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Funding C^3I
Charles W. Snodgrass

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FUNDING C³I

Charles W. Snodgrass

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During his 15-year career Charles Snodgrass has moved from the Office of Management and Budget through the congressional staff to a cabinet-level office, gaining a view of the Federal budgetary process which is both broad and deep. During that time he has been associated with many aspects of C³I acquisition, including a successful strategy to protect Air Force interests in defeating an automatic data processing bill in the Senate, and development of means of Congressional oversight of the US intelligence community during his years as a staff assistant to the House Appropriations Committee's Defense Subcommittee. Out of his sometimes controversial experience with Federal bread-and-butter issues, he gives us a behind-the-scenes tour of what is involved in managing funding programs through the approval process.

Snodgrass. I will talk to you from the perspective of a knowledgeable practitioner who has seen the Federal budget process and C³I from all sides. As Tony said, I am somewhat controversial. I was affectionately known as The Abominable No-man by my less than stalwart supporters throughout the government. On the other hand it depends on your perspective. The *Armed Services Journal*, a magazine that is read extensively in Washington, once did an article on "Congressional Micromanagement" — one of the buzzwords

for people who think that congressmen in general, and congressional staffers in particular, have too much influence on national policy. Some perceptive reader of *Armed Services Journal* wrote back anonymously — he would have gotten into trouble if his superiors in the bureaucracy knew who he was — to say that in his experience congressional micromanagement applied to programs which the Executive Branch had requested and Congress had turned down, while, on things like aircraft carriers which the Executive Branch had not asked for and the Congress had added, it was great statesmanship and forward-looking leadership. So I think that any time you hear these kind of comments about a congressional staffer or any controversial person you must look very carefully at who is making them and what perspective he's coming from.

As I read last year's seminar papers, I was reminded once more of what I tend to forget: that at the top, Washington is a very small town. I read the list of contributors to last year's Kennedy School seminar, and there were Bill Colby, Bobby Inman, Bill Odom from the National Security Council staff, Lee Paschall, Ray Tate and General Rosenberg — all of whom I had dealt with personally as a congressional staff member. So while you look at the government as a big impersonal arena and ask how the President can ever manage three million people, I think you find that on a particular issue, in this case C^{3}I, actually a fairly small number of people is involved, and much of what you read and see and hear is really conducted among those eight, nine or ten people. If I named an agriculture issue it would be a different ten people, but still there is a small number of people who really have the predominant influence on an issue.

I think one of the difficulties of studying issues in any graduate school or academic setting is to track what's really happening. It's a good idea when people like Professor Oettinger bring in people like myself, because we can give you a perspective that even with the most magnificent library in the world (which indeed exists here at Harvard) you could never really understand, because little if any of it is ever recorded. If pressed, we would deny any claim that it actually happened. Yet in fact that's what really happened, that's how things get done in Washington.

It goes even further: there's an interchange or circulation of elites, to use C. Wright Mills' expression. I made my initial contacts with General Rosenberg on the National Security Council staff five or six years ago; we established a good relationship when I was a congressional staffer. I was then appointed an Assistant Secretary of the Air Force, having met the Secretary of the Air Force through my involvement with the Intelligence community. I go to the Air Force, I'm somewhat controversial within the Air Force. General Rosenberg in the meantime has been sent back to the Air Force as Assistant Chief of Staff for Studies and Analysis, and he becomes my emissary to the blue-suit Air Force. He says: "Hey, he's a good guy. He's on our side now. He'll work just as hard for us as he did for them." And, you know, I probably got a six-month head start in my relationships with four-star generals because there was one-star General Rosenberg in the internal councils of the Air Force, saying, "Give him a chance, don't judge him, he can turn out to be on our side." I think it's fair to say that when I left, many of the three- and four-star generals who had opposed my appointment said that I had done one of the best jobs anyone in my position had done.

Going in the other direction, I find Bill Odom on the National Security Council staff, he's taken Rosenberg's place. I'm now Assistant Secretary of the Air Force, trying to go against a bill that Congressman Brooks is trying to pass. I set up a relationship with the NSC staff, based not on the congressional viewpoint but on the perspective of an Assistant Secretary of the Air Force; and off we go, arm in arm, to help attack a law that we don't like. In the meantime, Dan Murphy, Admiral Murphy who had been on the Intelligence Community Staff, goes over to work with Harold Brown, I worked with him during my congressional period. Now Murphy goes over to George Bush on the Vice Presidential staff, and — I don't want to belabor the point, but I think that one of the things you miss, if you look at it just from the academic perspective, is how these things are continually going back and forth, particularly in the defense arena. It tends to be a non-partisan, technocratic, apolitical sort of thing.

I was appointed Assistant Secretary of the Air Force by Jimmy Carter, but I never met Jimmy Carter in my whole life. I was appointed because I had worked in the Bureau of the Budget (now Office of Management and Budget) and the House Appropriations Committee, and knew as much about the federal budget process as just about anybody in Washington. I could just as easily have been appointed by Don Rumsfeld, or President Ford, or Nixon or anybody. Particularly in the Defense Department the preponderance of us were like that. After all, Hans Mark, the Secretary of the Air Force, had been a close personal advisor to Governor Rockefeller, and yet he was appointed by Jimmy Carter as Secretary of the Air Force*. Again, I think that's something that doesn't come through. A more pretentious way of saying that is that there's a statutory structure — The National Security Act of 1947 and 1958. I had statutory responsibility as Assistant Secretary of the Air Force, so that certain checks couldn't be issued unless I signed them, and computers that cost more than five million dollars couldn't be bought unless I signed the procurement document. But if I had confined myself to my statutory responsibilities it would not have been a full time job, it would not have been nearly as interesting and challenging.

I think this is particularly important because of some of the revolutionary changes in communications technology which you are studying in this course. Back in the days of sailing ships, before the telegraph, when scientific revolutions happened every three hundred years instead of every nine minutes like they do now, you could probably live with a rather structured, rigid statutory kind of responsibility, divisions in labor, and all that. But, at least in the jobs I had, and particularly the Air Force job, the compression of time because of technology has become so dramatic that there is no longer the luxury of just doing it by the numbers and through the organization chart. Indeed in my experience, while the organization chart is still followed in times of stability and relatively low-level issues, when it came to the Mayaguez and Bay of Pigs crises, the evacuation of Lebanon or something like that, the organization chart was thrown out and the personal structures started to become the real C^3 backbone of the government, and the fact that

*And now has received President Reagan's appointment as Deputy Administrator of the National Aeronautics and Space Administration (NASA).

Harold Brown had established a relationship of confidence with the President was a more important influence on whether his advice was followed than what the National Security Act of 1947 says. Indeed you can find nothing in the National Security Act that says the President should speak to the commander of the Iranian raid in the middle of the desert after they hit the planes and blew them up, and discuss whether the raid should go on or not — but indeed they did talk to the President. In the Lebanon evacuation Harold Brown, after it was all over, used to brag about the fact that he was in direct secure voice contact with the Marine second lieutenant on the first landing ship that went in, and he knew as soon as the Marine did when the bow of the LST opened up. That's a technological revolution thanks to communications satellites, secure voice scrambling and all the things that interest the codebreaker. And it does dramatic violence to the concept of organization charts, statutory responsibilities, that sort of thing.

Oettinger. All that you've said rings true with what we have heard from others, except for one point. You talk about acceleration, need for nimbleness, etcetera; but almost without exception everyone who has preceded you has argued that all these things are true except in procurement, except in R&D, except in all the things that have to do with C^3I — where somehow we are trapped into doing things that take so long, and are so ponderous and unresponsive, that there one is locked in — rigidity, not the kind of nimbleness you suggest.

Snodgrass. I think what they are saying is true, and I would agree with it. I've been speaking so far in pretty much an operational context, a crisis context. An aircraft carrier takes ten years to build. That's one of the ironies of the Reagan administration, for example, saying that they are going to add two more aircraft carriers and affect the naval balance of power. As Admiral Stansfield Turner rightly pointed out, whether you agree or disagree with the decision to build more carriers, you have to ask what the military-naval situation is going to be in 1992, because even going full out as fast as we know how, with all the money in the world, it just physically takes ten years to build an aircraft carrier. So if you're worried about the Russians the day after tomorrow, appropriating three billion dollars for the next Nimitz class of carrier is not going to help you at all. You had better put it into more spare parts for F-15s and C-5s and more Sidewinder missiles and that sort of thing, because that's what you're going to fight the Russians with the day after tomorrow. On the other hand, if you believe that there is a long strategic pull, and that we're still going to be preparing to fight the Russians ten years from now, then you ought to take care of that too. In that R&D kind of procurement function there's not that crisis pressure, that immediacy. But if you're talking about fighting Congressman Brooks' bill, for example, and it's going to be taken up on the floor of the House six days from now, you don't have time to go through the Joint Chiefs procedures, a brown, a buff and all those different colors, which take about five months to do during normal times by the cookbook. Brooks is going to have the thing up for a vote next week, and within 6 days you have to have one more than half the votes against him if you want to stop it. So while you can't get around the Defense Acquisition Review Council on buying an aircraft carrier because it is going to take ten years anyway, you can get around the Joint Chiefs coordination system if you can persuasively show that it is going to take too long and you are going to lose if you

follow the normal procedure. I think that is the difference. Later I'll talk about the problems of the industrial base and how you respond.

