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What Do We Mean by "Transformation"?

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WHAT DO WE MEAN BY "TRANSFORMATION"?

An Exchange

Andrew L. Ross, Michèle A. Flournoy, Cindy Williams, and David Mosher

What exactly do we mean by "defense transformation"? How might it affect the nation's strategy and the military forces that it deploys? How long might a process of transformation take, and what might it cost? The Secretary of the Navy's Current Strategy Forum held at the Naval War College on 12–13 June 2001 asked one of its four discussion panels to address these issues. Its members had long grappled with such questions from different vantage points.

MICHÈLE FLOURNOY

I think transformation is one of the most important topics that the defense community needs to grapple with today. Accelerating transformation of the U.S. military and of the Department of Defense more broadly will be a major theme of the new administration's defense strategy when that is unveiled. To be successful, however, the secretary of defense, Donald Rumsfeld, will have to be more clear in the guidance he gives on transformation, in terms of the objectives we are striving for, the desired capabilities we want the process to yield, and the trade-offs we are willing to make to accelerate transformation.

I want first to ask, why transform? Why is it so important? Second, I wish to articulate what I think are the primary objectives of transformation. Third, I want to give an assessment of where we are in the process today. Fourth, I will focus on some of the "long poles in the tent"—the things that are hardest to do and take the longest—before concluding with some recommendations. This material is drawn primarily from my own experience in the trenches of the Office of the Secretary of Defense but also from an opportunity I had to serve on the Defense Science Board task force on transformation.

Coming Soon to a Theater Near You: Reasons and Objectives

I see many reasons why we should be treating transformation of the U.S. military as a priority. One is that tomorrow's wars will not be like today's. The primary lesson for any potential adversary of the Gulf War was not to be so stupid as to confront the United States head-on, militarily. Look for weaknesses to exploit; look for strengths to undermine; look for asymmetric means of attacking the United States. A principal asymmetric means will be to deny and delay our access to their regions, to use anti-access strategies against us. The scenarios for which we are currently planning do not adequately reflect those challenges. They do not represent some of the most likely future challenges we will face.

Another reason is that the future is coming sooner than we think. The real challenges to our ability to project power in the face of anti-access challenges do not lie twenty or twenty-five years off. We do not have to wait for the rise of a near-peer competitor in 2025. The proliferation of key technologies and capabilities means that lesser countries, regional powers, will be able to pose significant anti-access challenges to us within the next decade. As I like to say, this threat is "coming soon to a theater near you." Current U.S. capabilities and concepts of operations will be severely challenged, absent transformation.

We should also transform the U.S. armed forces because of the opportunities this allows. New technologies offer new opportunities to be more effective in future warfare. Examples include information technologies, biotechnologies, directed energy—the list goes on. Of course, fiscal pressures will continue, and they will continue to require the Defense Department to do things in smarter ways, to get more efficient. Transformation should support that.

Finally, transformation takes time. If we want to be ready ten years down the road—twenty years, for some new challenges—we need to start the process now. There must be time for the inevitable missteps, failures, and blind alleys, and for learning from them.

Let me turn to the objectives of transformation. I think the primary objective is ensuring continued U.S. military superiority and, with that, our ability to advance and to protect our national interests in the face of emerging and future threats. This means several specific things, such as an ability to project rapidly and then sustain combat power in the face of strategies designed to thwart our ability to do that. It entails an ability to operate across the spectrum of conflict—not only high-end warfare but smaller scale contingencies, presence, and so forth. It means underwriting deterrence and "shaping" with a force that remains combat credible in a changing environment. That involves the transformation of forward presence. In sum, it requires maximizing the effectiveness and efficiency of U.S. forces. Those are the objectives of transformation, at a very broad level.

The Good News and the Bad News

How are we doing? Here is the good news. The "transformation" section of the Quadrennial Defense Review of 1997, not so long ago, was virtually blank for at least one service. There was not much happening in transformation in 1997—but today there is a great deal. Transformation became a recognized defense priority of the previous administration, and certainly it will be for this one. The military has articulated an ambitious joint vision for 2020. That vision is very broad, with little specific guidance, but it is compelling. Each of the services individually has established transformation "road maps" and "battle labs"; they are conducting transformation activities, war games, concept development, and experimentation. We have come a long way toward translating rhetoric into real activity and action. The establishment of Joint Forces Command has increased the importance, and improved the resourcing, of transformation in the joint arena.

