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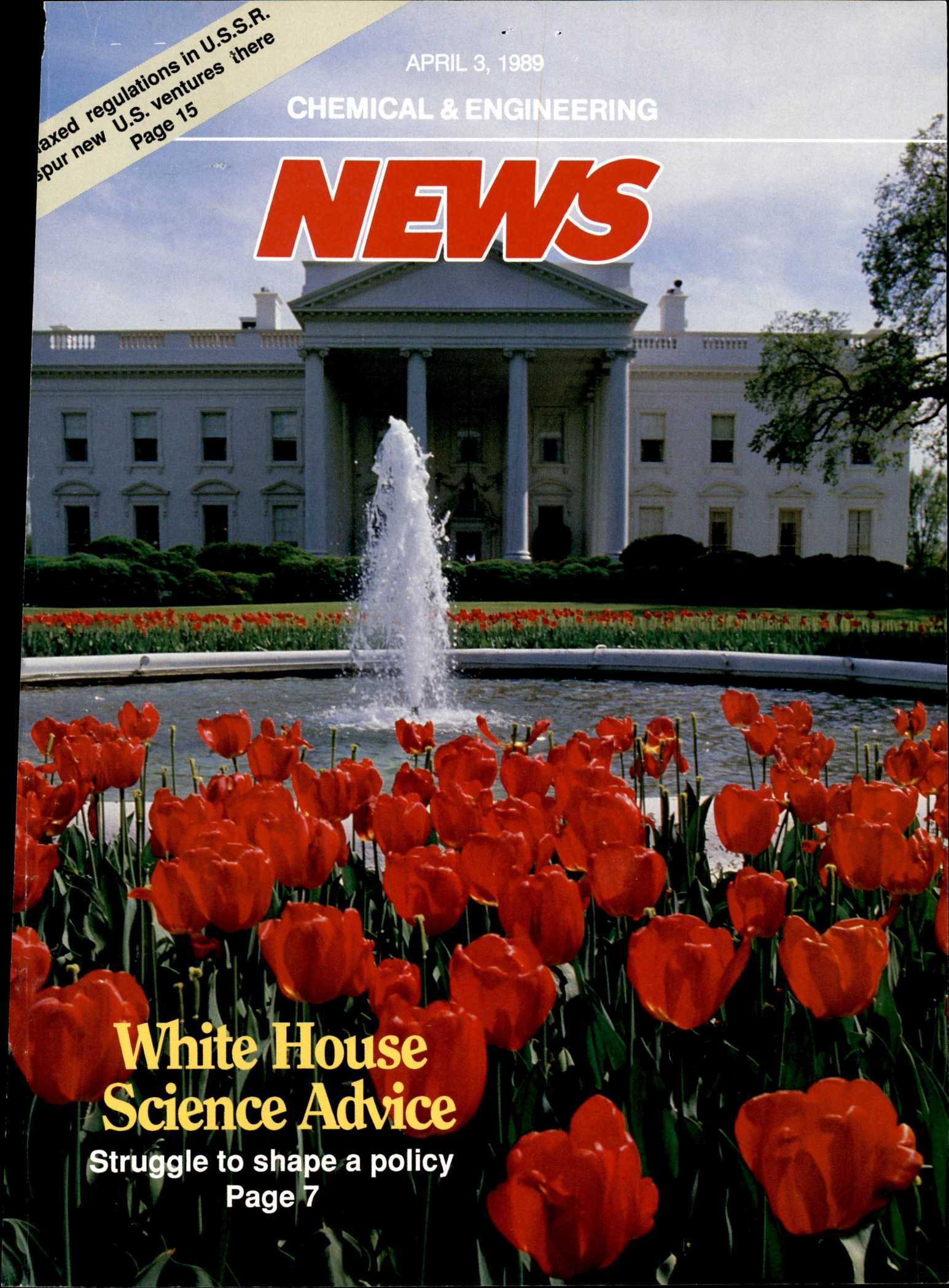
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APRIL 3, 1989

CHEMICAL & ENGINEERING

NEWS



White House Science Advice

Struggle to shape a policy
Page 7



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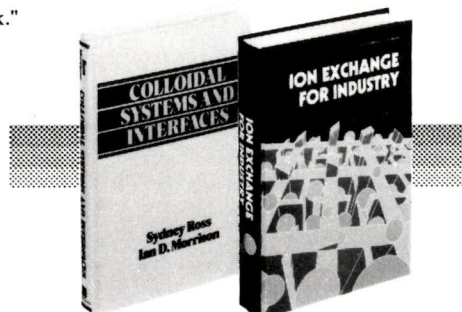
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News of the Week

■ **Utah electrochemists' disclosure that they have achieved nuclear fusion at ambient temperatures in an electrolytic cell has triggered excitement and skepticism among scientists.** **Page 4**

■ **USDA is stepping up its biological control efforts, including initiation of joint research with the Soviet Union and China.** **Page 5**

■ **Warner-Lambert suit charges Rohm & Haas with supplying a pesticide-contaminated resin for use in a cholesterol-lowering drug.** **Page 6**

■ **American Chemical Society officials discuss science education, risk assessment, other issues with White House aides.** **Page 6**

Business

U.S. joint ventures in the U.S.S.R. are on the upswing as a result of Soviet softening of bureaucratic controls, other regulations. **Page 15**

Former EPA chief Lee Thomas is heading up Law Environmental, an environmental engineering and earth science consulting firm. **Page 19**

Government

International controls on transboundary movement and disposal of hazardous wastes agreed to at Basel convention. **Page 21**

Increased regulation on the release of toxic chemicals by industry called for by several Congressmen. **Page 23**

Defense report lists 22 technologies deemed vital to maintaining and improving nation's defense. **Page 24**

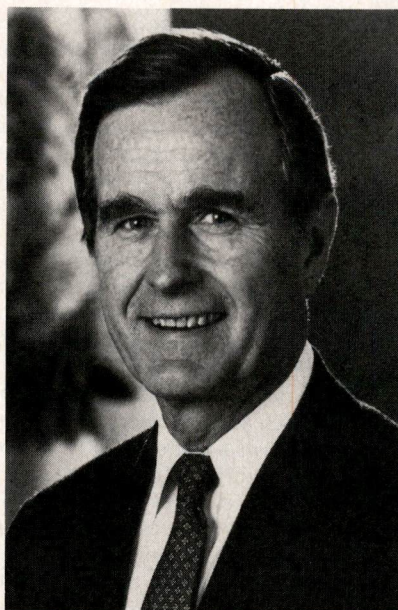
Concerns of possible conflicts of interest among Superfund contractors are raised by General Accounting Office study. **Page 25**

Science/Technology

Nitrogen for blanketing provides growth area for gas separation; industry applications include safety blankets and controlled and transport atmospheres for preserving perishable foods. **Page 27**

Cover: Photo of White House by Paul Conklin/
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News Focus

Debate over science advice in the White House continues as various groups air their thinking about its role, await the President's selection of a science adviser. **Page 7**

Chemical & Engineering News

1155—16th St., N.W., Washington, D.C. 20036

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LETTERS

Energy consumption

SIR: In reference to Joseph A. Council's letter (C&EN, Jan. 30, page 2), there are other, major problems regarding the relationship between energy consumption and economic activity in an increasingly service-oriented economy.

However flawed older energy consumption statistics may be, we tend to ignore the importance of fuel wood and animal fodder in the 19th and early 20th centuries. John Fisher has presented these data usefully in his "Energy Crises in Perspective" [Wiley, New York (1974)].

Over the years we have come to measure energy consumption with increasing accuracy and to place commensurate confidence in government statistics on some energy subjects. However, as those who study economic activity have observed, no such confidence is warranted when discussing the gross national product. Thus measures of ratios between energy use and gross national product should be regarded as suspect; this was first emphasized by Peter Gutman ("The Subterranean Economy," *Financial Analysts Journal*, November/December 1977). Gutman later believed that real economic activity exceeded official gross national product 14%. (The overwhelming portion of the underground economy consists of otherwise licit behavior and is not much affected by the level of criminal enterprises.) Edgar Feige, who set out to disprove Gutman ("How Big Is the Irregular Economy?" *Challenge*, November/December 1979, page 5), now thinks that Gutman systematically underestimates the off-the-books economy by a factor of two thirds (*Business Week*, April 5, 1982, page 64).

But Gutman and Feige do agree that in the U.S., as elsewhere, the level of underground economic activity has increased sharply in recent decades—both absolutely and as a percentage of officially reported gross national product. The effect is to understate the energy efficiency of the U.S. and other economies and to do so more each year.

There are several reasons why this is so. The economy is shifting to those sectors where income is more easily disguised. High marginal tax rates foster tax evasion. And both the complexity of taxation and the frequency of tax reform—which adds a lottery component to U.S. taxation—make it costly or even impossible to minimize the expenses of legal compliance.

The U.S. chemical industry, among others, is disadvantaged by the lack of predictability of future tax rates. Since taxation is a major determinant of in-

come, repeated efforts to reform tax policy increases the investment uncertainty for U.S. industries relative to that of their foreign competitors.

E. R. Habicht Jr.
Port Jefferson, N.Y.

Changing public perception

SIR: "Chemical dependency" is rapidly becoming the accepted newspaper euphemism for drug, alcohol, and tobacco addiction. This unhappy usage adds to the existing negative connotations for chemistry and chemicals from such word combinations as "chemical wastes," "hazardous chemicals," and, of course, "chemical warfare."

It is evident that chemistry does not have a good public image these days. The common word linkages noted above are not doing much to improve that image. At least in the instance of the phrase chemical dependency, chemists ought to be active in pointing out that such usage is not only inaccurate but possibly harmful.

We are, of course, all addicted to chemicals, the vast majority of which are essential to life. Individuals who are addicted to drugs, alcohol, and so on are not benefited by attempts to soften the impact of their problems by employing words to describe them that are believed more socially acceptable. In fact, such usage may be injurious by delaying acceptance that a serious problem exists.

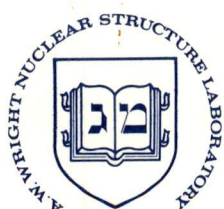
In the longer run, chemists should make a strong public case for the many positive contributions that chemistry and chemicals have made and upon which our modern society depends for agriculture, housing, health, clothing, and transportation. Changing a public perception is difficult but by no means impossible. (Note that in only a few years the image of Japanese-made articles went from "junk" to "high quality.") Cleaning up waste dumps is only one problem that faces the chemical industry today. Cleaning up its image may be equally daunting, but all chemists can and should participate by seeking to educate their fellow citizens. Start with the elimination of the phrase chemical dependency.

D. J. Berets
Stamford, Conn.

Correction

• March 20, page 44: Photo shows Prolabo Microdigest A300 automatic digester, not the Prolabo Maxidigest as was intended.

fig



Yale University

A. W. Wright Nuclear Structure Laboratory

272 Whitney Avenue, P.O. Box 6666, New Haven, Connecticut 06511

D. Allan Bromley

Henry Ford II Professor
and Director
203-432-3082

March 27, 1989

The Honorable John H. Sununu
Chief of Staff
Executive Office of the President
The White House
Washington, D.C. 20500

Dear Governor Sununu:

I much appreciate your taking time in what must be an almost impossible schedule to talk with me last Friday.