The second point I wanted to make is about the perspective I'd like to bring to today's class. I think it is relatively unique. I won't belabor the details, but I have had the perspective of working with two Cabinet officers — John Gardner when he was Secretary of Health, Education and Welfare, and Harold Brown, the Secretary of Defense. I've had the perspective of the President, having worked in the Bureau of the Budget which became the Office of Management and Budget. I worked from the Congressional perspective on the Appropriations committee. And finally, for the last two months, I've worked in the industrial sector for a very high-technology computer company, Electronic Data Systems Corporation, Ross Perot's company, in the information business in the private sector. I've also had a lot of diversity in subject matter: National Institutes of Health, Food and Drug Administration, Federal Trade Commission, Department of Labor, Job Corps, Unemployment Insurance, Workmen's Compensation, Agriculture Department, Environmental Protection Agency, intelligence, communications. I haven't been able to hold a job very long! But it's given me a great background, to the extent that if any of those areas are of interest to you I would be happy to talk later on about the National Institutes of Health, Food and Drug Administration, Federal Trade Commission, Job Corps, the Labor Department, or whatever.

I think the most important thing I have learned from this diverse experience is that there is definitely no one way of looking at things. Where you sit makes a lot of difference in how the world looks to you. The Bureau of the Budget sees things in a completely different way than the Secretary of the Air Force. Both have constraints. They both have a way of looking at the world, but they are completely different. Congress looks at it still another way, and the Senate Appropriations Committee looks at things differently than the House Appropriations Committee. For example, the Constitution makes the House the place where all appropriation bills are originated. We felt that that put a great constitutional burden upon the House Appropriations Committee to make sure that we looked at everything in detail, every last dollar, the whole $700 billion budget. The Senate, on the other hand, since it gets the second bite at the apple, looks at it more or less as an appeals court would. They figure the House Appropriations Committee has looked at everything in depth, and if you got it past the House it must not be too bad, so they husband their resources and they look at the things the House has cut out. It gives them more time to go into those things in depth and they can act as an appeals court. The cuts they agree with they drop out too, the ones they don't they put back in. That tends to be the meat of the conference between the House and the Senate: The Senate arguing that the House Appropriations Committee has gone too far.

One of the big problems I saw throughout my years in Washington was the tendency to want to use one all-purpose set of briefing charts. The tendency was to make the same presentation to Harold Brown, the Bureau of the Budget and the Congress. But you can't do that — because if you use a presentation that works with Harold Brown, who is the most technologically oriented Secretary of Defense we have ever had, you have to talk about Navier-Stokes equations and lift over drag and how long it has been in the wind

tunnel. After all, Harold Brown, Hans Mark and Edward Teller, back in the 1960s at Livermore, actually designed the warheads that went on top of the ICBMs that they now have operational control over. To make a long story short, the only way to convince Harold Brown to build a new warhead or something was to explain in excruciating detail what the equations were and all that. If you tried to give that same presentation to Joe Addabbo, the Chairman of the Defense Appropriations Subcommittee in the House, he had what we called a MEGO (my eyes glaze over) reaction in about two and a half seconds. So you have to be very flexible, remember who the audience is, where they are coming from and how you have to appeal to them. Indeed, I'm finding that's equally true in business, even in the eight weeks I've been there. I have to make a completely different kind of presentation to Ross Perot than to my immediate group president.

Student. Would you like to say anything about the role of the Office of Management and Budget in the context we have been talking about — things like zero-based budgeting and the Planning, Programming and Budgeting System? And how much does the President actually use the Office of Management and Budget to manage the government? Or is it a matter of just trying to control funding priorities?

Snodgrass. Most fundamentally, it varies dramatically from president to president. The Office of Management and Budget is one of the more responsive bureaucracies in Washington; it really does reflect the desires of the President. I have first-hand personal experience of that. I worked in the old Bureau of the Budget and in the new Office of Management and Budget; the change took place while I was there. It was very heady during the last days of the Bureau of the Budget. Joseph Califano was Lyndon Johnson's right-hand man, and Joe realized that the most sophisticated, hard-working, capable staff that existed anywhere in the environs of the White House resided in the Bureau of the Budget. He was taking young budget examiners like me who were 25 or 26 years old, GS-7s, GS-9s, and were willing to work 24 hours a day, seven days a week, and making us heads of task forces that were affecting at the least the Undersecretary and Assistant Secretary of the Department — and he had a 200-man staff that would have committed hara-kiri if Joe Califano asked them to. The Bureau of the Budget in the final years of the Johnson Administration was running the government, there were no ifs, ands or buts about it. That was partly a reflection of the fact that Lyndon Johnson had been on the Senate Appropriations Committee for many years and realized that the budget process is the only process in Washington that, in some fundamental sense, works. The reason it works is that it is the only process in Washington that has absolute deadlines. If they don't pass an appropriation bill by the first of October people don't get paid, social security checks don't go out and that sort of thing, whereas we've been screwing around for years on what we should do about telecommunications policy and whether we should repeal or revise the Act of 1934, and nothing has happened; but the telephone system still works, calls still get made. That's the difference between the budget process and all the other processes in government. As a result, it tends to be the real decision force in the federal government.

Oettinger. One of the comments we have heard is that, in the process you describe, somehow the things having to do with communications, with intelligence, get the short end of the stick, that the processes that you're describing don't work well there. Is that a parochial thing? This is where your experience across a number of agencies and across a number of fields (including, specifically, the period of being an "Abominable No-man" in C'I) could help. Could you focus on any contrasts? Those perceptions of the C'I people that they feel peculiar, are they valid from your vantage point? Or is that just a normal kind of perception by somebody who is on the losing end of an argument?

Snodgrass. I'll come back to that. I want to finish my response to the earlier question. The Bureau of the Budget in the Califano-Johnson era was running the government on a day-to-day operational basis, and cabinet officers toed the line to the OMB budget examiners. I did that for a year and a half. Nixon came in and brought with him Roy Ash, who had been at Litton Industries, a big conglomerate. If you've been reading the papers lately, you've noticed that Ash has just been kicked out of AM-International, one of the reasons being that he was so busy doing strategic planning and looking into the distance that he forgot to look at the bottom line, and a billion-dollar company was not making any money. They were recording losses. The board of directors kicked him out and got someone else in who is famous for looking at the bottom line and turning profits quarter after quarter after quarter. Well, Ash came into the government with the same kind of stategic long-range outlook. Having worked for Lyndon Johnson for four years, and being used to Lyndon wanting to know every detail down to the last dollar and Califano the same, the Bureau of the Budget made the same kind of presentations to Roy Ash — and he just went bananas. He didn't want anything to do with what the last ten million dollars was in the Federal Trade Commission budget.

Secondly, there had been a feeling that the Bureau of the Budget was somehow a Democratic stronghold, so when Ash came in he changed the name to the Office of Management and Budget (the word "management" was underlined, at least in Ash's point of view), and brought in a whole new group of people to staff the management side, most of them MBAs from Harvard. The budget examiners couldn't get the time of day from Roy Ash, they couldn't get in to see him; and the budget process went down while the management process went up. He also politicized the Bureau of the Budget, because when he brought all these people in he put politically appointed assistant directors across the top. Since 1939, when the Bureau was established, there had only been one political guy, the Director. Even the Deputy had been a career civil servant. As a result it didn't work out. The one remaining effective process in town now became ineffective too, because the Director of OMB paid no attention to the budget process. Things didn't get done, deadlines were missed, budgets were put together that weren't internally consistent, while he was off playing his games with the management side. I don't have any trouble understanding why he got in difficulty in AM-International for the same reasons. And frankly the Bureau of the Budget, the Office of Management and Budget, went down as an institution of high prestige in Washington.

