Lee W. Rivers

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I want to share with you some of the observations that I've made over the last two years while working in Washington. But first I want to establish my credentials, which are really industrial. I spent 38 years working for a very large American company, Allied Signal. In 1985, I went to the White House Science Office and spent 18 months there, 12 of them as the Industrial Research Institute Fellow. I was representing the industrial perspective, if you will, in the White House Science Office. Then I stayed on for another six months after that as a consultant to the Science Advisor. Last April, I formed my own company and went to work for a very interesting breed of cat, which is not an agency of the federal government, called the Federal Laboratory Consortium for Technology Transfer. The Consortium is a network of technology-transfer people from 300 federal laboratories. You may not know that we have 300 federal labs. The truth is, we don't have 300 labs. We have more like 700 federal laboratories. They're operated by 12 different agencies of the federal government and they're spread out all over the place. They range from very large laboratories with up to 12,000 people, down to six or eight agronomists somewhere out in North Dakota. The fact is that the nation has a vast reservoir of untapped talent in these federal laboratories.

You've heard all about competitiveness, and you've heard all about the problems this nation faces, and that's all true. I'd like to turn those viewpoints around and look at them from a much more optimistic point of view, because this nation is also a very great nation. I believe we have it within our power to recover the position that we've had in the past. We're never going to exceed it, but we're going to stop the fall of our standard of living by learning to work together much more collaboratively and collectively than we have in the past. This is really preaching to the choir, because you already know that we have federal laboratories. You're reading this because you're interfacing actively, or

contemplating interfacing actively, with one particular laboratory. We've got to do a lot more of that.

There are some frightening things out there in the attitudes and the perceptions of the community that I came from, the business community. So I'm now going to address my comments to those of you from industry. Recently, the National Governors Association, the Conference Board, and the National Science Foundation prepared a study called *The Role of Science and Technology in Economic Competitiveness*. The study's Executive Summary states, "In spite of business support for industry-university partnerships, slightly more than half of the business respondents [to a survey] did not believe that cooperative research among industries and universities would have a critical impact on U.S. competitiveness. And even fewer, approximately one quarter, believed it would have a critical impact on the competitiveness of their firm." In contrast, over 80% of the state officials and two thirds of the university respondents believe that cooperative research among industry and universities will have a critical impact on U.S. competitiveness. Furthermore, the business respondents went on to say that they "do not believe technology transfer to be a critical issue affecting the nation's competitiveness." If that's the attitude that we're going to carry, we're going to be in for big trouble, because, again, the only way we're going to reestablish the strength of American industry is to learn to work much more collectively and collaboratively than we have in the past.

This vast federal laboratory system, accessible through the Federal Laboratory Consortium, spends somewhere between 18 billion and 20 billion a year of your taxpayer dollars within laboratories like Fermilab. The amount of technology and knowledge in science that is being generated from the minds of the scientists in these laboratories and is now being used by American industry is minuscule. Ever since 1980, Congress has been passing a series of pieces of legislation, starting with the Stevenson-Wydler Act in 1980 and culminating with the Technology Transfer Act of 1986, intended to open up these laboratories and make them much more accessible to state and local governments, and to small and large businesses.

There are a couple of problems associated with taking full advantage of that legislation right now. One problem rests within the government and one rests with this attitudinal feeling that exists within industry. We are so accustomed to

being able to build technology and science in our own big corporate research laboratories, that we do not think as hunters and gatherers of technology. A vast number of your industrial brethren are not looking toward our federal laboratories as a source of creative interaction and the development of technology.

The battle is really a technology battle. During the 18 months I spent in the Office of Science and Technology Policy in Washington, I walked through a big door that had a gold eagle on it, and a sign that said, "Office of Science and Technology Policy." For 18 months, I looked for that technology policy and I could not find it. It does not exist. Now there's a lot of talk about facing up to the fact that we need to move our science, in which we're pre-eminent, much more rapidly into products, goods, and services for the world marketplace in order to compete internationally.

