would say, "I mean procedural measures, but I'm allowing you to define procedural measures." He could tell them to let him know how much money they need and how many people. Obviously resources are going to be limited, so they have to be careful and intelligent in preparing their request. Their first responsibility is to make existing systems work, which doesn't take a great deal.

And once again, if they're allied commanders, the Secretary of Defense says, "I'm going to go to work with the political authorities of other countries, to give you, the allied commander, the authorities and resources you need to do your job." Then he'd say that somehow he is going to create, at the seat of government in Washington, and stateside in the United States, institutions for multiservice concept and procedures development, for technical support of multiservice activity, for battle simulation of multiservice operations, for requirements generation that looks at the problem as a multiservice problem for configuration management, so that you're not going to have systems in one area of operation that can't get on target. Institutions are going to have to be responsive to these commanders' future systems needs. And now he expects his commanders to create institutions for the same purposes in their commands, because that is what is needed — enduring institutions.

Student. Is the Department of Defense such an institution?

Cushman. The Department of Defense has the responsibilities. It doesn't have the institutions. It is a large institution with the institutional responsibility, but it doesn't have the matrix of institutions. It doesn't have the authoritative study organizations, develop-

ment organizations, doctrinal or research organizations or schools that do this kind of thing. The structure is there, but they are not actually functioning as they should. The Secretary of Defense has to recognize that, and see to it. He has to say, "I intend to create the necessary institutions that are going to support you in this," knowing that if they do exist today, they're not functioning today. In some cases they don't exist.

And then he says, "I want to make very clear to the Service chiefs that they are only the providers, they are not the users of systems." You know, that's bitter medicine, because they really don't believe it. Then he's going to say (my fantasy only goes on a little while longer), "I'm not fooling around about this. I mean what I say. I'm giving you the responsibility. I know what that means to you, and I expect you to take these responsibilities very seriously, because you're in command and this kind of responsibility goes with command. Readiness of your own command and control system, the full web, goes with command — inseparably. And I intend to support you in it. But I also intend to visit your commands. In fact, I intend to audit your commands, have inspections made and see how well you're meeting this responsibility. And then, in a couple of months, I will call you in again — one at a time — and you will give me a personal report about what you have done and what you intend to do. And I will listen to that report and I will take the appropriate action if I'm not satisfied."

I think that's a very sober charge to these gentlemen, and if he means business it'll be very profoundly motivating. It'll call for a rather substantial change in outlook — by everybody. That's what's required. Finally, the Secretary of Defense vigorously concerns himself with rearranging the bureaucracy at the seat of government so that the influence of the major operational commanders comes to bear as they move to meet their responsibilities, and can be accommodated. That's no simple matter. It might take several blowings of the trumpet to get the attention of the bureaucracy, and convince them that he really means it when he says that. It'll eventually happen.

That's basically my recipe, and I'm sure that you have some questions on it. "All right, all right, General, that's just great and peachy keen, but how are you going to go about it?" "What about these institutions?" But is the message fairly clear about what I'm trying to say?

Oettinger. Unmistakable, Mr. Secretary. In a moment your guidance as to what these institutions might be like will be welcome, but so long as we're in the spirit of fantasizing ... Suppose all those unified and specified commanders walk out of there, and I'm having a drink at the Army and Navy Club with my friend, the Chief of Staff of my home Service, and we exchange views: "You hear what the Secretary said in there?" and that kind of thing. Now, we're the Joint Chiefs and we have statutory authority, under the same law you are describing, to advise the Congress directly of our views. That's embedded in the same statute. So I don't have to clear my views with the Secretary of Defense or the President of the United States. I hike my ass over to Capitol Hill as quick as my little feet will carry me and say, "Hey, they're about to get us, and all those traditions, all the naval bases and the army barracks. There's no telling what this joker who's Secretary of Defense will do by the time he gets through. And he's got another three and a half years."

Cushman. Does that sound like a plausible counterscenario to the rest of you? It does? All right, I would have to deal with the substance of the argument, and then the philosophy. The substance is that none of the actions which the Secretary of Defense is going to take are going to do away with those existing stations. Maybe if they still exist, they still exist in a providing function.

