DOE/ER/12147--T1-A.2

The Government-University-Industry
Research Roundtable

1996 Annual Report

National Academy of Sciences
National Academy of Engineering
Institute of Medicine

2101 Constitution Ave. N.W.
Suite NAS 340
Washington, D.C. 20418

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

MASTER

The Research Roundtable was created to foster strong American science and technology through effective working relationships among government, universities, and industry.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

**The Government-University-Industry
Research Roundtable**

1996 Annual Report

**National Academy of Sciences
National Academy of Engineering
Institute of Medicine**

**2101 Constitution Ave. N.W.
Suite NAS 340
Washington, D.C. 20418**

**Website: <http://www2.NAS.edu/guirr>
Email address: GUIRR@nas.edu**

*The Research Roundtable was created to foster strong American science and technology
through effective working relationships among government, universities, and industry.*

CHAIRMAN'S MESSAGE

The Roundtable's activities for 1996 focused on the powerful dynamics of change currently affecting the national science and technology enterprise. All members of our industrial, academic, and government constituencies are experiencing these dynamics, with responses ranging from incremental adjustment to dramatic re-structuring. The Roundtable uses its convening power to draw out leading-edge thinking on the impacts and responses generated by these profound contemporary changes in the research environment. It also seeks to catalyze in-depth studies, and propagate effective practices in meeting challenges identified. Where added value can be created, the Roundtable collaborates with other groups in these efforts.

In 1996, Council meetings focused on the following:

1. the impact of information technology on the structure of research and educational organizations;
2. ways to improve communication between the science and engineering community and the public; and
3. new approaches both to measuring the results of research investments, and to communicating those metrics to non-technical decision-makers and to the public.

Significant milestones were also achieved in four major projects, representing, in part, follow-up activity from previous Council Meeting discussions:

1. facilitating the Federal Demonstration Partnership, designed to maximize the efficiency of the federal research support system;
2. compiling results of a regional workshop on experiences in industry-university collaborative organization;
3. publishing the results of a study comparing the cost structures for research performed in the industrial, academic, and government laboratory sector; and
4. catalyzing, and participating in, a series of campus-based convocations on stresses being experienced in the research university environment.

All of these activities produced striking evidence that this is a time of both stress and opportunity in the national science and technology enterprise. Stress exists because of budget limitations and competing demands for long-term investments, as well as the challenge of tackling ever more complex problems. Opportunity is offered by the amazing discoveries and tools produced by science in recent years, many still awaiting integration into everyday life, others promising cascading discoveries if vigorously pursued.

If we are to minimize the stress of change, and maximize our ability to capitalize on the opportunities offered by science and technology, we must work toward a common understanding

of the most effective relationships among the major science and technology performers. This is the business of the Roundtable. As the Roundtable enters its second decade, I sense the unfolding of historic new linkages of science with the most basic foundations of our economic, social, and cultural institutions. The Roundtable can play a critical role in these historic steps.

Before I close, I want to take this opportunity to thank members of the Roundtable who have completed Council service this year. These are former Governor Howard Dean of Vermont, Professor Max Summers of Texas A&M University, and Dr. David Kessler, former Commissioner of the Food and Drug Administration. We also regretfully note the death of our colleague Dr. William Wiley, of the Battelle Memorial Institute. His contributions to the science and technology community were many, and he will be deeply missed.

Richard F. Celeste
February, 1997

STRUCTURE AND OPERATION

Purpose and Structure

The Government-University-Industry Research Roundtable was created just over a decade ago to provide a unique forum for dialogue among top government, university, and industry leaders in the national science and technology enterprise. The purpose is to facilitate personal working relationships and exchange of ideas about issues, problems, and promising opportunities facing those charged with developing and deploying science and technology resources. Its mission statement, updated in a tenth year retreat in 1995, summarizes this goal:

“To convene senior-most representatives from government, universities, and industry to define and explore critical issues related to the national science and technology agenda and its global context that are of shared interest; to frame the next critical question stemming from current debate and analysis; and to incubate activities of on-going value to the stakeholders.

This forum will be designed to facilitate candid dialogue among participants, to foster self-implementing activities, and, where appropriate, to carry awareness of consequences to the wider public.”

The open dialogue and informal exchange of ideas preclude a process of making formal recommendations or offering specific advice to the federal agencies. However, the Roundtable seeks to stimulate new approaches by dissemination of its discussions, and pro-active contacts with organizations that may want to build on the idea-base it establishes.

The Roundtable is sponsored by the National Academies of Sciences and Engineering and the Institute of Medicine. It is guided by a Council that sets the Roundtable agenda, addresses some topics directly, and oversees the plans and activities of four Working Groups that address selected topics in depth. The members of the Council and Working Groups are listed on page 21.

Mode of Operation

Several features of the Roundtable's structure and operation are central to its effectiveness:

1. Neutral Setting, Balanced Views. The sponsorship of the Roundtable by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine provides a neutral setting with credibility among all elements of the research community in the three sectors. All points of view are presented in Roundtable deliberations. The Roundtable avoids becoming a proponent for the views of any one constituency.
2. Active Council Participation. The meetings are designed so that senior federal R&D officials, top industry officers, and senior state officials are full and active participants

on the Council along with university leaders and active researchers. Their contributions and leadership are essential to the accomplishments of the Roundtable.

3. Addressing Problems from both Policy and Operational Levels. The combination of study and analysis by operational-level representatives in the working groups, and discussion by policy-level representatives in the Council, produces an environment that leads to the introduction of new ideas and new procedures into the research system.
4. Long-term vs. Short-term Issues. The Roundtable strives for a workable balance between attention to broad, ongoing concerns of the science and technology community (for example, an examination of the current status and future prospects for the academic and industrial research enterprise, and the international context for national science and technology policies) and to the search for solutions to immediate problems (for example, streamlining administrative procedures for government-sponsored university research or terms of university-industry cooperative research).
5. Special Role of the Roundtable. The Roundtable is most effective as a mechanism to frame and incubate issues, allowing it to play two distinctive roles within the Academy Complex and in the science and technology community as a whole. One is to initiate analyses of frontier issues that have not been explored. The other is to help convey the results of major analytic efforts to an active leadership group and wider public, in recognition that the national science and technology enterprise is driven by the combined efforts of diverse individuals and organizations of many sizes and types, as well as the support of the public as a whole.
6. Self-implementing Character of Roundtable Initiatives. The legal context in which the Roundtable is chartered necessarily restricts its ability to make recommendations. At the same time, many issues involving all three sectors are poorly understood, and the added insight that comes from multi-sectoral discussion of them can lead to an improved understanding that allows participants to return to their individual sectors and take actions that are consistent with that broader understanding.
7. Flexible Financial Support. Support for the Roundtable is provided by foundations, federal agencies, industry, universities and state agencies. The majority of these funds is provided as general support for the Roundtable, enabling the Roundtable to respond quickly to problems and opportunities as they arise and to address issues in flexible, diverse, and innovative ways.
8. Personalities. The Roundtable is foremost a process----a process for bringing together the diverse constituencies concerned with the research enterprise. The ability of the Roundtable to stimulate constructive change in the system depends on the "delicacy" and the balance with which it is able to address issues that are typically complex, intractable, emotional, and controversial. As such, it is an intensely personal enterprise, whose effectiveness has depended on the ability of the Roundtable Chairman, the

Council, the working groups, and the staff to work constructively with the full range of relevant constituency groups and individuals.