But there are still barriers to transformation, and that is the bad news. The Bush administration will have to address these barriers if it is serious about transformation. Perhaps the largest obstacle is complacency, the absence of the pervasive sense of urgency that has existed in the past when transformations have occurred. "Of course we will transform," the services seem to say, "but at our own evolutionary pace and without making any hard trade-offs. This will naturally happen, over time; that is how we do business." Another barrier arises from the fact that, historically, periods of low operating tempo have been most conducive to urgent military innovation; today, we are trying to transform even as we are responding to major international challenges.

Not the least of the problems is a general underestimation of what it takes actually to change the status quo in a large organization like the Department of Defense. There is no department-wide strategy or road map laying out or translating the very broad *Joint Vision 2020* into more concrete mission objectives and priorities. There are no clear metrics for measuring progress. There is no lens through which we can judge investment priorities and trade-offs, no Defense vision linking the transformation of the military to the transformation of the department and of its business practices more broadly. We have stated that the linkage exists, but we have not fleshed it out in specific terms. In any case, transformation has not been given "teeth," has not been made a priority by the department in the services' planning, programming, and budgeting processes.

While I would applaud many of our experimentation efforts, some of them have been too constrained, infected with a "zero defect" culture that promotes showcasing as opposed to true experimentation. There has been an inadequate emphasis in some cases on real discovery, which requires a tolerance of failure.

Sometimes the most productive experiment is one that fails; we have not seen much of that. Further, many of the models and measures of effectiveness by which we evaluate results do not adequately reflect how a transformed force would operate. Finally, joint experimentation has tended to focus too narrowly on the seams between the services rather than on new "concepts at large" for utilizing the joint force.

Relatedly, there is an inadequate process for translating the results of experimentation into real programs. Suppose the experimentation process discovers something promising. Do we have an adequate way of making sure that it gets into the defense program? The answer is yes, theoretically; but there are not many success stories yet. What we learn from experiments should lead us to reassess our priorities and resource allocations, with respect not only to matériel but to doctrine, concepts, and organizations.

A further barrier is the shortage of institutional advocates; there is as yet no full-time staff in the Pentagon dedicated exclusively to transformation. There are no adequate mechanisms for consistently focusing high-level attention on this issue. If we are going to get transformation, it will require impetus from the top. On the other hand, short tours of duty—that is, rapid rotation of key personnel—limit the impact of many military professionals who are at one time or another responsible for transformation activities. They stay only two or three years in the job, and that tends to limit their efficacy in those roles.

We must also acknowledge the specter of interservice rivalry, a Pandora's box that senior leaders are so afraid to open that they do not create fora where ideas and concepts of operations can really compete. Relatedly, even a very promising concept developed and experimented with by a particular service may be viewed with suspicion by the others if it is brought into the joint arena—as if the service in question were bent on using the innovation to increase its own budget share and decrease others'.

Finally, as I have hinted, we face the reality of near-term demands. Any new strategy, even one that would genuinely increase the emphasis on transformation, must deal with the demands of the real world, the here and now. Transformation often gets crowded out by more immediate concerns. Those concerns include the effects, which are still with us, of the procurement holiday of the 1990s. A number of recapitalization needs are in direct competition with transformation priorities.

The Long Poles in the Tent, and Recommendations

Let me turn now to the two most important areas upon which we should focus. The first is development of new concepts of operations for priority mission areas. Concept development has not been given high enough priority; too few

"racehorses" are dedicated to the task. The services typically give the task either to contractors or to small "futures groups," not core elements of their own staffs. In the joint realm as well, there are too few avenues for vetting and testing new concepts. Joint Forces Command is a tremendous addition, but it cannot do it all, certainly not at its current size and level of staffing.