Ironically enough, David Stockman is now beginning to bring back up the prestige of the OMB, and he's doing it in the same way Joe Califano and Lyndon Johnson did. He worked 17 hours a day, called in all 200 budget examiners one at a time, and went down to the last dollar with every budget examiner. They jokingly say that all the budget examiners were told, "Go back and pick out every idea for every cut you've had for the last twelve years that nobody would let you make while you were having all this emphasis on management, let's put them all together and add them up, and that's where we'll get our $50 billion cut!"

In my lifetime there have been three dramatically different kinds of budget authority, and it had to do with the leadership at the top. And yet if you read the statute establishing the Office of Management and Budget it hasn't changed a lick in the last 15 years. So again I make my point that, despite what some of the Marxian philosophers would tell you, I believe that people do make a difference, and the kind of leadership you have makes a difference.

Now raise your question again.

Oettinger. Well, it was essentially not too distant from this one. What does what you describe have to do with whether C^3I gets treated any differently from anybody else, as most of the practioners of that black art seem to believe?

Snodgrass. To do this we are going to have to split the C^3 from the I, because I feel there is some difference between the two. I actually was the first combined C^3I budget watchdog. When they put me in my assignment on the Appropriations Committee Mr. Mahon, for reasons that I still don't know to this day, said, "You are responsible for communications and for intelligence." The Defense Department at that time had two completely separate organizations, and it wasn't until Gerry Dinneen* came in that they pulled them together — so I always jokingly told Dinneen that I got there two years before he did in the conceptual sense of putting them together. Now the C^3 people (there has always been an Army Signal Corps and that sort of thing) had gone through relatively the same budget process as everybody else in the Defense Department.

The intelligence people, on the other hand, had hidden behind the "green door" — behind the classification smokescreen. In all frankness they had had pretty much of a free ride in terms of budgetary oversight. We were very sensitive to it on the Appropriations Committee, and we would always deny it if publicly asked, but in fact Allen Dulles did come up to Mr. Mahon and Clarence Cannon and maybe one other congressman for half an hour on a Sunday afternoon in the basement of the Capitol and said, "Mr. Mahon, I need X hundred million dollars for the CIA this year," and they said, "Fine, where do we sign the check," and went home.

*Assistant Secretary of Defense for C^3I in the Carter Administration.

I was the first person ever on Capitol Hill to have full-time responsibility for looking at the intelligence budget. I was the one who had to carry the bad news to the intelligence community that henceforth they had to submit a written budget justification, that they had to have three weeks of hearings just like everybody else, that the House Surveys and Investigations Committee staff was going to go in and do detailed investigations of particular intelligence programs, that we were going to have a written transcript, that we were going to have a secret, highly classified report that told them what they did. Well, you know, if you've had a free ride for 20 years, the natural inclination is to test the system for two or three years to see whether they really mean it. Jim Schlesinger came to Mr. Mahon to ask to have me fired, Bill Colby asked to have me fired, George Bush asked to have me fired. Every time Mr. Mahon would call me in the office and wink and say, "Chuck, you're in big trouble: you're doing your job, according to what Bill Colby's just told me."

So on the intelligence side I believe there was a period of testing. It never got to me personally, because I felt that if I had been in the intelligence community's shoes I sure would have done the same kind of thing to see whether or not the Appropriations Committee had the endurance to stay the course. After all it is nicer to have your budget given to you without much outside scrutiny, and spend it the way you want. Then they appointed the House and Senate Select Committees on Intelligence; and they started doing the same thing. They picked up all the things that I had invented in the Appropriations Committee and moved them over, just about *en masse*, to the House and Senate Intelligence Committees. All of a sudden they were not able to concentrate all their resources on Chuck Snodgrass, they also had to shoot at Bill Miller, head of the Senate Intelligence Committee staff, Jim Bush on the House Intelligence Committee staff and others. And they finally say, "Gee, it looks like Congress is going to stay the course, they're going to do it, we'd better change our strategy from one of confrontation to one of cooperation." I would say the leader in that strategy shift was Admiral Inman. That's why Admiral Inman is now the Deputy Director of Central Intelligence. He started fighting with honey instead of a club. A lot of the things that you hear about how intelligence is unfairly treated, is getting extra attention and all that, are due to the fact that much of the senior leadership in the career intelligence bureaucracy lived for 95% of their life with unnaturally little supervision, and for 5% of their life had supervision, and so to them it seems like a lot compared to what they had for most of their bureaucratic life.

On the other hand, I worked for three years for Congressman Whitten on the Agriculture Appropriation Committee. He was called the Permanent Secretary of Agriculture because he had been Chairman of the Agriculture Appropriations Committee since 1949 and had seen something like ten or fifteen Secretaries of Agriculture come and go, and there was Jamie Whitten year after year, still determining the appropriation for the Agriculture Department, and if Mr. Whitten even lifted an eyebrow, 25 people fainted in the Department of Agriculture. If Agriculture people could have been transferred over to the Central Intelligence Agency and seen how lightly the CIA was being treated by the Congress, even after this massive increase in Congressional oversight, they would have said, "Boy, they're really skating compared to the way we're getting treated in the Agriculture Appropriations Committee."

So, again, I think it is a matter of your perspective. And I would say that even to this day the Defense Department, the intelligence agencies, the communications parts of the Defense Department get treated much more favorably than the State Department budget does, or any civilian agency budget. Look how John Rooney used to decide, down to individual ambassadors practically, who could go, whether they would get a desk or they wouldn't get a desk, how many trips they could make to the interior of the country.

With OMB today, when I talk about how Stockman is running the country through the OMB budget examiners, my remarks apply primarily to the civil agencies — the cuts in Medicare, food stamps, welfare, all those sorts of things. As best I can determine, OMB has had relatively little to say about the Defense budget. Reagan and Weinberger sort of worked it out one-on-one without Stockman. So again, if you're sitting in any place other than Defense, you'd say, "Gee, they are really favored people." For example, the Secretary of Health, Education and Welfare had to spend hours with Stockman and his budget examiners, and they went down detail by detail cutting his programs, whereas Cap Weinberger went and saw Reagan for half an hour and got his budget, and that was it.

I've spent so much time on this because I think you've got to have this perspective to understand. C^3I had had no oversight, or relatively limited oversight, for so long that what I would consider to be normal congressional oversight looked like excessive oversight. And, again, the intelligence community in particular tends to be very insular, with people who came right out of college as an agent and spent their whole adult life in it. If nothing else there is the practical problem: if you've worked in the CIA for more than about five years you can't get a church to hire you, you can't get a university to hire you. They don't want people to think they are being infiltrated by intelligence agents. Also if you've been doing anything significant that is highly classified, you can't put it on your résumé. Moreover you don't want to leave. Intelligence work is extremely exciting in an intellectual sense; the most exciting thing I've ever done is to be part of the apparatus reviewing the programs of the National Security Agency and the Central Intelligence Agency. So the C^3I folks don't know what things are like in the rest of government, how other people get treated by Congress. I think they overreact. They complain too much.

Finally, I will confess that it is more difficult to articulate the need for a C^3 system than for many other things, because many of the most important parts of the C^3 system are intangible things that you can't "show and tell" to Congress. You can take congressmen to Cheyenne Mountain and show them the Command Operations Center and they will see a bunch of computers, but those computers look just like the ones they saw at the National Military Command Center and down at the Kennedy Space Shuttle facility. Whereas, although they are all IBM 3033s, the software in them is totally different. And the huge cost overruns, the failures and problems in Cheyenne Mountain, for example, were software failures, not hardware failures. And how do you explain to a congressman — how do you explain even to a General — how it operates, how much it costs, where it should go, how much it weighs? How do you explain what software is? You can't take it in to show him at a congressional hearing. On the other hand, if you are selling F-15 aircraft, you can take the congressman and give him a flight in an F-15, pull six Gs, go to 15,000 feet, go to

Mach-2, and they come back and say, "Boy, where do I buy more of those?" The product the C³I people are selling is just more difficult to articulate.

I have the same problem in the business I'm in now. EDS sells computer services, and we have large regional data centers in Dallas and in a couple of other cities. The thing we put on the user site is a terminal. One terminal looks more or less like another terminal: what is different about EDS versus some of our competitors is that we do it better, more efficiently, cheaper. But if you compare our presentation with CSC's or ADP's presentation you can't see any tangible difference. So to some extent we have the same kind of problems the C³ people have, explaining to our EDS customers why they should use EDS rather than a competitor such as CSC.

The final problem that C³ has is its unique dependence on the perspective of the commander who is using it. We change commanders in the military every two to three years, so what was a perfectly adequate C³ system for General X is totally inadequate for General Y.