The Science Adviser position is one that I believe offers major opportunities for service to the Bush Administration and to the nation both in the science for policy and policy for science areas, and I was very much heartened to hear of your desire to return the office to something more like the level of influence and activity it enjoyed under President Kennedy.

Members of the President's Council on Science and Technology — or whatever the exact title may be — will I am confident, be prepared to devote substantially greater time and effort to the activities of the Council themselves, as well as attract a larger fraction of the nation's most able scientists and engineers into related subpanel and other activities, than has been characteristic of the White House Science Council. The development of improved communication and understanding between the Administration and the broader scientific and engineering communities that will flow from such activities will be of particular importance. As one of the very few Republicans on this academic campus I have been very much disappointed by the depth of my colleagues' lack of understanding of the extent to which the Reagan Administration was working on their behalf and by their unwillingness to give it even the benefit of doubt on many important issues. That such attitudes are passed on to generations of students can be very destructive, although as I mentioned to you, our students, at least, are becoming increasingly resistant to them.

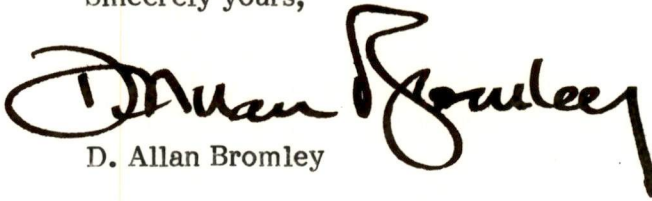
I have long felt that both the Department of Defense and the academic world — particularly the scientific and technological component of it — would greatly benefit from a rebuilding of the bridges between them that functioned so well in the immediate post World War II decades — and indeed until the late 1960's and Vietnam. Real progress is being made but much remains to be done.

I had planned to leave the enclosed biographical and bibliographical material with you on Friday but found that the copy I had with me was faulty; the enclosed copy is an up-to-date one.

Again my thanks for taking time to talk with me. I should be happy to provide any additional information that you might find useful. Having admired your activities as Governor of New Hampshire — particularly with reference to Seabrook! — for many years, it was a particular pleasure to finally have the opportunity to meet you.

With all best wishes,

Sincerely yours,


D. Allan Bromley

DAB:mts

Enc.

D. ALLAN BROMLEY

BIOGRAPHICAL DATA

BORN: May 4, 1926, Westmeath, Ontario, Canada

CITIZENSHIP: U.S.A. (naturalized April, 1970)

MARITAL STATUS: Married (Patricia Jane);
Two Children (David John - born 1953)
(Karen Lynn - born 1956)

UNDERGRADUATE EDUCATION:

B.Sc. (with highest honors) Faculty of Applied Science
(Engineering) 1948 Queen's University at Kingston,
Ontario

GRADUATE EDUCATION:

M.Sc. Physics, 1950
Queen's University at Kingston, Ontario

M.S. Physics, 1951
University of Rochester, Rochester, N.Y.

Ph.D. Physics, 1952
University of Rochester, Rochester, New York

M.A. (Honoris causa), 1961
Yale University, New Haven, Connecticut

Dr. Phil. Nat. (Honoris causa), 1978
University of Frankfurt, Frankfurt, Germany

Docteur [Physique] (Honoris causa), 1980
University of Strasbourg, Strasbourg, France

D.Sc. (Honoris causa), 1981
Queen's University, Kingston, Ontario

Litt. D. (Honoris causa), 1981
University of Bridgeport, Bridgeport, Connecticut

D.Sc. (Honoris causa), 1982
University of the Witwatersrand, Union of South Africa

Sc.D. (Honoris causa), 1982
Notre Dame University, Notre Dame, Indiana

Dottore [Fisica] (Honoris causa), 1984
University of Padua, Padua, Italy

D. H. L. (Honoris causa), 1987
University of New Haven, New Haven, Connecticut

D.Sc. (Honoris causa), 1988
Trinity College, Hartford, Connecticut

EMPLOYMENT HISTORY:

1952-53	Instructor, Physics Department University of Rochester, Rochester, New York
1953-54	Assistant Professor, Physics Department University of Rochester, Rochester, New York
1955-57	Associate Research Officer Atomic Energy of Canada, Ltd., Chalk River, Ontario, Canada
1958-60	Senior Research Officer and Section Head Atomic Energy of Canada, Ltd., Chalk River, Ontario, Canada
1960-61	Associate Professor, Physics Department Yale University, New Haven, Connecticut
1960-63	Associate Director, Heavy Ion Accelerator Laboratory Yale University, New Haven, Connecticut
1961-present	Professor, Physics Department Yale University, New Haven, Connecticut
1963-present	Director, A.W. Wright Nuclear Structure Laboratory Yale University, New Haven, Connecticut
1970-77	Chairman, Physics Department Yale University, New Haven, Connecticut
1972-present	Henry Ford II Professor of Physics Yale University, New Haven, Connecticut

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- b) Shell Oil Fellowship - 1949
- c) NRC (Canada) Predoctoral Fellowship - 1950
- d) NRC (USA) Postdoctoral Fellowship - 1952
- e) Fellowship, American Physical Society - 1962
- f) Fellowship, Connecticut Academy of Arts and Sciences - 1968
- g) Fellowship, American Academy of Arts and Sciences - 1972
- h) Fellowship, American Association for Advancement of Science - 1974
- i) Guggenheim Fellowship, 1977-78
- j) Humboldt Foundation Prize - 1978 and 1982
- k) Benjamin Franklin Fellowship, Royal Society of Arts (London)-1979
- l) Distinguished Alumnus Award - 1985
University of Rochester, Rochester, New York
- m) Fellowship, Brazilian Academy of Sciences, 1987-
- n) National Medal of Science, 1988

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- a) 1955-60, Top Secret Canadian Clearance
- b) 1969-present, USAEC/ERDA Q Clearance, No. WA131938
- c) 1972-present, Department of Defense, United Nuclear Corporation
- d) 1974-present, Department of Defense, Naval Studies Board, Top Secret
- e) 1981-present, White House, Top Secret and Specials

COMMITTEE AND PANEL ACTIVITIES:

American Physical Society

- a) Member of Council, 1967-71
- b) Member of Publication Committee, 1968-72

National Research Council

- a) Member of Panel on Nuclear Physics, 1965-66
- b) Member of Panel on Intermediate Energy Physics, 1965-66
- c) Chairman, Committee on Nuclear Science, 1965-74
- d) Member, Executive Committee, Division of Physical Science, 1967-74
- e) Member, Executive Committee, Assembly of Mathematical and Physical Sciences, 1974-78
- f) Chairman, Office of Physical Sciences, 1975-78
- g) Member, Naval Studies Board, 1974-78
- h) Chairman, U.S. National Committee, International Union of Pure and Applied Physics, 1973-1979
- i) Member, Board on International Organization and Programs, 1978-1981
- j) Member, Advisory Committee for the International Council of Scientific Unions, 1981-1987

National Academy of Sciences

- a) Chairman, Physics Survey Committee, 1969-73
- b) Member, US/USSR Working Group on Science Policy, 1974-present
- c) Head, U.S. Nuclear Science Delegation to the People's Republic of China, May-June, 1979
- d) Member, U.S. National Committee for ICSU, 1981
- e) Member, Advisory Board, Physics Survey Committee, 1984-1985

White House Science Council

- a) Member, 1981-present

Office of Science and Technology Policy

- a) Consultant on Nuclear Physics 1976-79
- b) Chairman, Presidential Panel on Indo-US Cooperation, 1982-present
- c) Vice Chairman, Panel on the Health of U.S. Colleges and Universities, 1984-1985
- d) Chairman, Presidential Panel on U.S. - Brazilian Cooperation in Science and Technology, 1986-present

U.S. Department of Energy (formerly ERDA)

- a) Member, High Energy Physics Advisory Panel (HEPAP), 1973-1977
- b) Member, US/USSR Working Group on Research on Fundamental Structure of Matter, 1974-present
- c) Member, Nuclear Science Advisory Committee (NSAC) 1981-1987
- d) Member, Basic Energy Sciences Evaluation Review Committee, 1981
- e) Member, Energy Research Advisory Board Panel on Interactions with Universities, 1982-1983
- f) Chairman, NSAC Panel on Electron Accelerator Facilities, 1982

National Science Foundation

- a) Member, US/USSR Working Group on Scientific Manpower and Education, 1972-73
- b) Chairman, Subcommittee to Review University Based Nuclear Science Laboratories, 1979
- c) Member, Alan T. Waterman Award, Selection Committee 1980-1983
- d) Member, National Science Board, 1988-1994

U.S. Civil Service Commission

- a) Member, Presidential Award Selection Committee, 1981-1982

National Engineering and Science Research Council of Canada

- a) Member, Ad Hoc Committee on Nuclear and Particle Physics, 1979
- b) Member, Kaon Review Committee, 1986

Atomic Energy Control Board of Canada

- a) Member, TRIUMF Grants Committee, 1975-76

Premier's Council, Province of Ontario, Canada

- a) Member, Evaluation Panel for Centers of Excellence, 1987-1988

American Association for the Advancement of Science

- a) Chairman, Physics Section (B), 1978
- b) President-elect, 1980
- c) President, 1981
- d) Chairman of the Board, 1982

American Academy of Arts and Sciences

- a) Fellow, 1972-present
- b) Chairman, Membership Committee (Physical Sciences) 1987-present

International Union of Pure and Applied Physics

- a) Vice President, 1975-1981
- b) President-elect, 1981-1984
- c) President, 1984-1987

International Council of Scientific Unions

- a) Member U.S. Delegation 1976-1987
- b) Member Executive Board 1982-1983

Council on Foreign Relations (US)

- a) Member, 1982-present

Institute of Nuclear Power Operations

- a) Member, Advisory Council 1983-1987

Electric Power Research Institute

- a) Member, Advisory Board 1984-present

EDITORIAL ACTIVITIES:

- a) Member, Editorial Board, **American Scientist**, 1968-1981
- b) Member, Editorial Board, **Annals of Physics**, 1967-1979
- c) Member, Editorial Board, **Il Nuovo Cimento**, 1972-present
- d) Member, Editorial Board, **Nuclear Instruments and Methods**, 1975-present
- e) Member, Editorial Board, **Journal of Physics G-Nuclear Physics**, 1979-1984
- f) Member, Editorial Board, **Science, Technology and the Humanities**, 1978-1982
- g) Member, Editorial Board, **Nuclear Science Applications**, 1979-present
- h) Member, Editorial Board, **Technology in Society**, 1981-present
- i) Member, Editorial Board, **Atomic and Nuclear Data**, 1982-present
- j) Consulting Editor, **McGraw-Hill Encyclopedia of Science and Technology** (Atomic, Nuclear and Particle Physics), 1974-present

- k) Consulting Editor, **McGraw-Hill, Fundamentals of Physics Series**, 1967-present
- l) Editor, **Academic Press Series, Academic Paperbacks**, 1967-73
- m) Associate Editor, **Physical Review**, 1966-69