The operational approach is designed to recognize the extraordinary flux in the structure of national science and technology endeavors. It emphasizes the need to stimulate change by new mechanisms of partnership that bridge traditional organizational and communication lines. It is meant to facilitate new and innovative thinking, and to create efficient and fast-moving mechanisms to test and develop the new ideas. The Roundtable often will implement its mission through the leadership of its Working Groups, by coordinating efforts with other units of the Academy Complex, or with some of the many other organizations active in efforts to ensure a healthy science and engineering base for America's next decades

Funding

Financial support for the Roundtable comes from a variety of sources. Major supporters during 1996 were the major federal R&D agencies including, the Departments of Agriculture, Defense, Energy, and Transportation, the National Aeronautics and Space Administration, the National Institutes of Health, the National Institute of Standards and Technology, and the National Science Foundation; and our university-industry partnerships: University of Illinois at Urbana-Champaign/Motorola; Stanford University/Hewlett-Packard; University of California at Los Angeles/Amgen; Washington University/Monsanto; University of Wisconsin/Procter and Gamble; University of Washington/Battelle Pacific Northwest; California Institute of Technology/Rockwell International; Florida State University/IBM; Ohio State University/Honda; University of Texas at Austin/Sematech; Northwestern University/Upjohn; Massachusetts Institute of Technology/C.R. Bard, Inc. The long-term funding strategy is built on core support from federal agencies and university-industry partnerships, with supplemental funding coming from foundations, states, and other sources.

STAFF

THOMAS H. MOSS, Executive Director
ALLISON A. ROSENBERG, Associate Executive Director
ANNE-MARIE MAZZA, Program Officer
WANDA E. LONDON, Research Associate
LORI DUPREE, Project Assistant

COUNCIL ACTIVITIES, CURRENT MAJOR PROJECTS, AND FOLLOW-UP PLANNING

The Roundtable Council meets as a whole three times each year. It also directs, through its Working Groups, a variety of focused projects that evolve from ideas generated in preceding Council meetings. This section outlines the thrusts of the 1996 Council meetings, and also indicates the status and plans of activities in the major project areas.

Council Meeting Topics in 1996 (Meeting Agendas pages 15-20)

March, 1996 Council Meeting: "Examining the Impact of the Information Technology on Science and Engineering Research and Education" This meeting, with discussion leaders from university, industry and government research agencies, focused on long-range implications of the unfolding technology revolution, as well as impacts currently being felt. New models of research and higher education infrastructure were discussed, with potential for faster progress and economies of operation, but also for dislocations of traditional modes of operation. Many of the ideas and questions raised during this meeting have become part of the agenda and background of a detailed National Research Council study now being launched on the impact of the information revolution on university structure and operations: "Universities in the Information Age".

June, 1996 Council Meeting: "Enhancing Scientists' Appreciation of the Public's Perception of S&T" Rather than focus on the familiar theme of public understanding of science, the Roundtable Council reversed the question to examine whether the science and engineering community has sufficient understanding and skill in communicating with the public. Invited guests from the media acquainted with practices in conveying scientific subjects and issues, as well as scientific leaders known for their ability to reach the public, led the discussion. Follow-up meetings are being held with science and engineering professional groups active in public affairs issues, and the meeting has also led to some new activities with Roundtable Working Group III and media leaders.

October, 1996 Council Meeting: "Toward Effective Practices in Guiding and Evaluating Research Investments" In an era of constrained resources, and public stockholder, or other strong oversight over research programs, each component of the Roundtable's university, industry, and government constituencies is being challenged to develop more effective and persuasive rationales for planned research investments. The Council invited leaders in the area of planning and evaluation practices, as applied in a variety of research settings, to join them in a discussion of this broad subject. A more specific focus was also put on approaches to implementing the new "Government Performance and Results Act" (GPRA) governing the federal research program planning and evaluation. As a follow-up, the Roundtable is examining the feasibility of an "Effective Practices" study to demonstrate to users the range of tools available for such efforts. It will also work with Federal Demonstration Partnership leaders in conducting a workshop and disseminating effective and innovative approaches to the GPRA compliance required in future federal budget processes.

Major Project Status and Planning

Federal Demonstration Partnership

The need to reduce growing tension between government and universities over procedures for administering federally-sponsored research was a primary basis for creation of the Roundtable. The most direct way the Roundtable pursues this objective is through its role as coordinator for the Federal Demonstration Partnership (FDP). The FDP, a cooperative effort among sixty-five universities or research institutes and eleven Federal agencies, is designed to improve the management of federally-funded research. The goal is to enhance research productivity without compromising the stewardship of public funds, by eliminating unnecessary administrative procedures and by streamlining those necessary to ensure accountability.

The Federal agencies and research institutions that constitute the FDP work together to design, test, and evaluate procedures aimed at improving the efficiency of sponsored research management. They also cooperate in efforts to clarify current changes to federal government-wide policies issued by the OMB.

In 1995, the FDP continued its efforts to formalize a link to the Federal government. In September 1995, the Director of the President's Office of Science and Technology Policy (OSTP) urged the Committee on Fundamental Science (CFS) of the National Science and Technology Council (NSTC) to "adopt as part of its charge responsibility for reviewing evaluation results" from the FDP. The Committee on Fundamental Science agreed to do this in June of 1996, and CFS will serve to articulate recommendations for innovations in federal research policy and practice to the OMB and to other federal agencies.

On June 10-11, 1996, the Roundtable hosted the kickoff session for "FDP III," so named in recognition that this is the second expansion -- and so third phase -- of this initiative, which began in 1985 as the Florida Demonstration Project. Joining the 45 academic institutions and the ten federal agencies that constituted the membership of FDP II were 20 additional research institutions, one new federal agency, and five professional associations that make up a new class of participants called "Affiliate Members."

The meeting, attended by roughly 200 participants, was characterized by a new level of enthusiasm and creative thinking. While the original purpose of the FDP was to free investigators from unnecessary paperwork, and so ensure greater scientific value for the public's investment in research, few faculty members remained active in this initiative in recent years. Requirements for membership in FDP III included designation of both an administrative and a faculty representative for each academic or research institution, and more than 25 investigators attended this first meeting. Additionally, Dr. Harold Varmus (NIH) and Dr. Neal Lane (NSF) both participated in this christening event, challenging the group to think boldly and to present results of their work to the CFS, which -- together with Dr. Ernie Moniz (OSTP) -- they co-chair.

Numerous original suggestions streamlining federal research grants and grants administration were presented during the June meeting. Task forces were appointed to develop

some of these ideas into proposals for actual demonstrations, including just-in-time proposals; effort reporting; and development of a basic grant award.

In December 1996, Dr. Moniz challenged the FDP to consider the impact of the Government Performance and Results Act on sponsored research and to contribute to the Presidential Review Directive on University-Government Relations. The FDP is working with government officials on these activities.

The Costs of Research

In 1992, the Research Roundtable initiated a study to promote better understanding of the costs of research conducted in academic, industrial, and federal laboratories. In a period of constrained resources, Roundtable members felt it was essential to encourage development of a methodology to compare the costs of carrying out research in various settings. This is particularly important in view of common perceptions of wide disparity in these costs across sectors, and the resulting impediments to common ventures and to appreciation of common interests. In early spring, 1996, the Roundtable issued a final report from this project, entitled "The Costs of Research: Examining Patterns of Expenditures Across Research Sectors." The report concludes that patterns of expenditures for research are strikingly similar across research sectors.

In this study, James Roth, a partner at Arthur Andersen who worked on the project on a pro bono basis, collaborated with seven private and state-supported universities to develop a template to identify and to classify the various elements of costs attributable to research in universities. The next step in this phase of work focused on obtaining comparable research cost data from industrial and federal research laboratories. Ultimately, thirty-three institutions—7 universities, 13 companies, and 13 federal laboratories—completed the common template, all working with the latest complete year of fiscal data available to them.

