

APPROVED FOR RELEASE  
DATE: 02-15-2012

~~Secret~~

(b)(1)  
(b)(3)

*Taking Stock*

# An Interview with Dr. Ruth David, CIA's Deputy Director for Science and Technology



Interviewer's Note: The scientific and technical history of the CIA is immediately apparent to anyone who walks through the atrium of the New Headquarters Building at CIA, with its mockups of the U-2 and SR-71. Other space-related aspects of CIA's scientific accomplishments have become well known to the general public with the release of information concerning the use of satellites in intelligence collection.

The achievements of the past notwithstanding, the scientific and technical aspects of intelligence face the same problems of renewal and redefinition confronted by other areas of the profession. Dr. Ruth David, CIA's Deputy Director for Science and Technology, addressed these and other issues in an interview with *Studies in Intelligence*, recorded on New Year's Eve, 1996. Dr. David joined CIA in July of 1995, from the Sandia National Laboratories, where her last position was Director of Advanced Information Technologies.

*In a memo you addressed to the directorate in May 1996, you said, "We do not intend to neglect space-related issues, but the larger problems and opportunities facing intelligence in the years ahead are those of the information age." Expand, if you will, on that transition.*

In a very real way, the space age shaped where this directorate is today. That is where our roots are, that is why DS&T was originally formed, and the issues of space were

the greatest challenges we faced. Though those remain important, we are, overall, facing a very different situation. We are in the midst of a technological revolution that is affecting every aspect of our lives, and not just in the intelligence business. With the explosive growth of information technologies—worldwide, not just in the United States—we have to step back and take a look at what this means to every phase of the intelligence process. Look at collection: we face major challenges in the way our targets communicate, the way they store information, and the way they share information. And then we have to pay attention to how we need to leverage information technology through all the other phases of the intelligence process. The information age is touching every aspect of our business, and it is touching it in ways that mean we no longer control the pace of change.

In the space age, the government, including the Intelligence Community (IC), was at the front edge. We were pushing the state of the art in most of the critical technologies. We were, in that sense, the limiter of what could or could not be done. In the information age, however, the marketplace is being driven by commercial entities, by private businesses.

That represents both good and bad news for us. It is good news in that we do not require massive Federal investments to advance the state of the art in many fields, but it is bad news in the sense that we have to be

**“  
We are in the midst of a technological revolution that is affecting every aspect of our lives, and not just in the intelligence business.  
”**

works for the National Security Agency.

~~Secret~~  
Interview

“

**It is important for me to have an appreciation of why things are the way they are before I start suggesting ways to change.**

”

continually playing catch-up and trying to anticipate future technological changes and their impacts on the business of intelligence. [ ]

*What is it like for the people in this directorate to make that shift from government operating ahead of the state of the art to having to deal with commercial technology?* [ ]

It is a huge shift because our work force needs to spend a large percentage of its time understanding what is happening externally, and that is not the culture we have created in the IC. But, if we do not have that understanding of what is happening externally, we risk trying to recreate things that people on the outside have already done, probably at great expense or delay. Another danger is that, if we are unable to recreate it, we will not be able to leverage the changes taking place externally, with the result that we will operate inefficiently and at greater cost. We are somewhat unique, in that our success from a collection perspective often depends upon our ability to exploit how others use technology—and that requires a deep understanding of the technologies at play. We face a great many dilemmas in not being ahead in the way we used to be, but many of those problems are those of mind-set. [ ]

*You have been here a little over a year. How much have you accomplished in changing that mind-set?* [ ]

It is a difficult process, but I think we have made at least incremental progress. I have concluded over the last year that there are many people in this organization who see the problem and are doing everything they can to deal with it. Unfortunately, I believe this remains a minority of the

population—and we have a long way to go! [ ]

But I am encouraged by the people who are speaking out and trying to move in this direction. As I step back and look at this, I do not think the movement to change is something I have created. I think I am simply trying to articulate something a great many people have already seen. What I am trying to do is build the momentum that will allow us to move forward. This is a fundamental shift that people working at the local level have recognized, and I am trying to put into place the strategic changes that will allow that to happen. The information-age technologies affect every business line we have. [ ]

*The fact is, though, that you are an individual who has come from outside a rather closed structure. Does that make the message harder to get across?* [ ]

In some respects, that is true, but much of that had to do with my initial learning curve, not knowing in detail the business of intelligence. I continue to devote a lot of time to learning this business and to developing my understanding of how things are done. It is important for me to have an appreciation of why things are the way they are before I start suggesting ways to change. [ ]