C³ systems are therefore more affected by changes in requirements. And if you know anything about software you know that if you keep on changing the requirements they interact in complex ways, so that often you have to start over, or else spend massive amounts of money to adapt. I think the requirements change much more in the C³I area than they do for an F-15 or a Sparrow, or some of the other hardware the military buys.

Oettinger. I wonder if you could elaborate on that point. Why, from your viewpoint, is the change in specs and requirements so much greater than in other areas of your experience? And there is another thread which came up in our earlier presentations — that command and control functions tend to cut across organizational lines, across military services, and change organizational things. If I heard correctly what you said a moment ago, its not so much a matter of budget levels — you say that hasn't been all that effective — it may be a matter, on the intelligence side, of more oversight than there used to be. But you didn't say very much about influences on internal organization and structure and so on which, along with the changing requirements, may be closer to the heart of the matter.

Snodgrass. Well, as a matter of fact, I will plagiarize President Reagan's first major speech on television. I don't know what the numbers are because I didn't bring them today, but I know about the order of magnitude. If you look at the C³ budget in 1975 when I joined the Appropriations Committee, and in 1980 when I left, you will find that in round numbers the communication budget went from $2 billion to about $5 billion. All we did in Congress was make relatively marginal changes; the totals in round numbers more than doubled in five years. I think it is hard to make a case that not enough money has been spent in the C³ area. As a matter of fact, many of the problems the Appropriations Committee had with the military, in my opinion, were really not money problems, but were due to the fact that we were starting to get involved in organizational issues. This goes right to the point you are making about crossing organizational lines.

What were some of the controversies? We looked at the Pentagon, for example, and found four telecommunications centers: one for the Army, one for the Navy, one for the Air Force and one for the Joint Chiefs of Staff. You know, the Pentagon is not that big a building. A computer really can't tell the difference at the bit-and-byte level between a Navy message and an Air Force message. So we said in a directive: "You shall have a single Pentagon Telecommunications Center." It ultimately turned out that we had to back down to two, but still that was half as many as four. The big arguments weren't about how much it was going to cost — everybody could see that it was going to be less — but the Air Force just couldn't bring itself to have its messages going through a communications center that was run by the Army. In the end we prevailed; we just kept cutting out the money for the salaries and machines, and it started to hurt badly enough that they had to go ahead and do it.

Within the next year or so, I think, there's finally going to be a single major telecommunications center in the Pentagon. It turns out that it's going to be not only less expensive, which was one of the motivations, it is also going to be more efficient, because we made them in essence buy a whole new generation of computer equipment which took advantage of all the latest technology. The real issue was never dollars. The issue, and the reason the services fought it so much, was that it was forcing the traditionally separate roles and missions and everything to be put together. We also thought, and I still believe it to this day, that not only was it going to be cheaper, it was also going to be better; because through the years there had been many crises in which one of the problems was that the world never seems to work the way it's supposed to, and an Army kind of crisis was first discovered by a Navy kind of intelligence asset or vice versa — and with all those separate systems it took so long, because there was such jealousy and protection of turf; getting the message across the interfaces took forever. Once you have a consolidated Pentagon Telecommunications Center where everything is coming in in one place and has routing slips that takes it out where it needs to go, the chances that the message will fall through the cracks, will not make it across the interface, in our opinion were greatly diminished. We felt there were substantive non-financial reasons to do it.

The next thing I want to go into also relates to your question. It is another area in which the Appropriations Committee took the lead and which we were roundly criticized for, but which I believe is now generally recognized as a contribution. Again it was not basically a financial issue. When we started looking for the first time at how the Intelligence budgets were put together, we realized that, first of all, they had never been put together in one place before — they were just scattered here, there and everywhere in the Defense Department, the State Department, the Energy Department, wherever. They had them hiding behind secrecy and security and everything. Just putting them together gave you a perspective that nobody had ever had before. We found that technology was making it harder and harder to determine what was a national intelligence system and what was local, or tactical, intelligence. After all, in the days before communications satellites, before jet airplanes, tactical intelligence was a scout with Kit Carson out on a horse, and it took about three weeks by Pony Express to get a message back to President Buchanan or whoever it was in Washington, whereas now the guy in the Fulda Gap in Germany can get

the message back instantly, encrypted, to the Pentagon Command Center within 2½ seconds. Now is that guy at a tactical level, or a strategic level, or what?

So we in the Appropriations Committee coined the phrase "national/tactical interface" (Figure 1) to describe this, and to visualize the total amount of money the United States is spending on intelligence. We believed that the national people can help the tactical people, and vice versa. Just about everybody could agree on the extremes — that such-and-such an asset is national and doesn't have any value to the local military commander, that some other asset is tactical and has little relevance to national — but there was this gray area in the middle, the interface, where it could go both ways. The SR-71 is an example. It can take very fine grained analysis over a particular spot in the Sinai, fly down the Suez Canal and count everything — or it can go up to altitude and it can photograph half the Soviet Union in less detail in a one-hour pass. It depends whether you fly high or low, put in fine- or coarse-resolution film. And with modern communications it can be gotten in real time back to the President, or to USAFE — depending on which way you point the satellite dish. Technology is making these problems more and more difficult to sort out. It seemed to us that the only sensible way was to put the whole box together and start to define these interfaces and say where they should go.

Does that save you any money? Well, maybe in the end, because if the SR-71 guy knows about the satellite and vice versa, you may be able to buy a few less SR-71s, or a few more satellites or whatever. Fundamentally the problem was to make sure the right information got to the right person no matter who collected it, so most of the things we dealt with were interface problems of a kind that are unique to C³I. Air Force F-15s don't compete very much with Army Cobra helicopters. F-15s are engaged in aerial dogfights with MIG-23s or MIG-25s, and a Cobra can't go after a MIG-23 or vice versa — though we are starting to change this in the Air Force. The F-15 was built primarily as an air-to-air fighter, and it couldn't compete with the Cobra for close air support for an Army ground unit. A ship doesn't compete with an Army field kitchen. So it's mostly in C³ where you have this competition across the services.

Furthermore, C³ has the most common technology. There is all the difference in the world between Huey helicopter technology and SR-71 technology. But an IBM 3033 computer can do all sorts of things depending on where you apply it and what kind of software you put on it. I think that's why C³I has so many more fights. We see this in our corporation. The management information system is where most of the bureaucratic battles in private companies are fought — because, after all, how you put the management information system together determines where the profit centers are. The measures of internal investment, internal rate of return, all of that, can make a tremendous difference in your bonus, depending how you set up the management information system. The same analogy holds true in the C³ arena. If you let everybody have his own C³ that's one thing; if you concentrate it all on the flight deck of the aircraft carrier or in the National Military Command Center in the Pentagon, you have a different bureaucratic power relationship and some three-star generals are up while others are down, depending upon where you place it.

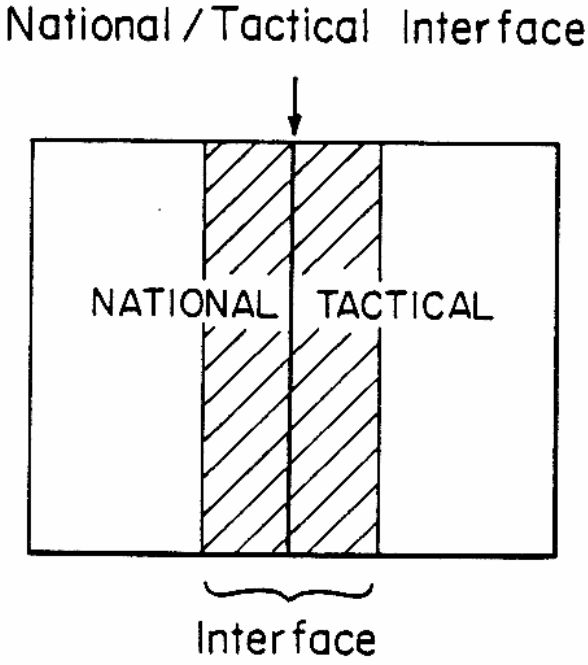

Figure 1. National/Tactical Interface

For example, the military decided that the Space Shuttle was becoming so important that they couldn't depend on NASA at Houston for its command and control. They needed to have military control, a Central Space Operations Center, and they proposed to put it in Colorado. Why do they want it? You can work the Shuttle with one command and control center, but it will be controlled by NASA civilians. So the Pentagon proposed to have two Shuttle control centers — even though one in the purely technical sense would do the job — so that the military could control the Shuttle when they wanted to use it. And why is it proposed to place the military Shuttle control center in Colorado? Two reasons. First, Gary Hart was Chairman of the Senate Military Construction Committee, and he happens to be from Colorado. Secondly, NORAD is in Cheyenne Mountain in Colorado, and with the demise of the air-breathing bomber threat NORAD's role has not been clear; if they could put the Central Space Operations Center under the NORAD umbrella, an organization which was going down in bureaucratic prestige (what had been a four-star general had been demoted to a three-star general) they could justify going back to the four-star level, could start to be on the leading edge of technology again. I'm never sure in my own mind what all that means. Is that a technological imperative? A bureaucratic imperative? I'd say it's a little bit of both, with some congressional logrolling thrown in.

