Seminar on Intelligence, Command, and Control

Government Advisory Boards: Improving the Business of Government? Lessons from the Trenches
Ted M. Wackler

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Ted Wackler is currently the executive secretary of the National Science and Technology Council, a cabinet-level body chaired by the president, which is charged with coordinating science and technology policy across the executive branch. In his previous assignment, he spent two years as executive director of the Intelligence Science Board, acting as the primary liaison between members of the board and the senior government officials to whom the board reports. He was responsible for identifying topics of importance to the intelligence community leadership, posing them to the board, and following the board's studies through to actions and recommendations. Topics of recent interest included trusted information sharing, hyperspectral intelligence, scientific and technical analysis in the intelligence community, and integrated collection architectures, among others. Prior to entering government service, he spent several years at The MITRE Corporation as a senior engineer and program manager of the Environmental Task Force, chartered by then-Vice President Al Gore, which became the Measurement of Earth Data for Environmental Analysis (MEDEA) program. In this role he worked on technical issues related to the potential use of space-based intelligence collection assets for environmental monitoring, and to creation of a long-term synoptic archive for classified imagery. He began his career as a qualified flight officer in the U.S. Navy, where he served operational tours in the Mediterranean and the Red Sea. He has a bachelor of science degree in aerospace engineering and a master of science degree in civil engineering, with an emphasis on environment and water resources. He is also a licensed professional engineer.

Oettinger: You've all had a chance to read Ted's biography, so he needs no further introduction. With that, Ted, they know who you are, so it's all yours.

Wackler: I very much appreciate the opportunity and the honor of coming here to speak with you today. I hope that what I have to say is interesting at some level to at least most of you.

When I put together these slides yesterday, I got done with my title and I thought "Who would want to listen to that?" Government advisory boards, and the business of government, just sound boring. But I have worked with these advisory boards for a long time now—six or eight

years or more. I've learned a lot of lessons from the trenches about how to make these things work, and I think we can draw lessons about government in general from what I've learned about making these boards work within government as a practical matter. What I'd like to do, and what I think you usually do, is have a discussion about some of these things. I'm going to make some assertions, and I'd love to have you point out where you think I'm wrong or where you think I've missed something, talk about things I haven't put on the table, and go from there. We had a discussion at lunch that to me was very interesting and enlightening.

I'm currently in the White House, in the Office of Science and Technology Policy. There I work with a body that coordinates the S&T [science and technology] function across the entire executive branch, so we work with all the agencies to make sure their S&T issues and policies are coordinated. It's a broad range of issues. I'm brand new in that office—I've been there for about a month, so I know just enough to be dangerous.

But that's not what I'm going to talk about here today. Instead, I'm going to talk about my previous job, which was as executive director of the Intelligence Science Board [ISB]. In that job I was at the Central Intelligence Agency [CIA], and my role was to be the interface between this outside advisory board and the people in government who wanted the board to do things, in terms of making decisions about programs, budgets, missions, and that kind of thing. That's the main focus of our discussion here today: the ISB (I will call it that throughout the day). A couple of the folks here in this room know as much, if not more, about the ISB as I do: Dr. Oettinger has chaired the board for its entire life span, and Dr. Robert Fein is a very active member of the board. I hope we can talk about their experience in terms of the things they are working on and their roles as well, because I'm sure I won't capture it as well as they could.

Oettinger: You know you can't avoid interruptions from me!

Wackler: We have these government advisory boards, and what we'd like to do is have them help the way the government does business. The question is: Do they help the way the government does business, and how do they help the way the government does business?

Oettinger: What he's asking is not a rhetorical question. A couple of months ago a friend introduced me to the deputy director of a major intelligence agency. He thought it would be useful for me to have lunch with this man, because he had a low opinion of what advisory boards contribute to the republic. When I had lunch with this gentleman, his first words to me were: "Advisory boards suck." It was kind of uphill from then on.

Student: Are you making a distinction between standing advisory boards and panels that might put together special reports, like the National Research Council [NRC] or something like that?

Wackler: Some things are similar and some that aren't. I think we can all draw a lesson from each other. Not all of us who try to provide input to people in government work under the same constraints or have the same kinds of freedoms. Some, like the NRC, have a great history of accomplishment and a great bank of how to do things. They have a bureaucracy. They're an institution that advises the government and works with the national academies to provide advice to the government.

What I'm talking about is a little different. It's a little more direct, and in principle it relies on the willingness of people in government to listen. The life of the NRC, for instance, or of the national academies, does not. They're going to say what they're going to say, regardless of whether or not people in government want to listen. An organization such as the ISB has to worry about that, and we'll talk about some of the ways we have to think about that.

As a caveat, I realize that I may get too far down into the weeds here, and that I'm going to be talking about nuances that you don't think matter, so if I get that way, please bring me back up. I've worked in this world for so long that there are things that I recognize are important but I may not be making the case for their importance explicitly, so help me if I get there. I'm going to try to go through it in a step-by-step manner, but I may miss a few things.

Oettinger: The NRC is the bureaucracy attached to the National Academy of Sciences, the Institute of Medicine, and the National Academy of Engineering. If you start asking who pays the bills for the NRC, it is mostly contracts from the government, so although the academies and the NRC are nominally independent, they were chartered originally by Abraham Lincoln's administration to provide the president of the United States with the best available scientific advice. Lincoln, of course, was no mean politician. He was also a very good lawyer, who made his track record in railroad law with Chicago law firms. He understood railroads and telegraphs very well and didn't need all that much advice. So there's always the suspicion that the national academies and the NRC are essentially independent mouthpieces for the agencies that pay their bills.

If you look at my biography, you'll see that I spent four years as the chair of a computer science and engineering board of the National Academy of Sciences, which got cashiered for being too friggin' independent for the tastes of its government sponsors. So it's a delicate balance. They're independent, but somebody has to pay the bills. The aphorism "follow the money" is as valid in this realm as in any other. I just didn't want to leave you with the impression that the independent National Academy of Sciences and NRC were totally ethereal and virginal.

Wackler: On that topic, which we will hit on a little harder later on, independence is really a balance. No matter how independent you are, holding that balance is a day-to-day effort. When I worked in this job for the ISB, that was an ongoing battle.

Let's go through the overview and summary (**Figure 1**), and discuss that we have a bunch of these boards, and then we'll use the ISB as an object lesson on how they work. To do that, we'll go through the process, the substance, and the effects. The process means the details: how you make it happen, from the coffee on the table, to the budget, to all that stuff. The substance is the notion of having the right kind of expertise working on the right kinds of topics, and getting to the right kinds of results. The effect, then, is what you can convince government agencies to do, and how you can convince them. I hope that at the end of this we'll all have learned something in a practical sense about how government actually works, not just with these boards, but in general.
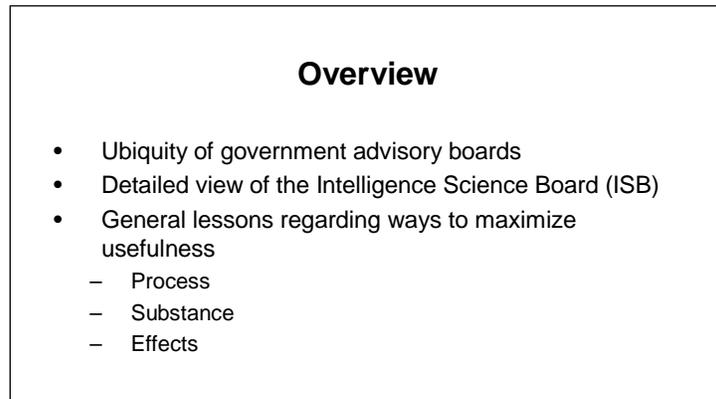
Overview