Oettinger. So where's the money coming from for all those other institutions? I mean, they may exist, but some of them may be drained dry. Because you haven't said a word, Mr. Secretary, about money.

Cushman. Well, we don't know what the money's going to be yet, so don't blow the whistle on the program until you've heard the dollars. We're going to get the money by not building systems which we have to junk. Let me argue the philosophy of it first. To begin with, this kind of thing does require Congress to understand in advance. You just don't do this without getting agreement from the key committee chairmen in Congress — the Armed Services committee chairmen especially, but the Appropriations chairmen as well, in both the House and the Senate. It would be foolhardy to have this meeting and not have their agreement. When the meeting comes, they are not going to be all that surprised, because there will have been staff work getting ready for the meeting, the leaks will have taken place, the backfires will already have been started and then snuffed out. So he's essentially saying what they all expected him to say, and that meeting at the Army-Navy Club — in the first place, if the Secretary of Defense finds out the commanders stopped at the Army-Navy Club on the way back to their commands, he's going to get worried, because he thought they were headed back to put this kind of idea into effect immediately.

There are that kind of political problems. The legislative history of the 1958 act is buried in the MITRE paper I wrote. You ought to read the whole thing some time if you haven't, because it tells all the agony they went through even to establish these unified commands. It's very clear in that report that it was not their intention to create a new departmental organization, that the Army cannot be eight different armies for eight different unified commands, etc. Well, the argument is overwhelming in favor of the Secretary of Defense doing this — from the point of view of the money the people will save, and the readiness that you will gain in the outcome. The literature and files of the Department of Defense are loaded with examples of wasted money and poor readiness as a result of the past procedures, and you can generate all kinds of pressure, and then you say "This is the law, and it's the only way that I can see for us to properly decentralize and save money." But of course whatever the Secretary of Defense does is going to have to be done very carefully and with understanding.

I was a lieutenant colonel in the Department of Defense in the McNamara years. I was working in the office of Cyrus Vance, who was the General Counsel. There were three of us, one Air Force major, one Navy lieutenant commander, and myself, an Army lieutenant colonel, working for a civilian lawyer who in turn worked for Mr. Vance. Incidentally another member of that small group was Joseph Califano. We were McNamara's organi-

zation people, and I had an interesting job. I was project officer for the Army's reorganization to do away with the technical services. And I watched the way in which the groundwork was laid by MacNamara and Vance for that, and everyone was astounded that it was able to do away with the Army's technical services and establish the single Army Materiel Command, completely reorganize the Army, and it went right through. No changes in the law were required in any of this, just the question of redistributing some money, changing the funding allocations, establishing certain institutions, making certain policies. It has to be done that way, with a good deal of class and understanding, that's a very important point.

Student. You mentioned a set of problems that might create even greater obstacles to doing what you're suggesting. Most of the joint commanders have to be backed by the Service, indeed nominated to the joint command by the Service. There is a long tradition of Service. Given this background, can a unified commander really act as a independent body?

Cushman. Yes, you see, one thing has happened. It's been 36 years now since the end of World War II and the arguments that led to the 1947 act. The revisions of 1949 and 1951 were quickly made in the act. The revisions of 1958 came later. A whole new generation of commanders are in the mainstream now, and they just don't have the fixations that that bunch of generals and admirals had about the services back in those days. They have a lot of them, but there are some very solid unified commanders who will accept this responsibility. I know these people. Some institutional changes would have to be made — for example, the tenure of the commander should probably be longer. The method of selecting the commander and his subordinates might have to be something other than Service nomination. One of the institutions which will no doubt throw fear and trembling into the hearts of the personnel chiefs of the Services is to have some way of managing the selection of officers for joint staff or joint command, and managing their development. The joint Service schools, which are purely educational institutions now and are not developing doctrine, have very little responsibility for doctrinal development and thought; those joint schools have to be developed. These are the sort of instititutions that the Secretary of Defense would busy himself in creating. Yes, those obstacles are severe. I personally don't see any choice, however, other than to go about doing that.