In the report, the elements of the total cost of research are segregated into three broad categories: Research Laboratory or Academic Department Costs (including scientific salaries, fringe benefits, research-related departmental administrative costs, and other direct costs); Facilities Costs (including depreciation or use allowance for facilities and equipment, hazardous waste management, security, and utilities); and Central Services or Home Office Costs (including executive administration, legal services accounting, library, and other centralized research-related activities). The total costs of research are also partitioned into the proportion attributable to direct and to indirect expenses (note the latter is not equivalent to the indirect cost rate), including departmental and central administrative expenses and facilities.

From either perspective, Arthur Andersen's analyses conclude that the pattern of expenditures incurred for research activities in federal laboratories, universities, and industry are strikingly similar, despite common perceptions that there are wide differences. The finding that there is strong comparability of costs is important given the different organizational structures and types of research characteristic of different research institutions and sectors. Important, too, is the conclusion that the distribution of costs in academic settings is similar to those of other research performers, contrary to the perceptions of many.

Several important caveats must be attached to these findings. First, in an area of limited previous work, the methodology developed in this investigation is necessarily experimental, and some issues of comparability remain unresolved. Second, the relatively small sample size, and the non-random selection of participants, together preclude sophisticated statistical analyses. Third, data collected for a single year of expenditures does not illuminate trends, such as rates of inflation or fluctuation in indirect expenses over time. Fourth, neither the quantity, quality, nor value of the research carried out by the diverse organizations were evaluated. Finally, it is important to realize that the three sectors, and individual representatives of each, have differing broad missions. For these last two reasons, the data on research costs alone cannot be used to make comparisons across participants or sectors.

Despite these critical caveats, members of the Roundtable believe that the methodology and the findings of this investigation should contribute to improved understanding of the true costs of research. For the first time, there is a simple methodology for examining the costs of carrying out research in universities, industry, and federal laboratories. As the report by Arthur Andersen states, policy pertaining to research funding will require empirical analyses of far greater depth than those provided in this assessment of costs across sectors. If this report provides incentive or direction towards future studies of research funding, the effort will be a success. In this fashion, the core methodology presented here—buttressed by future refinements in specific settings and applications—can help in understanding the impact of national research resources.

Stresses on Research and Education at Colleges and Universities: Phase II

The appropriate scope and balance of activities of universities and university researchers have become issues of general public debate, receiving front page attention in the popular press. There is broad consensus that the academic community is experiencing stress as a result of changes in local, national, and international contexts, and that morale on campus among researchers has declined. In 1993, the Roundtable and the National Science Board (NSB) sponsored discussions on a number of campuses and a conference in Washington, D.C. to illuminate the major sources of stress affecting the academic research and education community and to identify possible remedies to those concerns.

Based on the written reports of the participating institutions and on discussions between those university representatives and federal participants at the national meeting, the NSB and the Roundtable jointly issued a final report on this initiative entitled "Stresses on Research and Education at Colleges and Universities: Institutional and Sponsoring Agency Responses" (Government-University-Industry Research Roundtable, Washington, D.C., July 1994). That report summarized six specific policy issues identified by a majority of participants, and it outlines action items or remedies for related concerns. Those issue areas are: (1) creating and communicating priorities in research and education; (2) balancing research and education activities; (3) facilitating multidisciplinary research and education; (4) identifying patterns of institutional support for research; (5) restoring a sense of community on campus; and (6) developing relationships with new partners in research.

A second phase of the project was launched in 1996, expanding the grass roots, campus-based approach that was the foundation of prior work. The main objectives of this second phase of study were: to catalyze discussions and change on campuses; to encourage national dialogue

among all parties with interests in the academic enterprise; and to revive or recast the compact between the federal government and universities. Officials at each of the participating institutions organized discussions among faculty and administrators, separately and jointly, on a set of questions agreed on by the project's Guidance Group. Each campus developed a report summarizing those discussions, and describing constructive programs and activities underway on their campuses.

Early in 1997, a national convocation was held in Washington to bring together representatives of those institutions and representatives of the "cohort I" schools with members of federal agencies, Congressional staff, and other interested organizations. On the first day of the convocation, members of the academic community shared information about the primary sources of stress affecting their communities, and about creative practices for responding to those issues. On the second day, spokespeople from other sectors affected by changes underway in higher education and research expressed their perspectives and concerns with a larger audience that included the academic participants.

Plans are now underway to develop and disseminate a review of the discussion that took place during the national convocation, and to identify effective next steps for enhancing the government-university partnership. A final report should be available by June 1997. Also, a short series of focused workshops, each addressing one of the top issues identified during the campus discussions and explored at the national convocation, may be convened in the next several months. Representatives of the "Stresses" initiative also have been invited to brief a task force of the President's Office of Science and Technology Policy that is conducting, under a Presidential Review Directive, an inter-agency review of the impact of federal policies and programs on academic institutions.

Formulating U.S. Research Policies Within An International Context

In 1994, the Roundtable began a project entitled "Formulating U.S. Research Policies Within an International Context." The purpose of this project is to examine shifts occurring within the worldwide research enterprise and to raise for discussion possible changes that may be appropriate for U.S. research policies.

During 1996, the Roundtable continued a series of informal discussions built around visits of international leaders to the Academy complex and federal agencies. These events provided government, industry, and university leaders a chance to discuss their views regarding domestic and international changes affecting the research enterprise.

As a follow-up to these discussions, a colloquium will be held in May 1997 to compare national strategies for determining the scale and character of their science and technology investments, along with the important dimension of communicating the basis of these strategies to constituencies outside of the science and technology community, such as legislatures, governing boards, and the public. The colloquium will consider the views of university, industry, and federal research investigators, as well as the views of the international research community. In late 1997, the Roundtable will publish and disseminate a proceedings report on this colloquium which will serve to stimulate broader discussions.

Industry-University Research Collaborations

The prevalence and vitality of research partnerships between industrial organizations and universities have increased dramatically over the last two decades. Data from the National Science Foundation reveal a fourfold increase in the number of university-industry research centers established in the 1980's compared to the number created in the 1970's. One recent report indicates that up to ninety percent of companies with significant biomedical research interests had relationships with academic institutions in 1994, while another survey shows that those growth companies that engage in cooperative ventures with universities enjoy substantial benefits in increased productivity.

Despite the rapid growth and emerging durability of joint ventures, there is surprisingly little empirical information available about the probability of satisfaction or the actual benefits realized by those who engage in collaboration across sectors. In theory, industry looks to academia primarily as a fountain of basic, leading edge research and as a wellspring of scientifically trained personnel. Entrepreneurial academics, it is commonly believed, turn to industry for additional funding and for access to state-of-the art facilities and equipment. In fact, the limited empirical literature examining the nature of success and of satisfaction in this domain reveals a more idiosyncratic and nuanced portfolio of motivations and considerations. Among few general findings to emerge from limited research is the growing recognition that immediate commercial return is not the only or predominant motivation for companies to enter into research relationships with university researchers.

As the sheer number and complexity of collaborative research partnerships increase, members of the Research Roundtable believe it will be ever more important that corporate managers, bench scientists, and decision-makers in government, universities, and industry better understand the structure and nature of successful collaborative ventures. In order to further progress toward this goal, the Roundtable cosponsored, together with the Industrial Research Institute and the Council on Competitiveness, a workshop at Duke University in the fall of 1995. Participants in the conference included representatives of industry and academia who had extensive experience in organizing and managing research collaborations. The agenda was built around four case studies of actual university-industry partnerships and around breakout sessions designed to evoke discussion about the precursors to, and characteristics of, successful joint ventures.