- Ubiquity of government advisory boards
- Detailed view of the Intelligence Science Board (ISB)
- General lessons regarding ways to maximize usefulness
  - Process
  - Substance
  - Effects

Figure 1

I learned three primary lessons over the last number of years working with this board (**Figure 2**). First, the bureaucracy is going to outlive all of us. It's just a fact of life, and those of you who want or plan to go into government will just have to deal with that. The earlier you learn that if you fight the bureaucracy it will eat you alive, the better off you will be. The bureaucracy is going to drive the realities of the budgets and the policies already in place.
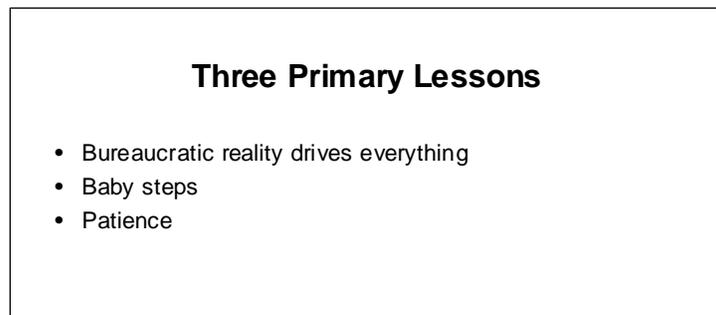
Three Primary Lessons

- Bureaucratic reality drives everything
- Baby steps
- Patience

Figure 2

Oettinger: Lest that seem excessively pessimistic or restrictive, I would argue that exactly the same words apply to a university, a corporation, or any business that has more than the owner in it. The minute you have two people in an enterprise, all the problems that Ted is mentioning arise. This is a dose of reality about human organizations; it is not limited to the government of the United States. It's just an institutional set of issues.

Wackler: In fact, one of my cautions here is that I don't want to seem too pessimistic in what I'm going to say. It may come across that way; I don't intend it to. The bureaucracies are there for a reason; on balance, they have an overall good result, and we can talk about that if you want to. It's just that you need to recognize the handcuffs they put on you. Those handcuffs go from the budget, to the policies, to the employee who's been there fifteen years and knows everybody who has already done something in the past that didn't work.

Most times when we change government, we change it a little bit at a time. The big changes often don't work. When you're under the kinds of conditions that allow you to make big changes,

such as creating the Department of Homeland Security in 2002, you often don't do it in the right way, or in a thoughtful way, and it may tend to backfire later on, which is too bad. We ought to think of this in little bitty bites, continue to work at it, and have patience. I guess that is a corollary to the first bullet, which is a reason why you have to think of the other two the way you do. I hope that at the end you will have understood that this is not cosmic; it's just the reality of having done this for a while.

This comes from a 2004 GAO [Government Accountability Office] Web site (**Figure 3**). There are roughly 1,000 of these things across the government.[1] In case you didn't know, that's a lot! The money we spend on that is also a lot.
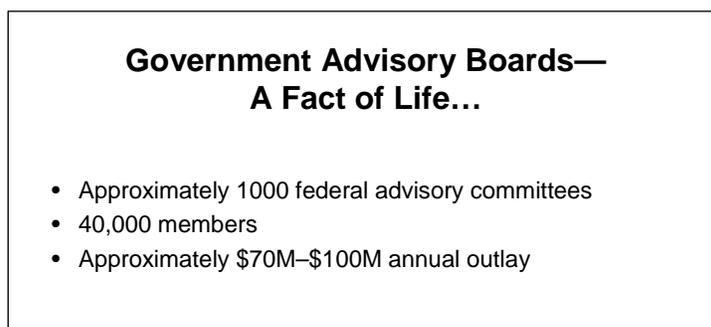
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**Government Advisory Boards—
A Fact of Life…**

- Approximately 1000 federal advisory committees
- 40,000 members
- Approximately $70M–$100M annual outlay

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Figure 3

Student: You say 40,000 people contribute time to the government and you're paying $100 million a year. I assume that covers per diem and travel expenses.

Wackler: That would be the case if they were plugged in the right way and were actually creating an impact, which is the whole point of talking about this today. If you look through the list, a number of the boards are unpaid and have no budget, so it will average out. The ISB, for instance, spends not quite $2.5 million a year.

Oettinger: Beware of geeks bearing gifts! If somebody gives advice without being paid for it, you might suspect that there may be some ulterior motive, so you need to distinguish an advisory body from a lobbying body.

Student: My point is that it's underfunded, not overfunded. These days $100 million is not a tremendous amount of money in a budget like ours. That's a very good return on your investment.

Oettinger: That should be cause for possible concern that what you're looking at is biased advice.

Wackler: Your assertion that $100 million is not a large amount of money in the federal government is correct, but if you're spending that much and you either don't know what you're getting for it or you're not getting anything for it, then you need to think about that.

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[1] A list is available at the following URL:
http://www.gsa.gov/Portal/gsa/ep/contentView.do?P=MC&contentId=14451&contentType=GSA_BASIC

The irony of this is that the boards on the list you're looking at are the ones regulated by Congress, by the Federal Advisory Committee Act [FACA], which was passed in 1972 to ensure that these advisory committees are open to the public. A number of boards, including the ISB, do not come under that law, because they work on classified issues.

These boards are everywhere. Every agency has them for a variety of things. They have more or less impact.

What do they do? In general, and in a perfect world, they help the bureaucrats understand issues outside the realm of their own experience. They help them have courage to do things that are hard to do because of policy or budget pressures. They are more or less accepted.

Bieda: I wanted to add that all of these committees go through an acceptance process. If you remember Darryl Williams's presentation, he didn't want his organization to look as though it was, or was trying to become, some kind of federal advisory committee. They had to pay close attention to not doing what a federal advisory committee would do so that they didn't fall under the FACA legislation, because that's not what his program was intended to do.[2]

Oettinger: He was very modest about what I thought was a stroke of genius: erecting an advisory apparatus for U.S. Strategic Command as an FFRDC—a Federally Funded Research and Development Center: an odd duck that quacks out of tune but just happens to fit his needs. Going back to Ted's point about small things, details are enormously important. You may think that it's a perversion for your professor to sit here and say "Suggesting an FFRDC was a stroke of genius and a work of art," but when you're dealing with miniature coloring every touch of color becomes an artistic gesture. In that world, it was a stroke of genius on Darryl's part.

Wackler: I'm going to try to make the case here that the process by which these things are arranged and put in place is as important as their substance and their political connections in terms of whether or not they actually help the way the government does business. These boards cut both ways. A lot of time they are foisted on the policymaker by the Congress or by the person above the policymaker to whom the board reports. Thus, in most places they are greeted with, at the very least, a certain amount of antipathy. I would say the average response is "Prove to me that you can help me." That's the best you can expect.

To be fair, there are people in government who recognize the difficulty of innovation, of getting new ideas into the system, of getting people to accept new ways of doing things, and they encourage outside people to come in and do that. Those policymakers, I think, are in the minority, as are the ones who generally say "No, we've got it covered. Leave me alone. I get paid to make these decisions; I don't need you guys coming in and making my life more complicated." It is important to remember that there is a good amount of negativity, because as the boards go about their business they have to deal with that.

