Research Universities as Partners with Industry
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DR CLOUGH: Thank you, Ken. Bill Miller set us up well with some provocative ideas. With regard to Bill Gates, I recall that when I was the Provost and Vice President for Academic Affairs at the University of Washington, a development officer came to me and asked for support for a swing through the East Coast to raise money. I said, " Well, you know, I would have probably authorized this if you had told me you were going to create a development office over in Redmond, first." There were probably a thousand people going in the gate of the Microsoft building every day capable of a major gift based on the appreciation of Microsoft stock.

These are obviously, times when we have to think hard about university needs and resources. I think the observation about foundation resources is a very intriguing one because the stock market has gone up enormously in the past five years, greatly increasing their assets.

As we look around, for example, in my hometown of Atlanta, Georgia, we see many foundations that started out with $25 million or $30 million in assets and are suddenly sitting on $200 million. The Woodruff Foundation in Atlanta is one of the largest in the nation and such an institution can be players in the future of research and research universities.

There are a lot of things that may influence the environment for research and research universities, and some of them have been illustrated by the remarks of Frank Raines and Bill Miller. I will just mention a few others. Everybody understands that federal support for research is going to decline, though the level of the decline is still an issue. Probably the only growth area will be in biotechnology and health.

Some of us on the Council of Competitiveness met recently with Senator Bill Frist, who is a surgeon as well as a very thoughtful legislator who fully understands research. He made it clear that support for biomedical research was one of the easier ways to increase research funding in this day and age. Defense was the popular area some time ago, but it is now much easier to explain to a Congressman the linkage of research health.

In terms of industry support for research, I think it is something we need to increase. But we have to be very careful about this. I think that there are limits to the potential here, from several points of view. You have to realize, for starters, that industry funding for university research presently is only about 7 to 10 percent of the enterprise. We can talk about it increasing, and it is in fact increasing, but it is still coming up from a very low base.

Even at a school like Georgia Tech, where we have made concerted and successful efforts to increase our ability to interact with industry in the past three years, we have only about twenty percent of our research base coming from industry.

There are also broader issues. One of the things we have observed as we have increased the amount of research from industry is a substantial increase in the proportion of small contracts. Almost eighty percent of the contracts that we have been able to generate from industry have been less than $50,000 each. That does not necessarily mean they are not good contracts or that they don't support good research. It does mean, though, a lot more administrative effort. It means, for instance, a great deal of time and effort expended in the issues of intellectual property disposition. All these things mean that we need a more focused approach toward managing the university research enterprise.

In addition, I think that when universities talk about expanding support from industry, they have to be careful about what kind of support they take. Big companies like Motorola understand research, and they are going to come to universities with research projects that make sense for that environment. In fact, many companies are reducing their _internal_ spending for long-term research. It means, however, in some cases, that they are increasing their _external_ support of long-term research. This is one of the few areas of research support actually increasing in the last decade.

It is significant that internal industry research is moving toward the short-term horizon. A lot of industries are eliminating their comprehensive research labs. They are pulling their research efforts back to the business time frame, over closer to the production line, rather than allowing them to explore open-ended questions.

However, that does open up an avenue for universities, I believe, because universities do medium-to-long-term research well. Even as industries move away from this time frame internally, they are still going to need the results of such work. Universities can play a very significant role there.

Thus, as we look to increase the amount of industry support to universities, we must be careful to define the appropriate university role. I was at a conference recently where there was a small consulting firm that argued that they had to have proprietary control of all of the results of university research they sponsored. There had been long discussion of that with their partner university.

When a university finds itself in that type of discussion, it probably should just not attempt to carry out that kind of research. I think Franklin Raines said it well. Universities have a unique role to play and we need to play it carefully, without distorting our fundamental mission.

In terms of that fundamental role, I think we also have to be careful how we approach the decline of federal research funding. I think we have to be moderate in our approach to informing the Congress of our needs. Some people will certainly call it lobbying if we go in heavy-handed. We will look, as Frank Raines said, like every other claimant on the

federal budget. So we have to be very careful to choose the issues and occasions in which we will battle.

I think universities do have to look for ways to build smoother and faster collaboration approaches with our industrial partners. We have to work with them and find ways, for example, to get over the intellectual property hurdle. We have spent a lot of time on this at Georgia Tech and I think we are seeing the payoff there.