The final report on this workshop will be published in early 1997. The report, entitled *Industry-University Research Collaborations: Report of a Workshop* will present synopses of the case studies and of the content of breakout discussions. This report continues a tradition of collaboration between the IRI and the Roundtable in examining issues at the interface of universities and industry. Previous reports in this series include *Intellectual Property Rights in Industry-Sponsored University Research* (1993), *Industrial Perspectives on Innovation and Interactions with Universities* (1991), and *Simplified and Standardized Model Agreements for University-Industry Cooperative Research* (1988). As the emerging trend toward partnerships for research continues, this report should serve as a guideline for those seeking to stimulate and to nurture collaboration between academic and industrial investigators and organizations.

A next step in this area will be examination of effective practices in overcoming some of the recurring problems and impediments in industry-university research collaboration. Considerable experience has accumulated to identify these barriers, and the most inventive companies and institutions often have been able to find arrangements that align goals of both parties. Working with federal agencies that rely on such partnerships as part of their strategies, the Roundtable will draw together practitioners to describe and compile these "effective practices".

Status of Roundtable Working Groups

The Roundtable carries out a considerable portion of its activities in Working Groups. This allows ideas that are stimulated in the major Council meetings to be examined in detail, along with consideration of follow-up strategies to be undertaken by the Working Group itself, or through cooperation with other units of the Academy complex, or outside groups with synergistic interests.

Working Group I: Illuminating Research Costs and Administration

In spring, 1996, the Roundtable issued a report entitled "The Costs of Research: Examining Patterns of Expenditures Across Research Sectors" (see project description, above). The report, which compared research cost structures for industry, universities, and government laboratories, concludes that patterns of expenditures for research are strikingly similar across research sectors. Since the report was released, Working Group I has been considering possible follow-up activities. One possible direction might be to explore in greater depth the compliance costs associated with federally-sponsored research grants, both at universities and at federal laboratories.

Two additional lines of inquiry that may be explored by this group are: (1) various approaches to targeting and evaluating the success of investments in research; and (2) a systematic review of current databases reflecting particular aspects of the research enterprise, identifying important questions of public policy that cannot be addressed with available data and specifying the nature of quantitative information required.

Working Group I also is charged with providing guidance to the leadership of the Federal Demonstration Partnership. The status of that work is described above.

Members of Working Group I, which is chaired by Joe Wyatt, are: James Baker, Catherine Woteki, Maynard V. Olson, and D. K. Sharma. Special Associates to the working group for the FDP are Barbara Siegel (FDP Executive Committee), Charles Paoletti (FDP Executive Committee), and Karl Erb (NSF).

Working Group II: Preserving and Increasing the Vitality of Research Institutions

Working Group II is responsible for overseeing work related to the ongoing, campus-based review of the stresses facing the nation's research universities. The group carries out this responsibility in conjunction with a specially appointed Guidance Group. The scope of this work is described above,

and the objective is to accelerate the speed of self-discovery and self-improvement taking place nationwide on college and university campuses.

This working group also oversees the Roundtable's activities in the area of research collaboration and consortia. In 1996, these activities included the report, based on a workshop held late in 1995 that was cosponsored by the Industrial Research Institute and the Council on Competitiveness, on industry-university research collaboration. Plans are underway to convene another workshop on research consortia, broadly defined, in the fall of 1997.

Finally, this working group has input in shaping the Roundtable's activities in the international arena. With the NSF, the Roundtable is planning a major, international symposium entitled "National Science and Technology Strategies in a Global Context."

Richard Celeste chairs Working Group II. Other members are: Carol Browner, Jack Gibbons, Martha Krebs, Neal Lane, Harold Varmus, and Wm. A. Wulf. Special Associate to the working group for the "Stresses" initiative is former associate Roundtable Council member France Cordova.

Working Group III: Public Understanding of Science and Technology

Working Group III, chaired by Kenneth Shine, has developed a proposal for an award honoring industry-university-public school partnerships that attain outstanding achievement in improving the level of student understanding of science and mathematics. Currently, this working group is seeking corporate sponsors to underwrite the costs of administering the award ceremonies and prize money. Approximately \$250,000 will be allocated to awards, with the national winner receiving \$100,000 to be used to further the activities of the winning partnership.

On another activity, this working group has begun discussing ways to influence the manner in which science and technology is portrayed in the media. The working group recently met with representatives of Clark & Weinstock and International Creative Management to discuss the possibility of establishing an organization in Hollywood to develop better relationships between the media and the science and technology community.

Members of Working Group III include: Mortimer Downey, Daniel Goldin, Dean Kamen, Alan Ladwig, Kathleen Kingscott, Martha Krebs, Alan McGowan, D.K. Sharma, Ed Zschau, and Joe Wyatt.

Working Group IV: Ensuring the Continued Health of Human Resources

Working Group IV, chaired by Ernest Moniz, is working with The Business Roundtable's Education Task Force on a project that will focus attention on the professional development of math and science teachers, including both pre-service and in-service training. Recognizing that half of all the teachers who will be teaching in the year 2005 will be hired over the next decade, and recognizing the need for challenging academic standards to focus the efforts of students, teachers, and parents on improving student performance, the working group and the task force believe this is a unique time for universities; the science, mathematics, and engineering

community; business; and government to transform the quality of preparation for the next generation of teachers.

It is clear to the working group that if our children do not have teachers capable of teaching at the level required by the new standards, they will never meet these standards. While current reform efforts require substantive change in how science and mathematics are taught, an equally substantive change is needed in professional development practices. Teachers can not be expected to provide our children with appropriate instruction, if they have not received adequate training themselves. Over the next several months, the Working Group and Task Force will develop a joint statement and an agenda for a meeting focusing on this topic.

Members of Working Group IV include: Bruce Alberts, Lynn Conway, David Kessler, D.K. Sharma, William Spencer, and David Vapnek.

GOVERNMENT-UNIVERSITY-INDUSTRY RESEARCH ROUNDTABLE

Council Meeting
March 12-13, 1996
National Academy of Sciences
2101 Constitution Ave. N.W.
Washington, D.C.

AGENDA

Tuesday, March 12

5:30 p.m.

Cocktail Reception (*Rotunda*)

6:00

Dinner and Presentations (*Members Room*)

Implications of the revolution underway in information technology for scientific research and education

Kirstie Bellman Program Manager
Information Technology Office
Advanced Research Projects Agency/DOD

William Wulf AT&T Professor
Department of Computer Sciences
University of Virginia

Charles Geschke President and Chief Operating Officer
Adobe Systems

8:00

Roundtable Council discussion

9:00

Adjourn

Wednesday, March 13 (*Board Room*)

8:00 a.m.

Continental Breakfast Session

Costs of Research Study: Report on Findings

Joe Wyatt Chancellor
Vanderbilt University

James Roth Senior Partner
Arthur Anderson and Co., S.C.

9:00

Implications of ongoing changes in the information infrastructure for universities and industry

Peter Denning Professor of Computer Science
George Mason University

Maynard Olson Professor of Molecular Biotechnology
University of Washington

Wednesday March 13 cont'd

Ed Zschau

**Senior Lecturer of Business Administration
Harvard University**

10:30

Roundtable Council discussion

11:30

Status report on ongoing Roundtable activities

12:00

Adjourn

GOVERNMENT-UNIVERSITY-INDUSTRY RESEARCH ROUNDTABLE
Council Meeting

**Enhancing Scientists' Appreciation
of the Public's Perceptions of S&T:
Novel Perspectives and Popular Advisors**

REVISED AGENDA

June 25-26, 1996

National Academy of Sciences
2101 Constitution Ave. N.W.
Washington, D.C.
Main Building

If we want to improve the communication of science to those behind the frontier, the scientific community probably needs to recapture access to the public. Public information about science is now, to a large extent, in the hands of institutional public-relations departments...and the media. We need a direct line...Too often these days, when scientists are given an opportunity to speak about their work, they are more interested in advancing the cause of their next grant, or their company's financial status, than in conveying information to the public.

