Materials Researcher Measures Success by Enacting Change in Government Policy

Interview with Merrilea J. Mayo, Government–University–Industry Research Roundtable

The work of a materials researcher is inherently multidisciplinary. As people, materials researchers are also an uncommonly multidimensional lot. If someone leaves the research dimension for an "alternative" one, the research community can quickly try to make them believe that leaving the ivory tower is equivalent to selling out. For Merrilea J. Mayo, "selling out" of research was "buying into" a world where impact is not measured in papers, citations, or patents, but instead in affecting the larger picture of how to make the U.S. government–university–industry enterprise work more effectively. For the past six years, Mayo has been at the helm of the Government–University–Industry Research Roundtable (GUIRR), making an impact on how research is funded and conducted in ways most researchers have not considered.

—Julie A. Nucci, interviewer

What is the history and mission of the Government–University–Industry Research Roundtable (GUIRR)?

The organization was founded in the early 1980s as a result of a national report that said university and government needed to work in a collaborative manner to solve problems resulting from the government regulation of university research. For example, professors used to have to spend their grant money by the end of the fiscal year, just like the government did. It was a nightmare trying to support students. Now, professors are allowed to carry over money from one year to the next, ensuring continuity of their work and of student support. That difference is the result of GUIRR and one of its first big experiments, the Federal Demonstration Partnership (FDP). The FDP operates to this day and is still the undisputed champion in the fight against bureaucratic accretion. GUIRR quickly expanded to include industry participation. The senior-most leaders of all three sectors now work together on issues that affect the research enterprise.

How do you measure the success or impact of this organization?

My metric of success, personally, is whether we affect policy and if people are doing things any differently because we exist. And the answer to that is usually yes. As a very dramatic example, we took on deemed exports last year. This is a series of reinterpretations of existing regulations that would have, for example, required foreign students on all U.S. university campuses to be "badged and segregated." Now, that didn't happen. But the *reason* it didn't happen was in part because we and some of our sister units here actively engaged in conversations with the Commerce Department and the Defense Department on why this was not a good idea. Our ability to have conversations directly with the high-level federal officials involved is very helpful. Our private effort was complementary to the much more public efforts of the Association of American Universities and the Council on Government Relations. It took a combination of private dialogue (to create mutual understanding) and public pressure (to give federal officials political cover) to undo the mess that the U.S. was about to create.

What do you consider your most significant accomplishments?

Sometimes, something we do takes on a life of its own. I made a graph showing the relationship between government R&D [research and development] funding and student R&D output [see Figure 1]. That particular graph—often it's passed around without my name on it—has been to the office of the Vice President of the United States. It has a very nice complimentary letter written about it by a Nobel laureate. It has been used to lobby for more R&D funding for the federal agencies. Nancy Pelosi, the new Speaker of the House, requested it recently. I've seen it in packets handed out to scientists for their Congressional Visit Day activities. In a discussion with the President's Science Advisor, I mentioned the graph, and he said, "So YOU are the origin of that graph? I have been trying to track down where it came from...." So that was gratifying. Another example was a survey of multinational companies that allowed us to prove that the quality of the workforce, and not the cost, was the overriding factor in where companies choose to locate their R&D facilities. I've also helped found some nonprofit organizations, which has been rewarding as well.

What do you consider your biggest challenge?

The biggest challenge of this position is working with very high-level people. They have one or two hours a year to devote to my organization. How do you take one or two hours of a person's time and transform that into something that can affect an entire nation?

What are the current issues championed by GUIRR and how do you expect them to evolve in the coming years?

A key problem we are currently tackling is the difficulty companies have in getting sponsored research agreements processed at universities. You would think this would be routine, but our recent survey showed that this was a major reason why companies tend to sponsor research outside the U.S. We launched an organization to deal with this problem. The problem originated in fundamental disagreements between companies and universities in how to handle intellectual property rights.