Student. It seems to me, if I were McNamara about to embark on this, I'd want to take the other point of view just to see where I came out. What authority and power does he have right now to effect substantial changes in these things, that he hasn't been exercising? For instance, he's managing the generation of requirements for new systems. That's right under his control. He has joint Service programs in the communication command and control area; aren't those working efficiently?

Cushman. No!!! It's really very true that they are not working efficiently, because they slip away from you. All you have to know is a few case histories. The Beta project is a good example.

Student. There are lots of war stories. But one of the things I would be worrying about is the Office of Management and Budget. Because it looks as if I'm turning over the formation of my budget to operational commanders, and I'm avoiding the sense of responsibility which is mine for being a constituency . . .

Cushman. I think it would be very easy to create some nightmares of organizations and institutions into which this might lead, such as the Pacific Research and Development Command — a three-star general, complete with laboratory, scientific advisors, payroll and civilians, $1,000,000 and contract authority with; for example, AT&T or TRW.

Student. The Air Force will certainly jump into that.

Cushman. Well, yes, that will be a nightmare. But that's not what we are talking about. We are talking about requirements generation, testing and evaluation, exercising what you have, gaining from understanding what you have and an institutional voice in the process of deciding what money is going to be spent for what by these providers. The providers have the providing function. It doesn't do away with the Army's DARCOM or the Navy's Materiel Command; NAVELEX still functions just as it does now, except that it doesn't build anything that hasn't got a "chop" on it from this institution that I'm talking about, that represents the unified overseas commander. Now mind you, these are delicate institutions to create. The procedures for making them function have got to be carefully worked out. But they can be created.

Student. But that's the point. Right now, supposedly, the command and control systems are being built exactly the way you say.

Cushman. Maybe supposedly they are being built that way, but that's not the way they are showing up.

Oettinger. The point Dr. DeLauer made last week is the same as you've made. They slip away very quickly. It's all planned nicely in the Office of the Secretary of Defense, but then who's got time and energy to follow through? And pretty soon it ebbs away into the Service.

Student. You mentioned the Navy. Let me describe how a couple of systems developed. They were orginally conceived in concert with the field commanders. Then after everybody had put their two cents in, it says "Requirements documents were made up." The requirements document went out to the field commanders again for comment.

Cushman. Navy field commanders? Navy unified commanders?

Student. It justs happens that that works out that way, doesn't it?

Cushman. Well, not to say that the CINCPAC doesn't look at it as CINCPAC. I grant that. But the net result is the audit: that the systems are largely an unplanned splicing together

of ill-fitting components which have been delivered to his forces by relatively independent parties far away who have coordinated adequately neither with him nor with his staff. I think I'm correct in saying that when AWACS was developed, no thought was given to its possible use as a surveillance system for maritime war — it was for theater of operations landmass war. Its maritime use was an afterthought. Now the AWACS are being retrofitted to do this job, for which they are admirably suited. But the price is extraordinarily high, and the time it's taking to retrofit is wasted time. It could have been done in the inception.

That's exactly the kind of thing I'm talking about — you see what I mean? While the cases of really good forethought are so rare that they are like shining examples. We can't have that. Now this is a complicated business, and I don't know how you reconcile the problem if one unified commander says, "I like it" and another one says, "I don't like it." That's the institution I have not yet been able to figure out. But the Secretary of Defense is going to have to insist on having such an institution. It might already exist in the form of the Joint Chiefs of Staff — but if so, they are not performing that particular function very well.

Student. I would say first of all that if your Secretary of Defense were inclined to do that, it would probably be the very first time we have had a Secretary of Defense who was willing to look at the forces as a commander, which that act in fact made him, and not so much as he historically has, which normally has been as a crisis manager, or as someone whose primary concern is in justifying a budget to Congress.

Oettinger. As contractor-in-chief.

Student. Second, I thoroughly agree with and applaud the mechanisms, the institutions you are suggesting. But aren't you in fact setting up an institution we have seen before? We already have a general staff, and now we have a tactical general staff, based on the kinds of general institutions you are talking about. That's not to say that they are not needed — it's just that you might have a little difficulty explaining it.