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- a) Harvard (Physics Department), 1972-77
- b) M.I.T. (Physics Department), 1973-79 (Laboratory for Nuclear Science), 1968-73, 1988-1992
- c) University of Pennsylvania (Physics Department), 1974-75
- d) University of Rochester (Physics Department), 1974-75
- e) Cornell University (Physics Department), 1974-76
- f) State University of New York, Albany, 1972-74
- g) Brooklyn Polytechnic/NYU, 1973-74
- h) Queen's University, Canada (Faculty of Applied Science), 1973-75, 1982
- i) State University of New York, Stony Brook (Physics Dept) 1981
- j) McMaster University (Physics Dept) 1983
- k) Indiana University (Physics Dept) 1983-present

NATIONAL LABORATORY ACTIVITIES:

- a) Brookhaven National Laboratory
Consultant, 1961-present
Visiting Committee, Member, Physics Accelerator and Instrumentation Divisions, 1977-1983 Chairman, 1981
RHIC Policy Committee, Chairman 1984-present
- b) Oak Ridge National Laboratory
Consultant, 1962-present
Visiting Committee, Electronuclear Division, 1962-65
Visiting Committee, Physics Division, 1966-72
Advisory Committee, National Heavy Ion Laboratory, 1972-73
Policy Committee, Holifield Heavy Ion Laboratory, 1974-present
- c) Los Alamos Scientific Laboratory
Consultant, 1969-73
- d) Bates Linac Laboratory (M.I.T.)
Policy Committee, 1973-1981
- e) Argonne National Laboratory
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AUA Committee on Disciplinary and Laboratory Reviews (Chairman, 1979-1980)
University of Chicago Oversight Committee for the Argonne National Laboratory, 1987-present
- f) Lawrence Berkeley Laboratory
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Visiting Committee, Accelerator Division, 1982-1987
Chairman 1985, 1986
- g) Lawrence Livermore National Laboratory
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- h) South Eastern Universities Research Association
Member, Board of Directors, 1985-present
Chairman, CEBAF Review Committee, 1986-present

INDUSTRIAL ACTIVITIES:

- a) UNC Incorporated, Director, 1967-present
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- b) United Illuminating Company, Director, 1973-present
Public Electrical Utility
- c) Union Trust Company, Director, 1975-present
Commercial Bank
- d) Northeast Bancorp, Inc., Director, 1975-present
Bank Holding Company
- e) Extrion Corporation, Founding Director, 1971-75
Manufacturer of ion implantation accelerators and devices (sold to Varian, July 1975)
- f) General Ionex Inc., Director, 1980-1984
Manufacturer of small accelerators and components
- g) Barnes Engineering Co., Director 1984-1986
Manufacturer of infrared detectors imaging systems and related devices.
(Sold to EDO Inc., 1986)
- h) Labcore, Incorporated, Founding Director, 1971-73
Supplier of architectural and conceptual design - hospital, academic, institutional areas
- i) Chronar Corporation, Director 1986-1987
Supplier of photovoltaic power sources and devices
- j) High Voltage Engineering, Technical Consultant, 1967-70
Manufacturer of particle accelerators and high voltage products
- k) International Business Machines Corporation
 - (i) Member, Laboratory Advisory Committee, 1970-72
 - (ii) Joint Study Program, Yale/IBM, 1967-73
Developed integrated computer based data acquisition system - hardware and software
 - (iii) Joint Study, Yale/IBM, 1975-1980
Profiling of hydrogenic contaminants in possible metals for containment vessels of breeder and fusion reactors
- l) General Telephone and Electronics, Founding Member, Technical Advisory Committee, GTE Laboratories, 1973-1982, Chairman 1973-1978
- m) Union Carbide Corporation, Management Advisory Council for Oak Ridge National Laboratory, 1973-1981
(Chairman, 1975, 1980, 1981)

NON PROFIT ORGANIZATION:

- a) Oak Ridge Associated Universities, Inc.
Director, 1977-1980
- b) University of Bridgeport
Trustee, 1981-1987
- c) Southeastern Universities Research Association
Director 1984-present
- d) David and Lucile Packard Foundation
Chairman—Junior Faculty Fellowship Committee 1988—

OTHER CONSULTING ACTIVITIES:

- a) Office of Science and Technology Policy, 1971-73; 1981-
- b) Brooklyn Polytechnic, Executive Technical Development Program, 1966-
- c) National Research Council of Canada, Ad Hoc Panel on Nuclear Science Planning, 1974-75
- d) Agency for International Development (Turkey), 1969
- e) New York State Board of Regents, 1973-74
- f) World Bank, 1976
- g) Ministry of Education, Federal Republic of Germany, 1982-1987
- h) Office of Technology Assessment, 1980-1985

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Science Advisor

7279 Westchester
West Bloomfield, MI 48322
25 Jan 1989

*I called 1/31/89
ATC
She will send
info packet.*

Andrew H. Card
Deputy Chief of Staff
The White House
Washington, D. C. 20500

Dear Mr. Card:

Cristena Bach suggested that I contact you regarding a letter I submitted to Chase Untermeyer expressing my interest in seeking the position of Presidential Science Advisor in the White House. At that time I submitted my resume and since then I have had several contacts made on my behalf as well. Could you please advise me of any additional details of which I need to be aware? I will be glad to send you a copy of my resume or any other information directly if that would be helpful.

Sincerely,

Ruth A. Reck

Dr. Ruth A. Reck

c. c. C. Bach

Sai-Tech
Advisory

CONGRESSMAN DON RITTER
TELEFAX TRANSMISSION COVER SHEET

TO: Andy Card

TELEFAX #: 456 2397

FROM: Charles Bostian

DATE: 1/26/89

MEMO: Here are the last two pages of the
Keyworth paper "Building A World Champion
Technological Team: A Government View"
My transmission on January 25 Failed to
include the last two pages .

Hudson Institute Briefing Paper - Page 5

cycle as the vectors for innovative ideas from outside--whether outside the manufacturing unit in a company, or outside the company in a university or government lab. They reminded us that free-floating ideas can drift away--they must take root in a problem-solving team.

The *Science* article referred specifically to the kind of links that create incremental improvements in products. But the idea applies equally to the other part of the industrial process--introduction of ideas so new that, as I said earlier, they restart the clock. The 4-megabit RAM chip is an example of how powerful incremental improvements can be; but the invention of the transistor, or of the integrated circuit, is an example of clock resetting.

Superconductors: a test of our ability to grasp opportunity

Opportunities to reset clocks may be rare, but we will all see many in our lifetimes. One of the latest was the discovery of warm superconductors. But I must tell you, as one keenly interested in how the United States responds to this opportunity, that we are displaying signs of ossification in our half-hearted effort to capture it. Meanwhile, the Japanese are charging ahead to do something they've rarely done in the past. The Japanese have a well-known reputation for being *second* entrants in technology markets. They let someone else invent, then they improve. But this time, they intend to be the first entrants, the inventors of the new superconducting technologies.

Superconductivity illustrates with painful clarity that government is still hamstrung in mounting any coherent effort on R&D--and industry has not proven itself much more effective. The federal government moved some dollars around, but the few *innovative* new programs to develop some manufacturing and device development experience have been treated like step-children. And industry hangs back and

watches what's happening, waiting for the other guy to prove the principle first.

I suspect the first, most disruptive impact of superconductivity will hit us right in the breadbasket--in information technologies--not in the more debatable arenas of flying trains or energy-saving motors. If we're correct, if chip technology is in line for a new revolution away from silicon, then we could see a real scrambling of the electronics and information industries.

We don't have to wait for further breakthroughs in temperature, because the real criterion is not the operating temperature of a superconducting *chip*, but of a superconducting *product*. If we can devise ways to incorporate cooling into the product--and a number of intriguing possibilities have been stimulated by warm superconductors--then the customer won't care what the transition temperature is. If he can turn on a computer and wait a minute or so for it to cool down somewhere in its innards, then he has a room-temperature superconducting computer. Someone's going to develop a product like that. That, to me, spells opportunity, and I'd like it to be our opportunity.

The *Science* article also reminds us how important *speed* is in sorting out winners and losers. As the authors say, the team with a two-year product cycle may, within only a few years, develop an insurmountable market lead over the team with a three-year cycle, even though they both may start with identical technologies and track records.

Superconductivity may be somewhere around that starting gate right now. Who's going to run faster? We must recognize the urgency of the challenge and be willing to act as if we were at war. It shouldn't take a war to mobilize us, but we ought to realize that our competitors consider the current competitive arena to be a battlefield.

Real authority to direct R&D toward national priorities

A couple of years ago, stimulated by work we did on the President's Commission on Industrial Competitiveness, some serious suggestions emerged about pulling together the major civilian government R&D agencies into a Department of Science and Technology. The reason was simple, and it goes right back to that fundamental issue of matching priorities with programs. Except for the President, there is no one in government who has both the responsibility for science and technology policy and the means to implement it. You need line authority to carry out policy. And in government, line authority means budget authority. We have to make government responsive to today's competitive climate, its institutions able to use R&D more effectively, in better teamwork with industry.

If we're successful in raising this issue of a Department of Science and Technology to the level of national debate, I suspect you're going to hear a lot of distinguished people talk about the wrong thing--having been distracted by perception, not reality. They're going to talk about "rank," not the ability to implement change. They're going to propose that, rather than interfere with the workings of the agencies and departments, we simply make the President's Science Advisor a Cabinet officer. Of all the things we could do, including doing nothing, that may be the worst, because it creates the illusion of dealing with the problem while accomplishing nothing.

Rank is not the medium of influence in the White House. The UN has been affected little, if at all, by our UN Ambassador having been promoted by the Congress to nominal cabinet rank; neither have trade

negotiations risen in foreign policy by making the Trade Representative a cabinet officer. And the current elevation of the Veterans Administration may make our veterans feel better represented, but representation is not the way the White House works. It fails completely to address the essential problem of line authority. The people who will clamor for a Cabinet-level position without authority, do so because they think a Cabinet-level position *confers* authority. It doesn't.

So let me come back to what is important. It's important to link policy with programs, and that has to be done by providing real management tools at the policy level. It can be done in a super-agency, and it can be done in a variety of ways that will protect the integrity of the creative research process while linking it with the other kinds of problems we absolutely have to address. The academics will scream because it threatens to introduce change and accountability. Industry may not scream, but it will murmur, because it fears interference with industrial prerogatives. All those concerns must, and can, be addressed. But I hope that the next President can be persuaded that we are at economic war and that it's time to mobilize.

How can we really call ourselves configured for competitiveness as long as the government's responsibility for America's R&D is assigned a lower priority than veterans' affairs, the UN, trade negotiations, transportation, or labor--or even defense, since Gorbachev is hardly as competitive as Toyota, Hitachi or Hyundai? Is a Department of Science and Technology a fool's quest? If the private sector can succeed alone, then teamwork with government is an unnecessary quest. But if it can't, how can we reasonably expect a meaningful partnership with government under the current configuration?

Sci Adv.

CONGRESSMAN DON RITTER
TELEFAX TRANSMISSION COVER SHEET

TO: Andy Card

TELEFAX #: 456 - 2397

FROM: Charles Bostian

DATE: 1/25/89

MEMO: Please substitute this for
the document that Mr. Ritter gave
you this afternoon.