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[2] Darryl Williams, "Combating Global Terrorism: Bringing All Elements of National Power to Bear," in *Seminar on Intelligence, Command, and Control, Guest Presentations, Spring 2006* (Cambridge, Mass: Harvard University Program on Information Resources Policy, I-06-1, in press).

There are several ways to deal with it. One is by edict: you convince the right person that you need to exist and that person just decrees "This board will exist." That's good to have. The other way is to do good work: to prove some value, whether in the short term or the long term, whether you help people to fight their particular in-box, provide some support for a pet project, or whatever. All those things can be brought to bear in helping to move the activity forward.

You might wonder about the mechanisms for how these boards plug in. Do they write reports? Do they have informal discussions with the senior people in government? Do they have retreats? They do it in various ways, from long reports that are a year or more in the making to informal conversations. All of those happen.

I like to think about the theoretical upper limit on the value that these things provide. Within a policymaker's decision space, there's only so much wiggle room. Most budgets are the way they are, and there's only a little room to move money here or there, so even at the upper limits you have to recognize that the value of these things is perhaps, in most cases, marginal. You push a little in one direction. You encourage people to think in a way they haven't thought before.

You might, in a perfect world, have a eureka moment. I've been working with the ISB for a number of years, and we've never really had a eureka moment: that is, "We've discovered the atomic bomb, and if we could just build it the world would change." The other example, which Professor Oettinger sometimes gives, is putting cameras in satellites.

Oettinger: That was Edwin H. Land, to be precise. Land, who was the founder of the Polaroid Corporation, knew a lot about optics, and suggested to President Eisenhower that a camera could be built that would take photographs of the earth from outer space, which in those days was an absolutely unheard-of phenomenon. He also had the good luck of knowing a local scientist who had used computers to trace rays of light through a lens, so that the idea could be reduced to practice by designing large enough lenses accurately enough and manufacturing them accurately enough so that the whole cockamamie combination worked. The results included first the U-2 and then the succession of satellite programs that in a very direct way kept the cold war from erupting into a hot war and our having the occasion to stick our heads between our legs and kiss our asses goodbye for nuclear reasons.

Land and Einstein, to my mind, are in that particular eureka pantheon. Einstein wrote the letter to President Roosevelt about the practical possibility of making an atomic bomb, and regardless of what you think of the ultimate consequences that did change the world. As a member of the President's Foreign Intelligence Advisory Board Land suggested that airborne cameras had a role to play far beyond anything that the aces of World War I might have envisioned. In World War I there were folks up there in single-engine planes taking photographs of the battlefield, but they weren't talking about tens of thousands of feet up and out of reach of ground-based weapons.

Wackler: At this point we move to our object lesson: the advisory board that I know most about (**Figure 4**). We'll talk about the practical implications of how to put one of these things together, how to tie it to the policymakers who want to have the advice, how to put it together so that it's most likely to be of value, and how to position it so as to be an enduring resource. These are all

things that we thought through in the past couple of years, because intelligence, as you're all aware, has been turned on its ear by legislation, by 9/11, and by the changing world we live in.
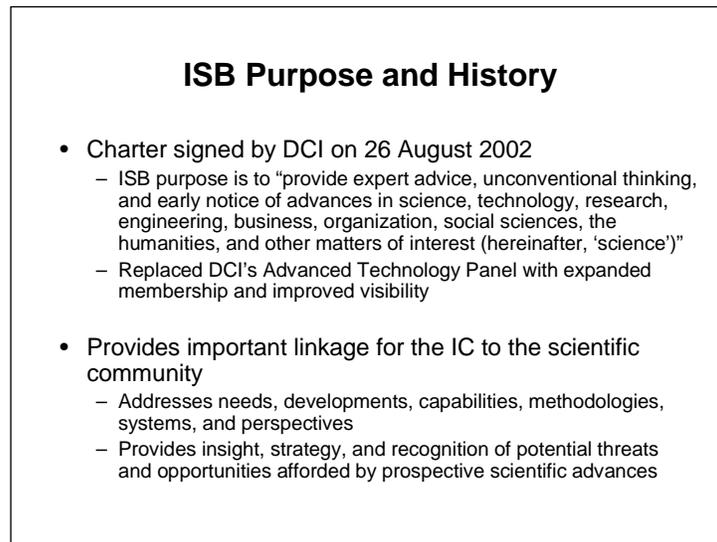
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ISB Purpose and History

- Charter signed by DCI on 26 August 2002
  - ISB purpose is to "provide expert advice, unconventional thinking, and early notice of advances in science, technology, research, engineering, business, organization, social sciences, the humanities, and other matters of interest (hereinafter, 'science')"
  - Replaced DCI's Advanced Technology Panel with expanded membership and improved visibility

- Provides important linkage for the IC to the scientific community
  - Addresses needs, developments, capabilities, methodologies, systems, and perspectives
  - Provides insight, strategy, and recognition of potential threats and opportunities afforded by prospective scientific advances

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Figure 4

If you take a thing like an ISB, and you bump it up against a group of organizations that have a great operational demand and mission that they're going out and doing every day, but are also under siege from almost every quarter, you say "What conditions would you want to have in place in an organization or a group of organizations that would make it most likely to have an ISB-like entity make an impact?" I could argue that, in the world of the ISB, now is the time to have an impact. Whether you're an innovative policymaker or an outside board that is looking out for the interests of the taxpayer, whenever organizations are in great upheaval there is an opportunity to have an impact on the way they come down. That has created a chance for the people on the ISB, and the ISB as an institution, to have an effect. The ISB is different from a lot of other boards because of that. It was conceived right after 9/11 and it has raised a bunch of issues, which I'll talk about, but it has also given us the opportunity to have an impact.

The other thing that advisory boards in the intelligence world have to deal with is the overlay of security. That is not trivial. It creates its own world of issues that the intelligence community deals with more or less well. The board has to deal with it, because, if policymakers don't want to talk to you about something, they could (I don't know that they have done this) claim that they can't tell you for security reasons.

Oettinger: Going back to your disclaimer early on about not wanting to shed too pessimistic a light on government agencies and advisory boards, I think this phenomenon is true of all organizations. Let me take banks as an example, because of my early consulting days working for New York banks. The trust department and the loan department, et cetera, do not necessarily share secrets. A consultant or board appointed by the chairman of the board or the chief executive officer to look into reorganizing this or that is not going to get the time of day from the division chiefs in bank X, Y, or Z, and if you think that the dean of one faculty would give the time of day to the dean of another faculty or a commission appointed by the president of the university then

you're being naïve. Proprietary information in a corporate entity and the family jewels of a school or department at a university and so on raise many of the same problems you mention in intelligence. Security just makes it a little bit worse. You don't go to jail for violating confidentiality in a business or a university the way you would for committing a violation of a section in Chapter 18.[3] There are some differences, but I wouldn't overemphasize them.

Wackler: It's true that any organization has the same types of issues with information being power. I would argue that the complexity is higher, but be that as it may, getting information out of people, whether there are compartments or not, is one of the things you have to deal with. In intelligence, some agency may have a secret type of thing that they think is so valuable that they put it into a compartment, as they call it. Sometimes they'll put something into a compartment even though it's really not very special, and it's hard to get out of that compartment.