Within the headquarters, there has been a general lack of incentives to break with current doctrine or current approaches; there is a general sense that if you are too innovative, you may dash your promotion opportunities. Now, contrast that with how the Germans, before World War II, came up with the concept that eventually yielded the blitzkrieg. The German army told a group of lieutenant colonels and colonels that, in effect, they could not be promoted *unless* they came up with something that broke current doctrine.

What I am really arguing for is a fundamental change in culture from one of consensus—which would pursue a transformation that causes no one to be uncomfortable—to a productive and open forum where ideas and concepts for solving priority mission problems or tasks can truly compete.

The other "long pole in the tent" is organizational change—the transformation, or more broadly the rationalization, of the Department of Defense itself. If transformation focuses only on the fighting "tooth" and ignores the supporting "tail," it will ultimately fail. We have to reduce unnecessary duplication between the services in key support areas like logistics, C4ISR*, possibly even some aspects of training. We need acquisition reform. We have to eliminate unneeded infrastructure, to outsource and commercialize functions like accounting, health care, long-haul communications, and so on. If the Defense Department does not transform the way it does business, it will not have the resources to transform the U.S. military. Nor would it be able to support effectively a transformed force. There are huge political and bureaucratic barriers to surmount here, but this issue has to be put on the table if transformation is going to succeed.

The recommendations I would offer are largely drawn from the Defense Science Board task force on transformation. The number-one recommendation is to establish a sense of urgency at the top. Such a sense may be growing inside the office of the secretary of defense, but not in all of the services. It is largely absent on Capitol Hill, among the people who control the purse strings. Next, we need an implementation road map to energize and focus transformation efforts. The broad vision of *Joint Vision 2020* has to be converted into much more specific articulations: what are the key operational challenges? On what mission areas will we focus? What capabilities do we want the transformation process to yield?

* Command, control, communications, computers, intelligence, surveillance, and reconnaissance.

Then we need to establish and use appropriate metrics to assess progress. Also, we should strengthen the voice of joint force commanders; they will be the people in the field upon whom we will rely in the future, and they should be engaged today to help articulate needs.

I am urging us to change organization cultures and incentive structures, so as to allow and reward real experimentation, open competition between concepts and ideas, and innovation. I am also calling for an overarching vision that links military transformation with the department's own transformation and that ultimately creates a cadre of professionals who are committed to and, very importantly, accountable for progress in transformation.

CINDY WILLIAMS

Let me begin by agreeing wholeheartedly with Michèle—the Department of Defense and the U.S. military have been stuck for a decade in a Cold War mindset. They need to change, and change quickly, both to overcome the challenges of the future and to take advantage of new technologies. Instead of the term "transformation," however, I prefer the old-fashioned words "innovation" and "change." "Transformation" has come to evoke specific solutions, like precision weapons or the Army's current transformation plan. In that regard, the term is often associated with a view of military change that starts with the technologies and then seeks problems for the technologies to solve, instead of the other way around. In looking to the future, it is critical that we start with the military problems and then seek solutions. Some of the solutions will be technical, but others may be procedural or conceptual.

Another reason I shy away from the term "transformation" is that transformation as often touted—large and fundamental change in every aspect of military affairs—may be too much to hope for. Transformation, or revolution, is relatively rare in large institutions, which are conservative by nature; how do we make it happen unless something big and bad occurs? In industry, for example, transformation is most likely not when a firm is riding high, but when it has lost market share and is worried about its very survival. Military transformation is most likely not when a state enjoys overwhelming primacy, as the United States does today, but when the military has lost a war or otherwise lost the confidence of civilians. The fact is, an institution that is already best-in-class typically finds it difficult to make even modest changes, let alone transform itself. I worry that when the vision of large-scale transformation is not realized, disappointed advocates may lose confidence that even more modest change is possible or worth pursuing.

For both these reasons, I prefer to talk about spurring the military to solve specific problems that it will face in the future. I look for innovation or change to

meet concrete needs, rather than lists of technologies and top-down efforts to find ways to use them—which often seem to be the unspoken goal of "transformation."