Cushman. No, I think the Secretary of Defense's argument goes something like this: he not only clears this with Congress, but he clears with the President — the Commander in Chief. That's in the Constitution. The 1958 act is the culmination of the original act as modified, but it finally made it very clear that the Secretary of Defense is the President's appointed agent, responsible to the President for all the functions of the Department of Defense. Secretary Weinberger could reflect rather profoundly what he is responsible for, and he can say to the Congress, "I've now been here long enough to understand, it's very clear to me that if something goes wrong out there in one of those commands, I am responsible to the Commander-in-Chief; I am the Commander-in-Chief's responsible officer of the government for that, and I accept that responsibility, and I cannot execute that responsibility for insuring readiness until I am satisfied that those subordinate commanders who must be ready have the means to meet their responsibility, and I do not see how I can possibly be held responsible and accountable unless I take this action." He

is not subject to relief or punishment under the articles of the Uniform Code of Military Justice. There is an article in the code under which a unified commander could presumably be tried by court martial for negligence. Not so the Secretary of Defense; but the equivalent is there.

So he is responsible, and the Secretary of Defense has to look at himself as the civilian representative of the civilian Commander-in-Chief, as a sort of deputy or surrogate Commander-in-Chief full-time, thinking about the Department of Defense and all armed forces of the US, just as the President would if he had nothing to think about except that. That calls for him to look at himself quite differently. It's up to him to assume responsibility and accountability to the President and the Congress for performance of the mission. This is a very profound statement. It would put him in an extraordinarily powerful position.

When you finally figure out responsibility, the question is who gets relieved if it goes wrong? Unfortunately, the Department of Defense is not well organized, you can thank the government for that. I was a brigade commander in the 101st Airborne Division in Vietnam in 1968 — and I say to you that if I had conducted an operation in the manner of the Iran rescue mission I would have expected to be relieved. But you look around in the Department of Defense to find someone to relieve, and it's hard to find. That's one of the problems. Responsibility is not fixed, nor is accountability. The Pearl Harbor investigators had a very difficult time trying to find out who was responsible. In the seat of government, hardly anybody could be fixed as responsible; the institutions were not there for that. As it ended up, the two commanders in the field, Short and Kimmel, were relieved and retired in disgrace. And that is very illuminating — but that principle has to be established, and guarded against the man on horseback, the great General Staff, and all that.

These are very key issues. The federal nature of our federal government — the checks and balances within the executive branch itself, and certainly within the Pentagon — has got to be maintained. Congress is going to insist on getting into it, and not have a monolith to confront in dealing with these matters, but all of that has to be taken into account, and so does the issue of responsibility.

Student. In the case of Iran the commander-in-chief was relieved.

Cushman. Well, I don't know, that may not be a very good example. The Bay of Pigs is another example.

Oettinger. There was much better accountability, and you know Richard Bissell got fired for that one. So it was actually that the responsibility was more sharply focused than what you described in the military.

Student. Would you comment on the strengths and weaknesses of the command and control you saw during the Panmunjom tree chopping?

Cushman. Yes, I was in Korea as the commander in the western sector at the time. At the top (Figure 1) you have the Pentagon, the White House, the Pacific Command and the other unified commands and US Forces Korea, but that is just one half. The Commander, US Forces Korea was also CINC of the UN Command, which was the ROK-US Command in Korea, and he also commanded the Eighth Army, that's the Allied element. Under this command was I Corps Group, which I commanded. It is a ROK-US force. It had the U.S. Second Division, and 11 Korean divisions organized in the three ROK corps. The U.S. Second Division had three brigades and, under them, battalions. That's your chain of command.

Oettinger. In the design of the continental U.S. telephone system that number of links — seven, or maybe eight or nine — is the maximum number of links that a phone call can traverse in getting from anywhere in North America to anywhere else in North America. It is thought that any more than that would break the back of things. As a matter of fact, to make it really work, most calls from Absolutely Nowhere to West Absolutely Nowhere take fewer than that. So in just technical, let alone organizational terms, you need to grasp what that magic number seven says.

