

washingtonpost.com

To Fight Terror, We Can't Think Straight

By T. Irene Sanders

Sunday, May 5, 2002; Page B02

Last month, Secretary of Defense Donald H. Rumsfeld announced changes to the U.S. military's top brass, elevating people such as Gen. James Jones (the Marine commandant slated to become supreme allied commander in Europe) who stand out for being unconventional thinkers. Rumsfeld's decision to modernize the Defense Department is in part a reaction to the unanticipated horrors of Sept. 11. But even before the attacks -- in fact at a Pentagon speech on Sept. 10 -- Rumsfeld said, "We must change for a simple reason -- the world has. And we have not yet changed sufficiently."

For far too long, our military and intelligence establishments have simply analyzed the past in order to anticipate the future -- relying on what's commonly called a linear way of thinking. When you think you have all the answers, you don't continue to ask questions. "We have a scenario for everything that could possibly happen in the world," a CIA employee told me back in 1993, during a class I was teaching about the science of complexity, on the morning after the television news had shown images of an American soldier being dragged through the streets of Somalia. Despite his bravado -- a trait that I believe is endemic to the agency -- sneak attacks and unforeseen scenarios have continued to surprise us: the bombings of a U.S. military barracks in Saudi Arabia in 1996, of the U.S. embassies in Kenya and Tanzania in 1998, and of the USS Cole in 2000.

The war on terrorism has heightened the need for a new way of thinking about defense. The model for this way of thinking, which is transforming fields as diverse as banking and the automobile industry, was born in the mathematical science of chaos theory. In general terms, the challenge before us is to move from an emphasis on simple cause-and-effect relationships to a focus on more intuitive, associative forms of pattern recognition. The question that lingers in my mind is whether the attacks provided enough of a wake-up call to revolutionize our approach to our own security.

As the House and Senate intelligence committees prepare for a joint investigation into the failures of the intelligence community leading up to Sept. 11, they seem to be going about it as they always have done, asking the same old point-the-finger questions: What did we miss? Who's to blame? If committee members understood complexity science and used it to guide their investigation, they would have a better chance of getting the insights and answers we all need.

That's because the science of complexity emphasizes the context in which a particular event takes place, and provides a broad framework for understanding what was missed and why. Take a look at how linear and nonlinear thinking have affected the auto industry over the past few years. Traditionally, manufacturers designed their cars to meet a certain price because they believed that they knew how much customers were willing to pay. That's a linear way of thinking. The success of sports utility vehicles reflects a more nonlinear approach. The early leaders in this new category of vehicles tapped into the changing patterns of a whole generation of mid-life baby boomers, who wanted more recreation and adventure in their overburdened lives. Only now are manufacturers looking into making the SUVs they created safer and more fuel-efficient.

Linear thinkers tend to rely on past experience to travel from Point A to Point B. Nonlinear thinkers

tend to look for changes since the last time they made the trip. A failure to recognize those changes is why blue-chip giants often get caught off guard by small, innovative companies such as Southwest Airlines, Starbucks, IKEA, Old Navy, DirecTV, Hotmail and NetBank. Understanding traffic flow is another example of the difference between the two ways of thinking. Even if you knew the driving habits of every individual on the Beltway, you couldn't predict the morning rush hour with any degree of confidence; there are simply too many other factors at play. Just one driver's tap on the brakes can affect all the other drivers around him and alter traffic patterns for miles. A sky-cam helicopter, on the other hand, can give a pretty good indication of overall traffic patterns, because it provides a view of how events and weather conditions are interacting.

This big-picture approach makes more and more sense in a world that is composed of complex adaptive systems -- whether naturally occurring ones such as a rain forest or your immune system, or ones we have created such as the World Wide Web and our rapidly globalizing economy. Each of these systems evolves over time in relationship to the larger environment in which it operates. Small changes or small inputs of resources at strategic points in these complex systems can be amplified throughout the entire system, bringing about significant overall shifts. This process is popularly known as "the butterfly effect," because it reflects the idea that a butterfly fluttering its wings in Asia could cause a hurricane in the Atlantic. That metaphor helps explain how Osama bin Laden and the al Qaeda network were able to have such an impact on large global economic systems.