Strategy and Resources

When the Quadrennial Defense Review for 2001 began, the services did not want to repeat the method used during the Quadrennial Defense Review of 1997, a process they called "budget driven" or "cost driven." They wanted instead a "strategy-driven" review process. I agree completely that reviews should be driven by strategy. But my understanding of strategy is quite different from the concept those advocates have in mind. Proponents of a "strategy-driven review" say they want first to look at what the nation needs to do in the world, and second to make a list of everything the military should be capable of doing. Next they would decide what forces are needed to do all those things. Finally, they would figure out the cost of those forces in the future, add up the bill, and present it to the American public in the expectation that taxpayers will pay it in full.

That is not strategy. If the military has all the resources in the world, if it can bring all the forces in the world to bear at every point, it does not need a strategy. The whole point of strategy is to set priorities and make choices among competing alternatives when resources are constrained. What the proponents of the laundry-list approach have derided as a "budget-driven process" is the essence of strategy itself.

Setting a top line for defense and working within it is fundamental to devising a strategy. The Defense Department needs to know how much money it will have, in order to know how deeply it will have to cut into the areas where, as Michèle Flournoy likes to say, it can accept greater risk. But that does not apply when setting the top line for the individual services. In the 1997 quadrennial review, the defense budget "pie" was divided up among the services using the same formula as was used year after year during the Cold War.

That is counter-strategic. The department needs not only a joint process to determine its requirements but a joint view to determine its strategy. We must decide priorities not on the basis of what is best for the Army, Air Force, Navy and Marine Corps, but on the basis of what is best for the nation. If this means that the Navy's share of the defense budget grows while the Army's shrinks, so be it.

Allowing the services' budget shares to shift from year to year may benefit innovation. As I discussed earlier, bringing about innovation in a large institution that is already the best is not easy. Unless the military faces substantial competition from the outside or fails in war, it is not predisposed to change. But one way to promote change is to reward it, not only in individuals but in services. A service that has more innovative ideas, that looks to the future rather than back to

the Cold War, might be rewarded with a larger share of the budget. It is possible to set up an incentive structure that could at least reward and thereby encourage innovation, if not the more ambitious goals of sweeping transformation.

Nothing Comes Free

Ten years from now, keeping today's strategy, all of today's forces (equipped in the way that is currently planned), with today's infrastructure, is going to cost somewhere between thirty-five and fifty billion dollars a year more than it does today. However, it is possible instead to have strong forces and a military strategy that meet the challenges of this century instead of the last one, and to do so at today's, or even last year's, level of funding—that is, with a budget held constant for the next decade, adjusted only for inflation every year.

In fact, at least three possible military strategies and plans would allow the Defense Department to hold the line on defense budgets but at the same time to stimulate a significant degree of innovation, pursue a strong modernization program, and still pay the troops as currently planned.* Each of the three would produce a very strong military, certainly stronger than today's and probably stronger than the military we will have if we continue down the present path, even spending that extra thirty-five to fifty billion dollars. Of course, nothing comes free. Saving tens of billions of dollars means giving something up. In the three future plans I have looked at, the main engine of savings is force-structure reduction. Each of these three plans cuts forces that are less useful and keeps those that will be more useful in the world of the future. Each also makes modernization cutbacks in areas that do not fit in with its strategic concept.

Of these three plans, one would resonate with a naval audience, and also, I believe, with the Bush administration, much more than would the other two. It assumes that the dangerous fault line that existed on the Eurasian landmass, where Nato and the Warsaw Pact stared each other down across the inter-German border, is gone, more or less for good. Instead, it posits a need for more attention to Asia and the Pacific. It assumes that the United States enjoys overwhelming primacy today but that with that primacy come some pitfalls. One of them is that weaker, and poorer, countries who oppose us are going to look for the cheapest ways they can find to defeat our very expensive systems. That means mines, cheap submarines that operate in coastal waters, and man-portable air defenses—the kinds of things that are often referred to as "asymmetric threats." It assumes, as Michèle Flournoy argues, that access to theaters is going to be increasingly difficult to come by.