Oettinger. Another common argument that has come up is that within the services, relative to the hardware, the weapons, etcetera, the role of the command, control and intelligence systems tends to be downgraded, and that within the services C'I gets the short end of the budget stick. Does that ring true to you? And to what extent did the battles that you were involved in have to do with adjustments across service budgets between weapons and command and control systems?

Snodgrass. I fundamentally don't believe that the problem of command and control is budgetary. If this country can't buy a good command and control system for five billion dollars I don't think it can be bought. I feel that even more strongly having come into the private sector. My company runs large regional data centers and we run them at extraordinary levels of efficiency — exceeding the advertised capacity of the 3033s. The reason is that we're driven by the bottom line, and we don't have the sort of bureaucratic imperatives that say "I want to run my own computer even if it is more expensive than sharing a computer with someone else." We have done extensive cost-benefit analysis and found out conclusively that's its cheaper for us to lease 500,000 miles of AT&T long lines and ship all the data into Dallas no matter where it is coming from, do the massaging in huge, very efficient central processing units and ship it back out. Because we are driven to make the biggest return on the dollar we do it the way the technology says it should be done, period. And we couldn't care less whether its done on Joe's computer or Moe's computer or whatever. So I don't think that lack of resources is the reason this country has not been able to build an effective command and control system. I think it's more the non-budgetary issues: fighting for turf, the separation of the military Services, the competition between the civilian and military sides of the Pentagon, and with the civilian agencies such as NASA.

After all, many military commanders think the worst thing that ever happened was the establishment of the National Military Command Center in the Pentagon, which in essence wires up Washington with the whole world, in real-time, with secure voice. The field generals in many cases have been delighted that it has taken so long and has been so inefficient and didn't work because, again, what fun is it to be a four-star general, head of CINCPAC, if any time a real war starts Lyndon Johnson goes over the bombing list every night and tells you what you can or can't bomb? You didn't go to West Point 25 years ago and train your whole professional life to have somebody look over your shoulder. So C³ is impinging on the relationship of field commanders to the National Command Authority in ways that were never possible before. And you can find very respectable military opinion which says that the Iranian raid failed because the commander is so busy looking back over his shoulder and talking to Washington under the spotlight that he isn't able to take the chances he needs to take.

Student. We had a talk from General Cushman, who would have supported that view, but would have said it a little differently. He'd say that sort of system is relieving the field commander of the responsibility. He no longer has the personal investment. It's not that his pride is being hurt, it's ethos.

Snodgrass. I noticed that in one of your papers* you talked about the combat electronic warfare intelligence (CEWI) battalions the Army set up. CEWI was sort of the reverse. In my opinion that is where we finally got the organization right. We decided that Army divisions needed to have an integral combat electronic warfare intelligence capability all in one place. But you had to fight the old-line organization, the Army Security Agency, which for years had had the "stovepipe" — their own line to their own general in Washington who handled all that. Any time things got rough with the division commander the Army Security Agency person could just thumb his nose at the local commander, go around him to Washington, and the general couldn't control it. The Army Security Agency came to the Congressional Appropriations Committee saying, "This is terrible, they are breaking us up." And we said, "No, we think intelligence has no intrinsic merit. It's right that the division commander, who has all the responsibility for fighting the war, also has control over you people." The Army for years had neglected investing in sensors, so in essence, for about five years, we had a marvelous conceptual organization but if we had gone to war there were no sensors for CEWI battalions to fight with. So there budgets did make a difference, and there the Appropriations Committee was relatively generous in terms of letting them have more money to procure sensors with.

A similar point: the Russians were really ahead of us in electronic warfare, because they had both the organization and the budgets in place ten years before we did. They arrived at essentially the same radio electronic combat concept that the US Army came to ten years later. They started pouring the money in ten years ago, so we started out behind in both organization and budgets, and it's probably going to be 1985 before the US Army

*"Re-shaping the American Military Intelligence: Decisions for the 1980's," C. Kenneth Allard, in *Seminar on Command, Control, Communications and Intelligence. Student Papers — Spring 1980.* Program on Information Resources Policy, 1981, pp. 159-208.

really has both the right kind of sensors and the right kind of organization. The only reason we're even going to have it then is the Arab-Israeli War in October 1973; the Israelis nearly lost the war because the Egyptians were using the Soviet radio electronic combat concept, and that finally woke up the US Army to what was happening This was before 1975, when the Congress wasn't really looking at the Army Security Agency organization. They had gotten just about what they wanted, but they didn't have any organizational concept that made sense, and they weren't spending the money on the right kind of equipment. I guess my biggest concern about what's happening to the defense budget now is that it's possible to spend 225 billion dollars a year in very stupid ways and not really increase the US defense capability at all.

Fundamentally through the years one of the things the Appropriations Committee was trying to do was say, "Let's step back and look at organization, and where technology is going, and relationships, and stuff like that. Let's not just throw money at the problem." So, for example, when we started looking at the National/Tactical Interface, we established something called the Intelligence Community Staff. That didn't cost much money. We spent $2 million for a building. Why did we buy a building? Because until then, to the extent that there was any oversight of intelligence agencies, it was done from CIA headquarters. Well, you can imagine how you would have felt as a Defense Intelligence Agency or National Security Agency person when someone said, "Hey, we're going to have a discussion on what we should do for the Intelligence community budget. Oh, by the way, it's going to be out at CIA headquarters, and the head of the Intelligence Community Staff is a CIA guy." You might think you wouldn't get a fair shake in that kind of deal. So the Appropriations Committee established this Intelligence Community Staff. We gave them a new building. (There is a saying in Washington called the Golden Rule: he who has the gold, rules. When they were getting their budget from the CIA it wasn't clear that they were going to say adverse things about the CIA even if they were justified.) We gave the Intelligence Community Staff about $2 million and subtracted $2 million from the CIA budget so there was no net change. For $2 million, which was nothing in a multibillion-dollar intelligence budget, the Appropriations Committee made a major change in the way intelligence was organized. Moreover — and this didn't cost a dime — the Intelligence Community Staff had been staffed exclusively by people on detail; the National Security Agency would send a person to the Intelligence Community Staff for two years and then they would return to NSA. Well, if a guy knows he's going to have to go back to home base in two years, he may not want to give really critical reports on the National Security Agency while he's working at the Intelligence Community Staff, because he's afraid he might not have a home to go back to if he does that. So we said that at least 51% of the Intelligence Community Staff had to be manned by full-time bureaucrats who got their salary from the Intelligence Community Staff. In our company Ross Perot makes sure he owns 51% of the company no matter what we do, so that he can have ultimate control. We used the same idea for the Intelligence Community Staff.

What came out of that? Executive Order 12306 basically came out of the Intelligence Community Staff; Stansfield Turner started running the budget through it. So we started getting the budget under control. The real issue wasn't money, but control; the real issue was independence — what would happen if you put the money in one organization rather than in another organization.

Another example in which money really wasn't much of an issue is Beta.* Beta was just a large computer program with very sophisticated software, an all-source black box. Different sensors — an SR-71, a forward observer, a human spy, whatever — would all input their data into the black box, and out would come one answer: "There is a target at such-and-such coordinates; put an artillery shell on it." When they came to the Appropriations Committee they wanted to do that just between the Air Force and the Army. We thought even that was a revolutionary improvement, and a right step; and we didn't think it would have taken place without the National/Tactical Interface pressure we had brought to bear. The Appropriations Committee looked at it and said, "Well, where are the Marines and the Navy? If we fight in the Mediterranean all four services are probably going to be fighting the same war." We noticed that only tactical intelligence units seemed to be involved, and asked: "Where are all the National Intelligence assets?" And so in a $50 million program we added something like $2 million to put in a couple of Marine and Navy officers, a couple of Marine and Navy sensors, a couple of National sensors. And yet there was a huge battle because, again, there is still resistance to making everybody play with everybody else. It didn't cost much money to do that, but the end product will ultimately be far more useful than what would have happened if the Appropriations Committee had let nature take its course.