Thanks!

(Rough Draft)

Proposal for Improved Federal Science and Technology Contribution to the Economy

- I
- i) Science Advisory Leadership should come from someone who is a private sector combat veteran of the global competitive wars, not an academician or an administrator of academic entrepreneurial activity. Academia is currently very healthy as the existing Federal R&D economy works well for them. The Science Advisor should have some portfolio (i.e., turf and staff), the minimum being OSTP.
- ii) Federal Science and Technology Cohesiveness should originate in some kind of advisory body, chaired by the Science Advisor, reporting to the President, and including private sector "stars" and workers, joined by the Undersecretary of Commerce for Technology, the NSF Director, the R&D chiefs of DoE and DoD, the Director of DARPA, the Administrator of NASA, and the head of NIST. Obviously these groups do not act in a convergent manner since they're not asked to.
- iii) Long-Range Science and Technology Policy: I agree with Keyworth *et al.*, that we will always be driven by the momentum of past issues - DoE by AEC and the "Labs", NSF by the needs of the university community, etc. Global competitiveness and the creation of national wealth and well-being will not be the primary driving forces until some hard changes are wrought systemically. It's probably time to think of a science/technology department (ministry) or someone with a lot of authority who could accomplish the same thing without going through the pain of "reorganizing" - which in D.C. usually means chaos. Until we are better organized, DoD will continue to make all big decisions on technological competitiveness as in Sematech and the recent DARPA initiatives on High Temperature Superconductors and HDTV.
- One way to start this ball rolling is to select a Science and Technology Advisor and have him or her interact with the White House to help select the key players for the team - the new NSF Director, the new NIST Chief, (working with the Secretary) the new Undersecretary of Commerce for Technology, the new DoE R&D head, etc. If such an attempt is made it will be the first time ever that a science and technology leadership team is formed with allegiance to goals other than those set by respective agency constituencies. Attempts at evolving reorganization later would be a lot easier if such a serial personnel selection process were followed at the outset.
- II
- Quality: Japanese success with technology is very much a function of a whole new way of managing enterprise to ensure "continuous improvement." Where U.S. firms have done this, results are stunning. The quality revolution is underway in the U.S.A. and the

Bush Administration can help further it. I've gone through this with the Bush campaign team for the last six months. Jim Pinkerton understands the substance and the politics completely, and I hear that Darman is interested (save money, improve services, etc.) This can work for the Administration, both in its role as a cheerleader for American efforts and inside the Federal Government agencies themselves. Bridgeheads already exist. Science and technology are not separate from the quality revolution. Just look at VCRs, compact discs, and HDTV as examples of where "continuous improvement" incorporated the very latest technological advances rapidly and over relatively long periods of time (decade plus). This helps put science and technology in context with the broader goals of health, well being of the U.S. economy, and global competitiveness.

- III Create a Vehicle for Long-Range or "Patient" Capital Investment: Nowhere in our private system can the ten-year-plus project be pursued. Doing this fits right in with Bush Administration thinking on capital gains tax and fits right in with the quality revolution / continuous improvement strategies (the keys to Japanese success).
- IV Foster U.S. Industry Collaborative Approaches: Loosen anti-trust restrictions to go beyond traditional R&D joint ventures to product and process development. (HDTV is a prime current example.)

OSTP

1/25

> Reorg Fd Sci/Tech impact on
> Sci/Tech -

Under Sec of Technology
NIST - Commerce

> Personnel Selection Process

Working Roh Estrada NASA

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Qualtray NSF

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DOD RDT&E

Selected by
Asst to POTUS
OSTP

Combat Veterans of Global Eco Wars

where Sci/Tech is the means.

Switzerland
microdays

? Ralph Gomory - ~~SP~~

? John Young

no Academe

Combining Domain
and provide
Common Dissection

Sworn brethren - Sci/Tech not an end unto itself

- Industrial Research Institute

Peter Cannon (Rockwell)

Mary Goode (Allied Signal - ~~SP~~)

Robert Johnson (D)

Wam Gals

Eric Black

Sci Adv.
1/25/89
AHC
mk in
my office

Proposal for Improved Federal Science and Technology Contribution to the Economy

Don Ritter
Member of Congress

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CONGRESSMAN DON RITTER
TELEFAX TRANSMISSION COVER SHEET

TO: Andy Card

TELEFAX #: 456-2397

FROM: Charles Bostian

DATE: 1/25/89

MEMO: This is the paper by George
Keyworth that I promised
to send you

Hudson Institute

Briefing Paper

November 4, 1988

No. 101

"Building A World Champion Technological Team: A Government View"

Dr. George A. Keyworth, II

Condensed from a speech to the Industrial Research Institute
1988 Fall Meeting, Washington, D.C., October 24, 1988

[SUMMARY: The federal government funds half of all research and development in the United States, but it has failed to apply R&D effectively to meet the modern competitive challenges to American industry. Research institutions in the U.S. are typically defensive and resistant to change. Spending more money to do more of the same will not solve the problem. We need a new structure in government--a Department of Science and Technology--that has budget authority for R&D efforts now dispersed throughout the federal agencies, so that national priorities can be linked with federal investment.]

When I was Science Advisor to the President, one of the issues that dominated our thinking on the White House Science Council was the relationship between science and technology and industrial competitiveness. The durability of that issue throughout the decade only reminds us how ineffectively we've dealt with it.

I vividly remember one Council meeting when we had been trying to isolate those R&D elements most important to industry, and we eventually got into the subject of what makes companies competitive. David Packard, one of the Council members, suggested we might get a clearer picture if we thought first about what makes *any* organization successful, and being an ex-football player he directed our attention to professional football teams. He pointed out that they all have roughly the same quality players, both in ability and training. What, then, makes some teams winners and some teams losers? As he saw it, there were two

elements: how much the team *wanted* to win, and how well the team members worked together to achieve that goal. He noted that his company, Hewlett Packard, didn't stay a winner just because it had bright personnel, but because his bright personnel had a zeal for winning and because they functioned so well as a team.

We haven't done a very good job of building teams in this country. In particular, a critical player in applying technology to competitiveness, the U.S. government, has not been noted for effective leadership in building teams for competition. Government goes through the motions, but it stumbles in the delusion that it can respond to changing demands without causing any inconvenience to existing institutions. As I look at the competitive future of America, I think it's time for us to experience some inconvenience--and it's going to be much better for us if that inconvenience is caused by our own actions than by those of our competitors.

It's hard to imagine a better time to be rethinking some of those issues than right now, months away from a new administration. I'm convinced that government can play a far more effective role in stimulating industrial competitiveness, without becoming intrusive--and therefore counterproductive.

There won't be many dissenters from my view that America's economic future hangs heavily on our ability to compete in technology-dominated, or *knowledge*-dominated, markets. We have no choice but to move up the value-added ladder faster

Or consider the National Institutes of Health, whose support for research over several decades virtually created the new field of biotechnology. The leadership at NIH was quite prepared to see that budding industry become the darling of the Tokyo stock exchange rather than lend the burgeoning American industry any significant preference. Even the National Science Foundation, which eventually became my favorite agency, could not see that its dominant role in university science and engineering demanded that it take the lead in responding to the new, and threatening, industrial climate.

Resistance to change is not surprising. Universities are at once the most creative and the most hidebound institutions in the world. Don't expect leadership from academia. And don't hold out too much hope for leadership to bubble up from the federal R&D institutions. They're showing their age. Most date from the decade after the end of the war, when we institutionalized the lessons we learned then about the importance of science and technology. Theyoungest is NASA, but there, too, people forget that it was born as part of a competitive race, and now NASA, too, is beginning to have hardened arteries. Most R&D organizations, unless they're managed in such a way as to inject new vitality through competition and real-world tests, will grow stale at about the age of one human generation. So, for even the youngest of the major agencies, the past decade presented a difficult challenge to keep the flame alive.

One might think that these remarks about the scene in 1981 are prologue to a recitation of how we turned it around. If I were talking about many areas of government--the ones I had nothing to do with--I could do that. These past eight years have overhauled national perceptions about government and have dramatically changed the political climate. But whatever we accomplished in science policy only highlights how much more we could have done and reminds us of how poorly we, as a nation, have responded

to challenge. I still have vivid images of the R&D agencies determinedly plowing along in their own ruts, serving constituencies comfortable with the way things have always been done.

It's time to do something.

Nevertheless, my message today is positive. It is time to do something, and we shouldn't have too much trouble figuring out what to do. Our national R&D structure, when looked at as a whole, resembles an immense manufacturing enterprise in which we make exquisite parts but fail to pay attention to how to put them together--or even *why* we're putting them together. In business terms, we lack marketing discipline for our national R&D enterprise. And while industrial R&D is not representative of national R&D in scope, any R&D must respond to some kind of marketplace. For even the most esoteric basic research, there's a marketplace of ideas, one not as remote from the real world as purists would insist.

So let me pose a question that may have a different answer in 1988 than it had in 1981 or 1985. If half the technical talent in this country is working as part of some element of federal policy, how can we bring more purpose and coherence to that policy implementation? How can we impart a sense of competitive urgency into that \$65 billion a year doled out from Washington?

One difficulty we've confronted in recent years has been in building teams across organizations and across sectors to respond to competitive issues. And yet only by linking R&D efforts can we really take advantage of this tremendous potential. For example, we may try to link basic and applied R&D--by finding faster, more effective ways to move new knowledge across boundaries. Ralph Gomory and Roland Schmitt, in a recent article on innovation in *Science* magazine, pointed out the importance of having people who understand the manufacturing design and production

laboratory; and most of the work falls in between those bounds.

When I became Science Advisor, international competitiveness was beginning to dominate national debate. The Reagan Administration was required to look more harshly at the R&D arena. My friends in academia raised a hue and cry about philistines at the ivied gates, but, eight years later, that righteous isolation has been overtaken by reality--and by the injection of new vitality in academic research from the increasing proximity of real-world problems.

There has been broad agreement since 1981 that the health of U.S. industries was a paramount national priority of government. We were spending, then, upwards of \$40 billion for government R&D. But then, as now, there was at best only a weak connection between the way we were actually spending the money and the policies we were pursuing to improve industrial competitiveness.

Up against the R&D bureaucracy

Part of my job was to address that dilemma. I knew that the national priorities were national defense and economic competitiveness. Defense priorities were well-understood and well-advocated. But formulating and implementing policies simultaneously to direct those government R&D funds to make our industries more competitive presented a new challenge--and one that was surprisingly foreign to government. We confronted an entrenched system to support R&D in which the penalties were now clearly outweighing the benefits.

The benefit of our fragmented system is that independent institutions for support of research have a built-in insulation from political and other institutional pressures. That's also the chief penalty. Because during periods of rapid external change--like the nearly simultaneous rise of the information age and of the Asian

industrial nations--our institutions become defensive rather than creative. As a result, I saw how difficult it was for the President to translate his priorities into action.