What are the main roles of a group like an ISB? There are a couple. In intelligence institutionally it is difficult to engage intellectually with your peers on the outside if they aren't cleared. There are people who might have interesting ideas about the things that need to be done inside the agencies, or how to do them, but you can't speak with them because of security. All government has that problem, because the incentives to reach out are hard to find. In the intelligence world, the incentives against reaching out can be large, so a board like this might help you reach out to people on broad topics, such as biosecurity. There are aspects that the intelligence world has to deal with in a classified environment, but the world of biosecurity is influenced by experts in fields from informatics to any kind of biology. I'm not expert in that area, but it's clear that the intelligence experts inside the community would benefit from knowing more and learning from their peers in the open world about those kinds of issues. A board like this might bring in experts from that world and make that interaction happen. That's an example of something we've actually done in the recent past.

The notion that new technologies, or new ways of doing business, are difficult to insert in the government probably won't come as a surprise to anybody here. There are a lot of reasons for that, including budgets and bureaucracy. It's hard to write a contract for new technology. The legacy systems make it difficult for everybody. Bringing new ideas to bear on issues is part of the ISB's role. The ISB could also help rethink the missions of intelligence; that is something else that can and should be done. The board has worked on a number of issues in the past that go through those kinds of things.

The approach with this particular board has been multidisciplinary. The world of intelligence requires every discipline that there is, so we need physicians, we need attorneys, we need IT [information technology] people, we need people who are experts in biology or physics…you name it. If you can think of a type of expertise we don't need, let me know. So an outside board like this might reflect the kinds of expertise needed inside intelligence organizations. This particular board has a physician, an attorney, a psychologist or two, an IT expert or three, a nuclear physicist or two, and others.

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[3] U.S. Department of Commerce, *Manual of Security Policies and Procedures* (Washington, D.C.: U.S. Department of Commerce, April 4, 2003).

Oettinger: That sounds easy to pull off, but it isn't. History and bureaucracy have something to do with it. Because World War II ended with the dropping of the atomic bomb, and the next fifty years were dominated by nuclear standoff with the Soviet Union and the cold war, agencies—the intelligence agencies among them—and their advisory groups were essentially dominated by nuclear physicists, who understood bombs, and then later by mechanical folks who understood ballistic missiles, especially the intercontinental variety. So these things have their reasons, but the echoes of the cold war, like the echoes of almost everything, hang around longer than one might wish in a bureaucracy. Again, this is true also of universities, where tenured professors who specialize in what are no longer desirable subjects may have been around longer than the president of the university would like. If you followed some of the debates about President Summers, the rejuvenation of the faculty has been one of the topics in the university. You can have your views about what happened, but I keep trying to make the point that these pathologies are not unique to the intelligence community. What Ted is talking about—the diversity of disciplines that might be relevant to the conduct of intelligence affairs in a post-cold war, still somewhat foggy period—is not as easy as it might appear because of the entrenched interests.

Because of another aspect of history, even when you win the battle over diversifying the skills on a board like this to reflect the reality of a complicated, multipolar world, you may not necessarily be able to recruit them. One example would be people in anthropology. Why would one want to have anthropologists involved in problems of intelligence? The answer is writ large in our adventures in the Middle East, where so many mistakes have been made as a result of the lack of understanding of cultures that are different from our own. The study of cultures is one aspect of some branches of anthropology. Why would it be hard to recruit anthropologists? Because anthropologists do field work; they do it in strange places, often in isolation, and if they would like to stay alive in the back woods of country X or Y they would really rather not be, or have been, associated with an intelligence agency. So there are disciplines where, for perfectly understandable reasons, recruitment is hard.

So again, back to Ted's point, there are a lot of details, and you've heard this from the preceding speakers as well. You heard it from Gordon Lederman about budgetary issues; you heard it from Darryl Williams on organizational issues.[4] The devil—or god, depending on your view of the world—is in the details, and we should be very thankful to our several speakers, including Ted, for taking us down into those details, which is precisely where textbooks and the press leave off.

Wackler: The other reason why it's hard to pull off a multidisciplinary board like this is a kind of corollary to the notion that academics, or people from different kinds of fields in general, don't always understand each other. As I mentioned, we have an attorney on the panel. I'm an engineer, and I'd never been around attorneys much in my life (maybe that's good, maybe it's not). Engineers speak in equations: equal to or not equal to, and that kind of thing. When I was listening to him one day it startled me to realize that this is not the way attorneys speak. Attorneys speak in opinions, and talk about "This fact trumps that fact," and "Under these conditions that

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[4] See note 1; see also Gordon Lederman, "Restructuring the U.S. Intelligence Community," in *Seminar on Intelligence, Command, and Control, Guest Presentations, Spring 2006* (Cambridge, Mass: Harvard University Program on Information Resources Policy, I-06-1, in press).

applies, but not under another condition," and "That law was passed and this decision of the Supreme Court said this," and "You can look at it this way," or "You could argue that this is the case." So if an attorney is talking to an IT guy, who works in the world of bits and bytes and Dirac code, it's very difficult to get them to understand each other on particular issues, especially when they're talking about legal frameworks that apply to, say, computer security. How do we update the legal framework that applies to that area if the attorneys don't understand computers and the IT guys don't understand the legal issues? So we have those issues within our board: the same kinds of issues you would have in a larger way in a government agency. It's a very interesting dynamic to get them to work together.

Oettinger: If I may make one aspect concrete about the lawyers, lawyers come in many persuasions, specializations, and training. One of the keystones of criminal law practice is the notion of probable cause. You don't do things like get warrants for wiretapping or for entry into someone's home in our country without probable cause. Courts don't look kindly on invasions of privacy unless there is probable cause that a crime has been committed and the dwelling you want to enter or the mail you want to look at is somehow plausibly associated with a crime. The criminal justice system is oriented around a crime's having been committed. You don't have probable cause unless someone is dead or maimed, or something has been stolen, but the whole aim of intelligence is to avoid getting there in the first place. Therefore, getting a criminal justice-type lawyer to understand the aims of an intelligence agency in perhaps having a wiretap to prevent a terrorist act or a crime from being committed is not easy.

These are not perversions. They don't happen because people are nasty. It's because their objectives are different. Writ large, that is the perennial complaint about the FBI [Federal Bureau of Investigation] not talking to the CIA. They have a hard time speaking the same language. The FBI is a police agency, whose role is to catch criminals. The role of the CIA and other intelligence agencies is to prevent crime. Things like the prevention of organized crime, or drug interdiction, do have some similarities with intelligence activities.

It gets even more subtle and complicated than I've just outlined, but I want to make it clear why what Ted has just said is not an example of bureaucratic perversion, but one of those nasty facts of life. Different aspect of society require different skills and different specializations, and once we get down that track it is hard to communicate from one specialty to another.

Student: What's the application process, or appointment process, to put together an advisory committee like this? Does the committee have to respond to accusations of cronyism and providing retainers to friends and associates? How does the ISB ensure that it attracts the right people?

Wackler: Tony, you've done it. Maybe you should answer.

Oettinger: You go ahead. I'm interested in your perception now that you work somewhere else.

Wackler: First of all, independence—political, organizational, and intellectual—is important. This links back to the notion of the antipathy of government officials toward these kinds of boards. If the board is truly independent, then you have to put up with it when it tells you something you don't want to hear. If you want to load the board with people who you think will

tell you what you want to hear then it's not independent and it loses its value. I wouldn't be interested in working on a group like that. They have their point, too, I suppose, in certain realms.

For the ISB it's a bootstrap kind of process. You convince somebody who has some stature and some credibility to run the thing, and that person gets a few like-minded people, and they do some good stuff, and other people hear about it, and say "That sounds kind of cool," and you convince them, and then it builds on itself. In my experience, that's the way the ISB has worked.

