Roundtable on Science, Economics, and Public Policy

Opening Remarks

Introduction

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David Morrison (right)

The subject of this Roundtable is "Science, Economics, and Public Policy." On the one hand, that is about as timely a topic as one can raise at a meeting like this, or indeed any meeting in which scientists, engineers, or more broadly, technologists, are gathered. On the other hand, with the desire of Congress to try to cut the federal deficit, and the not-too-subtle hand of Gramm-Rudman hanging over expenditures, all of the government agencies and all of the interest groups are seeking means to justify their fair share of the budget for R&D, and then some. More power to them.

As you might imagine, the trade-offs between things like national security and national economic competitiveness, as well as social welfare and education, are

very difficult to make. Interest groups of scientists and science advocates, both for large science and small science, are saying we fit in this milieu somewhere. Obviously there is very little doubt that science, technology, national security, and the well being of society are all tied together. The real question is how and what is the relationship among these factors, and is it meaningful to really try to define the kinds of relationships that are involved?

I won't belabor the point to this audience, but research and development expenditures in this country are enormous. Forecasted expenditures for 1986 are about $117 billion with about $58 billion of that coming from industry, $55 billion from the federal government, and the remaining $4 billion from not-for-profit sources, colleges, universities, and the like. Within this distribution of funds, roughly 12%, or $14 billion, will probably end up in basic research; around 22%, or $26 billion, in applied research; and the overwhelming majority, about 66%, or $77 billion dollars, in development.

As I look at it, these investments that we are planning to make in 1986 and all of those that have preceded them, for as far back as when our federal government got involved in research, give us as a nation a tremendous resource of technology. It is one of the last of a vanishing resource base that we have in the United States. You just have to look around to see that we've lost our ability to economically extract minerals and compete with other countries throughout the world that are doing this. We are out of the basic materials, and the processing business. Our consumer electronics industry is, for all intents and purposes, gone. Manufacturing is fighting for its very survival. We are in danger of losing our edge in microelectronics and pharmaceuticals, and our leading position in computers is being challenged. This is not a very good story to tell.

Our present and future, as far as I'm concerned, rests upon our ability on the one hand to expand through science this existing warehouse of technology, and on the other to more effectively use the warehouse of technology and knowledge we already possess The linkages between science and economics, economics and

policy, policy and science are critical to the process of using that warehouse to increase our competiveness in the world-wide marketplace.

I think it is easy to see where science and where economics enter this picture. But where does policy enter the scene? The simple answer is "everywhere." I mentioned the federal budgeting process but the same issues are faced by industry. Whether you are government or industry and have money to spend, you have to set some sort of priorities. Those priorities are not necessarily set on great quantitative rules; they seem to be set primarily on judgements. Judgements come from people and people are part of policy. That is where policy enters the picture.

Policy enters from another direction. Picking up from a recent *Wall Street Journal*, I see that "U.S. and Japan have agreed on a framework for settling a politically troublesome series of unfair trade cases against Japanese semiconductor manufacturers." I think that says that the whole subject is global, international, and something that we could spend a lot of time explaining.

I'm counting on the members of our Roundtable to tie this all together so we can understand at least what the issues are.

There is an interesting commonality among the panel gathered for this Roundtable. We are sitting in the seat of high-energy physics; a science that has raised critical issues having to do with the relationship of science, economics, and public policy. The makeup of the panel may be particularly appropriate. Three of us have backgrounds in chemistry and a fourth is a materials scientist. Perhaps this says that the chemists are the most unbiased people in the world and that's why we are here.