Cushman. We always tend to draw these chains of command as if they were the only thread. But there is a European Command, an Atlantic Command, a Southern Command, SAC, NORAD — there are eight U.S. commands, while Pacific has Philippines and Japan, and U.S. Forces Korea/UN Command has First ROK Army, Air, Navy — not much Navy, because that comes mostly under CINCPAC. I Corps Group has three corps, and each corps has three divisions, and so on. This is the web I was talking about. It doesn't work as a single thread.

In the area of the tree cutting incident at Panmunjom (Figure 2), the Demilitarized Zone is four kilometers wide, where the front line was established in the summer of 1953 when the truce was signed — actually it's demilitarized in name only. Seoul is 25 miles down Highway 1. The Joint Security Area was smaller than Harvard's grounds.

A group of ROK laborers was clearing a tree under the leadership of two American officers, a captain and a lieutenant, and was attacked by North Korean guards on August 16, 1976. The two officers were killed. At the time President Ford was in Kansas City; the Secretary of Defense was with him. Deputy Secretary Clements was in Washington. I forget who CINCPAC was, Admiral Gayler or Admiral Weisner I think. The Chairman of the JCS was acting chairman — Holloway; I think the Chairman himself was in Europe. Stilwell was here; he was to turn over his command in three weeks. A special military unit called the Joint Security Area Detachment had a camp here. It was directly under the UN Command administratively, and tactically it was charged with the Security Area job, with the Second Infantry Division troops as backup.

General Stilwell was in Japan when the men were killed, and quickly returned. I was in Seoul, my wife had just gotten to Korea, and I had taken a leave. I was called by my command post and immediately went back.