(Maxine Singer, from her April 17 address to the annual AAAS Science and Technology Policy Colloquium, quoted in Science & Government Report, May 1, 1996)

Tuesday, June 25, 1996

5:30 Cocktail Reception (The Rotunda)

Evening program: Novel Perspectives on S&T (Members' Room)

- Popular Representations, Public Appetites

Chip Cronkite, Cronkite, Ward & Company

Boyce Rensberger, Editor, "Horizon: The Learning Section," The Washington Post

Ned Potter, News Correspondent, ABC, New York

Stephen Jay Gould, Professor of Geology and Zoology, Harvard

Wednesday, June 26, 1996

7:45 Continental Breakfast

8:00 **Breakfast session: Budget briefing (Lecture Room)**

Albert Teich, AAAS, on the final FY96 budget and the seven year outlook

Charles Larson, IRI, on industrial trends

Congressman Vernon Ehlers, R-MI, general commentary

Wednesday June 26, 1996 cont'd

9:00 Morning program: Novel Perspectives on S&T (Lecture Room)

- From the Laboratory to the Market and the Voting Booth

Charles Morris, Fund Manager, T. Rowe Price

Harry Clark, Founding Partner, Clark and Weinstock

Steve Wagner, President, QEV Analytics and former Vice President,
Luntz Research & Strategic Services

12:00 Adjourn

Next Meeting

October 29-30, 1996

GOVERNMENT-UNIVERSITY-INDUSTRY RESEARCH ROUNDTABLE

**Council Meeting
October 29-30, 1996**

**National Academy of Sciences
2101 Constitution Ave. N.W.
Washington, D.C.**

**AGENDA
(Revised)**

Can we Develop Performance Standards and Outcome Measures for the Research Enterprise?

Tuesday, October 29 (Members' Room)

5:30 Joint GUIRR/COSEPUP Cocktail Reception

6:00 *Presentation: Corporate "Best Practices" in Guiding Research & Development
Investment*

Keynote Speaker:

James Shellhaas, Managing Director, Peregrine Partners
Past Partner, McKinsey & Co., with leadership responsibilities
in the Technology Management Practice

Discussant:

Irwin Feller, Director, Graduate School of Public Policy
Pennsylvania State University

6:30 Dinner and Discussion

9:30 Adjourn

Wednesday, October 30 (Lecture Room)

8:00 *Breakfast Session: Focus on Government Performance and Results Act*

Jack Fellows, Chief, Science and Space Programs Branch, Office of
Management and Budget

Tom Weimer, Staff Director, House Subcommittee on Basic Research

Christopher Mihm, Assistant Director, Federal Management and
Workforce Issues, Government Accounting Office

Wednesday, October 30 cont'd

9:00

Three Points of View

James C. McGroddy, Former Director of Research, and Vice
President, Science and Technology, IBM T.J. Watson
Research Lab

Purnell Choppin, President
Howard Hughes Medical Institute

Paul David, Professor, All Souls College, Oxford and
Stanford University

11:00

Report on Visiting Committee Assessment of GUIRR, Cooperation Opportunities with
COSEPUP

H. Guyford Stever, Chairman, Policy Division
Phillip A. Griffiths, Chairman, COSEPUP

11:45

Status Reports on Working Groups

12:00

Adjourn

COUNCIL AND WORKING GROUP MEMBERS
Roundtable Council

Members

RICHARD F. CELESTE, *Roundtable Chairman*, Former Governor, State of Ohio; and Partner, Celeste and Sabety, Ltd. (97)⁺

BRUCE ALBERTS, *ex officio*, President, National Academy of Sciences

D. JAMES BAKER, Under Secretary for Oceans & Atmosphere, U.S. Department of Commerce

JEAN BONNEY, Director of Education\Research Business, Digital Equipment Corporation (99)[@]

CAROL M. BROWNER, Administrator, U.S. Environmental Protection Agency

LYNN CONWAY, Professor of Electrical Engineering and Computer Science; Director UMTV Demonstration Project, The University of Michigan (98)

HOWARD DEAN, Governor, State of Vermont^{*}

MORTIMER L. DOWNEY, Deputy Secretary, U.S. Department of Transportation

ROBERT V. EDWARDS, Chairman, Computer Sciences and Engineering, Case Western Reserve University (99)[@]

JACK GIBBONS, President's Science Advisor, Director, Office of Science & Technology Policy, Executive Office of the President

DANIEL GOLDIN, Administrator, National Aeronautics and Space Administration

STEPHEN JAY GOULD, Professor of Geology and Zoology, Museum of Comparative Zoology, Harvard University (99)[@]

ANITA K. JONES, Director, Defense Research and Engineering, Department of Defense

DEAN KAMEN, President, DEKA Research & Development Corporation (97)

DAVID A. KESSLER, Commissioner, Food and Drug Administration^{*}

⁺Year in parentheses indicates end of term; [@] Took office during 1996; ^{*}Left office during 1996;

MARTHA KREBS, Director, Office of Energy Research, U.S. Department of Energy

NEAL LANE, Director, National Science Foundation

HAROLD LIEBOWITZ, *ex officio*, President, National Academy of Engineering *

MAYNARD V. OLSON, Professor, Department of Molecular Biotechnology, University of Washington (97)

ARATI PRABHAKAR, Director, National Institute of Standards and Technology, U.S. Department of Commerce

KENNETH SHINE, *ex officio*, President, Institute of Medicine

WILLIAM J. SPENCER, President and Chief Executive Officer, Sematech (97)

MAX D. SUMMERS, Distinguished Professor, Texas A&M University (97)*

DANIEL VAPNEK, Senior Vice President, Research and Development, Amgen (97)

HAROLD VARMUS, Director, National Institutes of Health

WILLIAM WILEY, Senior Vice President, Battelle Memorial Institute #

CATHERINE WOTEKI, Deputy Under Secretary for Research, Education and Economics, U.S. Department of Agriculture

WM. A. WULF, *ex officio*, Interim President, National Academy of Engineering

JOE B. WYATT, Chancellor, Vanderbilt University (97)

ED ZSCHAU, Senior Lecturer of Business Administration, Harvard University (97)

*Year in parentheses indicates end of term; @ Took office during 1996; *Left office during 1996; # Deceased

Associates

E. WILLIAM COLGLAZIER, Executive Office, National Academy of Sciences

FRANCE CORDOVA, Chief Scientist, National Aeronautics and Space Administration*

JAMES F. DECKER, Deputy Director, Office of Energy Research, U.S. Department of Energy

KAREN HEIN, Executive Officer, Institute of Medicine

ROBERT J. HUGGETT, Assistant Administrator, Office of Research and Development,
Environmental Protection Agency

RUTH KIRSCHSTEIN, Deputy Director, National Institutes of Health

SAMUEL KRAMER, Deputy Director, National Institutes of Standards and Technology, U.S.
Department of Commerce

ALAN LADWIG, Associate Administrator for Policy & Plans, National Aeronautics and Space
Administration @

JASPER LUPO, Director, Resources and Laboratory Management, Department of Defense *

ERNEST MONIZ, Associate Director for Science, Office of Science and Technology Policy,
Executive Office of the President

ANNE PETERSEN, Deputy Director, National Science Foundation *

BOB ROBINSON, Administrator, Cooperative State Research, Education and Economics, U.S.
Department of Agriculture