In the last couple of years we've gone through a couple of rounds of bringing in new members. It's been an extremely interesting process. We get names from people in government. The board gets to recommend. The government overseer of the board gets to approve. I have yet to see any attempted influence one way or the other. Questions about "What's the applicability of this particular kind of expertise set?" come up. In the case of this group, when there's a call for new membership they talk to their peers who run universities, or people like the chief technology officers of Hewlett Packard and Microsoft, and get some thoughts. We go through a process of deciding what kind of expertise we have on the board, what kind we need, what issues are coming down the pike at us, and whether there's something we're going to be asked to do or that we think we're going to need to do, for which we need a particular kind of expertise. It's that kind of thing. In our circumstances, it's very informal. There are other boards where there is much more of a formal process.

The ISB at the moment has the benefit of being fairly new. In government-speak, three years is new. We don't have those long-term bureaucratic processes that build up over time. If the ISB endures that will come. It comes with the territory, I guess. The Defense Science Board, on the other hand, has a very formalized process for getting new members. I guess the ISB process is formal in the sense that it's in our charter that the chairman recommends, and then the person to whom the board reports approves that membership.

Oettinger: Let me just expand on that a little bit. Ted has described it as a democratic kind of consultative process, which it is, partly because of my personality. The charter specifies that the chair shall nominate people, and then the person in the government to whom the board reports does the active appointing. Throughout the history of the board nobody has ever asked me if somebody is a Democrat or a Republican, or any kind of ad hominem thing about race, religion, or whatever. They've only asked questions about competence or whether we have the right overall mix of people.

Not believing myself to be Leonardo da Vinci, I need advice from people about the qualities of people in fields where I don't know anybody or anything, so I consult other members of the board. One member is a former president of MIT [Massachusetts Institute of Technology], and you would figure that somebody who has run a major institution for many years would have a pretty good sense of how to weigh and evaluate horseflesh. So I use him to chair a panel that searches for the best person who knows something about this or that. That's how this consultative process evolved: out of a concern for quality and a certain measure of unaccustomed modesty about what one person can know.

There are other considerations. What is the proportion of academics versus industry people? You have different kinds of perversions, because the academics, if they have tenure, can say what

they please and can't be fired. The industry people sometimes have to be careful about what they say or do because somebody might dislike what they say and cut off their contracts. On the other hand, the industry people tend to know more about some of the practical things they're engaged in day by day. So the mix of academics versus industry people is one of the things that differentiates us from the Defense Science Board, which tends to be more oriented toward the military-industrial complex, to be blunt about it.

Student: If the government makes 40,000 appointments do these groups have to contend with charges of cronyism: that government officials are using this network to give their friends lucrative appointments or nice trips, rather than basing the appointments on meritocratic considerations?

Oettinger: Nobody gets rich from being on this board.

Wackler: I can't speak about the other boards. I don't have personal experience with them. Given the number of people involved, I'm sure that for several of them it's a political process.

Oettinger: Some are more political than others. The President's Foreign Intelligence Advisory Board, for example, tends to reflect the personality of the incumbent president of the United States. Some presidents have used it as a very serious, well-qualified body. I go back to our earlier discussion of Edwin Land and his membership on that board: the U-2, satellite programs, and so on would not have happened without strong and competent membership on the board. Other presidents have used it as a parking lot for campaign contributors for whom a serious job couldn't be found.

Perhaps the most recent example of a political disagreement is that Brent Scowcroft, who had been Ford's national security advisor and is a revered figure in national security circles, was recently fired by Bush on the grounds that Scowcroft disagreed with him. There are those of us who think that Scowcroft was being punished for his integrity, but it's the prerogative of presidents to surround themselves with advisors of their own choosing. At that level, it depends on the personality. Carter abolished that body entirely on the basis of "Who the hell needs it?" Then it was resuscitated and has had its ups and downs. The configuration of these boards can change with the incumbency of whoever gets the advice. Do they want the advice, or do they just want a place to park cronies? In some sense you're getting a distorted picture by looking at one example, which happens to be the one that Ted and I are most intimately familiar with, but that shouldn't mask the enormous diversity: competence, cronyism, advice giving, or parking orbit. It's a really mixed bag.

Wackler: There's another spectrum upon which the ISB works, and that is that the issues it takes on range from the strategic—long-term issues where it's looking at a whole new approach to how the government deals with a particular kind of topic—to the tactical, where there's a question about a new technology, or a new application of an old technology, because of a change in the way business is done, and somebody wants to know "Is that working for us?" Activities may range from somebody asking a board member a question about a particular topic during a meeting, to a one-on-one meeting to talk about a particular topic, to a short report where we'll get five or six people together to take a month to look at an issue and report on it, to reports that the

board will take a year or more to complete. Those studies look at a broad range of issues surrounding a particular topic and how government pulls it together.

The reason the board does that is that most people in government are at the tactical level. They work on a one-year budget. Everybody has to rework that budget, and rejustify everything they do, every year. So the incentives to think long term are few and far between in general. If you want to be valuable to people in government who are working hard, doing the best they can, and have more to do than they possibly can do, even helping them with their in-box would be great if that will buy the government official some time to work on things that are more strategic. I don't think anybody would argue that it wouldn't be good to push the horizon of government out a bit so that people could plan for the longer term.

In government the things that go beyond the budget cycle are the big acquisitions. Even those depend on the budget cycle every year; they could be cut at any time. If you're building a battleship or an aircraft carrier, you have to fight every year to keep the funding for that aircraft carrier you started five years ago. It's one thing to cancel an aircraft carrier after it's halfway finished, when you can take people down to the yard and say "Look, we already built half of it, so you don't want to cancel it now." It's another thing to cancel a program where you're trying, for instance, to rebuild expertise in a certain area that you need, such as behavioral science. Say you decide in one budget year that you're trying to rebuild that expertise, and you argue for the budget and you get it, and you start to rebuild that particular expertise set in the government. Next year you have to argue again, and the following year again, and people get tired of arguing, and there's nothing concrete to show what you've done.

So the idea is that bureaucrats need help with the strategic issues and the courage to put those on the table. At the same time they have a body that lives beyond the bureaucrats. In government the budget cycle is a year, the House is a couple of years, the White House is four years, and the Senate is six; the average tenure of somebody in a position to make decisions about the budget in an agency would be, I would guess, eighteen months or maybe two years. For a lot of reasons, it's not very long, so they get value from having an institution that reminds people of the things that were important last year, or the year before, and says "We decided two years ago that this was important. I know it was the person before the person before you, but you need to remember that these things are important." That value comes out of having an institution that lives beyond the bureaucrats.

What's the balance there? It's having the real power reside in the government. You don't want this kind of board becoming the de facto decision maker; the board is just sitting on the sidelines making recommendations, perhaps over and over again. I should emphasize that often you need to say something again, and again, and again, and then sometimes it still doesn't happen.