I have spent a lot of time traveling to stations overseas to see how the people on the frontlines operate, and, ironically, I often find that the people on the frontlines have a greater appreciation of the need for change—the need to deal with a new technological environment—than do some people at Headquarters. I have learned a great deal through this process, and I think it has helped me better articulate the urgency that I feel. [ ]

*You have mentioned the impact of change throughout the intelligence process, not just in collection. How well postured did you find the directorate to deal with those other phases?* [ ]

Poorly. That comes from two realities: first, from its inception, DS&T focused primarily on collection problems; the other is that collection was the area involving the greatest technical barriers. Here, again, the information age is different. Technology is becoming increasingly important in all the other phases of the intelligence process. But it also is changing, in that those discrete phases are blurring. We can no longer be focused on just the collection problem, because in many areas we already have the capability to collect far more than we can process or report. We are confronting real issues of volume—how do we deal with massive amounts of data? [ ]

There is also the reality that one challenge is going to be that of putting together fragments of data from different collection stovepipes or from different kinds of sensors. The ability to ferret out and correlate fragments from those various forms of collection and put them together in a meaningful picture will require an unprecedented capability to look

“

**Probably the most important role the office can play in the longer term is in helping to define and create the future analytic environment.**

”

across the collection disciplines and also an expanded ability to assimilate and fuse data. [ ]

*You established in 1996 something called the Office of Advanced Analytic Tools that one would suspect has brought this directorate into close contact with the Directorate of Intelligence.* [ ]

Absolutely. In fact, we created that as a joint DS&T-DI office. We set priorities and manage the office jointly. It is just now getting on its feet, and we face a real challenge in staffing the office appropriately. We, like every other office in government (and in industry), have significant shortages of computer scientists and engineers, so we are going to face some staffing challenges. But, in my mind, the office has several different responsibilities. We have talked about the need to purchase off-the-shelf software where we can or technology of any kind. There is an important role in evaluation of off-the-shelf products for suitability in our environment. That is one service the Office of Advanced Analytic Tools will provide. The emphasis is not one of "you can or you can't buy a piece of technology," but simply to provide an independent analysis of its suitability for the intelligence business. [ ]

A bit more strategically, the office has a role in adapting commercial products that may have useful features but which will not fit cleanly into our environment. Probably the most important role the office can play in the longer term is in helping to define and create the future analytic environment. By that I mean having a strategic role in helping to build what I expect will be a different working environment for the

analyst. We are really talking about an environment that enables the analyst to change the way he or she does analysis—rather than simply automating today's practices. [ ]

That implies a "bottom up" look at the way we do our business. Our partnership with the DI is vital in this, first of all, because the DI is the expert on how we do intelligence today. They also have a lot of visionary people who see an opportunity to do their business differently. So our ability to work with them from a technological perspective and help them create that more agile environment is one of this office's most important responsibilities. [ ]

*But when you bring these folks together, you are merging populations representing different backgrounds, educational preparation, and even professional languages. How is that going?* [ ]

It is mixed. In some cases it is working well, especially in cases where you can locate those analysts, who, despite a different background, are eager to encourage the greater insertion of technology into the analytic process because they see its potential. We have analysts who go home and spend their evenings surfing the Internet. So, even in the case of analysts who lack a formal technical background, this does not mean they

do not appreciate what technology can do for them. [ ]

On the other side, bringing the analysts closer to the technologists forces the latter to recognize that technology is nothing more than a tool—an enabler. If it does not enable the analysts to do their work better, then we are doing the wrong job. Forcing that dialogue, forcing that engagement is important from both sides. [ ]

*But it is not easy.*

No. Not easy. We are trying to build a core of people who can do that well, and then to enable that core to grow. [ ]

*You mentioned people going home and hitting the Internet. That gets to the question of how much information is outside the classified context. How big is that issue?* [ ]

It is both a problem and an opportunity. It is a problem in the case of the Internet, for example, in that there is more data out there than information. Much of what is out there has absolutely no vetting. So you do not know what to believe and what not to believe. That is a very real problem. [ ]

One other problem is that our consumers are living in that same environment, have access to those data (in varying degrees), and assume it to be information. So we have at least to be conversant with what is out there so we can evaluate its validity when our consumers read the data back to us. And we have to be able to use it effectively to provide context for our intelligence product. [ ]

~~Secret~~  
Interview

“  
**We have to do better in  
 figuring out ways to exploit  
 the information  
 environment, and that  
 means developing greater  
 agility to deal with this  
 dynamic world.**  
 ”

The opportunity side, especially in the open-source arena, is that a growing number of our sources are going on-line. Today, it is still a small percentage of our sources, but it is growing. We are seeing radio stations go live on-line; newspapers all over the world are doing the same thing. But we have not discovered a way to predict how far or how rapidly this will grow. How reliable will the Internet be one year or five years or 10 years out?