WILLIAM SALMON, Executive Officer, National Academy of Engineering

DHARMENDRA K. SHARMA, Administrator, Research and Special Programs Administration,
Department of Transportation

KATHRYN SULLIVAN, Chief Scientist, National Oceanic and Atmospheric Administration,
U.S. Department of Commerce*

LEO YOUNG, Former Director (Retired), Resources and Laboratory Management, U.S.
Department of Defense

*Year in parentheses indicates end of term; @ Took office during 1996; * Left office during 1996

ILLUMINATING RESEARCH COSTS AND ADMINISTRATION

Working Group One

Members

JOE WYATT, *Working Group Chairman*, Chancellor, Vanderbilt University

D. JAMES BAKER, Under Secretary for Oceans & Atmosphere, U.S. Department of Commerce

MAYNARD V. OLSON, Professor, Department of Molecular Biotechnology, University of Washington

DHARMENDRA K. SHARMA, Administrator, Research and Special Programs Administration, Department of Transportation

Special Associates

KARL ERB, Senior Science Advisor to the Director, National Science Foundation

CHARLES PAOLETTI, Director, University Business Affairs, Office of Naval Research

BARBARA SIEGEL, Managing Director, Office of Research & Sponsored Programs, Northwestern University

**PRESERVING AND INCREASING THE VITALITY OF
RESEARCH INSTITUTIONS**

Working Group Two

Members

RICHARD F. CELESTE, *Working Group Chairman*, Former Governor, State of Ohio; and Partner, Celeste and Sabety, Ltd.

CAROL M. BROWNER, Administrator, U.S. Environmental Protection Agency

JACK GIBBONS, President's Science Advisor, Director, Office of Science & Technology Policy, Executive Office of the President

MARTHA KREBS, Director, Office of Energy Research, U.S. Department of Energy

NEAL LANE, Director, National Science Foundation

HAROLD VARMUS, Director, National Institutes of Health

WM. A. WULF, President, National Academy of Engineering

PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY

Working Group Three

Members

KENNETH SHINE, *Working Group Chairman*, President, Institute of Medicine

MORTIMER L. DOWNEY, Deputy Secretary, Department of Transportation

DANIEL GOLDIN, Administrator, National Aeronautics and Space Administration

DEAN KAMEN, President, DEKA Research & Development Corporation

KATHLEEN KINGSCOTT, Director, Public Policy, International Business Machines

MARTHA KREBS, Director, Office of Energy Research, U.S. Department of Energy

ALAN LADWIG, Associate Administrator for Policy & Plans, National Aeronautics and Space Administration

ALAN McGOWAN, Director, Fellowship Program, American Association of the Advancement of Science

JOE WYATT, Chancellor, Vanderbilt University

ED ZSCHAU, Senior Lecturer of Business Administration, Harvard University

ENSURING THE CONTINUED HEALTH OF HUMAN RESOURCES

Working Group Four

Members

ERNEST MONIZ, *Working Group Chairman*, Associate Director for Science, Office of Science and Technology Policy, Executive Office of the President

BRUCE ALBERTS, President, National Academy of Sciences

LYNN CONWAY, Professor of Electrical Engineering and Computer Science; Director UMTV Demonstration Project, The University of Michigan

DAVID A. KESSLER, Commissioner, Food and Drug Administration

WILLIAM J. SPENCER, President and Chief Executive Officer, Sematech

DANIEL VAPNEK, Senior Vice President, Research and Development, AMGEN

**STRESSES ON RESEARCH AND EDUCATION
AT COLLEGES AND UNIVERSITIES: PHASE II**

Guidance Group

Co-Chairs

RICHARD CELESTE, Chairman, Government-University-Industry Research Roundtable

JAMES DUDERSTADT, President, University of Michigan and Member, The National Science Board

University-Faculty

MARSHA MCNUTT, Professor of Geophysics, Massachusetts Institute of Technology

MAYNARD V. OLSON, Professor, Department of Molecular Biotechnology, University of Washington

University-Administration

FREDERICK HUMPHRIES, President, Florida A&M University

FRANCE CORDOVA, Vice Chancellor for Research, University of California-Santa Barbara

Association

RICHARD NICHOLSON, President, American Association for the Advancement of Science

Other

BRUCE ALBERTS, President, National Academy of Sciences

ROLAND SCHMITT, President Emeritus, Rensselaer Polytechnic Institute

ROBERT ZEMSKY, Professor and Director, Institute for Research on Higher Education, University of Pennsylvania

FEDERAL DEMONSTRATION PARTNERSHIP

The goal of the Federal Demonstration Partnership (FDP) is to improve research administration and thereby increase research productivity. Most of the work of the FDP is carried out by government and university representatives in task groups that design and assess demonstrations of new procedures for research administration. The FDP Steering Committee coordinates the task groups and represents the FDP to other bodies, including the Interagency Assessment Committee, which was established by the Office of Management and Budget to oversee the FDP.

Steering Committee (* denotes Member of the Executive Committee)

CAROLYN AUSTIN-DIGGS, Director, Asset Management Policy & Planning Division,
Department of Treasury

LENNIE CARTER, Manager, Sponsored Accounting, Office of Financial Services, Georgetown
University

ANNE DATKO, Division Director, National Research Initiative, CSREES/NRI, U.S.
Department of Agriculture

SHARON DAVIS, Director, Research Grants & Contracts Office, University of Nebraska-
Lincoln

ROBERT S. DECKER, Associate Dean for Research and Graduate Studies and Professor,
Departments of Medicine and Cell & Molecular Biology, Northwestern University

KARL ERB, Senior Science Advisor to the Director, National Science Foundation *

JERRY FIFE, Director, Contracts and Grants, University of North Carolina-Chapel Hill

JOHN C. FINI, Financial Director, Grants & Contracts, Massachusetts General Hospital
(Hospital Corporation)

EARL FREISE, Director, Sponsored Research, California Institute of Technology

JILDA GARTON, Vice President for Research & Administrative Services, Ohio State
University Research Foundation

NOLAN GOMM, Associate Director, Department of Contracts and Grants, University of
Southern California

GEOFFREY GRANT, Director, Office of Policy for Extramural Research Administration,
National Institutes of Health

JUDITH GREENBERG, Director, Genetics Program Branch, National Institute of General Medical Sciences, National Institutes of Health *

HARRY R. HARALDSEN, Chief, Policy and Support Division, Air Force Office of Scientific Research

ROBERT HARDY, Acting Head of Policy, Office of Contracts and Grants, National Science Foundation

KATHLEEN HARGETT, Procurement Analyst, Army Medical Research & Material Command

WILLIAM J. HARTMAN, Assistant Director, Division of Grants & Contracts, Office of Dean of Research & Graduate Education, Georgetown University Medical Center

SUSAN HILL, Procurement Officer, Army Research Office

M. THOMAS JONES, Vice Provost and Dean, Research and Graduate Studies, Kent State University

RICHARD KALL, Procurement Analyst, Contract Management Division, National Aeronautics and Space Administration

LEE M. KAPLAN, Medical Service, Massachusetts General Hospital (Hospital Corporation)

JOHN KAVANAGH, Director, Grants and Contracts, Dartmouth College

ROBIN J. LEACH, Associate Professor, Department of Cellular & Structural Biology, University of Texas Health Science Center at San Antonio

JAMES LEWIS, Director, Office of Projects and Grants, Columbia University

JACK LOWE, Associate Vice President for Research, Cornell University

DORIS LYONS, Director, Office of Sponsored Programs, Georgetown University

ANNE-MARIE MAZZA, Program Officer, Government-University-Industry Research Roundtable, National Academy of Sciences *

LINDA K. MEADOWS, Vice President for Research Development & Management, Ohio State University Research Foundation