I have more examples. There was a new aircraft called the TR-1, which is an updated version of the U-2. There was an Army aircraft called Guardrail. Both aircraft could do signals intelligence, both were essentially oriented toward tactical intelligence. So here were two aircraft both with somewhat similar missions. It took enormous pressure from the Appropriations Committee to get the Air Force and Army to put in ground processing units that could process the inputs from both aircraft. The incremental cost of being able to process both SR-71 and Guardrail data was only about five or ten percent, yet that small incremental investment would double the amount of intelligence you could get.

Student. It also doubles the amount of manpower you'd need.

Snodgrass. Yes. Both sides would be unhappy otherwise. Right, and we did other nasty things. It used to be that the Appropriations Committee would hear everything serially, so you'd hear the TR-1 advocate, and then four weeks later you'd hear the Guardrail advocate. And, you know, congressional hearings are kind of a mess, because members are running in and out and there are quorum calls, and all that. It's hard enough at best to get a consistent thread. It seemed to us as if the TR-1 guy had said this and the

*Battlefield Exploitation and Target Acquisition system; see Raymond Tate, "Worldwide C³I and Telecommunications," *Seminar on Command, Control, Communications and Intelligence. Guest Presentations — Spring 1980.* Center for Information Policy Research, Harvard University, Cambridge, Massachusetts, December 1980, page 35.

Guardrail guy had said that and now we weren't sure — so we came up with the brilliant idea, "Let's have one hearing and have the TR-1 guy and the Guardrail guy in the same room at the same time." And then if the TR-1 guy says Guardrail can't do this, we'll turn to the Guardrail guy and say, "Okay, now, show us whether you can or can't do it." I mean, there was blood on the floor, and when they were in the same room at the same time they were forced to admit more and more. That didn't make us very popular, because they had orders from their generals to get an Army system, or an Air Force system, and not an integrated, combined system.

That was so successful that we started doing the same thing for the Space Shuttle. The Shuttle was a bureaucrat's dream; NASA was going to develop it, but the military was going to be its major user in some significant sense. So any time anything went wrong, NASA would point to the Defense Department, and vice versa, and you could never get the blame sorted out. And that was compounded in Congress, because the HUD/ Independent Agencies Appropriations Committee did the appropriations for NASA and the DOD Appropriations Committee did the appropriations for the military part of the Shuttle, so we finally said, "Let's get Bob Frosch from NASA and Bill Perry from the Defense Department as joint witnesses on the Shuttle, and let's have the Appropriations Committee for Defense and the Appropriations Committee for HUD/Independent Agencies hold a joint hearing," which had never been done before.

Oettinger. How did you pull that off? Because turf problems for most committees or subcommittees in Congress are every bit as formidable as the interservice problems you describe.

Snodgrass. I agree. I guess I have to say that occasionally there are statesmen. Eddie Boland from Massachusetts (really a distinguished congressman; in my view you in Massachusetts have one of the best congressmen in the country in Eddie Boland) and Joe Addabbo from the Bronx in New York, for some reason, were both able to rise above individual jurisdictions and have a joint hearing. As a matter of fact, the only thing that was difficult was to come up with the idea in the first place. The minute we mentioned it to Boland and Addabbo, they thought it was a fantastic idea, and why hadn't we thought of that ten years ago. Those first hearings, I guess it was three years ago now, were the first place on Capitol Hill where the problems of the Shuttle, the tiles and so forth, came out. Again it shows you the importance of the informal structure versus the formal structure. It's my belief that the most important thing that happened in that whole deal was not the hearing itself, but what happened before the hearing, when for the first time the Executive Branch realized that it could be caught in inconsistencies. We know for a fact that the top-level people in NASA and the Defense Department got together three or four days before the hearing and got all their stories coordinated. The Defense Department took many of the security wraps off so that Frosch wouldn't be embarrassed if it was a classified hearing, and vice versa. They traded information that, because of the bureaucratic imperatives within the Executive Branch, had not been traded in any significant detail for a long time. We had accomplished a major objective before the first question was ever asked at the hearing. And the same was true on many of the National/Tactical Interface issues; we used the same strategic kind of approach. Where we had had the Chief of Staff of Army Intelligence testify, then the Navy, then the Air Force, we started having joint hearings in which we had all three of them there together plus Bobby

Inman, the Director of the National Security Agency. Then if NSA said that Army couldn't do this or that, we'd turn to the Assistant Chief of Staff of the Army and say, "We've been giving you x million dollars a year to do this; are you wasting this money?" and so they had to get together prior to the hearings to prepare to get their answers somewhat coordinated.

Actually, the three assistant chiefs of staff didn't get together — but their staff people who were preparing the testimony had to get together, and that's just as good as getting the chiefs together because the ideas permeate up from the staffs. Because it was a joint hearing they had to read the Air Force guy into all the Navy secrets and Navy had to read the Air Force into their secrets, because otherwise there would have been security violations across the interface. So, again, the security walls were broken down in order to prepare for the hearings before the House Appropriations Committee. And that in itself had a positive result because once they found out what each other could do, they weren't about to give up because it was pretty interesting and sexy and all that sort of stuff.

Oettinger. Could I get you to argue with yourself between two different hats? Approach that same thing that you just described wearing your Assistant Secretary of the Air Force hat. Would it be accurate to caricature you as saying, "Those bastards in Congress not only mucked around with the price of buying something, but also put the muscle on you to force you to change your specs so that now, instead of having something that would work well for your mission, you have to compromise your mission to get maybe half the loaf, or a quarter of the loaf, and what were those micromanagers doing not just trying to save a few bucks, but screwing around with the very essence of your job?" Am I distorting the point? Would you have made that extreme argument on the other side?

Snodgrass. Well, I was in the Congress eight years and an Assistant Secretary of the Air Force for only ten months, so it's hard for me to make that switch, and you asked me to emphasize the congressional point of view. Having said that, I, as Assistant Secretary of the Air Force, was trying to do many of the same kinds of things within the Air Force. It turned out that Logistics Command didn't talk to Systems Command, and they didn't talk to the Intelligence folks, and I was trying to use the same kind of techniques even within the Air Force.

I personally believe — it's my management style — that outside kibitzing probably ends up being more good than bad, no matter what. It just makes you respond and think and reevaluate. I can't find any areas where we in Congress did any fundamental damage to the military posture of this country; in fact, I think we improved things, because the Appropriations Committee had a national perspective that was above interservice rivalries.

I'll make this point: one of the things that's unique about the Appropriations Committee is that it is responsible for the *entire* federal budget, and it has overlapping subcommittee jurisdictions. So Mr. Addabbo would get up from his Appropriations Committee hearings on Defense and walk over to the Appropriations Committee hearings on Foreign Aid, leave the Foreign Aid hearings and go to the Appropriations Committee hearings on

the Drug Enforcement Administration, Treasury Department, and so on. So he was very aware that five million dollars in drug enforcement was a very big amount of money and could buy a lot of agents, while on some of these big military systems it was getting you the last tenth of one percent of the signal or something. And he started to raise questions: "On the margin, is that last five million bucks better spent on getting more Drug Enforcement Administration agents for the streets of the Bronx where I live and which are overrun by heroin pushers, or on getting the last little bit of that signal which probably is going to end up in the wastecan anyway because there isn't enough money to process it?" I've been on both sides of the fence, albeit much longer on one side than the other, and I never felt that the congressional intervention, overall, was anything but good.

I might say that another witness, Secretary of the Air Force Mark, has often told Congress that he thought that the intelligence capability of this country had been strengthened, not weakened, because of the increased congressional involvement in the intelligence budget. He mentioned a couple of things. He said that we had helped break down many of the barriers that I've been talking about: interservice barriers, security barriers, technological barriers, that sort of thing. He also said he thought that the great difference between the American system and the Soviet system was that we are much more flexible and responsive to changes in technology, in military strategy, whatever — because, after all, they've had the same head of the Soviet Navy for twenty-five years. Now, if that commander makes right choices that can be a very powerful plus, but with technology changing so quickly it's more and more unlikely that the same kind of technological imperative will last for long periods of time. Secretary Mark thinks that the give-and-take between Congress and the military makes them sharpen their intellectual arguments, makes them examine their assumptions.

Oettinger. Except, though (to go back to your competing aircraft question), to the extent that you force uniformity, aren't you reducing some of that free-spirited experimentation? In other words, one man's duplication of effort may be another man's creative flexibility in experimentation.