Ronald Reagan, especially in those early years, was as popular as a President is ever likely to be. He had leadership and vision, and an ability to introduce enormous change into a Washington system that most people thought would beat him. I saw the President manage, in just a few weeks of deliberate effort, to bring about a massive tax overhaul. By introducing indexing, and by forcing the Congress to give up perhaps its most cherished prerogative--to impose higher taxes without formally *raising* taxes--he put in place a policy change whose reverberations are only beginning to be appreciated. So imagine my frustration as I discovered the limits of the power of persuasion that a Presidential advisor could exercise on a bureaucracy.

Let me offer a few examples, all from those first few years. When I approached NASA about the urgent need for the U.S. to develop a commercially realistic space launch capability, including some lower cost, unmanned launch vehicles to serve an increasingly competitive market, I found an aging bureaucracy that was determined to maintain the monopoly of the Shuttle at any cost. Even worse, it was determined to parlay the Shuttle into the hoax of the unimaginative Space Station. If not for the Shuttle disaster, we might never have begun even to think about a new space policy that matched the times, and still we may never drag ourselves out of the 1970s and into today's competitive environment if NASA can't be redirected.

Another example: The Department of Energy did not seem to notice that we no longer faced an immediate energy crisis, and there is still a cadre there who are angry that we diverted billions of dollars from their favorite rathole--synfuels--into such things as engineering education or computer science.

than the Japanese in order to maintain our standard of living. If American workers can't produce more than other workers, then they can't live as well as other workers. That possibility scares me. But we still see far too little evidence that people in this country--and I don't mean just workers--are fully aware of the threat. We have not reached the point where winning the competitive wars dominates our attitudes. We must wake up to the fact that "not winning" is called losing, and that losers don't get second prize; they don't get any prize.

Getting better returns from our R&D investment

So let's talk about what might be needed to come in first. The answer is *not* simply spending more money on research and development. Instead, we must do a better job of spending what we do.

With the exception of some of those academics--whose zeal for more money is exceeded only by their self-righteousness in demanding it--I suspect that few believe that just spending more money on research and development is as important as spending that money more wisely. If we spent more money the way we're spending it now, what would we accomplish? We already have the most creative scientific talent in the world, and our universities and big federal laboratories are the best anywhere at what they do. We virtually drown in new knowledge, so rapidly and richly does it flow from the \$130 billion spent each year by U.S. research organizations.

But something's not working right. All that talk over the years about how our national expenditures on R&D have been "investments" in our economic future--it all has a hollow ring, when we see our competitors getting more return on our investment than we do ourselves. Don't misread me. I believe, as an article of faith, in the importance of investing in R&D for precisely those economic reasons. But I've been around too long to accept the fearful or

complacent arguments that we can't tamper with our way of supporting R&D because it worked so well in the past. It did. But it doesn't work nearly as well now. The reason we did so well industrially during the 50s and 60s may not turn out to be that we were doing things optimally, but that no one else was competing then. They are now. And if we delude ourselves that they somehow take unfair advantage of our superior system, we will lose.

It's not productive to point fingers or to look for scapegoats. We all share the responsibility for fixing the situation. I have a few timely suggestions that I think could make a big difference. The federal government supports half the R&D done in this country--about \$65 billion a year. That's an immense resource--considerably more than Japan's total--and it's a resource that's not used all that well.

The reason is not, as people sometimes say, that the majority of the R&D occurs in the Department of Defense and is therefore excluded from industrial applications. Yes, much of DoD's testing and development has little direct impact on civilian technology. That doesn't detract from its value, unless you think defending the country is unimportant. What's significant for civilian technology is that some of the most highly-leveraged research *anywhere* is done in DoD, in places like DARPA. Out of that work comes the kind of new technology development that can restart the competitive clock. We're as likely to see true innovations come out of DoD as anywhere in the government.

It's distracting to get hung up on these defense/non-defense distinctions, which are so readily politicized. The fact remains that half of the technical talent in the United States works under the policy direction of the federal government. Sometimes that's very remote, hands-off direction, like university scientists supported by the National Science Foundation or NIH; sometimes it's totally captured within the federal system, like a weapons

file- OSTP

MEMORANDUM

January 7, 1989

To: Andy Card
From: Brad Mitchell *BfM*
Re: Issues concerning the Office of Science and Technology Policy (OSTP)

Overriding
Issue:

The world is becoming technologically sophisticated at an exponential rate. As the end of the century approaches, it is increasingly clear that familiar policy mechanisms and standard approaches may no longer be sufficient to deal with future realities and problems. Policy-makers must have available methods for increasing their own level of technological sophistication so well-informed decisions can be made in this complex world. Furthermore, careful consideration must be given to the choice of the policy-makers themselves and their advisors.

Objective:

This memo addresses the President-elect's stated desire to improve the process by which advice and analysis on matters pertaining to science and technology policy are provided to the President.

Brief
Assessment:

The primary issue confronting OSTP is overall credibility within the federal government and with the science and technology community outside the government, including academia and industry. At the present time, questions and concerns exist as to the role and effectiveness of OSTP in the policy making process.

The resources appropriated to OSTP in terms of budget and FTE's are not at a level which would enable OSTP to carry out its mission, as outlined in P.L. 94-282. See Attachment A, Title I and Title II blue highlights.

As a result of the President-elect's strong positive statements concerning science and technology during the campaign, the science and technology community has high expectations for the Bush Administration.

Specific
Problems:

1. Organization:

- o It is perceived that the current Director of OSTP does not have direct access to the President and, consequently, does not play a major role in policy design.
- o OSTP does not have clearly defined roles and responsibilities.
- o OSTP has not effectively advised the President on the setting of national science and technology goals.
- o The current organizational structure does not reflect the President-elect's stated priorities and goals in the area of science and technology.

2. Resources:

- o The OSTP budget has declined the last four consecutive years. The 1989 OSTP appropriation is the lowest in over a decade (real dollars). See Attachment B. The decline in funding adds to the perception that the Office is not vital.
- o OSTP has a total staff of 27 people, only 9 of whom are permanent employees. The remaining 18 are detailees or liaisons from other agencies.

Potential
Solutions:

President Bush must clearly define the role, responsibilities, and priorities of OSTP as they relate to other offices in the Executive Office of the President (National Space Council, National Security Council, Economic Policy Council, Domestic Policy Council, Office of Management and Budget, etc.), so that the Office can be more effective in advising the President on setting national goals. Only after this definition is complete can an effective organization in terms of personnel and budget be designed. The following recommendations reflect my view that the Assistant to the President for Science and Technology should play the role of "honest broker", presenting proposals and offering advice to the President as objectively as possible.

1. **Organization:** Please see Attachment C for suggested organization.

- o Elevate the President's Science Advisor to Assistant to the President for Science and Technology with Cabinet level status (without portfolio). Establish direct access between the Assistant and the President, thereby enhancing the Assistant's role in the policy making process.
- o Appoint a Director of OSTP to be confirmed by the Senate. This person could also serve as the unofficial deputy to the Assistant to the President. The Director of OSTP would be the line manager of the Assistant to the President's organizational capacity.
- o Establish the President's Council of Science and Technology Advisors, composed of leading scientists, engineers and distinguished executives from the private sector. The members of this elite group should be appointed by the President. The Assistant to the President for Science and Technology should serve as the chairman of the President's Council of Science and Technology Advisors.

Rationale:

- The Assistant to the President would not be the Director of OSTP under this organizational plan. The Assistant would be free of OSTP's daily operational requirements and could more fully serve the President as an "honest broker;"
- The Assistant would play a key role in the science and technology priority-setting process as "pork barrel" science becomes increasingly problematic;
- The person named to the Assistant position would be exempt from Congressional confirmation. The Director of OSTP would be the liason to Congress.

This would cut the tie between the President's top science and technology advisor and the Congress, enabling the Assistant to provide confidential, objective advice to the President.

2. Resources:

- o Appoint the Assistant to the President for Science and Technology early in the transition period, preferably before the inauguration.

Rationale:

- An early appointment allows the Assistant to take part in early budget battles, especially FY 90, which may help address the resource problem indicated above;
- The Assistant could advise the President on the many other key scientific and technological appointments early in the Administration;
- The Assistant would have a reasonable amount of time to design the organizational structure of OSTP in a manner which would reflect the President-elect's priorities;
- An early appointment sends a strong, clear signal that this post is important to the President-elect. Better candidates will be attracted to science and technology jobs in the Administration if they perceive President-elect Bush has a personal interest in S&T.

Note: In 1981, the Reagan Administration waited several months before selecting a Science Advisor. Not surprisingly, the first seven distinguished professionals asked to take the position turned the job down.



Public Law 94-282
94th Congress, H. R. 10230
May 11, 1976

An Act

To establish a science and technology policy for the United States, to provide for scientific and technological advice and assistance to the President, to provide a comprehensive survey of ways and means for improving the Federal effort in scientific research and information handling, and in the use thereof, to amend the National Science Foundation Act of 1950, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Science and Technology Policy, Organization, and Priorities Act of 1976".

National Science and Technology Policy, Organization, and Priorities Act of 1976.
42 USC 6601 note.

TITLE I—NATIONAL SCIENCE, ENGINEERING, AND TECHNOLOGY POLICY AND PRIORITIES

FINDINGS

SEC. 101. (a) The Congress, recognizing the profound impact of science and technology on society, and the interrelations of scientific, technological, economic, social, political, and institutional factors, hereby finds and declares that—

(1) the general welfare, the security, the economic health and stability of the Nation, the conservation and efficient utilization of its natural and human resources, and the effective functioning of government and society require vigorous, perceptive support and employment of science and technology in achieving national objectives;

(2) the many large and complex scientific and technological factors which increasingly influence the course of national and international events require appropriate provision, involving long-range, inclusive planning as well as more immediate program development, to incorporate scientific and technological knowledge in the national decisionmaking process;

(3) the scientific and technological capabilities of the United States, when properly fostered, applied, and directed, can effectively assist in improving the quality of life, in anticipating and resolving critical and emerging international, national, and local problems, in strengthening the Nation's international economic position, and in furthering its foreign policy objectives;

(4) Federal funding for science and technology represents an investment in the future which is indispensable to sustained national progress and human betterment, and there should be a continuing national investment in science, engineering, and technology which is commensurate with national needs and opportunities and the prevalent economic situation;

(5) the manpower pool of scientists, engineers, and technicians, constitutes an invaluable national resource which should be utilized to the fullest extent possible; and

(6) the Nation's capabilities for technology assessment and for technological planning and policy formulation must be strengthened at both Federal and State levels.

Priority goals.

(b) As a consequence, the Congress finds and declares that science and technology should contribute to the following priority goals without being limited thereto:

(1) fostering leadership in the quest for international peace and progress toward human freedom, dignity, and well-being by enlarging the contributions of American scientists and engineers to the knowledge of man and his universe, by making discoveries of basic science widely available at home and abroad, and by utilizing technology in support of United States national and foreign policy goals;

(2) increasing the efficient use of essential materials and products, and generally contributing to economic opportunity, stability, and appropriate growth;

(3) assuring an adequate supply of food, materials, and energy for the Nation's needs;

(4) contributing to the national security;

(5) improving the quality of health care available to all residents of the United States;

(6) preserving, fostering, and restoring a healthful and esthetic natural environment;

(7) providing for the protection of the oceans and coastal zones, and the polar regions, and the efficient utilization of their resources;

(8) strengthening the economy and promoting full employment through useful scientific and technological innovations;

(9) increasing the quality of educational opportunities available to all residents of the United States;

(10) promoting the conservation and efficient utilization of the Nation's natural and human resources;

(11) improving the Nation's housing, transportation, and communication systems, and assuring the provision of effective public services throughout urban, suburban, and rural areas;

(12) eliminating air and water pollution, and unnecessary, unhealthful, or ineffective drugs and food additives; and

(13) advancing the exploration and peaceful uses of outer space.

