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**Subseries:** Meeting Files

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**OA/ID Number:** 08061  
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**Folder Title:**

July 1990: 7/27/90 (9:00 a.m.) President's Council of Advisors on Science and Technology Meeting, Roosevelt Room [Re: Agenda for July 26-27, Exec. Order and Charter, minutes Feb and March]

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THE WHITE HOUSE  
WASHINGTON

July 23, 1990

Dear Michael:

The Members of the PCAST and I are very much looking forward to meeting with you on Friday morning, July 27, at 9:00 a.m. in the Roosevelt Room.

I would like to furnish you some background information about the PCAST to bring you up to date since our inaugural meeting at Camp David last February. I am enclosing the following:

- the agenda for the July 26-27 PCAST meeting;
- the Executive Order establishing the PCAST, with the PCAST Charter;
- biographical statements on the PCAST Members; and
- minutes for the February and March meetings.

Again, we anticipate a fruitful exchange with you on the role of science and technology in U. S. economic policy.

Sincerely yours,



D. Allan Bromley  
Assistant to the President  
for  
Science and Technology

Enclosure

The Honorable Michael J. Boskin  
Chairman  
Council of Economic Advisers  
314 Old Executive Office Building  
Washington, D.C. 20500

**PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY**

**JULY 26-27, 1990**

**AGENDA**

**THURSDAY, JULY 26, 1990**

**OPEN SESSION, 8:50 - 11:15 a.m.  
CONFERENCE ROOM, COUNCIL ON ENVIRONMENTAL QUALITY  
722 JACKSON PLACE, N.W.**

<b>8:30-8:50</b>	<b>ARRIVAL -- COFFEE AND PASTRIES</b>	
<b>8:50-9:00</b>	<b>OPENING REMARKS</b>	<b>DR. BROMLEY</b>
<b>9:00-9:45</b>	<b>ENVIRONMENTAL QUALITY: TWENTIETH ANNUAL REPORT OF CEQ</b>	<b>HON. MICHAEL DELAND</b>
<b>9:45-11:00</b>	<b>GLOBAL CHANGE - CEES UPDATE INFORMATION BRIEFING AND DISCUSSION</b>	<b>DR. DALLAS PECK DR. ROBERT CORELL</b>
<b>11:00-11:15</b>	<b>CLOSING REMARKS</b>	<b>DR. BROMLEY</b>

THURSDAY, JULY 26, 1990 continued

**CLOSED SESSION, 12:00 Noon - 5:00 p.m.**

**ROOM 208, CORDELL HULL CONFERENCE ROOM  
OLD EXECUTIVE OFFICE BUILDING**

<b>12:00-2:15</b>	<b>PCAST UPDATE DURING WORKING LUNCH</b>	<b>DR. BROMLEY DR. RATCHFORD DR. WONG DR. PHILLIPS</b>
<b>2:15-3:00</b>	<b>INITIATIVES IN EASTERN EUROPE</b>  <b>DR. ROBERT W. HUTCHINGS DIRECTOR FOR EUROPEAN POLITICAL AFFAIRS NATIONAL SECURITY COUNCIL</b>	
<b>3:00-3:30</b>	<b>THE VICE PRESIDENT</b>	
<b>3:30-3:45</b>	<b>BREAK</b>	
<b>3:45-4:45</b>	<b>EDUCATION AND HUMAN RESOURCES PANEL -- DISCUSSION OF ISSUES AND DIRECTION</b>	<b>DR. LIKINS DR. RATCHFORD</b>
<b>4:45-5:00</b>	<b>CLOSING REMARKS</b>	<b>DR. BROMLEY</b>

FRIDAY, JULY 27, 1990

**CLOSED SESSION, 9:00 A.M. - 12:00 NOON  
ROOSEVELT ROOM, THE WHITE HOUSE**

<b>9:00-10:00</b>	<b>THE ROLE OF SCIENCE AND TECHNOLOGY IN U.S. ECONOMIC POLICY</b>	<b>DR. MICHAEL BOSKIN</b>
<b>10:00-10:30</b>	<b>DISCUSSION</b>	
<b>10:30-11:30</b>	<b>RECRUITMENT FOR FEDERAL SERVICE -- INFORMATION BRIEFING AND DISCUSSION</b>	<b>DR. MARY GOOD CHAIRMAN NATIONAL SCIENCE BOARD</b>
<b>11:30-11:45</b>	<b>OTHER PCAST ISSUES</b>	
<b>11:45-12:00</b>	<b>THE NEXT MEETING AND CLOSING REMARKS</b>	<b>DR. BROMLEY</b>