* See Cindy Williams, ed., *Holding the Line: U.S. Defense Alternatives for the 21st Century* (Cambridge, Mass.: MIT Press, 2001), reviewed in this issue.

On the basis of these assumptions, it emphasizes forces that can self-deploy—especially maritime and space-based forces—more than the nation has emphasized them in the past. It tries through military means to avoid reliance on fixed bases and ports. It emphasizes weapons, techniques, and tactics to defeat other countries' cheap asymmetric threats. It recommends that the Army be cut back substantially and reorganized, but along the lines of the Army's own transformation proposals, and equipped with lighter and self-deploying forces. It recommends that the Air Force be reduced in size somewhat and that its fighters be made more easily deployable. It recommends that the Navy stay at its current size and suggests the innovative use of information technologies and other equipment that might allow us to defeat cheap asymmetric threats.

A force like this is affordable at today's level of spending. It is one that would seem to fit within the world view and the strategy embraced by the Bush administration. Though it is substantially smaller, especially in the Army and to some degree in the Air Force, it is stronger in the areas where strength will be most needed over the long term.

DAVID MOSHER

Missile defense is our future. We are headed there. It is not a matter of if, but when—and also, to some degree, how. The very things that are driving us to transformation—preserving freedom of action, concern about asymmetric threats—are compelling reasons why we need theater missile defense, national missile defense—and the term *du jour*—"allied missile defense," the current administration's proposal to provide missile defense to our allies.

In some sense, missile defense is at the heart of transformation: if the nation could protect itself easily from ballistic missiles and cruise missiles, the effectiveness of asymmetric strategies would be reduced significantly. In part it is the difficulty of missile defense that is driving this push to transformation. The whole effort could be significantly affected by our ability to predict accurately what missile defense will cost, what its capabilities will be, and what the timetable is likely to be.

That is what I would like to talk about here, focusing on two things—first, why missile defense costs seem to rise so inordinately quickly, seemingly faster than almost anything else, and for national missile defense (NMD) in particular; and second, why those costs matter.

Costs Grow and Schedules Slide

In acquisition programs generally, the historical cost-growth rate has been somewhere between 20 and 30 percent, but missile defense seems to grow a lot faster than that. Early in the 1990s, the cost of a single-site hundred-interceptor

system was thought to be about five billion dollars. A few years later, it was eight billion dollars. Today we are talking about twenty billion dollars or more—a fourfold increase for a system that has essentially not changed. Other examples are theater missile-defense programs. The Navy Theater-Wide program is rising quickly. SBIRS-Low* was estimated at four billion dollars originally; now we are talking eight billion, and it will not get beyond where it presently is without a significant infusion of cash.

Why are ballistic missile defense programs fundamentally different from others? I have a theory, involving three basic factors: the ballistic missile defense debate is taking place in an extremely political environment; it is responding to what is perceived to be a very urgent threat; and, perhaps most important, the technical challenges of missile defense have been significantly underestimated. As a result of all this, costs grow and schedules slide. The implication is that if we do not get those problems under control, missile defense is going to keep sliding farther and farther to the right.

Missile defense was born in the crucible of ideological combat. Those who want missile defenses and those who are opposed to them approach the topic with religious zeal. The only other debate that elicits similar passion is that on abortion. In fact, that comparison suggests the highly moralistic and political tone of the missile defense debate and the kinds of pressures that give rise to these programs. Visionary thinking often underlies missile defense programs, but it is frequently not consistent with technical reality. Ronald Reagan's "Star Wars" (Strategic Defense Initiative) speech in 1983 was highly visionary, but the needed technology was decades away. Another example is the Navy Theater-Wide System. It has never hit a target, and yet there is a core of people, some in the Navy but most of them outside, who say that it can do not only theater defense but national defense, boost-phase defense, midcourse defense, ascent-phase defense. Any one of those capabilities will cost, they claim, only two billion dollars.