This attitude of not going out and looking aggressively at the federal laboratory system was recently brought home to me very vividly. I had come to recognize that a number of companies were beginning to look for new technology from the federal laboratory system. They were doing it by designating fairly high-level R&D officials as hunters and gatherers of technology. These R&D people were given the whole world outside of the corporate fence, including the universities and foreign alliances, as hunting grounds. In some cases, they were even being more specific than that; they were assigning an individual to just the federal laboratories.

Being well aware of this development, I put a little blurb in the *Industrial Research Institute Newsletter*, which goes to 265 of the largest American companies. The blurb said, if your company has designated an individual to interact with the federal laboratories, please let me know who that individual is so that I can plug him into the Federal Laboratory Consortium system. We have a monthly newsletter. We have two annual conventions. We have publications. We are a primary clearinghouse for federal-laboratory technology information. Four of the first six responses that I got to that inquiry were from European-based companies. What does that tell me? It tells me that the international companies we're competing with are much more attuned to reaching out for science and technology, and for collaboration and cooperation, than the average American company. That's my own personal observation, but it's reinforced by the study

that was done by the Conference Board, the Governors' Association, and the National Science Foundation.

If you think we have a problem with industry working that way, I have to tell you that the problem is fairly acute in Washington, too. It was a pleasure to come here and see a facility where particles are traveling just a smidgen away from the speed of light. I come from Washington, D.C., a city where *sound* travels faster than light. There's only a handful of people out of the 535 members of Congress who have any real speaking knowledge of science and technology issues. I was talking to a senator the other day, and I said to him, "Senator, what are we going to do about this great ignorance and apathy that exists in the Congress over science and technology issues?" He said, "I don't know and I don't care."

Both government and industry have to face up to the fact that we've got to explore new ways to develop technology. The Cooperative R&D Act of 1984 allows companies to form consortia and do what I call generic applied research or generic development work. It's pre-competitive R&D. You know what it is because the Japanese have been showing us how to do it for years. We've got to examine new ways of doing that kind of development work in this country. The problem is that it takes two years for the bureaucracy in Washington to put into place the regulations and rules by which the laws are going to be implemented. We're in the throes of that process right now. The Technology Transfer Act was passed in October of 1986, and the President's Executive Order, which put the administration's arms around all of this enabling legislation, didn't come until April 10 of 1987. To this date, not all the rules and regulations are yet in place.

I want to close with a message to you industrial folks. I've looked at this enabling legislation and I've now had almost two years of looking at the federal laboratory system. I have a much deeper appreciation for the skills, talents, facilities, and capabilities of that system. And I say to you industrial people, you be the aggressors. You come and find the ongoing work that's of interest to you. That's where the Consortium can help. We operate a computerized database backed up by a network of federal-laboratory technology-transfer experts who are willing to go that extra mile on your behalf to try to uncover, among 700 laboratories and 100,000-plus scientists and engineers, the work

that's of specific interest to you. By accessing through the clearinghouse or through my office, you're really accessing $18 billion worth of R&D.

These federal labs are equipped with excellent state-of-the-art facilities and equipment, and the legislation is there. If we in government don't yet know what it all means, or if we don't all have our act together, you, the industrialists, should come after us. You propose how you want to work with these laboratories. Shake them up. Talk to them about how you want intellectual property matters handled. I hope all of the government people in the room now are not listening, but you industrialists can fake them out, because the rules and the regulations haven't all been passed down. Do it either individually, or do it collectively in consortia, but take advantage of this resource. It's there. It's fully the intent of the Congress and now the Administration that it be used. That is the purpose of this meeting. It's the purpose of Fermilab reaching out to its Industrial Affiliates. But it won't work, in my opinion, unless the American industrial community aggressively seeks out constructive interaction with the laboratories.

Michael Odza of Technology Access Newsletter *(left), and Fermilab Director Leon Lederman.*

Carl Rosner, Intermagnetics General Corporation (left), and Fermilab Associate Director for Technology Dick Lundy.

Brian Frost, Argonne National Laboratory (left), and John Straus, Illinois Governor's Commission on Science and Technology.

Dick Carrigan, Head of the Fermilab Office of Research and Technology Applications.