For Immediate Release

January 19, 1990

EXECUTIVE ORDER

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PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY

By the authority vested in me as President by the Constitution and laws of the United States of America, and in order to establish, in accordance with the provisions of the Federal Advisory Committee Act, as amended (5 U.S.C. App. 2), an advisory committee on science and technology, it is hereby ordered as follows:

Section 1. Establishment. There is established the President's Council of Advisors on Science and Technology ("Council"). The Council shall be composed of not more than 15 members, one of whom shall be the Director of the Office of Science and Technology Policy, and 14 of whom shall be distinguished individuals from the private sector to be appointed by the President. The Director of the Office of Science and Technology Policy shall serve as Chairman of the Council. The Vice Chairman shall be appointed by the President from among the 14 private sector members. The Chairman shall report directly to the President.

Sec. 2. Functions. (a) The Council shall advise the President on matters involving all areas of science and technology.

(b) In the performance of its advisory duties the Council shall conduct a continuing review and assessment of developments in science and technology, and shall, through the Chairman, report thereon to the President whenever requested.

(c) The Chairman may, from time to time, invite experts to investigate and report to the Council on specific issues of national consequence.

Sec. 3. Administration. (a) The heads of Executive agencies shall, to the extent permitted by law, provide the Council and its panels such information with respect to scientific and technological matters as required for the purpose of carrying out its functions.

(b) Members of the Council shall serve without any compensation for their work on the Council. However, members appointed from among private citizens of the United States may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by law for persons serving intermittently in the Government service (5 U.S.C. 5701-5707).

(c) Any expenses of the Council shall be paid from the funds available for the expenses of the Office of Science and Technology Policy.

(d) The Office of Administration shall, on a reimbursable basis, provide such administrative services as may be required.

Sec. 4. General. (a) Notwithstanding any other Executive order, the functions of the President under the Federal Advisory Committee Act, as amended, except that of reporting to the Congress, which are applicable to the Council, shall be performed by the Office of Administration in accord with the guidelines and procedures established by the Administrator of General Services.

(b) The Council shall terminate on June 30, 1991, unless sooner extended.

GEORGE BUSH

THE WHITE HOUSE,  
January 19, 1990.

# # #

OFFICE OF SCIENCE AND TECHNOLOGY POLICY

CHARTER

PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY

1. Committee's Official Designation:

President's Council of Advisors on Science and Technology (PCAST). The Council was established by Executive Order Number 12700, dated January 19, 1990.

2. Objective and Scope of Activities and Duties:

- The purpose of the PCAST is to advise the President on all matters involving science and technology.
- In furtherance of this mission the PCAST shall conduct a continuing review and assessment of developments in science and technology and the chairman may invite panels of experts to investigate and report to the Council on specific issues of national importance.

3. Duration

The Council will have continuing responsibility for advising the President. The Council will terminate on June 30, 1991, unless sooner extended.

4. Official to Whom the Council Reports:

The PCAST will report to the President, through the Chairman of the Council.

5. Agency Responsible for Providing Necessary Support for this Council:

Office of Science and Technology Policy (OSTP).

6. Description of Duties:

The Duties of the Council are solely advisory and are stated in paragraph 2 above.

7. Costs:

The estimated annual operating cost of the Council is \$375,000, including 2 man years of support staff activity.

8. Estimated Number and Frequency of Meetings:

The President's Council of Advisors on Science and Technology shall normally meet twelve times each year at regular intervals, and at such other times as may be called by the President or the Director, OSTP. In addition, 10-15 meetings each year by Panels are anticipated.

9. Panels:

Panels may be formed to conduct studies on specific issues assigned by the President or the Director, OSTP.

10. Members:

PCAST members shall be appointed by the President from the private sector. The PCAST shall consist of no more than 14 members and the Chairman. The Director, OSTP shall serve as Chairman of the Council, and the Vice Chairman shall be appointed by the President from the members of the Council.

The Council may utilize additional technical experts as needed to constitute its panels and study groups. These technical experts shall be appointed by the Chairman and shall serve at the pleasure of the Chairman.

This Charter for the Advisory Committee named above is hereby approved:

Signed:

  
D. Allan Bromley

Assistant to the President for Science and Technology, and  
Director, Office of Science and Technology Policy, and  
Chairman, President's Council of Advisors on Science and  
Technology.