It is a business reality for the IC that we have to be able to leverage the Internet and the information explosion it represents. On the other hand, we cannot afford to become totally reliant on it.

*There is a fundamental change. Twenty years ago, on almost any target of consequence, the characteristic information posture was shortage. Now we are into information overload. How are we doing with that?*

It is a tremendous challenge, but not one that is unique to the IC. Every business is facing the same information overload. They have access to so much data that their ability to distill that which is relevant and meaningful to their business is the greater challenge. As a result, the commercial marketplace, once again, is driving the development of more effective search tools and browsers. We are not alone, but the reality is that we are having tremendous difficulty dealing with sheer volume. We do not have all the answers to this, but ignoring it is not the answer.

*Do you think we have been ignoring it?*

Ignoring it is probably too harsh a term, but there has been a tendency to write it off because we could not

deal with the volume and to turn to sources where we can control what we collect. We have to do better in figuring out ways to exploit the information environment, and that means developing greater agility to deal with this dynamic world.

*Agility in what sense?*

Agility in changing our business practices as the external world of information changes. Agility in re-deploying or reallocating resources in recognition that the information world we live in is changing. Our ability to plan any sort of program three or four years in advance and to have a relevant plan for how we intend to do our business is almost impossible. So we need to step back and think in terms of program objectives—what we intend to accomplish—rather than of the details of how we intend to attain those objectives.

You have mentioned the increased information available to the customer independent of the IC. Telling the customer what he or she already knows and calling it intelligence is not going to be a good way to do business, is it?

I have had more than one customer say that, as a matter of routine, they begin their daily business with a search on the Internet on topics of

interest to them, only to get those same clippings from us several days later. We cannot afford to be in that position, though it is going to be hard not to be.

CIA will turn 50 in 1997. One fundamental change we have witnessed is that, even 20 to 10 years ago, we and our customers had nothing like the access to global information media we have today. That has to change the way we think about our value added. Our consumers no longer rely on us as their sole source of information. We are but one of many sources, and we remain relevant and viable only when we add value to what customers can obtain from those other sources. One form of relevance and value may be saying that one or more of those other sources is providing invalid or incomplete information, and here is what they are not telling you. We still provide value added, but we need to understand how the nature of that value has changed because the information around us has changed.

*And we cannot calculate how to provide that unique value unless we understand the other sources out there in the marketplace, correct?*

Absolutely. Our ability to understand those other sources, to understand where we add value, and to articulate that value will determine our continued existence.

*What about the Community Open-Source Project Office and its ability to deal with our information problems?*

COSPO has done an absolutely superb job of increasing the Community's appreciation of open-source information. They have also

“

**I would like to see us increase the amount of time we spend together dealing with strategic issues, as opposed to debating budget numbers.**

”

advocated purchase of new information services from commercial sources in the form of bulk purchases that have been extremely valuable. We have statistics available that demonstrate that the value of our intelligence products has been enhanced significantly by open-source information. Sometimes, it is the only information available, but more frequently it provides background or context for intelligence. What I have found is that everyone in the Community, as well as the policymakers, are developing a greater appreciation for the value of open source.

*But don't you encounter some apprehension that efforts like this just enhance the view that open source has all the information decisionmakers need?*

That is a tightrope we have to walk. If the day comes where we lay our products down beside open-source products and we can demonstrate no value added, we are out of business. We are a long way from that day. Even assuming that open source provides much of the volume of information available to the decision maker, there is great value added by the IC in assimilating that information and putting it together in a coherent package.

There is also great value in assimilating that information and packaging it with fragments from sensitive sources that build a more complete story—or perhaps present a contrasting picture. We all know that in some parts of the world things get reported in the media that do not correspond with reality. The message to us as a Community is that we have to know what is being reported.

*One of the roles for us in the future is vetting through that mass of data or information available in the marketplace, correct?*

In fact, one of the things our open-source community focuses on is source analysis, understanding the reliability of information provided by various sources and maintaining a current assessment of those sources.