At Georgia Tech, we learned new approaches by visiting the universities we felt were working well with industry. We are also having meetings with all of our major corporate partners. For example, we had a couple of Motorola's chief scientific people in and had an all-day discussion with them about what we were doing right for them and what we were doing wrong. We found out, for example, we might have as many as thirty contracts or grants with Motorola, and yet each one of those was negotiated independently.

We saw that we needed to find a way to come up with a master contract with our industrial partners, so that each faculty member, and each lawyer that gets attached to every one of those projects, is not negotiating independently. There must be a master agreement approach, I believe, to working with major corporate partners. Bringing support in from the state government where feasible is also a big help in this time of declining federal funding.

I will mention a couple of examples of the impact of state activities at Georgia Tech, as Bruce Alberts mentioned would be helpful. We have something called the Georgia Research Alliance, which is a great asset. We have a wonderful governor, Zell Miller, who got a lottery passed to support education in Georgia.

Now, of course, we have all heard promises about using lotteries to support education. There are various tricks with revenues of this kind that make the addition of lottery revenues a zero sum game in terms of resources for education. But Governor Miller was smart. He created four programs, which were all new programs, so that the lottery's purpose could not be undermined. One was the Hope Scholarship Program, which is quite different from the one at the federal level. It is literally a merit scholarship for any young person in the state of Georgia who goes to either a public or private institution in Georgia.

I will not mention all of the programs, but another one was the Georgia Research Alliance. In this, the Governor's message was: "I want the six research universities in Georgia to work together. They've been competing, and now it's time for them to work together to be successful." In response we put together a package with both public and private institutions, which is quite an accomplishment given their normal rivalries.

So we have, in the Alliance, Georgia Tech, the University of Georgia, Georgia State, and the Medical College of Georgia (all public institutions), as well as Emory University and Clark Atlanta, the historically black university in Atlanta, as the two privates in that mix.

A project cannot get funding from this consortium unless it is done with the partners. It also requires leveraging into federal support, or other state or private support.

The Georgia Research Alliance has been a remarkable success. I will mention two other things that have made it unique. One is that it was not designed as a mini-NSF, with support spread over all fields of inquiry. The state had a study done by McKinsey and Associates, in which the consultants spent two years in Georgia focusing on how the state should target its future efforts for a viable economy in the 21st century.

They defined three key areas, not surprisingly, as biotechnology, environmental technology, and telecommunications. Funding requests must be targeted in those three areas in order to be successful. Focusing the state's research support resources was a very, very important part of the success of our program.

A second step toward success was hiring the right person to run it. To lead these collaborative efforts, that bring together industry and faculty and government groups, it takes a very special person – I call them "master managers". They need to understand faculty and university culture, and also appreciate the pressures that industry faces, as well as the political demands that are on government agencies and government entities.

Thus there were key reasons that the Georgia Research Alliance was successful: first of all, focus, and secondly, having the right person to lead the program.

You will find, I think, as we go into the era in which collaborations are so important, that we are going to struggle finding these key individuals who have the remarkable talent to be able to work in these different worlds all at one time.

I will mention one other thing. In Georgia we are fortunate to have an effective technology transfer program. Georgia Tech has eighteen technology transfer stations around the state, somewhat on the model of the Agricultural Extension Service. It is successful in demonstrating the importance of the university research mission to the citizens of Georgia.

We also have business incubator. Our incubator, the Advanced Technology Development Center, was voted the best in the nation last year. We found it to be a very powerful concept, and built a new building for it. The incubator is on one floor, and they have brought in a remarkable number of start-up industries. Moreover, the interchange between our faculty and the leadership of those industries has been very, very helpful to our programs.

Finally, I would note that we also are designing our university buildings today to mix the disciplines, and stimulate interaction across fields. I think this is an important concept for the Academies to think about. I realize that this is an incendiary concept in some settings, but we need to try these approaches. Our Georgia Center for Advanced Communications Technology, for instance, has computer scientists, electrical engineers, and physicists all mixed into one building. It has a floor of industry occupants, but we

still control the space. It is not just a case of industry buying a floor of a university building.

Our new biotechnology building will be built much along the same lines, and we will be building a similar new environmental technology building in two years. Physical proximity, I think, is very important to building collaboration and interdisciplinary thinking.