

Managing Science at the CIA

Growing mold in a bathtub is not usually known to attract students to physics, but it did start Donald Kerr, deputy director for science and technology at the Central Intelligence Agency, on a career path to science. As a young boy, Kerr was introduced to mold when he met a bacteriologist while on a family vacation to Cape Cod, Massachusetts. That chance encounter led Kerr to a PhD in plasma physics from Cornell University in 1966.

"When I finished graduate school, I went to Los Alamos [National Laboratory] and worked on atmospheric physics problems related to high-altitude weapons effects," says Kerr. In 1976, he moved to the newly created US Department of Energy, first to help manage its Nevada operations office, which deals with nuclear weapons testing, and then to lead defense programs. In 1979, he returned to Los Alamos, this time as lab director. After spending the late 1980s and early 1990s working in industry and providing advice to the intelligence community, Kerr received a call from Louis Freeh, director of the Federal Bureau of Investigation, about problems the bureau was having within its forensic laboratories. "It became clear he was not looking for consulting help, but . . . for real help," says Kerr. "I became one of the few people from the outside to be an assistant director of the FBI." (See *PHYSICS TODAY*, December 1997, page 51.)

After Freeh left the FBI in 2001, Kerr received a call from CIA Director George J. Tenet, an old colleague in the intelligence community. Tenet had long tried to persuade Kerr to join the agency. This time, says Kerr, "he said my old excuses wouldn't work anymore, and that's how I ended up where I am now."

"The interesting thing is that, culturally, the CIA and FBI are very different," he says. An FBI investigation focuses on getting the facts about events that have happened. In contrast, the intelligence business monitors indications and warnings of things that have not yet happened. "Scientists," adds Kerr, "are used to the way intelligence organizations think, because a fundamental of physics is to be able to predict things theoretically."

After the attack three years ago on the *USS Cole* in Yemen, the CIA increased resources for tracking terrorist

Donald Kerr has been involved in many scientific endeavours—from studying plasma physics to managing a network of forensics laboratories. Now, he faces the daily challenge of keeping the Central Intelligence Agency's technology one step ahead of the US's adversaries.

organizations. But the September 11th terrorist attacks nearly a year later indicated that intelligence-gathering techniques—such as spy satellites—developed to monitor nations are not as useful for surveilling nonstate organizations such as Al Qaeda. That realization, says Kerr, has significantly changed the whole tempo of operations. "We're responding today to situations that none of us envisioned 10 years ago, and with adversaries who react to what we do. . . . It's a very dynamic situation," he says. "What we have to think about today is what I would call close access kind of activity, where [CIA operatives] are close to the target. You're on the ground; you need [continuous] surveillance rather than occasional sampling, and different kinds of tools



Kerr

and techniques to make it work."

Kerr characterizes his science and technology directorate as being responsible for everything from mascara (disguises) to spacecraft (remote sensing). "We're at the juncture of technology, targeting, and tradecraft. . . . Technology by itself, no matter how elegant, can't be successful unless we can apply it." Targeting adversaries, he adds, is dependent on other directorates and agencies, and "tradecraft" is defined as how people and equipment get to the target. "An operation succeeds through the marriage of these things." However, every time a newspaper publishes how the US obtained a particular piece of information, the agency may lose surveillance capability, he adds. Kerr used the tapping of Osama Bin Laden's satellite phone as an example. "The day after that [newspaper] report came out he went off the air. . . . There's a real cost to the taxpayers involved with these leaks and frequent disclosures."

Science at the CIA

"The biggest problem I have in today's environment is keeping the short- and

long-term development requests in balance," Kerr says. The demands on the S&T directorate limit the time available to look at more fundamental questions, he adds. Is there a role for modern biology in the field? How can power sources be improved? Are there new ways of gathering information? To improve thinking on these questions, researchers working on long-term projects are often deployed to operational areas so that they can see firsthand the problems in existing equipment. "It's like being on the factory floor," Kerr says. Once the scientific staff members gain field experience, they are rotated back to the US. By continually moving the staff around, the lab receives a constant supply of fresh ideas.

One of Kerr's major initiatives was to increase the amount of unclassified technology used by the CIA. Kerr says the agency needs to find and use "the best technology that's out there, either in industry, or in universities, or in government laboratories. . . . Economically, that's always a better solution than starting from scratch." In the case of academia, that means the CIA hires academics as consultants and agency staff members visit the best university labs. To take advantage of industrial expertise, the CIA created a venture capital company called In-Q-Tel. Founded in February 1999, In-Q-Tel invests in companies that develop unclassified technology products that the CIA could use, and encourages companies to develop product additions that the CIA is specifically interested in. For example, the ability to machine translate Arabic family languages has helped speed up the analysis of documents from the Middle East region. A CIA office linked to In-Q-Tel also helps with technology transfer. "It's been very successful and we now have a number of In-Q-Tel products in use within the intelligence community," says Kerr.

New staff

The September 11th attacks had a big impact on staff recruitment at the CIA. "The number of applicants rose by a factor of 10," says Kerr, "and within that, we had a number of scientists who probably would have never considered a career with the government, let alone in the intelligence area." Although the CIA advertises some technical positions, the majority of recruitment is done on college campuses, through site visits and networks of CIA alumni and academic consultants. "Some of the people we're looking for are not new graduates. We're looking for people who are

maybe 5–10 years out of university, with some business experience as well,” he adds.

The CIA is not just looking for specific disciplines, but, says Kerr, “the flexibility of mind to do the things that matter. Almost all our projects are interdisciplinary, because you may start with some fundamental understanding of how genetic sequencing is done, but if you try to embody that in some form of sensor, you’re pretty quickly working with people

who are more skilled in some of the engineering disciplines.”

“We need this continuous infusion of fresh ideas and fresh thinking on our problems, because it’s easy to get used to the old way of addressing a particular issue,” he adds. “We want to be viewed as a place where scientists can make an important contribution to society and [where] they will be challenged in their discipline, as well as in their lives, by coming to do it.”

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