Snodgrass. Well, we weren't making them have common aircraft or common sensors, we were making them have common ground processors, and essentially all that meant was a bigger computer. Conceptually they were going to get all the ground processing they would have gotten anyway on a TR-1. They were just going to be able to ground-process a Guardrail too — and in fact, in that instance, we weren't decreasing the cost, we were increasing it by 10%. In Beta we increased the cost, we didn't decrease it.

Student. To follow up on what Professor Oettinger asked, I wanted to ask you to back up to the role of Office of Management and Budget examiner. Looking at the defense spending situation with the two aircraft and the ground sensors, do you think the OMB examiner would have worked as well as the Appropriations Committee?

Snodgrass. No. It didn't, and for one fundamental reason. The OMB process is done much more out of the public eye. You never read about the OMB, but you can turn on the

seven o'clock news and see Uncle Walter* showing a picture of Congressman Addabbo beating Davy Jones, Chairman of the Joint Chiefs of Staff, over the head about the aircraft carrier or whatever. The ability of the congressional staff and the members of Congress to ask questions in a more or less public forum puts much more pressure on the senior Executive Branch officials than when an OMB budget examiner is asking the same questions, essentially in private. In fact, most of the process I've described does take place at OMB, but it is done behind closed doors and is therefore a less powerful tool.

As an aside, one reason that I was such a target, and was perceived either positively or negatively depending upon which side you were on, was the fact that, because it was a new area, the members of the Committee gave me extraordinary authority as a staff member to actually interrogate the witnesses. When I was on the Agriculture Appropriations Committee, where things were more in hand and had been done in an extensive way for many years, Mr. Whitten knew everything that had ever taken place in the Agriculture Department. I wrote questions which he read or did not read at his choice; I was never allowed to directly interrogate the witness. Whereas the intelligence and communications issues were new to Congress and nobody knew anything about them, and I was given extraordinary powers to interrogate the witness. If you've looked at many of the hearings, 75 to 80 percent of the total questions asked were asked directly by me in my name with the members listening. That was particularly true in the first couple of years, when they literally knew almost nothing about the subject. The ratio was probably about 90 to 10 percent in 1975; it was probably down to 60/40 by 1980 when I left the Committee, because they were beginning to understand and be able to ask their own questions.

Oettinger. Why couldn't you in a conventional fashion feed them the questions? Or were they putting you on as cannon fodder?

Snodgrass. They might have been doing that a little bit, but I don't really think so. I think it was more because the technology is so high in this area, so complex, so filled with acronyms, all that sort of thing.

Oettinger. To the best of your knowledge, it was sincere?

Snodgrass. Yes, it really was. I mean, they were starting to get questions involving something called a T-A-S-E-S, and another thing called a T-A-C-A-M-O. How do you say that? What does it mean? It was just difficult because of the use of acronyms. And I knew that TASES was the Tactical Airborne Signal Exploitation System and TACAMO was Take Charge And Move Out, and so forth. To some extent the fact that it was in public had an influence — they didn't want to hear a snicker from the back row because they had said "TACAMO" wrong or something. And there was a genuine feeling that their staff experts were especially important in new areas like this, and that we could lead them through, and that once they understood it they could start to do more and more. I would

*CBS newscaster Cronkite.

guess that if the Appropriations Committee stays in this area for ten years they may well get to the point the Agriculture Committee has reached, where the staff will just be feeding the questions and not be allowed to interrogate the witness directly.

Student. Was the Intelligence Community Staff exclusively the staff of the Appropriations Committee, or did it serve other committees in Congress? How did that work organizationally?

Snodgrass. Actually it didn't serve the Appropriations Committee at all. It was supposed to serve the Director of Central Intelligence. We merely said, here's $5 million, and here's $2 million for a new building. Now we can't make you spend it, but once you put $7 million out there on the line it's awfully hard for a bureaucrat to walk away from it. We put it in a separate appropriation so he couldn't use it for anything else. The appropriation clearly said, $5 million for Intelligence Community Staff only. They went out and built their building and got their staff in place, and then the normal bureaucratic inertia took over.

Oettinger. Actually this thing has a longer history. The President's Foreign Intelligence Advisory Board had been after that for years and years because the former US Intelligence Board (which was kind of a committee which was nominally chaired by the Director of Central Intelligence) was the world's most ineffective debating society. Apart from any power base in Congress, such as was provided by the post-Watergate emergence of the Intelligence Committees, there wasn't a thing the Executive Branch or a President's office-based thing like the President's Foreign Intelligence Advisory Board could make stick. It surfaced in damn near every administration since Kennedy, but just never had the muscle for want of $5 million and a bit of congressional initiative. Only the legislature can give orders of that sort, and appropriate money.

Snodgrass. That's a very good point for most of the issues I've been talking about. Almost all of them have been around for years, unresolved in the intelligence community. They're not idiots in the intelligence community — far from it — they are the most intelligent, farsighted members of the civil service. I don't think there's anybody who even comes close to the people who staff the National Security Agency, for example. They are probably the most advanced users of computers in the world, period. Much of the technology in the civilian sector today was first developed inside the National Security Agency for cryptographic purposes; the space program and the cryptographers are the ones who made computers what they are today. So it's not that they are dumb, it's that they're victims of bureaucratic inhibitions. And we started bringing all those inhibitions into the open. Some of the stuff we did in relation to the National Security Agency related to arguments that had been going on since Harry Truman, literally. And as a matter of fact, talking about good guys and bad guys, I think you could just about get the National Security Agency to raise a monument to Chuck Snodgrass — because we finally gave them what they had really wanted ever since Harry Truman. On the other hand, other parts of the intelligence community, where they had successfully fought off the National

Security Agency for all those years, think the finest place in Purgatory should be reserved exclusively for Chuck Snodgrass and the Appropriations Committee.

So you are right: it was the muscle; and though they did ignore a lot of what we did, we just kept saying, "No play, no money," and that's the most persuasive argument you can use. Finally the gold started to rule, and when they found out after two or three years that they couldn't beat us, they decided they'd better join us. And then all these things started falling in place. And now the Intelligence Community Staff will probably go on forever, because where there is a building, there is a bureaucracy.

Oettinger. It will fall prey to its own perversions. And then we'll have to purge it and reinvent something more decentralized to avoid the arrogance and arteriosclerosis of one central funnel for the intelligence community.

Student. You mentioned the C^3 role in which commanders were in contact with Washington. Could you describe the communications net which was operating?

Snodgrass. I can't describe it precisely, for security reasons among other things, but I can say generically that with the advent of communications satellites and various other technologies — digital communications, secure voice, switching technologies, all of that — it's essentially possible to have that kind of linkup by means which vary depending upon the mission, the terrain, and the degree of security, encryption, and real-time access needed. All those things are variable in the equation. I can by some means or method enable the President of the United States to talk to anybody in the US government anywhere in the world, if you give me adequate time and resources. That is what technology has done, and it never could be done before. If the person the President wants to talk to is in the American Embassy, he can do it right now; he can talk to embassies in real-time in secure voice any place in the world. If suddenly there's a crisis at Machu Picchu, Peru and there is some reason that the President needs to talk to some person there, it might take more time, depending on the satellites' orbits, whether they have enough control gas to be easily moved or not, whether other satellites have to be launched, or whether there's a US aircraft carrier within range, or whatever. But the fundamental thing to remember is: if you are willing to spend the time and money, I can talk to any place in the world from the White House within 24 to 48 hours. I can talk to any place in the world by secure voice. The reason I'm equivocating is that it depends on airlift availability. If I've got a C-141 Stretch, which has the air-to-air refueling capability, and if I've got a flight crew ready, I could drop into Fort Huachuca, pick up my satellite ground receiver and go nonstop to Machu Picchu. It would depend on where the SAC tankers are that day. If they are in the right place, I can go nonstop from Fort Huachuca to any place in the world; on the other hand, if the Stretches are down and I've got to go with the regular C-141s, and I've got to land in the Azores, refuel on the ground and take off, and I can't get refueling rights from the Portuguese because they don't want us involved in Israel or wherever, it might take me three times as long. But sooner or later I can get there with real-time secure communications.

Student. I was more interested to know whether Beckwith was in direct communications with the Pentagon.

Snodgrass. But analytically it's really irrelevant.

Oettinger. No, General Cushman in his description of the Korean tree-cutting incident made a great deal of the fact that, although this capability was in place, there was a reasonable amount of care not to do too much skip-echeloning. At least that was his sense from where he sat. I think the question is really how much is too much.