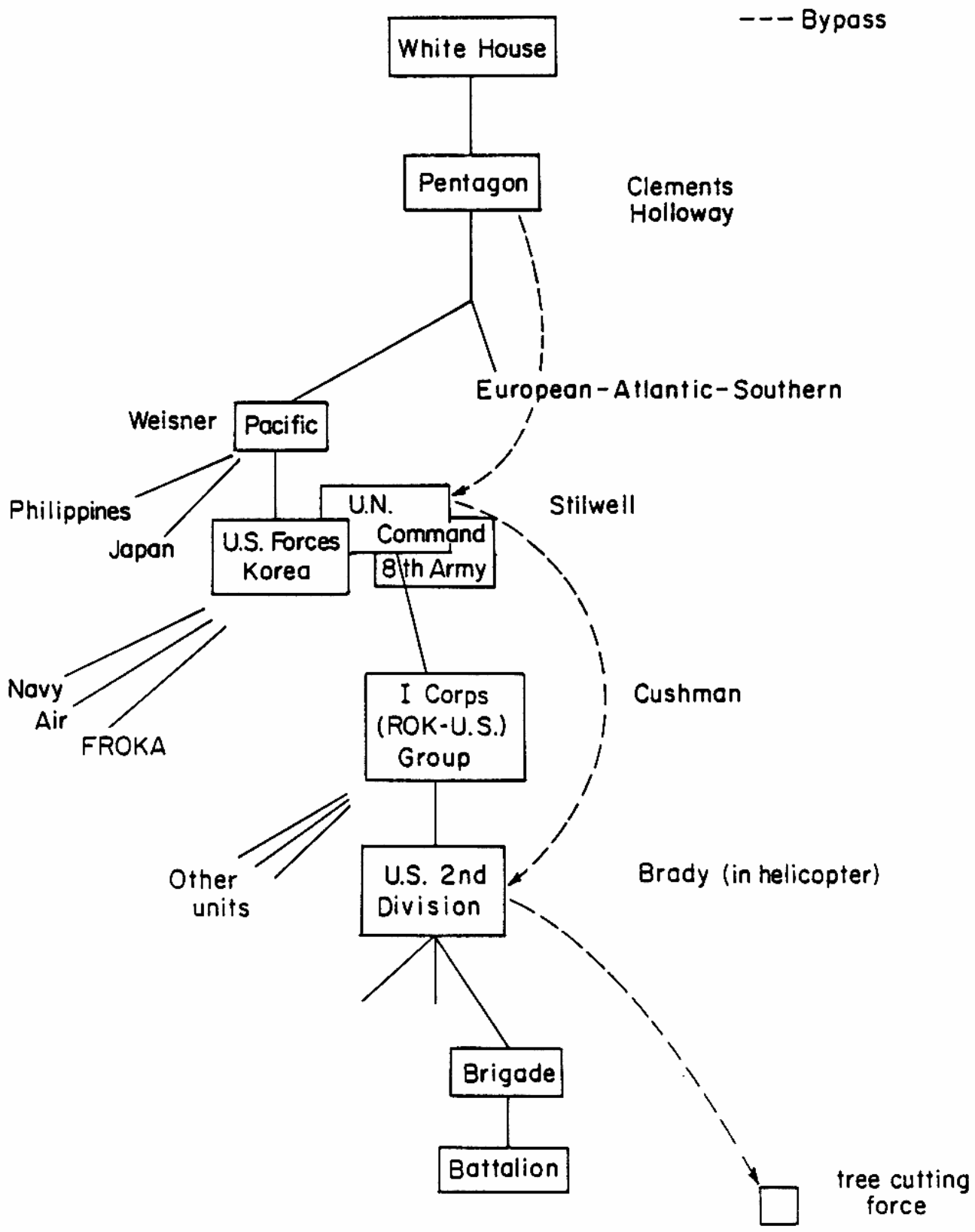

Figure 1. Command and Control During Korean "Tree-Cutting Incident"