DECLARATION OF POLICY

42 USC 6602.

SEC. 102. (a) **PRINCIPLES.**—In view of the foregoing, the Congress declares that the United States shall adhere to a national policy for science and technology which includes the following principles:

(1) The continuing development and implementation of strategies for determining and achieving the appropriate scope, level, direction, and extent of scientific and technological efforts based upon a continuous appraisal of the role of science and technology in achieving goals and formulating policies of the United States, and reflecting the views of State and local governments and representative public groups.

(2) The enlistment of science and technology to foster a healthy economy in which the directions of growth and innovation are compatible with the prudent and frugal use of resources and with the preservation of a benign environment.

(3) The conduct of science and technology operations so as to serve domestic needs while promoting foreign policy objectives.

(4) The recruitment, education, training, retraining, and beneficial use of adequate numbers of scientists, engineers, and tech-

nologists, and the promotion by the Federal Government of the effective and efficient utilization in the national interest of the Nation's human resources in science, engineering, and technology.

(5) The development and maintenance of a solid base for science and technology in the United States, including: (A) strong participation of and cooperative relationships with State and local governments and the private sector; (B) the maintenance and strengthening of diversified scientific and technological capabilities in government, industry, and the universities, and the encouragement of independent initiatives based on such capabilities, together with elimination of needless barriers to scientific and technological innovation; (C) effective management and dissemination of scientific and technological information; (D) establishment of essential scientific, technical and industrial standards and measurement and test methods; and (E) promotion of increased public understanding of science and technology.

(6) The recognition that, as changing circumstances require periodic revision and adaptation of title I of this Act, the Federal Government is responsible for identifying and interpreting the changes in those circumstances as they occur, and for effecting subsequent changes in title I as appropriate.

(b) IMPLEMENTATION.—To implement the policy enunciated in subsection (a) of this section, the Congress declares that:

(1) The Federal Government should maintain central policy planning elements in the executive branch which assist Federal agencies in (A) identifying public problems and objectives, (B) mobilizing scientific and technological resources for essential national programs, (C) securing appropriate funding for programs so identified, (D) anticipating future concerns to which science and technology can contribute and devising strategies for the conduct of science and technology for such purposes, (E) reviewing systematically Federal science policy and programs and recommending legislative amendment thereof when needed. Such elements should include an advisory mechanism within the Executive Office of the President so that the Chief Executive may have available independent, expert judgment and assistance on policy matters which require accurate assessments of the complex scientific and technological features involved.

(2) It is a responsibility of the Federal Government to promote prompt, effective, reliable, and systematic transfer of scientific and technological information by such appropriate methods as programs conducted by nongovernmental organizations, including industrial groups and technical societies. In particular, it is recognized as a responsibility of the Federal Government not only to coordinate and unify its own science and technology information systems, but to facilitate the close coupling of institutional scientific research with commercial application of the useful findings of science.

(3) It is further an appropriate Federal function to support scientific and technological efforts which are expected to provide results beneficial to the public but which the private sector may be unwilling or unable to support.

(4) Scientific and technological activities which may be properly supported exclusively by the Federal Government should be distinguished from those in which interests are shared with State and local governments and the private sector. Among these enti-

ties, cooperative relationships should be established which encourage the appropriate sharing of science and technology decisionmaking, funding support, and program planning and execution.

(5) The Federal Government should support and utilize engineering and its various disciplines and make maximum use of the engineering community, whenever appropriate, as an essential element in the Federal policymaking process.

(6) Comprehensive legislative support for the national science and technology effort requires that the Congress be regularly informed of the condition, health and vitality, and funding requirements of science and technology, the relation of science and technology to changing national goals, and the need for legislative modification of the Federal endeavor and structure at all levels as it relates to science and technology.

(c) **PROCEDURES.**—The Congress declares that, in order to expedite and facilitate the implementation of the policy enunciated in subsection (a) of this section, the following coordinate procedures are of paramount importance:

(1) Federal procurement policy should encourage the use of science and technology to foster frugal use of materials, energy, and appropriated funds; to assure quality environment; and to enhance product performance.

(2) Explicit criteria, including cost-benefit principles where practicable, should be developed to identify the kinds of applied research and technology programs that are appropriate for Federal funding support and to determine the extent of such support. Particular attention should be given to scientific and technological problems and opportunities offering promise of social advantage that are so long range, geographically widespread, or economically diffused that the Federal Government constitutes the appropriate source for undertaking their support.

(3) Federal promotion of science and technology should emphasize quality of research, recognize the singular importance of stability in scientific and technological institutions, and for urgent tasks, seek to assure timeliness of results. With particular reference to Federal support for basic research, funds should be allocated to encourage education in needed disciplines, to provide a base of scientific knowledge from which future essential technological development can be launched, and to add to the cultural heritage of the Nation.

(4) Federal patent policies should be developed, based on uniform principles, which have as their objective the preservation of incentives for technological innovation and the application of procedures which will continue to assure the full use of beneficial technology to serve the public.

(5) Closer relationships should be encouraged among practitioners of different scientific and technological disciplines, including the physical, social, and biomedical fields.

(6) Federal departments, agencies, and instrumentalities should assure efficient management of laboratory facilities and equipment in their custody, including acquisition of effective equipment, disposal of inferior and obsolete properties, and cross-servicing to maximize the productivity of costly property of all kinds. Disposal policies should include attention to possibilities for further productive use.

(7) The full use of the contributions of science and technology to support State and local government goals should be encouraged.

(8) Formal recognition should be accorded those persons whose scientific and technological achievements have contributed significantly to the national welfare.

(9) The Federal Government should support applied scientific research, when appropriate, in proportion to the probability of its usefulness, insofar as this probability can be determined; but while maximizing the beneficial consequences of technology, the Government should act to minimize foreseeable injurious consequences.

(10) Federal departments, agencies, and instrumentalities should establish procedures to insure among them the systematic interchange of scientific data and technological findings developed under their programs.

TITLE II—OFFICE OF SCIENCE AND TECHNOLOGY POLICY

SHORT TITLE

SEC. 201. This title may be cited as the "Presidential Science and Technology Advisory Organization Act of 1976".

Presidential
Science and
Technology Ad-
visory Organi-
zation Act of 1976.

42 USC 6611
note.

ESTABLISHMENT

SEC. 202. There is established in the Executive Office of the President an Office of Science and Technology Policy (hereinafter referred to in this title as the "Office").

42 USC 6611.

DIRECTOR; ASSOCIATE DIRECTORS

SEC. 203. There shall be at the head of the Office a Director who shall be appointed by the President, by and with the advice and consent of the Senate, and who shall be compensated at the rate provided for level II of the Executive Schedule in section 5313 of title 5, United States Code. The President is authorized to appoint not more than four Associate Directors, by and with the advice and consent of the Senate, who shall be compensated at a rate not to exceed that provided for level III of the Executive Schedule in section 5314 of such title. Associate Directors shall perform such functions as the Director may prescribe.

Appointment.
Compensation.
42 USC 6612.

FUNCTIONS

SEC. 204. (a) The primary function of the Director is to provide, within the Executive Office of the President, advice on the scientific, engineering, and technological aspects of issues that require attention at the highest levels of Government.

42 USC 6613.

(b) In addition to such other functions and activities as the President may assign, the Director shall—

(1) advise the President of scientific and technological considerations involved in areas of national concern including, but not limited to, the economy, national security, health, foreign relations, the environment, and the technological recovery and use of resources;

(2) evaluate the scale, quality, and effectiveness of the Federal effort in science and technology and advise on appropriate actions;

(3) advise the President on scientific and technological considerations with regard to Federal budgets, assist the Office of Management and Budget with an annual review and analysis of funding proposed for research and development in budgets of all Federal agencies, and aid the Office of Management and Budget and the agencies throughout the budget development process; and

(4) assist the President in providing general leadership and coordination of the research and development programs of the Federal Government.

POLICY PLANNING, ANALYSIS, AND ADVICE

42 USC 6614.

SEC. 203. (a) The Office shall serve as a source of scientific and technological analysis and judgment for the President with respect to major policies, plans, and programs of the Federal Government. In carrying out the provisions of this section, the Director shall—

(1) seek to define coherent approaches for applying science and technology to critical and emerging national and international problems and for promoting coordination of the scientific and technological responsibilities and programs of the Federal departments and agencies in the resolution of such problems;

Science and
Technology
Report.

(2) assist and advise the President in the preparation of the Science and Technology Report, in accordance with section 209 of this Act;

(3) gather timely and authoritative information concerning significant developments and trends in science, technology, and in national priorities, both current and prospective, to analyze and interpret such information for the purpose of determining whether such developments and trends are likely to affect achievement of the priority goals of the Nation as set forth in section 101(b) of this Act;

Data base.

(4) encourage the development and maintenance of an adequate data base for human resources in science, engineering, and technology, including the development of appropriate models to forecast future manpower requirements, and assess the impact of major governmental and public programs on human resources and their utilization;

Studies and
analyses.

(5) initiate studies and analyses, including systems analyses and technology assessments, of alternatives available for the resolution of critical and emerging national and international problems amenable to the contributions of science and technology and, insofar as possible, determine and compare probable costs, benefits, and impacts of such alternatives;

(6) advise the President on the extent to which the various scientific and technological programs, policies, and activities of the Federal Government are likely to affect the achievement of the priority goals of the Nation as set forth in section 101(b) of this Act;

(7) provide the President with periodic reviews of Federal statutes and administrative regulations of the various departments and agencies which affect research and development activities, both internally and in relation to the private sector, or which may interfere with desirable technological innovation, together with

recommendations for their elimination, reform, or updating as appropriate;

(8) develop, review, revise, and recommend criteria for determining scientific and technological activities warranting Federal support, and recommend Federal policies designed to advance (A) the development and maintenance of broadly based scientific and technological capabilities, including human resources, at all levels of government, academia, and industry, and (B) the effective application of such capabilities to national needs;

(9) assess and advise on policies for international cooperation in science and technology which will advance the national and international objectives of the United States;

(10) identify and assess emerging and future areas in which science and technology can be used effectively in addressing national and international problems;

(11) report at least once each year to the President on the overall activities and accomplishments of the Office, pursuant to section 209 of this Act;

(12) periodically survey the nature and needs of national science and technology policy and make recommendations to the President, for review and transmission to the Congress, for the timely and appropriate revision of such policy in accordance with section 102(a) (6) of this Act; and

(13) perform such other duties and functions and make and furnish such studies and reports thereon, and recommendations with respect to matters of policy and legislation as the President may request.