*One issue raised by this closer link between open sources and our sensitive-source information is the technical security of our information systems. Are you involved in that?*

We have talked a lot about becoming a more tightly connected—more collaborative—IC, and it is imperative that we reach that goal. We are already seeing a growth, though, in the number of product dissemination systems across the Community, with each collecting source providing its own dissemination mechanism. One reason for this is the information security problems we have yet to come together to deal with.

This is a make-or-break issue. If we as a Community do not come to grips with how we are going to deal with information security as a Community, we are not going to succeed in leveraging what information technology could do for us.

*Are you pleased with what you have seen in our ability to function as a Community?*

I personally think we have a long way to go. I would like to see us increase the amount of time we spend together dealing with strategic issues, as opposed to debating budget numbers. We have benefited greatly in certain areas from having shared strategic objectives. So there have been positive steps made in the last year and a half under Dr. Deutch's leadership. Pulling the Community together has really paid off. We have done well reaching a Community position on targets and priorities. It may be the techie in me, but I think we need to do equally well with setting Community objectives on technical enablers. These provide something of a "crosscut" to targets or intelligence issues, allowing us to function more effectively as a Community.

*One of the interesting things about this directorate is the range of its functions—from true R&D to efforts like the Foreign Broadcast and Information Service. Structurally, where do you see this directorate going in the next few years?*

The breadth of what we do is, once again, both an advantage and a disadvantage. It is an advantage, in that DS&T may be unique in the Community because we touch every single collection stovepipe, every INT. And I do not just mean touch; we are actively engaged with every INT. In addition, we are engaged in every phase of the intelligence process, from collection to dissemination. It is an advantage to see the whole spectrum and to be in a position to see opportunities for synergy and integration.

~~Secret~~  
Interview

On the other hand, it is hard to focus our activities. As we have drawn down resources in the past few years, we have found ourselves trying to maintain this broad scale of engagement, and I am concerned that, as a result, we find ourselves something of a holding company of somewhat ailing businesses, as opposed to having a smaller number of robust businesses. So, we are taking a hard look at whether we can continue this breadth of engagement. [ ]

*Is this just a question of resources, or are some of the businesses just not healthy?* [ ]

The reason the businesses are not healthy is a lack of resources. What we have done over the last few years, as resources have declined, is to try to maintain today's operations at the expense of investment. This includes investment both in our work force or in our capabilities. As a result, we have fallen behind in technology, and we have fallen behind in maintaining the skills of our people. That is why we are poorly positioned in some of our business areas. We have worked so hard at running in place to meet today's operational needs that we have not stepped back to notice when the road may fall out from under us. [ ]

*So the danger of going too far with "doing more with less" is that you end up doing less with less.* [ ]

You reach the point where you are no longer even capable of performing today's operations. [ ]

*But then you have to make the decision to stop doing certain things, which alerts you immediately to who the constituents are for the things you no longer want to do.* [ ]

Oh, yes. You got it! And every business we have has a vocal constituency. We have run into this in spades. I have begged people to tell me what we can stop doing. And when you propose something to cut, you can get really bloodied. [ ]

*That is a universal phenomenon. What is the answer?*

I wish I knew. This is another one of those issues the Community is going to have to come together on. Part of the problem is that it is hard to find out exactly where today's resources are and whether we have them aligned against the right priorities. As a result, we fight these battles on an incremental basis. I am a real believer in establishing decision criteria before you look at budget numbers. We tend to start with budget numbers rather than first deciding what is important to us. In the absence of sound decision criteria, you leave yourself open to a process where decisions are made based on who can outmaneuver everyone else. [ ]

*You mentioned that DS&T touches all the other INTs and the whole intelligence cycle. Without naming names, are there people who would prefer that you not touch their INT or their portion of the cycle?* [ ]

Undoubtedly. But I have always believed in changing from within: build the right partnerships and make people understand that it is to our mutual benefit for us to work together. It does not work across the board, but for the most part people understand there is value added in working that way. Things tend to go along well until we start arguing over resources. What we have lacked to date in that area is a joint planning structure—a way to develop shared

strategies—to put order in our resource discussions. [ ]

*What impact has the creation of the National Imagery and Mapping Agency had on this directorate?*

The operational impact is that our former National Photographic Interpretation Center is now under the control of NIMA. [ ]

[ ] This is another opportunity for us to build partnerships that, from a technological perspective, leverage investments across both agencies. We share common interests; for example, NIMA will be a success to the extent its imagery products contribute to all-source analysis. [ ]

The challenge to our all-source analytic community will be to bring about a seamless integration of "stovepiped" outputs, including imagery, into all-source products and services. And I hope the bridge from the stovepipes will be the analytic tools office. That means we need to work together in areas such as information security and data warehousing to make sure we have a seamless connectivity. Even though the imagery product is different in its own way from other products, the imagery community faces the same challenge of volume confronting all of us. How do they ferret out meaningful images from the rest? To the degree we have other business areas facing this challenge, we have opportunities for synergy. One thing we are seeing even in the open-source arena is the need to look at video information. Technically, this represents a real similarity with the challenges faced by the imagery

community. There are opportunities for us to build joint strategies.