DAVID MEARS, Director, Office of Research Administration, University of California

GUY MITTLEMAN, Associate Professor, Department of Psychology, University of Memphis

JEAN MORROW, Policy Analyst, Officer of Energy Research, Department of Energy

MICHAEL NEUMAN, Director, Research Curriculum & Development for Academic Computing Services, Georgetown University

RONALD NEWBOWER, Senior Vice President for Research & Technology, Massachusetts General Hospital (Hospital Corporation)

JULIE NORRIS, Director, Office of Sponsored Programs, Massachusetts Institute of Technology

WILLIAM L. OLBRICHT, Professor & Director, School of Chemical Engineering, Cornell University

CHARLES PAOLETTI, Director, University Business Affairs, Office of Naval Research *

JOHN PEZZULLO, Director, Research Information Services Support, Georgetown University Medical Center

BARBARA PIFEL, Director, Division of Sponsored Research, University of Central Florida

OLIVIA H. POPE, Director, Contracts and Grants, Florida State University

JACK PUZAK, Program Staff, National Center for Environmental Research and Quality Assurance, ORD, Environmental Protection Agency

RICHARD J. RICHARDSON, Provost, University of North Carolina-Chapel Hill

DAN E. SHACKELFORD, Procurement Analyst, U.S. Army Medical Research & Development Command

JOHN L. SHOWMAN, III, Senior Grants Specialist, Grants Operations Branch, Grants Administration Division, U.S. Environmental Protection Agency

BARBARA SIEGEL, Managing Director, Office of Research & Sponsored Programs, Northwestern University *

SAMUEL C. SILVERSTEIN, Professor, Department of Physiology, College of Physicians and Surgeons, Columbia University

JAMES C. SMITH, Robert O. Lawton Distinguished Professor, Professor of Psychology in Neuroscience, Florida State University

MARCIA L. SMITH, Director, Research Affairs, Massachusetts General Hospital (Hospital Corporation)

JAMES W. TAYLOR, Professor, Chemistry and Material Science, University of Wisconsin-Madison

LARRY E. TRAVIS, Chief, Procurement Office, Army Research Office

JO ANN TREAT, President, Texas A&M Research Foundation

WILLIAM VANCE, Associate Director, Research Administration-Financial, University of Wisconsin

JEAN VORHABEN, Director, Office of Sponsored Research, Rice University

JOHN E. WALSH, Associate Dean of the Faculty and Francis & Mildred Sears Professor of Physics, Dartmouth College *

HAROLD WEINSTOCK, Program Manager, Directorate of Physics & Electronics, Air Force Office of Scientific Research

MAREDA WEISS, Associate Dean, Graduate School, University of Wisconsin-Madison

ANN W. WILKS-PENROD, Interim Assistant Vice Provost, Research and the Graduate School, University of Memphis

JANE A. YOUNGERS, Director, Office of Grants Management, University of Texas Health Science Center at San Antonio

ROUNDTABLE PUBLICATIONS⁺

⁺*All publications available free of charge by writing the Roundtable.*

Academic Research Enterprise

The Costs of Research: Examining Patterns of Expenditures Across Research Sectors
Report by Arthur Andersen, LLP, for The Government-University-Industry Research Roundtable. Arthur Andersen's analyses conclude that the pattern of expenditures incurred for research activities in federal laboratories, universities, and industry are strikingly similar, despite common perceptions that there are wide differences. (March 1996)

Richard Celeste and Roland Schmitt, Government and Higher Education: Renewing the Partnership. - An OpEd article published by the National Academy OP-ED Service. These two prominent observers (Celeste the former Governor of Ohio and Schmitt the former president of Rennselaer Polytechnic Institute) of the links between research, the economy, and public policy, spell out how the next 50 years of university-based research can be as productive as the past 50 years. (August 1994)

Stresses on Research and Education at Colleges and Universities: Institutional and Sponsoring Agency Responses. Report of a collaborative inquiry conducted jointly by the National Science Board and the Government-University-Industry Research Roundtable. The purpose of this report is to contribute to discussions of the choices facing the U.S. academic enterprise as we approach the twenty-first century. (July 1994)

Stresses on Research and Education at Colleges and Universities: Preliminary Summary of Campus Reports. This is a preliminary summary of individual campus reports and recommendations for action prepared as a working document for the National Summary Meeting of a project sponsored jointly by the National Science Board and the Government-University-Industry Research Roundtable, December 7-8, 1993. (December 1993)

Fateful Choices: The Future of the U.S. Academic Research Enterprise - A discussion paper including an optimistic and challenging vision for the future of U.S. academic research; an analysis of the near-term decisions and longer-term options facing the enterprise if the positive vision is to be pursued; and a description of the changing environment for decision making. (March 1992)

The Future of the U.S. Academic Research Enterprise: A Report of a Conference - A summary of a December 9-10, 1991, Roundtable conference held to address critical issues confronting U.S. academic research and to explore the possibilities for national consensus on the future directions of the research enterprise. (March 1992)

Science and Technology in the Academic Enterprise: Status, Trends and Issues - A discussion paper on the status of the current academic research enterprise, emerging trends affecting it, and major issues to be addressed regarding its future; statistical

information on financial, human resource, infrastructure, and organizational trends in academic research. (October 1989)

Multidisciplinary Research and Education Programs in Universities: Making Them Work - A paper by Robert L. Sproul, Harold H. Hall, and members of the Working Group on Institutional Renewal, discussing how to organize, support, and operate multidisciplinary programs in universities. (June 1987)

Examining the Impact of Information Technology on Science and Engineering Research and Education. This is a brief summary of the March 1996 GUIRR Council meeting on this subject, with references for further information. (June 1996)

New Alliances

Industry-University Research Collaborations: Report of a Workshop-Published jointly with the Industrial Research Institute and the Council on Competitiveness. (December 1996)

Richard F. Celeste, "Government: What Kind of Partner?" - A new focus on industry relationships characterizes cooperative R&D initiatives at both the state and federal level; this article is adapted from remarks Celeste made 3 October during the symposium Industry-University-Government Cooperation for U.S. Technological Leadership in the 21st Century, part of the 1996 National Academy of Engineering Annual Meeting. In The Bridge; Vol. 26, Nos. 3&4, Fall/Winter 1996 (available from NAE Program Office)

Intellectual Property Rights in Industry Sponsored University Research: A Guide to Alternatives for Research Agreements - Published jointly with the Industrial Research Institute. (August 1993)

Richard F. Celeste, "Who Benefits From High-Technology Partnerships?" - An Op-ed article published by the National Academy of Science OP-ED Service discussing the potential of partnerships between universities and business to spur economic development, and a major obstacle to such partnerships--disputes over how to use the ideas arising from joint projects. (December 12, 1993)

University-Industry-Federal Laboratory Partnerships: Expectations and Effectiveness - Summary of Issues Raised at the October 1992 Roundtable Council Meeting. (September 1993)

Richard F. Celeste, "A New Partnership in American Science and Technology," - An op-ed article published by the National Academy of Sciences OP-ED Service encouraging federal-state interactions in science and technology. (June 21, 1992)

Federal-State Cooperation in Science and Technology Programs - A discussion paper by the Federal-State Dialogue on Science and Technology. (February 1992)

Industrial Perspectives on Innovation and Interactions with Universities: Summary of Interviews with Senior Industrial Officials - Presents the views of 17 industrial officials on innovation processes in their firms, connections to universities, and national R&D policy. (February 1991)

"Survey to Assess the Usefulness of Two Model Agreements for University-Industry Cooperative Research" - Results of a survey of about 70 university and industry "users" of the model agreements published in 1988. (August 1990)

Simplified and Standardized Model Agreements for University-Industry Cooperative Research - Published jointly with the Industrial Research Institute. (1988)

"Commentary: University-Industry Alliances;" Dorothy Nelkin, Richard Nelson, and Casey Kiernan; Science, Technology and Human Values, Volume 12, Issue 1, pp. 65-74. (Winter 1987)

State Government Strategies for Self-Assessment of Science and Technology Programs for Economic Development - Proceedings of a workshop held April 10, 1987.