(b) (1) The Director shall establish an Intergovernmental Science, Engineering, and Technology Advisory Panel (hereinafter referred to as the "Panel"), whose purpose shall be to (A) identify and define civilian problems at State, regional, and local levels which science, engineering, and technology may assist in resolving or ameliorating; (B) recommend priorities for addressing such problems; and (C) advise and assist the Director in identifying and fostering policies to facilitate the transfer and utilization of research and development results so as to maximize their application to civilian needs.

(2) The Panel shall be composed of (A) the Director of the Office, or his representative; (B) at least ten members representing the interests of the States, appointed by the Director of the Office after consultation with State officials; and (C) the Director of the National Science Foundation, or his representative.

(3) (A) The Director of the Office, or his representative, shall serve as Chairman of the Panel.

(B) The Panel shall perform such functions as the Chairman may prescribe, and shall meet at the call of the Chairman.

(4) Each member of the Panel shall, while serving on business of the Panel, be entitled to receive compensation at a rate not to exceed the daily rate prescribed for GS-18 of the General Schedule under section 5332 of title 5, United States Code, including traveltime, and, while so serving away from his home or regular place of business, he may be allowed travel expenses, including per diem in lieu of subsistence in the same manner as the expenses authorized by section 5703 (b) of title 5, United States Code, for persons in government service employed intermittently.

Report to President.

Intergovernmental Science, Engineering, and Technology Advisory Panel. Establishment.

Membership.

Chairman.

Compensation.

5 USC 5332 note.

FIVE-YEAR OUTLOOK

42 USC 6615.

SEC. 206. (a) Within its first year of operation, the Office shall, to the extent practicable, within the limitations of available knowledge and resources, and with appropriate assistance from the departments and agencies and such consultants and contractors as the Director deems necessary, identify and describe situations and conditions which warrant special attention within the next five years, involving—

(1) current and emerging problems of national significance that are identified through scientific research, or in which scientific or technical considerations are of major significance; and

(2) opportunities for, and constraints on, the use of new and existing scientific and technological capabilities which can make a significant contribution to the resolution of problems identified under paragraph (1) of this subsection or to the achievement of Federal program objectives or national goals, including those set forth in section 101 (b) of this Act.

Annual revision.

(b) The Office shall annually revise the five-year outlook developed under subsection (a) of this section so that it takes account of new problems, constraints and opportunities and changing national goals and circumstances, and shall extend the outlook so that it always extends five years into the future.

Consultation.

(c) The Director of the Office shall consult as necessary with officials of the departments and agencies having programs and responsibilities relating to the problems, constraints, and opportunities identified under subsections (a) and (b) of this section, in order to—

(1) identify and evaluate alternative actions that might be taken by the Federal Government, State and local governments, or the private sector to deal with such problems, constraints, or opportunities; and

(2) ensure that alternative actions identified under paragraph (1) of this subsection are fully considered by departments and agencies in formulating their budget, program, and legislative proposals.

Consultation.

(d) The Director of the Office shall consult as necessary with officials of the Office of Management and Budget and other appropriate elements of the Executive Office of the President to ensure that the problems, constraints, opportunities, and alternative actions identified under subsections (a), (b), and (c) of this section are fully considered in the development of the President's Budgets and legislative programs.

**ADDITIONAL FUNCTIONS OF THE DIRECTOR;
ADMINISTRATIVE PROVISIONS**

42 USC 6616.

SEC. 207. (a) The Director shall, in addition to the other duties and functions set forth in this title—

(1) serve as Chairman of the Federal Coordinating Council for Science, Engineering, and Technology established under title IV; and

(2) serve as a member of the Domestic Council.

(b) For the purpose of assuring the optimum contribution of science and technology to the national security, the Director, at the request of the National Security Council, shall advise the National Security Council in such matters concerning science and technology as relate to national security.

(c) In carrying out his functions under this Act, the Director is authorized to—

(1) appoint such officers and employees as he may deem necessary to perform the functions now or hereafter vested in him and to prescribe their duties;

(2) obtain services as authorized by section 3109 of title 5 of the United States Code, at rates not to exceed the rate prescribed for grade GS-18 of the General Schedule by section 5332 of title 5 of the United States Code; and

(3) enter into contracts and other arrangements for studies, analyses, and other services with public agencies and with private persons, organizations, or institutions, and make such payments as he deems necessary to carry out the provisions of this Act without legal consideration, without performance bonds, and without regard to section 3709 of the Revised Statutes (41 U.S.C. 5).

5 USC 5332
note.

COORDINATION WITH OTHER ORGANIZATIONS

SEC. 208. (a) In exercising his functions under this Act, the Director shall— 42 USC 6617.

(1) work in close consultation and cooperation with the Domestic Council, the National Security Council, the Council on Environmental Quality, the Council of Economic Advisers, the Office of Management and Budget, the National Science Board, and the Federal departments and agencies;

(2) utilize the services of consultants, establish such advisory panels, and, to the extent practicable, consult with State and local governmental agencies, with appropriate professional groups, and with such representatives of industry, the universities, agriculture, labor, consumers, conservation organizations, and such other public interest groups, organizations, and individuals as he deems advisable;

(3) hold such hearings in various parts of the Nation as he deems necessary, to determine the views of the agencies, groups, and organizations referred to in paragraph (2) of this subsection and of the general public, concerning national needs and trends in science and technology; and

Hearings.

(4) utilize with their consent to the fullest extent possible the services, personnel, equipment, facilities, and information (including statistical information) of public and private agencies and organizations, and individuals, in order to avoid duplication of effort and expense, and may transfer funds made available pursuant to this Act to other Federal agencies as reimbursement for the utilization of such personnel, services, facilities, equipment, and information.

(b) Each department, agency, and instrumentality of the Executive Branch of the Government, including any independent agency, is authorized to furnish the Director such information as the Director deems necessary to carry out his functions under this Act.

(c) Upon request, the Administrator of the National Aeronautics and Space Administration is authorized to assist the Director with respect to carrying out his activities conducted under paragraph (5) of section 205(a) of this Act.

SCIENCE AND TECHNOLOGY REPORT

Transmittal to
Congress.
42 USC 6618.

SEC. 209. (a) The President shall transmit annually to the Congress, beginning February 15, 1978, a Science and Technology Report (hereinafter referred to as the "Report") which shall be prepared by the Office, with appropriate assistance from Federal departments and agencies and such consultants and contractors as the Director deems necessary. The report shall draw upon the information prepared by the Director pursuant to section 206 of this Act, and to the extent practicable, within the limitations of available knowledge and resources, discuss such issues as—

(1) a review of developments of national significance in science and technology;

(2) the significant effects of current and projected trends in science and technology on the social, economic, and other requirements of the Nation;

(3) a review and appraisal of selected science- and technology-related programs, policies, and activities of the Federal Government;

(4) an inventory and forecast of critical and emerging national problems the resolution of which might be substantially assisted by the application of science and technology;

(5) the identification and assessment of scientific and technological measures that can contribute to the resolution of such problems, in light of the related social, economic, political, and institutional considerations;

(6) the existing and projected scientific and technological resources, including specialized manpower, that could contribute to the resolution of such problems; and

(7) recommendations for legislation on science- and technology-related programs and policies that will contribute to the resolution of such problems.

(b) In preparing the Report under subsection (a) of this section, the Office shall make maximum use of relevant data available from the National Science Foundation and other Government departments and agencies.

(c) The Director shall insure that the Report, in the form approved by the President, is printed and made available as a public document.

Public document.

TITLE III—PRESIDENT'S COMMITTEE ON SCIENCE AND TECHNOLOGY

ESTABLISHMENT

42 USC 6631.

SEC. 301. The President shall establish within the Executive Office of the President a President's Committee on Science and Technology (hereinafter referred to as the "Committee").

MEMBERSHIP

42 USC 6632.

SEC. 302. (a) The Committee shall consist of—

(1) the Director of the Office of Science and Technology Policy established under title II of this Act; and

(2) not less than eight nor more than fourteen other members appointed by the President not more than sixty days after the Director has assumed office (as provided in section 203 of this Act).

(b) Members of the Committee appointed by the President pursuant to subsection (a) (2) of this section shall—

(1) be qualified and distinguished in one or more of the following areas: science, engineering, technology, information dissemination, education, management, labor, or public affairs;

(2) be capable of critically assessing the policies, priorities, programs, and activities of the Nation, with respect to the findings, policies, and purposes set forth in title I; and

(3) shall collectively constitute a balanced composition with respect to (A) fields of science and engineering, (B) academic, industrial, and government experience, and (C) business, labor, consumer, and public interest points of view.

(c) The President shall appoint one member of the Committee to serve as Chairman and another member to serve as Vice Chairman for such periods as the President may determine.

Chairman.

(d) Each member of the Committee who is not an officer of the Federal Government shall, while serving on business of the Committee, be entitled to receive compensation at a rate not to exceed the daily rate prescribed for GS-18 of the General Schedule under section 5332 of title 5, United States Code, including traveltime, and while so serving away from his home or regular place of business he may be allowed travel expenses, including per diem in lieu of subsistence, in the same manner as the expenses authorized by section 5703(b) of title 5, United States Code, for persons in Government service employed intermittently.

Compensation.

5 USC 5332
note.

FEDERAL SCIENCE, ENGINEERING, AND TECHNOLOGY SURVEY

SEC. 303. (a) The Committee shall survey, examine, and analyze the overall context of the Federal science, engineering, and technology effort including missions, goals, personnel, funding, organization, facilities, and activities in general, taking adequate account of the interests of individuals and groups that may be affected by Federal scientific, engineering, and technical programs, including, as appropriate, consultation with such individuals and groups. In carrying out its functions under this section, the Committee shall, among other things, consider needs for—

42 USC 6633.

(1) organizational reform, including institutional realignment designed to place Federal agencies whose missions are primarily or solely devoted to scientific and technological research and development, and those agencies primarily or solely concerned with fuels, energy, and materials, within a single cabinet-level department;

(2) improvements in existing systems for handling scientific and technical information on a Government-wide basis, including consideration of the appropriate role to be played by the private sector in the dissemination of such information;

(3) improved technology assessment in the executive branch of the Federal Government;

(4) improved methods for effecting technology innovation, transfer, and use;

(5) stimulating more effective Federal-State and Federal-industry liaison and cooperation in science and technology, including the formation of Federal-State mechanisms for the mutual pursuit of this goal;

(6) reduction and simplification of Federal regulations and administrative practices and procedures which may have the effect of retarding technological innovation or opportunities for its utilization;

(7) a broader base for support of basic research;

(8) ways of strengthening the Nation's academic institutions' capabilities for research and education in science and technology;

(9) ways and means of effectively integrating scientific and technological factors into our national and international policies;

(10) technology designed to meet community and individual needs;

(11) maintenance of adequate scientific and technological manpower with regard to both quality and quantity;

(12) improved systems for planning and analysis of the Federal science and technology programs; and

(13) long-range study, analysis, and planning in regard to the application of science and technology to major national problems or concerns.

Interim report.

Report to President.

Transmittal to Congress.

(b)(1) Within twelve months from the time the Committee is activated in accordance with section 302(a) of this Act, the Committee shall issue an interim report of its activities and operations to date. Not more than twenty-four months from the time the Committee is activated, the Committee shall submit a final report of its activities, findings, conclusions, and recommendations, including such supporting data and material as may be necessary, to the President.