We also just finished a retreat on the science and engineering workforce that has led us to look at specific initiatives to instantly create employees who can match industry needs. We have an educational system with a time constant of at least four years, but the

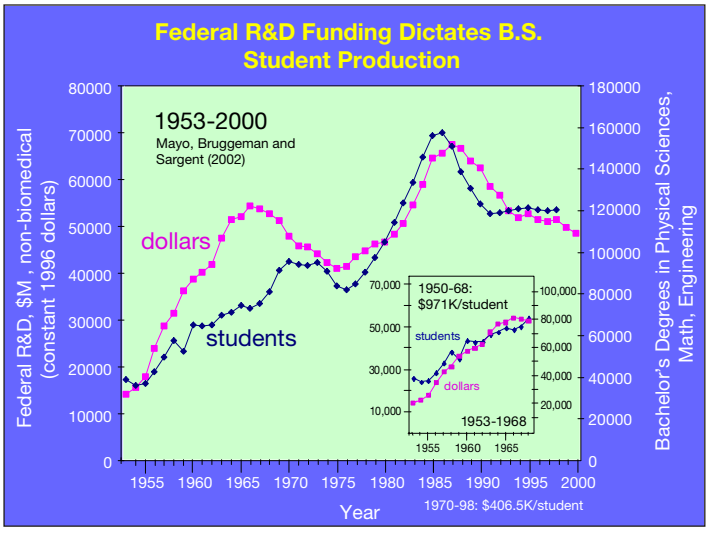

Figure 1. The graph that (may have helped) launch hundreds of thousands of dollars in R&D funding.

https://doi.org/10.1557/mrs2007.109 Published online by Cambridge University Press

industry-business cycle rotates much faster. Think dot-com boom/dot-com bust. During the dot-com boom, industry didn't have the human resources they needed. Then came the dot-com bust, rendering a lot of recent university graduates—who had the right skills—instantly unemployable. One of our goals is to be able to get the workforce to change on a dime.

Can you share a bit of your story about how a materials science professor ended up in public policy? Did you have an "ah-hah" moment associated with your career change?

Well, I'll tell you the story; there was sort of an "ah-hah" moment. I sat on the Materials Research Society's Public Affairs Committee where we had long discussions about what we needed to do in Washington, except that none of us had ever been to Washington and so none of us really knew what to do. I thought we could be much more effective if we knew how Washington works, so during my sabbatical I received a Congressional Fellowship. I worked in the office of Senator Lieberman for one year. My "ah-hah" moment was realizing that politics needed scientists much more than science needed scientists. There were decisions being made that almost defied the imagination with respect to the lack of information available or due diligence. I once traded cosponsorship of a bill that would have authorized the doubling of the entire research budget of the United States for cosponsorship of a bill authorizing a railway safety postage stamp. The entire research budget of the U.S. versus a postage stamp. Think about it.

Does the scientist in you ever miss the research environment?

Pieces of it, yes. I miss the depth of thinking that is required to tackle a research problem, as most of the problems I deal with are broad but not deep. I actually think I have an advantage in the policy world because I tend to address problems as a researcher, asking, "What's the real cause of this?" while most of my colleagues reprocess aspects that are common knowledge.

> *"My 'ah-hah' moment was realizing that politics needed scientists much more than science needed scientists."*

What I didn't expect was the political reality that most science policy work is expected to be done in the United States, so I do far less international travel and I have far fewer colleagues from other countries than I did as a professor.

I also miss working with students; but on the other hand, I have employees and I've bonded quite closely with them.

What advice would you give to scientists who are also interested in a career in policy but have no clue how to get there from here?

It is actually easier than you think. A wide variety of fellowships are available, such as from the National Academies, AAAS and other societies, and the Rand Foundation. Scientists can even walk into one of the House or Senate office buildings and go from office to office, leaving behind their resumes. A friend of mine found a job that way. Policy jobs are not always terribly highly paid but once scientists have spent some time in one of them, they can ratchet fairly quickly up the ladder.

Merrilea J. Mayo influences science policy in the United States as director of the Government–University–Industry Research Roundtable.

What message would you want the materials community to take from this interview?

I think materials researchers tend to underestimate the impact they can have on many fields other than materials science. I put together a lot of meetings of high-level people, and after the fact, I discover that a frightening number of them are materials scientists—far more than would normally be considered random chance. So I think that, for some reason, our field tends to generate people with a capacity to work in many different dimensions. We need to promote this vision of our discipline as a stepping stone to national influence. We have a lot to contribute to society in many dimensions other than science.

Mayo (center) and colleagues prepare for a GUIRR orientation.

Merrilea J. Mayo *is director of the Government–University–Industry Research Roundtable in Washington, DC.*

Julie A. Nucci *has experience in policy as the former European Union liaison officer for the Max Planck Institutes for Metals and Solid-State Research in Stuttgart, Germany.*

https://doi.org/10.1557/mrs2007.109 Published online by Cambridge University Press