I know you don't really care about this (**Figure 5**). It shows where the ISB fits under the new structure that came about as a result of the Intelligence Reform and Terrorism Prevention Act of 2004. The ISB is not legislated under that act. It fits under the associate DNI [director of national intelligence] for science and technology [ADNI/S&T].
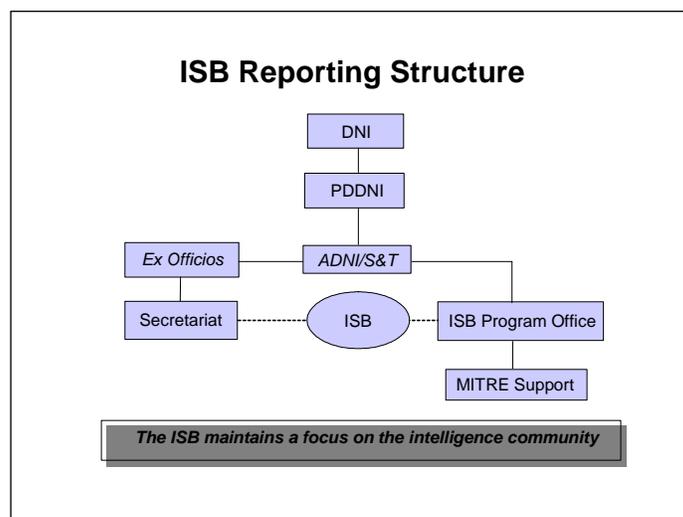
ISB Reporting Structure

DNI

PDDNI

Ex Officios — ADNI/S&T

Secretariat ------- ISB ------ ISB Program Office

MITRE Support

The ISB maintains a focus on the intelligence community

Figure 5

There are other people who aren't on this chart, because I didn't want to make it too confusing. The ADNI/S&T is the person who makes the policy decisions across the intelligence community. As you know, that position is developing. There is some disagreement about what the law says and some uncertainty about what that will evolve into. It's a brand-new position. So the ISB now reports to that person and is intended to help him determine policy.

Student: Does MITRE have a contract with the DNI to do this?

Wackler: Yes.

Student: Is that contract up for bids on a regular basis?

Student: MITRE operates FFRDCs, which do not compete against other organizations for contracts. However, a government organization that hires MITRE could decide that MITRE has done a rotten job and look for somebody else to do the work.

Wackler: The contract is not competed in a classic sense. The government person gets to decide. The reason to have an FFRDC in this position is the objectivity. The ISB needs objectivity and support for its operations, but it's kind of tangential in terms of how the board works, except that the FFRDC in some other way offers an objective support mechanism to bring in technical people to help flesh out issues.

Student: I think it's important, because I would guess that most of the 1,000 advisory boards do not have this kind of support. My guess is that this support makes the board much more effective than it would be otherwise, just as university faculty committees that have staffs are more effective than committees where it's all done by volunteers.

Wackler: When you decide what a board like this ought to do you have to take that into consideration. If you look at the membership of a board like the ISB, you recognize that those people aren't sitting around waiting for us to call them and give them something to do. They're already working eighty hours a week, going around the world, and doing all the things they do in the course of their jobs. So the way I think of it is that we leverage their expertise. We bring in people who are willing to put in some work to pull the research together, pull the background material together, maybe sketch out what the technical points are, and that kind of thing, and that seems to work reasonably well. If you rely on a board like this without that kind of support, you really have to fall back on almost an off-the-cuff advice kind of thing, because this group does not on average have a lot of free time. We have members who do more than others, but on average this group is not going to give you the huge chunk of time that would be required to write and edit and produce a report.

We will now segue from this notion of "We've learned the lessons about ISB and some examples of the kinds of things that board has done" to "What do you have to do to make all that work?" We've talked about a lot of it already. I'm going to hit a few things as we go.

The unfortunate fact is that the processes by which this has to work are hard to keep together (**Figure 6**). Government doesn't accommodate this kind of stuff very well. I struggled to come up with a metaphor, and an iceberg was the best one I could come up with. It's not good when a leading executive from Microsoft calls you up and says "My car didn't show up at the airport." When that person shows up at the meeting he or she will be mad. You have to watch out for little things like that. What it requires is an attention to detail, and a notion of the processes that need to be put in place. So there's an administrative dimension to all that stuff. People will complain about wanting more decaf coffee or different kinds of donuts. So you constantly work those issues.
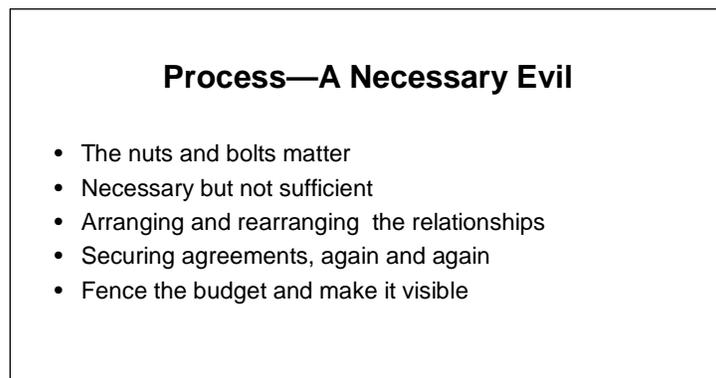

Process—A Necessary Evil

- The nuts and bolts matter
- Necessary but not sufficient
- Arranging and rearranging the relationships
- Securing agreements, again and again
- Fence the budget and make it visible

Figure 6

The processes that are more important are the ones that deal with how the board relates to the government, how it plugs into the government, and how to build the relationships you need in order to do what needs to be done. People on this board are not there to make money. They're not there, for the most part, because they're looking for bigger networks or the next job. Most of them are at the pinnacle of their field. They're looking for a way to make an impact: a way to make things better or easier.

Oettinger: Actually, an important fact in recruiting members is patriotism.

Wackler: That's true. I thought of it as my job in government to make this process as rewarding as I could for these people. I don't know that I succeeded, but the idea that I could help them plug in and make a difference is what kept me going.

Oettinger: It can be frustrating, because if truth be told any group like this will have a range of members, from agreeable people to prima donnas, from people who spend too much money to people who spend too little money, and from people who are careful with money to people who are slobs. The ISB is a group of twenty-five people, so Ted's days were full.

Bieda: Having attended one meeting, I've been thinking about your presentation and how you would analogize what keeping the board on track is like. You've seen the commercial about herding cats; think about large cats of all different species around the table, all very good at what they do, all with different opinions, all doing things differently, having to come to a consensus on some issues.

Oettinger: It's not necessarily consensual.

Wackler: For this board in particular, if you're one of these outside people you want to be listened to. You want people to respect your opinions. You're probably used to a certain amount of deference. You want people to ask your opinion. You want independence. You want to feel free to say what you think is the right thing to do. Arranging the situation so that all those conditions exist is important.

On the other hand, what you need to bring to the table as an outsider are patience and perseverance, because you're not going to get things done on the time scale that you would like. You need courage to say what you want to say—really the "damn the torpedoes" kind of courage, because if an independent board is going to work you sometimes have to go out on a limb just to prove that you're independent. You have to do it the right way, without poking somebody in the eye, but make sure that people understand that you won't roll over on important topics. I heard somebody who worked not with an outside board, but with a group that was intended to be an innovation factor inside one of these big agencies, say that you need a "get out of jail free" card from the people to whom you report. You need a chit that assures you that you can get off the hook if you really do something off the wall. You need some time to learn to do that kind of thing. All those things are important.