(2) The President, within sixty days of receipt thereof, shall transmit each such report to each House of Congress together with such comments, observations, and recommendations thereon as he deems appropriate.

CONTINUATION OF COMMITTEE

42 USC 6634.

SEC. 304. (a) Ninety days after submission of the final report prepared under section 303 of this Act, the Committee shall cease to exist, unless the President, before the expiration of the ninety-day period, makes a determination that it is advantageous for the Committee to continue in being.

(b) If the President determines that it is advantageous for the Committee to continue in being, (1) the Committee shall exercise such functions as are prescribed by the President; and (2) the members of the Committee shall serve at the pleasure of the President.

STAFF AND CONSULTANT SUPPORT

42 USC 6635.

SEC. 305. (a) In the performance of its functions under sections 303 and 304 of this Act, the Committee is authorized—

(1) to select, appoint, employ, and fix the compensation of such specialists and other experts as may be necessary for the carrying out of its duties and functions, and to select, appoint, and employ, subject to the civil service laws, such other officers and employees as may be necessary for carrying out its duties and functions; and

(2) to provide for participation of such civilian and military personnel as may be detailed to the Committee pursuant to subsection (b) of this section for carrying out the functions of the Committee.

(b) Upon request of the Committee, the head of any Federal department, agency, or instrumentality is authorized (1) to furnish to

the Committee such information as may be necessary for carrying out its functions and as may be available to or procurable by such department, agency, or instrumentality, and (2) to detail to temporary duty with the Committee on a reimbursable basis such personnel within his administrative jurisdiction as it may need or believe to be useful for carrying out its functions. Each such detail shall be without loss of seniority, pay, or other employee status, to civilian employees so detailed, and without loss of status, rank, office, or grade, or of any emolument, perquisite, right, privilege, or benefit incident thereto to military personnel so detailed. Each such detail shall be made pursuant to an agreement between the Chairman and the head of the relevant department, agency, or instrumentality, and shall be in accordance with the provisions of subchapter III of chapter 33, title 5, United States Code.

5 USC 3341.

TITLE IV—FEDERAL COORDINATING COUNCIL FOR SCIENCE, ENGINEERING, AND TECHNOLOGY

ESTABLISHMENT AND FUNCTIONS

SEC. 401. (a) There is established the Federal Coordinating Council for Science, Engineering, and Technology (hereinafter referred to as the "Council"). 42 USC 6651.

(b) The Council shall be composed of the Director of the Office of Science and Technology Policy and one representative of each of the following Federal agencies: Department of Agriculture, Department of Commerce, Department of Defense, Department of Health, Education, and Welfare, Department of Housing and Urban Development, Department of the Interior, Department of State, Department of Transportation, Veterans' Administration, National Aeronautics and Space Administration, National Science Foundation, Environmental Protection Agency, and Energy Research and Development Administration. Each such representative shall be an official of policy rank designated by the head of the Federal agency concerned.

Membership.

(c) The Director of the Office of Science and Technology Policy shall serve as Chairman of the Council. The Chairman may designate another member of the Council to act temporarily in the Chairman's absence as Chairman.

Chairman.

(d) The Chairman may (1) request the head of any Federal agency not named in subsection (b) of this section to designate a representative to participate in meetings or parts of meetings of the Council concerned with matters of substantial interest to such agency, and (2) invite other persons to attend meetings of the Council.

(e) The Council shall consider problems and developments in the fields of science, engineering, and technology and related activities affecting more than one Federal agency, and shall recommend policies and other measures designed to—

(1) provide more effective planning and administration of Federal scientific, engineering, and technological programs.

(2) identify research needs including areas requiring additional emphasis.

(3) achieve more effective utilization of the scientific, engineering, and technological resources and facilities of Federal agencies, including the elimination of unwarranted duplication, and

(4) further international cooperation in science, engineering, and technology.

May 11, 1976.

(f) The Council shall perform such other related advisory duties as shall be assigned by the President or by the Chairman.

(g) For the purpose of carrying out the provisions of this section, each Federal agency represented on the Council shall furnish necessary assistance to the Council. Such assistance may include—

(1) detailing employees to the Council to perform such functions, consistent with the purposes of this section, as the Chairman may assign to them, and

(2) undertaking, upon request of the Chairman, such special studies for the Council as come within the functions herein assigned.

Subcommittees
and panels,
establishment.

(h) For the purpose of conducting studies and making reports as directed by the Chairman, standing subcommittees and panels of the Council may be established.

ABOLITION OF FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY

42 USC 1862
note.
42 USC 1862
note.

SEC. 402. The Federal Council for Science and Technology, established pursuant to Executive Order 10807, issued March 13, 1959, as amended by Executive Order 11381, issued November 8, 1967, is hereby abolished.

TITLE V—GENERAL PROVISIONS

AUTHORIZATION

42 USC 6671.

SEC. 501. (a) For the purpose of carrying out title II of this Act, there are authorized to be appropriated—

(1) \$750,000 for the fiscal year ending June 30, 1976;

(2) \$500,000 for the period beginning July 1, 1976, and ending September 30, 1976;

(3) \$3,000,000 for the fiscal year ending September 30, 1977; and

(4) such sums as may be necessary for each of the succeeding fiscal years.

(b) For the purpose of carrying out title III of this Act, there are authorized to be appropriated—

(1) \$750,000 for the fiscal year ending June 30, 1976;

(2) \$500,000 for the period beginning July 1, 1976, and ending September 30, 1976;

(3) \$1,000,000 for the fiscal year ending September 30, 1977;

and

(4) such sums as may be necessary for each of the succeeding fiscal years.

STATUTORY REPEAL

5 USC app.;
42 USC 1861
note.

5 USC app. II;
50 USC app. 2271
note.

SEC. 502. Sections 1, 2, 3, and 4 of Reorganization Plan Numbered 2 of 1962 (76 Stat. 1253) and section 2 of Reorganization Plan Numbered 1 of 1973 (87 Stat. 1089) are repealed.

90 STAT. 472

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AMENDMENT

SEC. 503. Section 4 of the National Science Foundation Act of 1950 (42 U.S.C. 1863) is amended by striking out subsection (g) and by redesignating subsections (h), (i), and (j), and all references thereto, as subsections (g), (h), and (i), respectively.

Approved May 11, 1976.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 94-595 (Comm. on Science and Technology) and No. 94-1046 (Comm. of Conference).

SENATE REPORTS: No. 94-622 accompanying S. 32 (Committees on Labor and Public Welfare, Commerce, and Aeronautical and Space Sciences) and No. 94-765 (Comm. of Conference).

CONGRESSIONAL RECORD:

Vol. 121 (1975): Nov. 6, considered and passed House.
Vol. 122 (1976): Feb. 4, considered and passed Senate, amended, in lieu of S. 32.

Apr. 27, Senate agreed to conference report.
Apr. 29, House agreed to conference report.

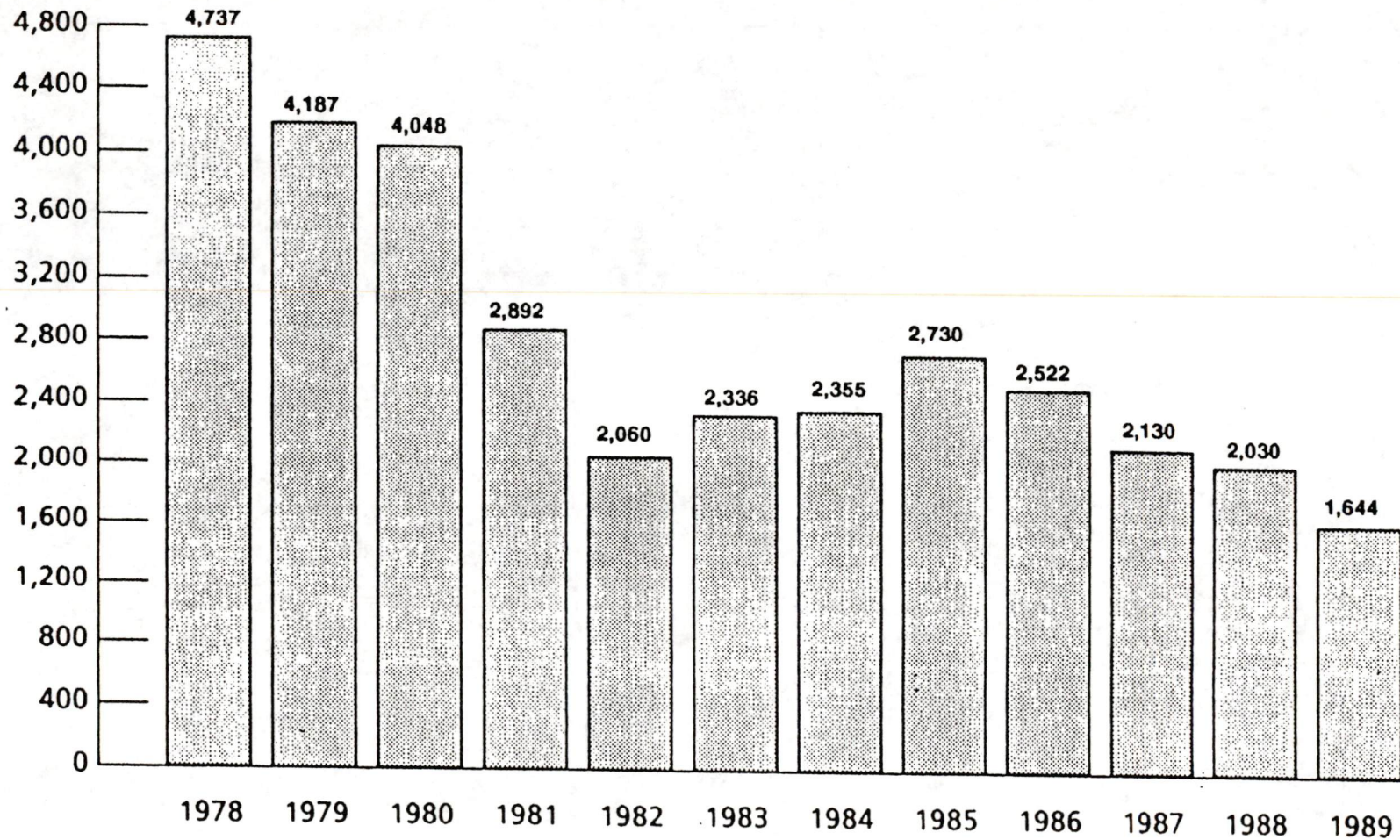
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS:

Vol. 12, No. 20 (1976): May 11, Presidential statement.

Executive Office of the President
Office of Science and Technology Policy

HISTORICAL SUMMARY OF APPROPRIATIONS

In Constant Dollars ^{1/}
Fiscal Years 1978 - 1989
(IN THOUSANDS OF DOLLARS)



^{1/} In constant 1990 Dollars

Executive Office of the President
Office of Science and Technology Policy

HISTORICAL SUMMARY OF APPROPRIATIONS

Fiscal Years 1978 - 1989
(IN THOUSANDS OF DOLLARS)

