U.S. Science and Technology Policy for the 1990s

Congressman George E. Brown, Jr.
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U.S. House of Representatives

At the plenary session held December 1, 1986 during the annual MRS Fall Meeting in Boston, MA, Congressman George E. Brown, Jr. was the plenary speaker. He was introduced by 1986 MRS President Gordon E. Pike.

Mr. Brown graduated from the University of California at Los Angeles with a degree in industrial physics, after which he worked for the city of Los Angeles for 12 years in areas of engineering, personnel, and management. Since then he has served in elective office at the local, state, and national levels. Congressman Brown was first elected to the U.S. House of Representatives in 1962, and during his long term in the House he had numerous committee assignments. He is presently a senior member of the House Science and Technology Committee and chairs its Subcommittee on Transportation, Aviation, and Materials. He is the ranking member on the Subcommittee on Investigations and Oversight. Brown serves on the House Agriculture Committee as the ranking member of its Subcommittee on Department Operations, Research, and Foreign Agriculture and also as a member of the Subcommittee on Conservation, Credit, and Rural Development. In addition, he is a member of the Congressional Technology Assessment Board. He is an advocate of parallel structures for national policy on technology and science.

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PLENARY ADDRESS

I am pleased to be here today at the Fall Meeting of the Materials Research Society. I am also pleased to have been asked to speak to the issue of our nation's science and technology policy for the 1990s. In one form or another, this topic will receive increased attention and a high priority in the next Congress.

I was tempted to dig out one of my old speeches from the mid-1970s entitled, "U.S. Science and Technology Policy for the 1980s" and simply update it for use today. I do not think that the policy problems facing us have changed materially since the late 1970s. And, unfortunately, I do not think that we are much farther along in finding solutions to these nagging problems—and we may actually be worse off.

As I reread some of my ten-year-old speeches on the needs and developments in science and technology, I found a number of issues in common with today's debate. We were then in a round of deliberations in Congress on how to improve the position of American industry in the face of trade deficits and advancing competition from abroad. We were examining the manpower needs in science and engineering. We were looking at new partnership arrangements between government, industry, and academia. We were also concerned about the effect of the national economic picture and the tax law on technological development, although the economic problem then was inflation while today's main concern is the national debt and the current huge budgetary deficits.

In the interim we have dropped and added some specific areas of interest. We have dropped, and unwisely, I might add, our emphasis on energy research and development, especially in the areas of conservation and alternative energy sources. We have picked up an emphasis on the commercial development of the biological sciences. And we are in a rather confused state regarding the emphasis and direction in space sciences and the commercial development of space.

We've suffered greatly in the interim from policy shifts and uneven, and even contradictory, policy direction at the federal level in the science and technology fields. Although I do not want this taken in a partisan vein, I have found great fault with the administration's policy leadership over the past few years, and that includes both Republican and Democratic administrations. To soften that statement, I should add that we in Congress have not always done much better.

But this administration has made a number of decisions which have hampered progress on the critical issues facing the 1980s and may make our efforts over the next decade difficult as well. For example, one of the first actions taken by this administration in 1981 was the elimination of the generic research center concept under the Assistant Secretary for Productivity, Technology, and Innovation at the Department of Commerce. Six years later, this concept has been "rediscovered" as cooperative research between government, industry, and academia and is being implemented by the National Science Foundation through their support of engineering research centers. This same pattern has occurred in federal math and science education funding, joint partnerships between government and industry, and in other areas.

More serious policy misdirections have occurred in the overall federal research and development budgets during the last six years. The most dramatic example of this is the shift in the military - civilian R&D mix, which has gone from about 50/50 to 75/25, in favor of military R&D.

In an article on the future of science, Dr. Lewis M. Branscomb, vice president and chief scientist for International Business Machines Corp., stated: "After 20 years of slowly declining real growth in both defense and nondefense federal R&D outlays, the civil component has continued its decline while military R&D will rise to 73% of the total in 1986.... Even in the rapidly growing defense R&D sector, basic research enjoys only a 3% share. The rise of basic research to 43% of federally funded nonmilitary research was achieved primarily by reductions in civil applied R&D.... Scientists and engineers have to join together in building a policy and a set of programs that not only deal realistically with the deployment of science and engineering resources, but carry the economic benefits to the voters."

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Even with civilian R&D there has been a dramatic decrease in development and demonstration necessary for the eventual commercialization of research funding. Add to this the increasing classification of federally funded R&D and the paranoia-driven restrictions on international scientific exchange, and the potential commercial payoff from federal R&D efforts becomes increasingly limited.

All of this points out a continuing, unmet need in science and technology policy that is larger than partisan politics and is not confined to a single decade. We must develop a better way to plan and evaluate government policy in science and technology, both in the executive branch and in Congress. Current mechanisms are fragmented and ineffective. We must also do a competent job of coordinating what we do on the federal level with the ongoing work in academia and in industry. Every time we get surprised by a crisis, such as the trade deficit, or reverse our policy direction, as we have done in recent years, we lose ground and enable speakers like me to recycle ten-year-old speeches.

To quote Dr. Branscomb again, "Cooperatively and consistently, all elements of the U.S. technical community, business and universities, scientists and engineers, must join in making the case that scientific and engineering strength is more than a 'nice to have when we can afford it' issue. They are the indispensable resource for competing in an increasingly competent world."