The idea behind the ISB as we worked it through the new intelligence apparatus was to create an institutionalized resource for people who have to make hard decisions about where money and resources in the intelligence community should go. I guess the major point here is this notion of creating the processes that allow this kind of institution to live beyond this budget cycle. I think of it as being for the DNI after next. If we help this DNI that's good, but we need to think about what this resource can do to help the decision makers and policymakers create policies that help the DNI after next. What can we put in place now that will bear fruit for the DNI after next? We need the low-hanging fruit, but we also need to plant the vineyard so that we get the next vintage down the road. That's a continual problem in government, for all the reasons I've talked about. I hope that the DNI after next will not come along for at least five years from now,

although it could happen one year for all we know. Even for the DNI himself, who knows how all this will evolve and whether or not it will actually become what Gordon Lederman intended it to be when they wrote the legislation.

Oettinger: Ted spoke of courage. It's mostly the executive secretary's courage rather than the board members' or the chair's, because he's in the hot seat. He's squeezed between two entities. On the one hand he's stressing independence, so in that sense he reports to the chair, but he's also a government employee, and in that sense he reports to the ADNI/S&T or some other entity. In that there is the potential for a deathly squeeze or some kind of abject sinking of both. So the position requires extraordinary courage and discretion and integrity. Ted has been too modest to stress those qualities, but I can say that.

Wackler: I don't think of it that way. I think of it as ambivalence about the future, regardless. To have courage, you would first need to be risking something, but it is true that in general that's a big reason why these boards don't work too well. You need an interface between the board and government that is independent, that can be a broker for the needs of government and the expertise of the board, and put it together. There's no good mechanism in government to incentivize people to do that. It requires personal trust between the person in that position and the boss, because you're going to make a lot of people angry. In that sense it's a career risk. In my case, if this board wanted to look at an issue that was going to make somebody in the CIA mad—not necessarily my direct boss, but somebody else, and maybe I wanted to work in their division after I finished this job—I'd have to feel free to help them piss off my future boss. I think that's what Tony is saying here: you can run into that kind of potential conflict. There are ways to work through some of that, but it's an ongoing issue.

Student: How often does this board meet? Where does it meet? Do board members communicate among themselves regarding board issues when they're not at the meetings? Is it a star kind of organization? Is it a fully connected mesh? What's it like?

Wackler: It meets on a quarterly basis, eight days a year. We're meeting next week in Manhattan. That's a good example. One of the board members had the idea that the intelligence community could learn some lessons about risk assessment and risk management from the financial community. This person works for Goldman Sachs; he's their vice president for global security. He put together a day and a half of discussions about how the financial and insurance sectors look at risk assessment and risk management issues. This one is an unclassified meeting. So that's an example.

To answer your question about whether it's a star organization or a network, I think it's a bit of both. It's a hybrid.

Oettinger: The connectivity keeps varying.

Student: You talked about security getting in the way, so presumably you have meetings that are classified and board members might want to discuss things, but they don't work in facilities where they can do that.

Oettinger: That is a royal pain. It adds to the overhead, but there are facilities hither and yon that mitigate that somewhat. Some of our connectivity is through secure video teleconferences, which helps avoid unnecessary travel now and then. It's a drag compared to the ability to pick up the phone and have a conversation or hold a meeting anyplace, anytime. Again, you go back to one of Ted's major points about the need for patience, and one of the sources for the patience requirement is having to deal with the demands of working in a secure environment as necessary.

Student: There is a handful of Harvard faculty members on the board. Do you as a subset, since you're geographically close to each other, attempt to have any sort of regular meetings?

Oettinger: No. It happens now and then, but the affinities are much stronger professionally and in the field. Again, going back to cronyism, it's an accident of whom you know.

Student: Harvard has the best people!

Oettinger: That's along the lines of Summers's assertion of the superiority of economists. I won't go down that track.

Student: Looking through the book of members and the immense amount that people have accomplished I'm missing people who are accomplishing things right now. Where are the engineers who are on the cutting edge?

Oettinger: Many of those people are on the Defense Science Board. Again, keep in mind that the intelligence community is only incidentally in the realm of technology. There are some; there probably should be more. That's one of the areas where collaboration with the Defense Science Board is a factor. Many of the working groups then bring in people with whatever expertise is required.

Student: So these working groups hold meetings?

Oettinger: Yes. The MITRE support staff is part of that, but so are people from industry or academia who know something about a particular area.

Student: Do you look at where the potential threats are, and how they are developing? Where are they: in universities in Beijing, Japan, or Russia? Who do you think are the potential threats right now, scientifically and in technology? How do you find out what is happening in those areas?

Wackler: Intelligence regarding other countries' research and development in S&T is a big issue. We do it in our intelligence agencies: we try to figure out if someone is building a bigger missile or a tank that goes faster, and all that. This board does not do S&T intelligence. It's not in our purview to look at that topic. What we would do is look at our intelligence agencies' ability to do S&T intelligence.

Oettinger: That's a wonderful lead in to next week's speaker: the national intelligence officer [NIO] for S&T. Larry Gershwin's job is to consider what country X or Y, or terrorists, might be doing in technology that would be a threat to the United States. Our role is to maintain contact with him and to help him, and if we think that he's doing a lousy job perhaps to tell somebody

"Your NIO for S&T is a jerk and you should replace him." We don't do his job. We may on occasion interact with him, both to suggest areas that we think he has overlooked and to draw information from him that would help us understand some phenomenon that we need to get familiar with for some other reason. We are in many respects clients of the apparatus as much as supporters or critics. Without having an infinite board that would be impossible to manage, we can't possibly encompass all necessary knowledge, so we have to rely on folks such as the NIO for S&T. We maintain good relationships with many of the other collectors and producers, inside or outside of the intelligence community, who have good information.

Wackler: The next slide is an example of two ways people advocate these boards should function (**Figure 7**). For lack of a better term I call them the idea board and the hammer board. This is a concrete example of two ways to do this, and two very different kinds of processes you would need to accomplish this.

What Type of Board Do You Want?

- Idea Board
  – Relationships
  – Encouragement
  – Cajole
  – Remind, remind, remind (as officials come and go)
- "Hammer" Board
  – Demand briefings
  – Evaluate, judge, critique
  – Report up the chain on good and bad

Figure 7

If you wanted to bring in an outside board, call government people before it, evaluate what they're doing, and give advice to your policymaker along the lines of "You should cut this program, or add money to that program," these are the kinds of thing you would do. You would use the board to make sure people had their ducks in a row: to frighten them into doing what they needed to do. This is done quite a lot, actually.

But the ISB is more the other type: it engages with the people doing the hard work. It pretty much assumes that people are working hard and trying to do the best they can, and encourages them, builds relationships, and tries to move things forward in a collegial way. So you might imagine that if you wanted to do that you would need a completely different set of relationships and processes than if you were just going to parade people before the board and then decide something.

Oettinger: There's some subtlety to that, because we're a bit of a hybrid on those scales. That stems from some provisions of the charter that are very helpful in that respect. We have the authority to initiate studies, which is more in the "idea" category, but we also have the

responsibility to accept tasks, and that is very delicate. It means that if the DNI or an agency head asks us to look into something, we could be used as a hammer, but first we have to accept the task. I have the authority to say "No, sir, you shouldn't do this," and that's an extraordinarily powerful thing in this context. If we think something is way off base, the ideas are bad, the technology is vaporware, and so on, we might cheerfully accept the task of being a hammer and saying "This is a bunch of crap and ought to be discontinued."

What we don't get into, and in fact are prohibited from getting into, is the nuts and bolts of yea or nay on an acquisition, where we would say "Give out this contract or that contract, because this is good stuff and that's bad stuff." Those nitty-gritty aspects of procurement remain where they should: with the cognizant government office. I wouldn't touch those with a ten-foot pole, because we're no more qualified—and cannot be—than anybody else. It would essentially be arrogating functions of government or becoming a handmaid of some executive who wants to use us as his hammer.