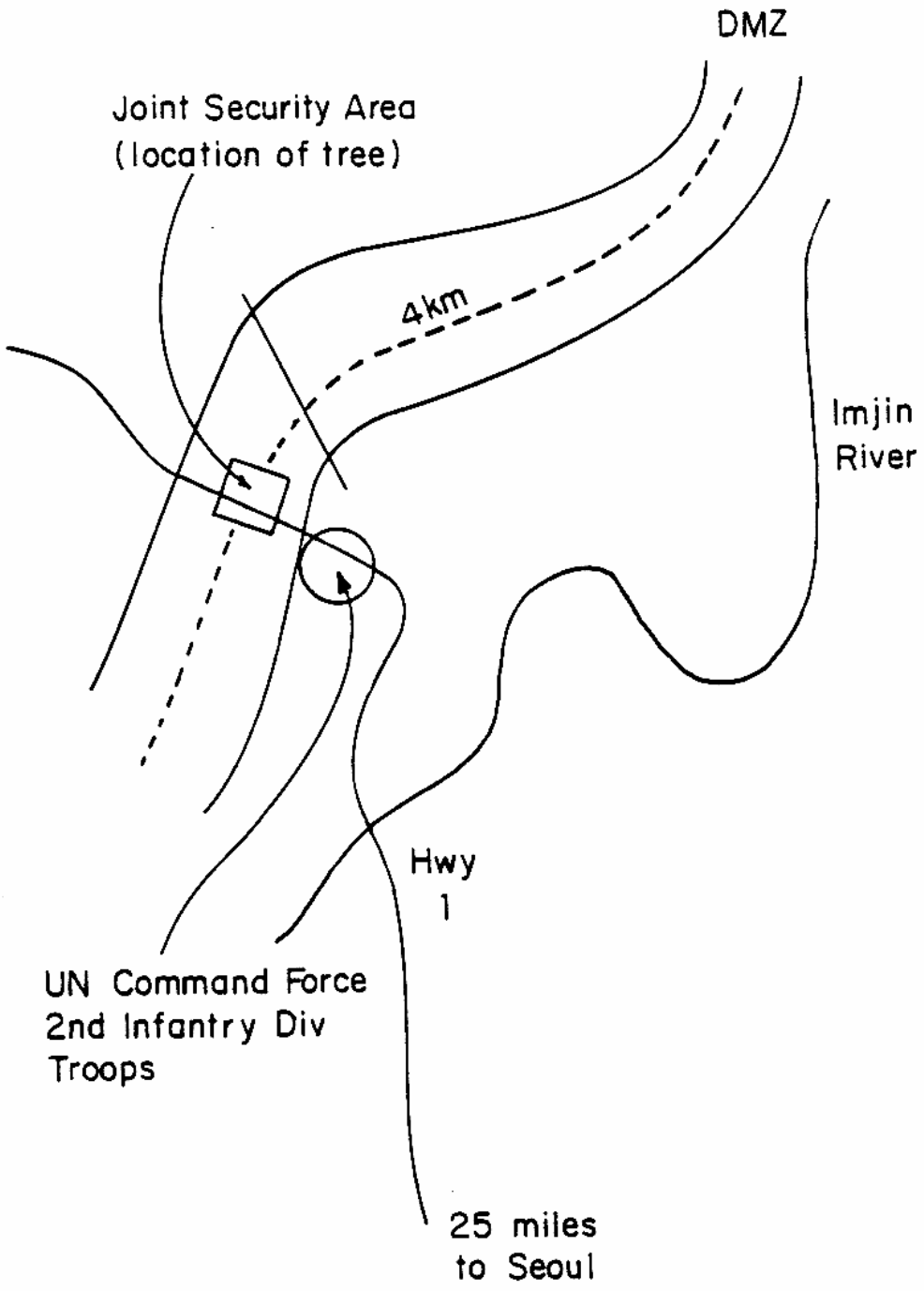

Figure 2. Locale of "Tree-Cutting Incident"

I won't describe exactly how it was done. It was decided to execute a very carefully planned surprise move and simply to chop that tree down. The issue was whether the U.S. had authority to trim that tree. The guards said to them, "You can't trim that tree," and they went out and did it, and the North Koreans attacked and it got out of hand. Maybe they didn't intend to kill two Americans, but they did, and the US response was to be sure to do what they originally set out to do: take that tree out of there. They also had a bigger responsibility to get things ready in case there was a bigger war. For the tree chopping, the chain of command went directly from Brady to Stilwell to Clements — Clements in the Pentagon to Stilwell in his command bunker in Seoul to Major General Brady — bypassing CINCPAC and bypassing I Corps. I had equivalent responsibility to be in a position of readiness in case things got bigger, but I was not involved in the tree chopping action.

Lower down, the chain of command went from Brady right to the lieutenant colonel who headed up this task — he came under Brady for that one. He had a small task force of Americans and Koreans, including an engineer platoon equipped with chain saws, to go and chop that tree down. Plans were made by General Stilwell, we all participated, and it was executed. Brady could talk directly to the lieutenant colonel — a one-echelon skip. Now, Brady was in a helicopter, where he could see and operate as necessary. He had his whole division and the rest of his force ready. I was in a helicopter too, but I was out of the loop, just monitoring. Stilwell was in his bunker. Stilwell could talk to Brady. Brady could not talk to Clements. Stilwell could talk to him — but that's just three links, and they weren't trying to connect top to bottom; they were not trying to let Clements check on the chain saw.

Actually, the first chain saw broke. Within minutes Brady reported to Stilwell: "The chain saw broke — it was a green tree. We're using a second chain saw." The report came that the second chain saw broke. But they had a third one and they cut the tree down.

That's the chain of command. I consider it to be extraordinarily suitable, and well done, and Clements did not want to talk directly to Brady. He knew better than that. In fact, Stilwell would have said: "I'm sorry, we can't link you up. He's in his helicopter." I don't know how this compares with the Mayaguez incident, or with the Berlin Wall, but this was a pretty good way of doing it, I thought, when it was executed. As it turned out, it was executed adequately, and it took the North Koreans by surprise. It worked out pretty well.

Student. Other than getting help when things go wrong, how would you define responsibility?

Cushman. Well, it's responsibility for mission accomplishment. Essentially responsibility is given to the person who gets the credit or the blame, if it goes right or if it goes wrong, the person to whom you say "This is your job, now get it done." It's a very key military concept, and the person who is given it accepts it, and does his best to execute it. Maybe General Patton, in the letter of instructions I quoted, defines it about as well as anyone.

To summarize, I do feel that what's ailing the Defense Department is the fundamental failure to recognize who is responsible for the readiness of these operational command and control systems, to recognize the operational commander's responsibility, to hold him responsible, to give him the means to meet his responsibility, and then to check on whether, in fact, he's meeting those responsibilities.