If I were to suggest a high priority policy need for the next ten years, it would be to establish a number of focal points in government for the planning, evaluation, and coordination of federal R&D efforts. Yes, I know that you have heard this before, and fear yet another layer of government impeding actual progress. I also know that this runs counter to the current administration's views on the role of government in our society. But the one theme that is sounded time and again as I review our past efforts in science and technology policy is this critical need for strategic planning and performance by the federal government—not control, but some degree of enlightened leadership.

We are already laying the groundwork for initiatives in this direction. In 1985 we saw the release of the *Report of the President's Commission on Industrial Competitiveness* (the Young Report), which raised anew many of the concerns expressed before. Also in 1985, the House Science and Technology Committee established a Science Policy Task Force, whose report is due soon, in an attempt to update the science and research policy issues facing us. There is active discussion of establishing a complementary Engineering and Technology Task Force of the committee in the coming Congress. In addition, in 1986 the Senate Democratic Working Group on Economic Competitiveness issued a report which intends to set a new agenda for congressional action. Likewise, the House Republican Research Committee issued a similar task force report in December 1985 entitled *Targeting the Process of Innovation—An Agenda for Meeting America's Competitive Challenge*. According to *Roll Call*, which ran a front-page story on this subject just two weeks ago, "President Reagan reportedly will announce several initiatives in his State of the Union address dealing with trade imbalances, worker retraining, education and currency issues. And lawmakers surely will introduce dozens of bills designed to help businesses and their workers repair the damage caused by the loss of markets here and abroad." And last Friday (November 28, 1986) Stephen Roach, a principal and senior economist at Morgan Stanley & Co., in a *Washington-Post* editorial page article entitled "Productivity Growth is the Only Way Out" said, "Ultimately, productivity is the key to any country's competitive position in global trade. And given our abysmal productivity record over the past decade, that's a point policy makers need to keep uppermost in their minds.... Capital formation should be encouraged, as embodied in such investment as the technology of productivity improvement.... It's time to take the long view and begin the rebuilding of a competitive infrastructure that allows America the opportunity once again to earn its share in the global marketplace. Productivity growth is the only way out. And that's a verdict best remembered by policy makers and corporate executives alike."

But the one theme that is sounded time and again as I review our past efforts in science and technology policy is this critical need for strategic planning and performance by the federal government—not control, but some degree of enlightened leadership.

I do not think that we need to spend much more effort outlining the problems and challenges facing us in this area. A good literature review conducted by a competent undergraduate student would probably yield as much as another blue ribbon commission detailing our science and technology needs. What we should spend our time on now is finding and implementing solutions.

Given the cyclical nature of our interest in these issues of science and technology, we should start by reexamining the past proposals made to deal with our nagging problems. We need to examine the operations of existing organizations, such as the President's Office of Science and Technology Policy and the Congressional Office of Technology Assessment. We need to review past legislative efforts, such as the 1976 National Science and Technology Policy, Organization and Priorities Act, the National Science Foundation Organic Act, and the Stevenson-Wydler Act. We should also review past legislative efforts which have not been enacted, such as attempts to establish a national technology foundation or set a national space policy or a national information policy. Likewise, we need to look at whether we are adequately funding ongoing research and technology programs at NSF, NBS, DOE labs, NASA, the Department of the Interior, and other federal agencies.

Then we need to reexamine past efforts to include academia, professional societies, such as the Materials Research Society, and industry in a cooperative effort to set our science and technology policy. And we need to find more cooperative funding arrangements, given the very real limitations on federal R&D funding, at least in the civilian sector.

Beyond these efforts, we should undertake a serious review of past efforts to reorganize the agencies involved in science and technology activities. Past discussions on establishing a Department of Science and Technology should be revived, if for no other purpose than to stimulate wide-ranging discussion, and there is some indication that this will happen. In essence, we need to engage in a top-to-bottom reevaluation of our current policies and operations in science and technology.

There is a need for a review of this scale to be conducted by all of the stakeholders in this area: government, academia, industry, and professional societies. Groups such as the Materials Research Society should place a high priority on examining the policy needs in their areas of interest and expertise as a part of this broader effort. You should make an effort to keep abreast of every hearing or meeting on these issues and be prepared to make a contribution. You may even want to convene your own meetings on the formulation of science and technology policy to keep a national debate going.

So rather than speaking on the "U.S. Science and Technology Policy for the 1990s," I am leaving you with the clear message that we do not even have a policy for the 1980s and probably have never had a clearly defined policy in this area in

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our country's history. We have been coasting on the momentum generated by such episodic events as the Vannevar Bush Report, and the Apollo project to put a man on the moon. Yet the definition of a policy in this area is more critical than in any other period in our history, and is a necessary first step toward restoring our domestic and international economic health. There is renewed interest in this issue in Washington and I hope that in the coming years we can finally accomplish our long overdue task.

I would also like to leave you with the clear message that you as individuals and as a society have a major role and responsibility in the coming debates. Federal government cannot, and should not, develop policies in this area by itself. Perhaps some of our past failures in developing science and technology policy have come from a policy development process which was too insulated from the partners in industry and academia. We cannot repeat those mistakes and the Materials Research Society cannot afford to let this occur.

I do not think that we need to spend much more effort outlining the problems and challenges.... What we should spend our time on now is finding and implementing solutions.

Science and technology policy left to the federal government alone lurches from crisis to crisis, and is whip-sawed by the contrasting philosophy of successive administrations. We have reached the point where this will no longer suffice. Our status in the new global market, and global political and social system, requires that we have a truly national policy for dealing with science and technology problems, a policy generated by interaction of all the stakeholders, and understood and supported by a broad cross-section of the American electorate. You in the Materials Research Society can contribute to this—and you must.

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