This political warfare is amplified by concern that there are looming threats to our forces and to the United States—the enemy is at the gates. This leads to a crash-program mentality, and that introduces some real problems. Urgency leads to optimism, then overoptimism—we can do this technically difficult thing, very quickly, and for not much money. Missile defense proposals are not fully matured, well conceived acquisition projects but ideas, concepts floated in a "crash environment." Because of the sense of urgency, however, they are treated as well-constructed programs. Rough cost estimates are assigned to them, which the budgeteers in the Pentagon and Congress accept as well-crafted figures—but

* Space-Based Infrared System.

they are not, because they lack the thorough analysis and pessimism needed for good cost estimates.

Particularly, there has not been enough thinking about the technical complexity of missile defense in general. The result is poorly designed programs with insufficient attention to testing, to system integration, to the reduction of technical risks. All that, in turn, leads to unrealistic estimates of what the systems can do, when they will be able to do it, and how much they will cost. A few examples are in order here. The Global Protection Against Limited Strikes (GPALS) system was proposed in the George H. W. Bush administration. Its goal was to protect the United States against up to two hundred Soviet warheads launched by a rogue commander. The price tag was forty-two billion dollars for the national missile defense component, which included a thousand satellites to intercept missiles and 750 ground-based interceptors. Today, for thirty billion dollars, or three-quarters the cost, we are likely to get only a hundred ground-based interceptors. GPALS also had a theater missile-defense "underlay," which was advertised at twelve billion dollars. Today, for the Army's Theater High-Altitude Area Defense (THAAD) and the Patriot Advanced Capability (PAC-3) programs alone, we are talking about over twenty billion dollars.

When William Perry, secretary of defense from 1994 to 1997, started thinking about this issue, he challenged the Defense Department and the services to develop over two years missile defense systems that could be deployed, if the threat required, in two additional years. It was an insurance program, and there was no cost estimate placed on it. The "two-plus-two" idea grew into a "three-plus-three" plan that envisioned a cost of eight billion dollars. As I mentioned, the cost today for essentially the same system has risen to twenty billion or thirty billion, depending on which version of the hundred interceptors you are talking about, and those estimates keep climbing. The Bush administration is now proposing a system with five interceptors by 2004 with no national missile defense radar, at least not initially. The goal is to get something done quickly and to worry about the details really later—another example of the rush to deal with the perceived urgent threat.

The Bush administration of 1988–92 strongly believed in missile defense and wanted to do a great deal with it; that produced pressure to underestimate. The Clinton administration did not like national missile defense but was backed into a corner by a Congress that wanted missile defense, and then by the Rumsfeld report; the Clinton White House also underestimated the program's costs, but for different reasons. However, the net result is the same—missile defense programs that promise, if not the moon, at least a great deal, and for a small amount of money.

But crash programs do not save money; they cost more. There are large technical risks, and because a crash program is by definition in a hurry, it deals with those problems in ways that cost a lot of money and even then may not solve them. If a threat is urgent and a nation wants a crash program, it has to put real resources into it, to have at least a shot at solving the technical challenges.

This Has Not Been Done Before

The technical challenges of a national missile defense system have been significantly understated. If theater-level missile defense is difficult—and it obviously is—NMD will push the state of the art in more dimensions than any other weapon system—"hit to kill," sensors, radar, interceptors, "man in control," data fusion. The list goes on and on; NMD will be very tough to do. Consider, for example, the systems integration. It is as if we wanted to build, in five or ten years, the nuclear deterrent that we have now—all the warheads, bombers, missiles, submarines, command and control systems, early warning sensors—from scratch, all at once, and properly tie them all together. Actually, for NMD the systems-integration problem is even worse, because the tolerances are far lower; for our nuclear deterrent, times are measured in minutes, but for missile defense times are measured in milliseconds—and the distances in centimeters. This has not been done before.

Three elements are necessary to deal with this technical challenge. They are familiar to anyone who has worked in the acquisition world: robust risk mitigation, careful system integration, and proper testing.

Robust risk mitigation requires alternative technologies developed in parallel. If we are pushing fast on something and it fails, we need to be able to throw it out and fall back on something that *is* working. An example was the Polaris submarine-launched ballistic missile program, which pursued parallel development efforts in the mechanism by which the missile was ejected from the tube. One of them was not working; the managers just brought in the other one, and the program continued apace.