New Alliances and Partnerships in American Science and Engineering - Background materials for a conference held December 5, 1985 (issues paper and case studies) along with interpreted highlights of conference sessions.

International Context for Research

Formulating U.S. Research Policies Within An International Context: A Discussion Paper - The purpose of this paper is to provoke discussion among policy makers and the U.S. research community regarding the implications of changing international conditions for the purposes, goals, and capacity of the U.S. research enterprise. (Draft - January 1994)

Future National Research Policies Within the Industrialized Nations - A report of a February 1991 symposium on emerging national research policies and programs. Participants included senior government officials and leading scientists directly involved in formulating research and higher education policies in the United States, Japan, the Soviet Union, the United Kingdom, Germany, and the European Community. (February 1992)

The Academic Research Enterprise Within the Industrialized Nations: Comparative Perspectives - A report of a symposium on the research systems of the U.S., Japan, Soviet Union, Great Britain, Germany, and France. (March 1990)

Improving Research Administration

General:

The Management and Cost of Laboratory Waste Associated with the Conduct of Research: Report of Workshop - The purpose of this report is to contribute to discussions

of the management and cost of laboratory waste associated with the conduct of research. (September 1994)

Scanley, D. A. and W. Sellers, "Making Things Better: A Summary of Past Recommendations for Improving the Management of Federally Sponsored Academic Research," Research Management Review, Volume 5 Number 1. (Spring 1991)

Reducing Bureaucratic Accretion in Government and University Procedures for Sponsored Research: New Approaches in Process and Additional Areas for Attention - Proceedings of a hearing held June 5, 1985. (full report and summary)

About the FDP:

"Federal Demonstration Project: Response to the National Performance Review," - A proposal for implementing recommendations of the National Performance Review. (March 1994)

"What is the Federal Demonstration Project?" - A description of a cooperative effort between universities and federal agencies to increase research productivity by eliminating unnecessary administrative procedures and by streamlining and standardizing needed controls. (August 1991)

"Summary of Interim Reports Submitted by Grantee Organizations Participating in the Federal Demonstration Project" - Describes the positive impacts of the FDP on principal investigators, universities, and the general research environment as well as problem areas that need to be addressed. (October 1990)

FDP Studies and Surveys:

"Direct Charging Space Costs," - Prepared by the Federal Demonstration Project Task Force on Direct Charging, the report examines the implications of developing and testing models to subject a greater portion of research costs to the peer review process by charging facilities costs directly to specific research grants and contracts. (October 1995)

"Federal Managers' Viewpoints on FDP Continuation Funding Pilot" - Prepared by the Federal Demonstration Project Task Group on Proposals/Applications, the report provides the results of a survey of federal agency views of the impact of the noncompeting renewal demonstration on the efficiency and efficacy of agency functions. (March 1992)

"Report on Equipment Screening Studies" - Prepared by the Federal Demonstration Project Task Group on Internal Systems, the report examines the cost effectiveness of equipment screening. (December 1991)

"The Impact of Noncompeting Continuation Applications within the Federal Demonstration Project" - Prepared by the Federal Demonstration Project Task Group on Productivity Assessment, the report provides the results of a survey of the time saved by

principal investigators under the demonstration of new procedures for non-competing renewal applications. (Draft November 1991)

"The Impact of the Use of Expanded Authorities within the Federal Demonstration Project" - Prepared by the Federal Demonstration Project Task Group on Productivity Assessment, the report describes the results of a survey that assessed the amount of principal investigator time saved during the demonstration of research administration procedures that expand the authority of universities and principal investigators to manage grant funds. The survey also looks at how saved time was reinvested. (February 1991)

"Report on Survey of State Requirements Applicable to Externally Funded Research Activities" - Prepared by the Federal Demonstration Project Task Group on State/Grantee Relations, the report describes the results of a survey on administrative requirements states apply to university research. (November 1990)

"The Florida Demonstration Project: Observations on the Impacts of the Project" - Observations on the impacts of the Project based on information collected on the operation of the Project by the Roundtable in cooperation with the participating universities in Florida. (September 1987)

Priorities

Richard F. Celeste, Testimony before the Subcommittee on Science, Committee on Science, Space, and Technology, Regarding setting Priorities in Science. (April 28, 1992)

What Research Strategies Best Serve the National Interest in a Period of Budgetary Stress? - Interpreted highlights of the discussion at a conference held February 26 and 27, 1986.

Academic Research Facilities

Don I. Phillips, Testimony before the Subcommittee on Department Operations and Nutrition, Committee on Agriculture, United States House of Representatives; Statement of Don I. Phillips, Executive Director, Government-University-Industry Research Roundtable, National Academy of Sciences, National Academy of Engineering, Institute of Medicine, regarding academic research facility financing. (June 17, 1993)

"Research Facility Financing: Near-Term Options" (Working Draft) - Intended as a vehicle for discussion, this document sketches the purposes, costs, impacts, tradeoffs, and political considerations associated with a variety of mechanisms for research facility funding. (February 1991)

James D. Ebert, Testimony before the Rules Committee of the United States Senate; Statement of James D. Ebert, Vice President, National Academy of Sciences, Regarding S. RES. 206-To establish a point of order against material that earmarks research monies for designated institutions without competitions. (June 21, 1990)

"Synthesis of Options for Academic Research Facility Financing" - A summary of three sector-specific workshops in which representatives of federal agencies, universities, and state governments each described alternative approaches their sectors can take to facility financing. The document describes the perspectives of each sector along with options for facility financing that each sector could take. (March 1990)

Perspectives on Financing Academic Research Facilities: A Resource for Policy Formulation - A resource for policy makers and a reference work, this discussion paper addresses objectives of facility funding, strengths and weaknesses of financing mechanisms, facility needs and sources of support, roles of the sectors, and key policy issues. (October 1989)

Academic Research Facilities: Financing Strategies - Proceedings of a conference held July 22 - 23, 1985 (full report and summary)

"Federal Funding of Scientific Facilities" - A discussion of the issues arising from direct congressional funding of facilities. (February 2, 1985)

Science and Engineering Talent

Nurturing Science and Engineering Talent - A discussion paper on the broad outlook for science and engineering talent organized around three themes: the status of the science and engineering talent pool, the factors affecting career choice, and the effectiveness of special programs to encourage science and engineering talent. (July 1987)

Competitiveness

Richard F. Celeste, Testimony before the Subcommittee on Technology, Environment, and Aviation, Committee on Science, Space, and Technology, Regarding the National Competitiveness Act of 1993 and the Role of the States. (February 3, 1993)

"A Dialogue on Competitiveness," Ralph E. Gomory and Harold T. Shapiro, Issues in Science and Technology, Volume IV, Number 4, (Summer 1988)

Brochures

Examining the Impact of Information Technology on Science and Engineering Research and Education-A summary of the March 1996 Roundtable Council Meeting.

Communication and Understanding between Scientists and the Public-A summary of the June 1996 Roundtable Council Meeting.

Can We Develop Performance Standards and Outcome Measures for the Research Enterprise?-A summary of the October 1996 Roundtable Council Meeting.

Annual Reports

Government-University-Industry Research Roundtable Annual Reports, 1985 - 1996.