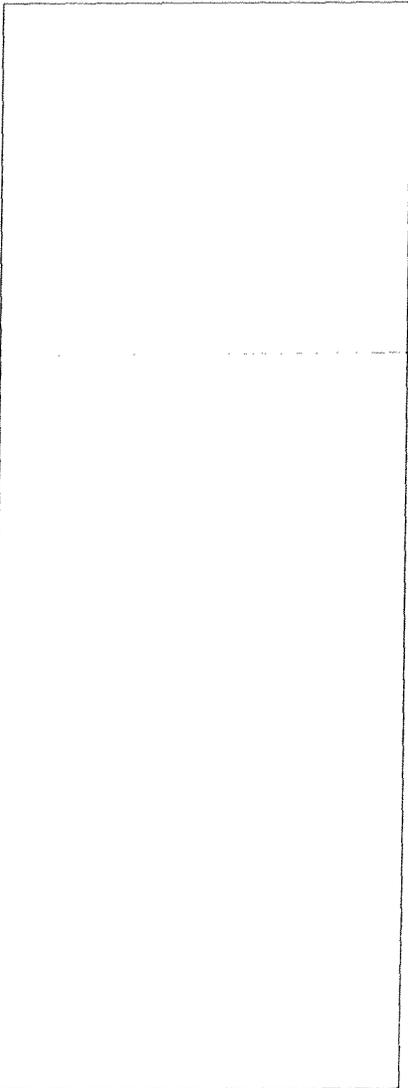
*Absent those synergies, is it not likely that what we could hear, from Capitol Hill and other observers, is "Congratulations. You just went out and built another stovepipe."?*

The resolve to avoid that is strong, but I am not sure the focus of the resolve is as clear as it needs to be. It is going to take concerted effort to avoid this outcome. Our Office of Research and Development is working hard on this issue from the perspective of technology strategy. But it is going to take continued dialogue at all levels of the organization—including strategic levels—to make this work. I have heard at all the debates over stovepipes versus more or less horizontal structures, and I tend to be one of the rebels who believes that two models need to coexist peacefully.

Stovepipes are good, in that they build and nurture substantive expertise along functional lines. That is very, very important. What information technology allows is the backplane connectivity that cuts through the stovepipes at different levels. We cannot wait until the product comes out the top of a stovepipe to establish connectivity. We need connective planes at different levels that are really going to allow us to leverage our assets as a collaborative community.

*Here, again, we have analysts who are comfortable with things like community e-mail. The technology is there, the mind-set to use it is there, but we may be running ahead of policy in some areas. You may not be able to put a stop to this. But would you want to?*

You certainly do not want to put a stop to it. What I worry about is that, because we have not done adequate Community-level planning in these areas, we are frustrating analysts who want to move ahead, and we are making it hard for them. That is something we have to turn around. We have to do the Community-level planning that enables that environment, rather than making it painful. Frankly, we are turning analysts off, and that is dangerous.



*You have mentioned the national laboratories, which happens to be your background. Was that a good grounding for you coming into this job?*

It was a very good grounding, perhaps more in the last five years of my career than in the first 15. That earlier period was devoted almost exclusively to activities in support of nuclear weapons engineering, so I had little contact with industry and academia, except in the long-term research area. In the last five years, technology transfer efforts, along with increased use of commercial systems and technologies—in weapons and other products coming from the laboratories—changed my experience.

The biggest difference I find coming from the laboratories to the Agency is that in the labs the majority of the work force, by far, consists of scientists and engineers. Here, they are a minority. So I have been dealing with a different perspective. I am used to building products for other technologists; this environment is very different.

It was a good background because the labs function as something of a halfway house between industry and government. But the two cultures exhibit major distinctions.

*Has that been your biggest surprise? Is there a biggest surprise?*

There have been a lot of biggest surprises. But that has been the most significant difference. By its nature, the intelligence business is one characterized by isolation. I see a need for greater outreach, but I also recognize the need to do that carefully.

*Thanks very much for your time.*