Snodgrass. What I said is not inconsistent with what John Cushman has said. The primary objective of US communications forces right now is what is called "transparency." "Transparency" means I will secure your speech or your teletype signal no matter where it goes, and I can send it anywhere. How I do it technically is "transparent" to the user. He won't be able to tell the difference. In the broadest strategic sense that's where all the real front-line communicators in the United States military are heading. They use the word "transparency" to mean that they want the technology to be totally invisible to the user, so that all he thinks he does is pick up a phone and talk to whomever he wants. It's none of his damn business whether it goes through a cable, a satellite, a tropospheric scatter device, a commercial communications satellite, a military communications satellite — it's none of his business how we scramble it, how we unscramble it, all that. You come to me as a user and tell me you want a communications system with secure voice, and I'll give it to you any place in the world. All you have to tell me is how much time I have and how much money there is to do it with. All that is becoming possible because of technology.

Oettinger. What about the choice that is made to link high and low levels in such a case, as opposed, say, to the Korean tree-cutting incident, where they fairly carefully kept the Secretary of Defense and the President the hell out of the loop, and directed the action from a lower level with more regard for intermediate levels of command?

Snodgrass. That is a management decision, not a technological one. We currently have the capability in the United States military to put in a transparent system, so that Harold Brown could have talked to the commander in real-time secure voice if he had wanted to. And I believe that over the long haul the bureaucratic imperatives of that are so great, and the technology is making it so easy, that what Cushman cited will be the exception rather than the rule.

Oettinger. In Lyndon Johnson's day it was quite the other way, and Cushman described the Korean tree incident as an indication of increased sensitivity to avoiding the Johnsonian style. So the important question is: does the technological potential inexorably govern the institution? Or is the institutional command choice exercised independently? You seem to be saying that if the facility is there it's going to be used.

Snodgrass. In the budgets for the last ten years, the military communications systems have been directed towards transparency, and there's no indication that the Reagan budget is backing away from it.

Student. I've just been reading about this, and we're talking, I guess, about AUTOSEVOCOM and AUTODIN 2, the Automatic Secure Voice network and the second version of the Automatic Digital Network. But the Defense Advanced Research Projects Agency has a new project that is looking at interlinking communications nets based on a datagram concept. The datagram is a message that carries the destination with the message. So you just pump it into the system and whoever receives the message knows where to send it. But they are also looking at the possibility of adding routing information so the source can specify, for instance, that it not go through Cairo. I mean, this is the possibility of that kind of system. Now the implementation, of course, is up in the air.

Snodgrass. Let me just make a couple of quick points. I won't give you all the song and dance behind them. First, I believe, after spending six years at very high levels, very intensively looking at the C³I issues, that the most important issues are in fact not in dollars — there are more than adequate dollars available to solve the problem. The real issues we've been talking about are organizational — cross-service rivalries, what technology really means, that sort of thing.

Secondly, I believe that the most overlooked issue is production, and that we're collecting far more intelligence than we know how to assimilate, to make into usable information for decisionmakers. And that the really significant marginal returns will come from buying more analysts, giving them authority, if they're an Iranian specialist, to go off and learn to speak Farsi, to go live for two years in Iran — and then, when all this marvelous technical collection stuff collects intelligence, we will have analysts who will be able to tell us what the raw data mean.

Production has not been emphasized enough in intelligence, because it has the same problem as C³I in general. It's hard to "show and tell" an intelligence analyst; you know, what do they do? They bring five people in and say, "That's my Iranian specialist, and that's my Korean specialist, and that's my Chinese specialist," and they all look sort of ordinary. But they can bring in the latest hand-held digital communications device and jeez, that's amazing! You mean to tell me that you can communicate halfway around the world in real-time secure voice? Well, we'll buy those. Hell, we've got plenty of those specialist people, we don't need them, but this sexy new piece of technology, let's get lots of them!

I think that's the overriding issue right now, specialized technology. You know, it used to be that the change from one generation to the next was from "I can collect one" to "I can collect two." Now, typically, it goes from "I can collect one" to "I can collect 20" to "I can collect 2000." It's no longer a nice orderly slope, it's an exponential growth in the ability to collect, and there's no way that we're matching it with exponential growth in the ability to produce.

I think that at some point in your course you should look at the Brooks Act and the Paperwork Reduction Act, which regulate how the government can buy computers. In essence, at least in my opinion, we buy computers in ways that make no sense. I wish I had more time to talk about it. We essentially buy computers on the basis of hardware cost when, in the current systems, hardware is about 20 per cent of the cost and software is about 80 per cent. Yet, for historic legislative reasons, we let that 20 per cent tail drive the 80 per cent dog. I think many of the failures you see in government command and control, communications, and computer acquisition are directly related to the Brooks Act. And I can assure you that in the private sector we do not procure computers that way.

As a matter of fact, the biggest problem I had when I was Assistant Secretary of the Air Force responsible for computers was trying to convice highly skilled and reputable private sector computer managers that the government did it that way. The reaction always was "My God, you must be kidding. You can't possibly do that."

My favorite story: when I asked a very senior industrial person whether he leased or bought his computers, he said he leased them, because they had just gotten a 3033 and it was already an obsolete machine, and they didn't want to be stuck with it. Yet we had just had absolute champagne parties and everything else a couple of months before because SAC had just gotten its first 3033. And I think many of the problems are traceable to that.

I also think there is an industrial base problem which is going to get severe in some parts of government communications. Once Texas Instruments didn't mind making highly reliable spacecraft parts — you had to make 10,000 silicon chips to get two which met all the requirements for a spacecraft because you couldn't go up and repair it. Now they're making "Little Wizards" for children, the profit margin is 50 per cent on their chips and they're making them a million at a time, and the Air Force comes in and says, "We'd like to buy two from you, you're going to have to make 10,000, and even if you do it we're only going to let you make eight to ten percent profit." And Texas Instruments says, "To heck with you, we're going to keep making Little Wizards." The military is having more and more trouble, particularly in spaceborne communications, maintaining an adequate industrial base.

Another organization I think you need to look at, because it plays a role disproportionate to its prominence on the organization chart, is something called the Defense Science Board. It's a technical advisory board composed of private-industry scientists who come in two or three times a year. You might say, "Well, that must not be very important," yet I would contend that it's been one of the primary technological drivers in the Defense Department, particularly in terms of the interchange of elites. It's basically a nonpartisan technological organization, and if you look at how many of those who served on the Defense Science Board have gone into the Defense Department at senior management levels, coming back out onto the Defense Science Board again, you'll see that those people aren't nearly as big a bunch of strangers as you might think. Civilian control — I think that's an issue that needs to be looked at, and many of the issues we're talking about today have to do with civilian-military control.

You'll see little about the role of the Air Staff in any of the literature, and yet as Assistant Secretary of the Air Force, the way I had to influence the Air Force was to establish some kind of relationship with the Air Staff, which was a very formalized, structured, rigid kind of organization. Yet I've read public administration literature for years, and I don't think I've ever seen an article on what the Air Staff does and how that relates to the way in which the Air Force's political appointees do or don't maintain control over the Air Force.

It's not just the government that's having this revolution. In my company we have regional data centers, we have issues of command and control. We're now starting to bid on large Defense Department procurements, and we're looking into how the EDS way of doing command and control relates to the way the Army does it. Can we transfer our method en masse into the Army? Or do we have to give them a solution that is different from what we would do internally for EDS? What you're learning in this seminar is relevant not just to the military, but to that civilian arena as well.

Oettinger. That's why we call the course "C^{3}I in Business and Government."

Snodgrass. I've pretty much covered the role of Congress. The one thing I would say (it's a weakness in your last year's papers, and you know we always felt neglected on the House Appropriations Committee) is that, for reasons that I've never understood, the Armed Services Committees seemed to get most of the attention in the academic literature. Yet if you look at the budgets through the years, most of the important changes have been made through the appropriations process, not through the authorizations process. I noticed that in your papers there were tens of dozens of references to Armed Services Committee hearings, but only one reference to the Senate Appropriations Committee. I would suggest to you that the Appropriations Committee hearings (and with the Defense Department we had over 10,000 pages of hearings and something like 12 volumes) are a great untapped gold mine for academic research.

Finally, I think the Space Shuttle is going to have a profound impact on all the issues we've talked about today, and I would encourage you to become familiar with all the arguments about what the Space Shuttle will and will not do, what it means and doesn't mean about vulnerability, and all that sort of thing, because once the Space Shuttle flies, I think you're going to see a real revolution. Until now it's been a bird in the hand versus a bird in the bush, and the Space Shuttle has been the bird in the bush; but once it actually flies, all the things that have been holding technology back — I think it's going to be like a dam breaking loose, and you're going to see tremendous changes in the way people look at these issues, including men in space who can do real-time command and control from the front end of the Space Shuttle.