That does not happen often in missile defense programs, because of the cost. Risk mitigation is expensive—a billion, two billion dollars a year, maybe higher. The THAAD program would be, I would argue, much farther along today had it not settled on a single contractor so early. The program needed competitive approaches—in the sensor, in the interceptor itself—and it did not have them. In case after case, alternative approaches were in the baseline plans of missile defense programs but were among the first things thrown over the side when costs started to go up.

The second element of managing the technical risks of missile defense is system integration, which cannot be emphasized enough. It is not part of development; it

is *central* to development. It is not cheap, either—a billion dollars a year was planned for system integration in the GPALS effort, and that was clearly not enough.

The third element is testing, but proper testing for missile defense puts us in a new paradigm. In the old days, to develop, say, a ballistic missile, you tested by launching a lot of them—for Minuteman I, fifty-six in the initial flight test program; for Polaris A-1, forty-two; for Polaris A-3, fifty-five. A ballistic missile goes from point A to point B—it does not try to hit a moving target—and that is a much simpler task than missile defense. Trying to hit a rapidly approaching, perhaps maneuvering, target is much more like air defense, where, for example, the Safeguard system had 165 flight tests, Patriot conducted 114, and the Advanced Medium-Range Air-to-Air Missile 111. Extensive system testing is also required on the ground for all the hardware "in the loop." The right facilities are needed for all of it.

Somebody Else's Problem

Why do we care about NMD costs? It is rather arcane. It is somebody else's budget, somebody else's problem. That is the wrong attitude, because the budget is tight. We are not going to have enough money for everybody's needs, even with budget increases. If the costs of missile defense keep growing and not enough money is available, it is going to eat up transformation and modernization. The missile defense budget is now five billion dollars a year; maybe it will grow to ten billion a year. That is not a lot in defense-budget terms, but if it takes from other programs the marginal billion dollars that would have allowed them to achieve their goals, that will be a problem.

There are also national concerns. To get support on Capitol Hill, a system has to look credible, and its cost estimates have to be credible. Systems that keep going over budget, running into technical difficulties, and being delayed are eventually perceived as weak—and are then cut back or killed. If the administration wants missile defense, it will have to push very strongly for it.

What the Bush administration is going to do, we do not know for sure. What is clear is that it wants "layers"—a ground-based component and probably some sea-based component. The system may be designed to attack missiles in the boost phase, or maybe in midcourse; in any case, the administration wants it quickly. The problems I have warned of here are going to arise. Transformation and missile defense are not scientifically or even politically incompatible. They may be *budgetarily* incompatible, however, unless we are realistic and honest about what missile defense is going to cost, what the challenges are, and how long it will take to do it right. We must soberly decide how the costs and uncertainties

of a crash program for missile defense should be weighed against other defense priorities. Missile defense will crowd out transformation if we do otherwise.

ANDREW ROSS

I would like to go back to a point that Michèle Flournoy and Cindy Williams raised. We used to speak of the "revolution in military affairs." "Transformation" sounds less radical than "revolution." Are they the same thing? Should we be thinking about this somewhat less ambitiously? What we are engaged in is innovation, but transformation advocates are talking about innovations that are rather far-reaching, that change what our military looks like in a fundamental sense. We have not restructured since the end of the Cold War; we are just smaller. So, what is it we should be engaged in here—fundamental transformation, evolution, or merely a series of innovations?

CINDY WILLIAMS

I am skeptical of the notion that we are really engaged in transformation or revolution. When I use the word "transformation," I am talking about Admiral Owens's* notion: a combination of information technologies and precision weapons that can completely transform the way that our military fights, by essentially lifting the "fog of war." I have already discussed the institutional reasons why transformation is not likely to happen in the way visionaries have in mind. A second problem is that lifting the fog of war is not entirely a technical problem and cannot be addressed entirely by technical means. No amount of technology will tell you the opponent's strategy, what he is thinking, what his goals are, what he wants.