And while it's not possible to predict the future, it is possible to develop foresight -- to identify small changes and new conditions that are beginning to influence the future.

A focus on detecting such subtle shifts and changing patterns should help us see, respond to and influence what is emerging, before it erupts on the worldwide radar screen. In the case of the terrorist attacks, a good deal of information and data had been gathered, but intelligence analysts failed to put together the pieces of the puzzle -- from the previous bombings, the attempted millennial attacks and the suspicions raised by Middle Easterners getting flight training.

On Friday, the Associated Press reported that last July, two months before the hijackings, an Arizona-based FBI agent alerted officials in Washington that Middle Easterners were training at U.S. flight schools. He advocated a nonlinear response: "FBIHQ should discuss this matter with other elements of the U.S. intelligence community and task the community for any information that supports Phoenix's suspicions," the agent wrote. "FBIHQ should consider seeking the necessary authority to obtain visa information from the USDOS (State Department) on individuals obtaining visas to attend these types of schools," the memo continued. Perhaps the August 2001 arrest of the so-called 20th hijacker, Zacarias Moussaoui, was prompted by the agent's memo. But it's clear that the FBI had not succeeded by Sept. 11 in activating a big-picture approach and following through with other agencies, from local police forces to the Immigration and Naturalization Services.

None of this is to suggest that these two ways of thinking are mutually exclusive, or that nonlinear thinking makes linear thinking redundant or obsolete. It's simply time for a change of emphasis. And it is one that is particularly important with regard to the current crisis. Complexity science may be able to help those of us in the Western world understand a perspective that has been part of Eastern and Middle Eastern cultures for centuries. I recently reviewed a dissertation proposal on organizational management by an employee of the Islamic Development Bank in Saudi Arabia, in which he describes the Islamic worldview as "fundamentally holistic and systemic -- one that integrates rather than divides; one that concerns itself with complex patterns rather than simple single events."

Our inability to see and understand the interconnected nonlinear nature of the world made us vulnerable to the malevolent intentions of those who could. The enemy we face is a loose coalition of semi-independent terrorist cells, each with a well-defined mission and a high degree of adaptability and flexibility in carrying out that mission. Al Qaeda does not rely on immediate direction from a central authority yet still maintains effective coordination -- a model similar to the one used by organized crime syndicates -- and hence has been far less susceptible to intrusion or destruction. It adapts its methods to accomplish its goals. This is in direct contrast to the defense and intelligence-gathering organizations in the United States, which are still large and centralized bureaucratic operations, characterized by hierarchical command-and-control structures.

Rumsfeld has recognized and is already acting upon this challenge. As he writes in the May/June issue of *Foreign Affairs* magazine, "Preparing for the future will require new ways of thinking, and the development of forces and capabilities that can adapt quickly to new challenges and unexpected circumstances. The ability to adapt will be critical in a world defined by surprise and uncertainty." But just how receptive are other people in positions of leadership to such a radical change of emphasis? People I have spoken with on Capitol Hill seemed resistant to the idea. "I'd hate to admit that there's *anything* we can learn from the al Qaeda network," one senator said to me when I suggested that there was a lot to be understood from the thinking and organizational structure of the terrorists.

The price tag for this type of arrogance is high. Despite our overwhelming trillion-dollar military and economic superiority, we were caught offguard by a terrorist network that put out an expenditure of about \$400,000. What's to stop that from happening again? Very little, it seems. As one White House official said last week, after FBI Director Robert S. Mueller admitted how little has been found out about the hijackers' plotting: "If it took . . . years to develop the 9/11 plot, then it is very, very possible that we are in a similar period right now, where individuals are practicing the same type of operational security in preparation for another attack."

It's about time we learned a new way of thinking.

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