Student: That would be illegal, right?

Oettinger: It would certainly border illegality, but there are subtle ways of dealing with that. There are boards that are essentially the rubber stamps of their masters and come to the conclusions desired by the manager. There's nothing illegal about it; it's just immoral.

Student: Unless you're doing procurement.

Oettinger: When you get near procurement you get on the borderline of things that can get you into jail. That's another reason for staying the hell away from it.

Wackler: This is my way of thinking about the need to have the right expertise (**Figure 8**). You have to have the people with the knowledge of the domains within which the decisions will lie. Those can change. One of the things that members of the ISB have is a perception of independence. When people come and talk to this board they need to perceive that the board is independent, so we make sure that happens.

There's also a presumption of excellence. If you take the membership list of this board around you've got an automatic leg up, so people will come in assuming that good stuff will happen. You'd have to prove to them otherwise.

We've discussed most of these issues that I have left on my list. The board members can bring freedom from the in-box.

One point that hasn't quite been hit on is that board members not only have expertise in their own field, but they also really need to understand how the expertise is applied to the domain of the intelligence community. People who are smart and have ideas want to be sure of what they're saying, so you have to make an educational investment in people to get them up to speed on what's going on in the community. That takes a while, depending on the personalities
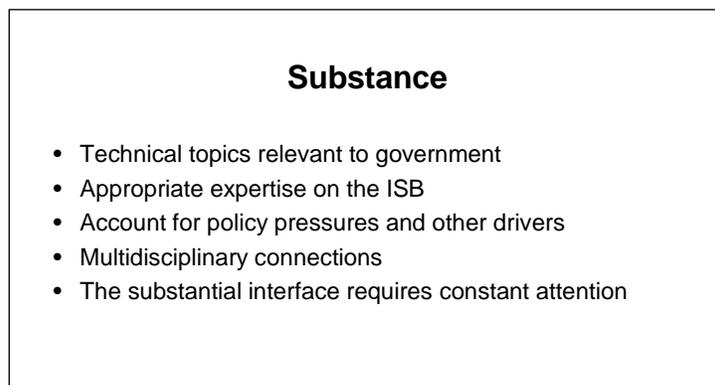

Substance

- Technical topics relevant to government
- Appropriate expertise on the ISB
- Account for policy pressures and other drivers
- Multidisciplinary connections
- The substantial interface requires constant attention

Figure 8

involved. It may take years before people are comfortable with putting their ideas on the table, especially when it comes to critical issues. The intelligence community is a group of disparate organizations and it's essential to get a handle on what's going on inside. That investment process is important.

Oettinger: Having humility becomes essential as a protective device. You have to say "Insofar as we know, from the areas we have been able to get information on…," because you never quite know what's over the next mountain or under the next rock.

Wackler: There's an important point on the next slide that we haven't hit explicitly yet, and that's this notion of what I call first-order impacts and second-order impacts (**Figure 9**). First-order impacts are: you answer a question, you give them an estimate, or you bring an idea to the table that somebody can pick up or use or whatever.
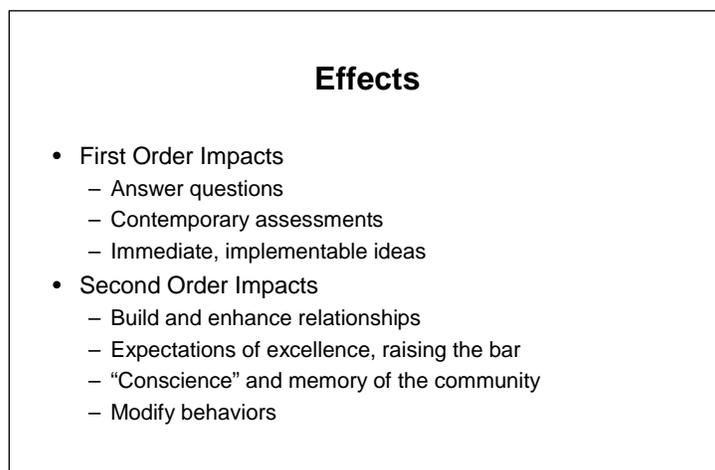

Effects

- First Order Impacts
  - Answer questions
  - Contemporary assessments
  - Immediate, implementable ideas
- Second Order Impacts
  - Build and enhance relationships
  - Expectations of excellence, raising the bar
  - "Conscience" and memory of the community
  - Modify behaviors

Figure 9

The other impacts, which I think are equally, or perhaps more, important over the long run, involve this notion of raising the expectation of excellence: bringing people in who are leading

their fields; who just by the nature of their being around get people to expect more, want more, and want to be better. If you're called in to brief the ISB, you want to look good. A manager can raise expectations among his people and hope to do better by bringing the ISB in and saying "Look how these guys see what we're doing." You can modify behavior. All those behind-the-scenes, second-order kinds of things over time build value into this type of institution, and that, once again, is hard to justify in the budget cycle. But when I talked to my former bosses it was the thing I would always put on the table: "We need to think about how to take advantage of these second-order effects, as well as of the first-order effects."

Oettinger: We completely agree on this. I would just add that I regard the first-order impacts as the price you pay for survival and the ability to provide the second-order effects.

Wackler: There's also the notion that the government can get out what it puts in: it gets what it pays for. I think of that in terms of their willingness to listen, to put warm bodies forward to engage, to really think about the results and recommendations. If you're a policymaker who has a board like this and you whitewash it, and once a quarter you simply go down and sit in on a meeting, you're going to get out of it what you put into it. So another continuing issue is trying to get people to engage. It's an investment on their part. It's something you can't expect them to do unless they have reasons to do it.

Oettinger: By the way, that's an important role of the executive secretary, because the part-time members can't possibly do that. If the executive secretary doesn't do it you get disconnected, and you're out there floating uselessly.

Student: In that case do people drop out?

Oettinger: That's another reason for Ted's underscoring patience, because you have to have the patience to survive troughs in this process and work toward getting a new high in your relationships and connections.

Wackler: I think I've gone way too far down into the weeds on this process. I started out by saying that I've learned a lot about how government works by just getting in there and mucking around and making mistakes and trying to get people to do things they don't want to do. It's been very interesting from my perspective. The opportunity to work with people like the ones on this board has been just fantastic.
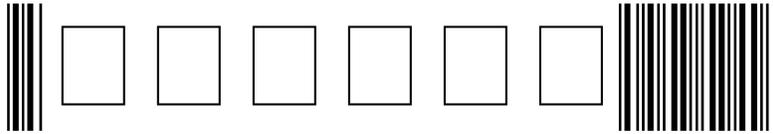
Oettinger: Sir, we have a small token of our large appreciation for you.
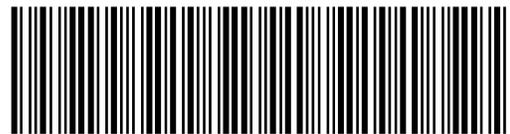
Wackler: Is that a dollar?

Oettinger: No, it's much more precious than that; it's a Harvard coin.

Acronyms

ADNI/S&T	associate director of national intelligence for science and technology
CIA	Central Intelligence Agency
DNI	director of national intelligence
FACA	Federal Advisory Committee Act
FFRDC	Federally Funded Research and Development Center
ISB	Intelligence Science Board
IT	information technology
NIO	national intelligence officer
NRC	National Research Council
S&T	science and technology

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