But even the technical aspects involve technology that we thought ten years ago we would have by now but that is nowhere near being deployed. Advances that we imagined would be made in the private sector—like communication systems that were going to make bandwidth virtually free—did not happen, for business reasons. A third reason is operational. In many ways, we are not going to be entirely happy with the implications of lifting the fog of war. Already, individuals in the field complain of information overload, of "cyber-rubbernecking" by the leadership in Washington.

Finally, information technologies are not free. People seem to think that they are cheap compared to platforms, but today we are spending about sixty billion dollars to buy and operate command, control, communications, intelligence, and information systems. That is about a fifth of the defense budget; it is not far from the size of the entire budget of the U.S. Army.

* William A. Owens [Adm., USN (Ret.)], *Lifting the Fog of War* (New York: Farrar, Straus and Giroux, 2000).

MICHÈLE FLOURNOY

First we had the "revolution in military affairs." We decided that had too much "baggage," and we came up with "transformation." Now that too has come to mean all things to all people. If we substitute "innovation," in four years it will suffer from the same problem. Words matter, and choice of terms is important, but in this case what matters is operational challenges. What are the specific missions that we want to be able to carry out, in what operating environments? What capabilities do we want? I do not care what we call the process; I want to know what are we talking about.

ANDREW ROSS

Let us get to what is at the heart of the matter—cost. The Chief of Naval Operations has warned that there are inadequate resources to transform for the future, that there may be a trade-off between current and future readiness. It has been widely agreed that significant additional increases in defense spending are unlikely. How big a problem is that for transformation? Some, on the other hand, have said the problem is not more money but creativity and management. Who is right?

MICHÈLE FLOURNOY

My sense is that in the near term, money is not the problem; concept development and organizational change are the immediate deficiencies. Down the road, translating the results into new programs will involve some real costs and trade-offs. Throwing money at the problem is easy, in a way, but it puts the cart before the horse. In the near term, the problem is to change a culture, to foster concept development and innovation, and that is much harder.

The specific technologies that people associate with transformation are not always cheaper. The unmanned aerial vehicle is an example. People call them "drones"; it sounds like a cheap replacement for an airplane, one that would not cost much to operate because it does not have a pilot inside. It turns out that the Global Hawk System would cost fifty-five million dollars a copy—an air vehicle plus its ground control center. That is very comparable to the price we paid for the U-2s, which it can be thought of as replacing. Will there be savings in operational costs because there will be no pilots on board the aircraft? No—the Air Force plans to have *two* pilots on the ground running it. Unmanned aerial vehicles have many advantages, but they are not necessarily cheaper.

DAVID MOSHER

There are inherent internal pressures in the defense budget, aside from transformation, that force trade-offs. One is the mysterious fact that operations and

maintenance costs climb every year. The migration of money from procurement into the operating accounts keeps growing, and no one really knows why. It is something to keep in mind.

ANDREW ROSS

Among the barriers to transformation that have been mentioned is complacency. Some of the visionaries feel a sense of urgency regarding transformation, but the larger defense establishment and the country as a whole do not. In striking contrast, in the national missile defense realm there is a great sense of urgency; it has become highly politicized, and that has led to problems. The ballistic missile defense testing program has been characterized as a "rush to failure." If somehow a sense of urgency is generated for transformation, will we see the same kinds of problems?

MICHÈLE FLOURNOY

It is a double-edged sword. Historically, major transformations and innovations have been driven by military failures. We can certainly wait for that to happen, but that would be an unfortunate way to proceed. The day after some catastrophe, there will be enormous pressure to do something substantial—and quickly; of thirty choices made then, ten are likely to be bad. So what I advocate is not waiting for that to happen but taking a measured approach that values serious threat assessment.

I would rather see the Pentagon and the services look closely at threat assessments—what regional powers are procuring, what their doctrine says, what they are writing about, how they say they would take on the United States, what they are doing with their own defense investment. Two things are blocking such an assessment. One is that countering those threats may call for systems that would compete with preferred procurement programs already in the pipeline. Many, many potential transformation ideas never get off the ground; they are seen as threats to established priorities, and they have no natural institutional advocates. That is a mistake. I recognize the downsides of a sense of urgency, but I think that they can be managed.