Date signed: January 23, 1990

Date filed: January 24, 1990

**THE PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY  
(PCAST)**

**NORMAN E. BORLAUG**, Distinguished Professor, Department of Soils and Crop Sciences, Texas A&M University

**D. ALLAN BROMLEY**, Assistant to the President for Science and Technology and Director, Office of Science and Technology Policy (**Chairman**)

**SOLOMON J. BUCHSBAUM**, Senior Vice President, Technology Systems, AT&T Bell Laboratories

**CHARLES L. DRAKE**, Albert Bradley Professor of Earth Sciences and Professor of Geology, Dartmouth College

**RALPH E. GOMORY**, President, The Alfred P. Sloan Foundation

**BERNADINE P. HEALY**, Chairman of the Research Institute, The Cleveland Clinic Foundation (**Vice-Chairman**)

**PETER W. LIKINS**, President, Lehigh University

**THOMAS E. LOVEJOY**, Assistant Secretary for External Affairs, Smithsonian Institution

**WALTER E. MASSEY**, Vice President for Research and for Argonne National Laboratory, University of Chicago

**JOHN P. McTAGUE**, Vice President - Technical Affairs, Ford Motor Company

**DANIEL NATHANS**, Professor of Molecular Biology and Genetics, Johns Hopkins University

**DAVID PACKARD**, Chairman of the Board, Hewlett-Packard Company

**HAROLD T. SHAPIRO**, President, Princeton University

## **PRESIDENT'S COUNCIL OF ADVISERS ON SCIENCE AND TECHNOLOGY**

### **NORMAN E. BORLAUG**

Nobel Laureate Borlaug is currently leader of the Sasakawa-Global-2000 agricultural program in sub-Saharan Africa, Distinguished Professor of International Agriculture at Texas A&M University, and a Senior Consultant to CIMMYT.

He was Director of the Wheat Research and Production Program of the International Maize and Wheat Improvement Center, Mexico, from 1964 until his retirement in 1979.

Dr. Borlaug's career began in 1935 in the U.S. Forest Service, and he subsequently worked as an instructor in plant pathology at the University of Minnesota in 1941, where he received his Ph.D. in plant pathology in 1942. From 1942 through 1944 he was a microbiologist with the E. I. DuPont de Nemours & Co.. He also served as research scientist in charge of wheat improvement with the Cooperative Mexican Agricultural Program, Mexican Ministry of Agriculture and the Rockefeller Foundation, 1944-60, and later, as Associate Director of the Foundation assigned to the Inter-American Food Crop Program, 1960-63.

### **SOLOMON J. BUCHSBAUM**

Solomon J. Buchsbaum has been Senior Vice President, Technology Systems, at AT&T Bell Laboratories since 1979.

Dr. Buchsbaum's early career included work at the MIT Research Laboratory of Electronics. After receiving his Ph.D. in physics from the Massachusetts Institute of Technology in 1957, he joined Bell Laboratories in 1958 as a member of the technical staff and later became department head and director of the Electronics Research Laboratory. In 1968, Dr. Buchsbaum was named Vice President for Research at the Sandia Laboratories and served there in a number of different capacities. He returned to Bell Laboratories in 1971 as an Executive Director. In 1976 he became Vice President, Network Planning and Customer Systems.

Dr. Buchsbaum is a member of the National Academy of Sciences and of the National Academy of Engineering. He was the recipient of the President's National Medal of Science in 1986.

### **CHARLES L. DRAKE**

Charles L. Drake has been the Albert Bradley Professor of Earth Sciences at Dartmouth since 1984 and Professor of Geology since 1969. Dr. Drake's professional career began at Columbia University in 1953. After receiving his Ph.D. in geology from Columbia University, he joined the staff at Dartmouth College, where he has continued his career, including service as Professor and Chairman of the Department, 1967-69; as Dean of Graduate Studies and as Associate Dean of the Science Department, 1978-81.

Dr. Drake is a recipient of the G. P. Woollard Award, Geophysical Division of the Geological Society of America.

### **RALPH E. GOMORY**

Ralph E. Gomory is President of the Sloan Foundation and, until his recent retirement, was Senior Vice President for Science and Technology, IBM Corporation. He received his Ph.D. in mathematics from Princeton University in 1954.

Dr. Gomory's professional experience includes teaching and research at Princeton University, 1957-59. In 1959, he joined the Research Division of IBM and was named Director of the Mathematical Sciences Department in 1965. In 1970 he became IBM Director of Research and held that position until 1985, becoming IBM Vice President in 1973, Senior Vice President in 1985, and IBM Senior Vice President for Science and Technology in 1986. He has been awarded a number of honorary degrees and prizes including the John von Neumann Theory Prize in 1984 and the President's National Medal of Science in 1988.

### **BERNADINE HEALY, VICE CHAIRMAN**

Bernadine Healy is Chairman of the Research Institute of The Cleveland Clinic Foundation, a position she assumed in 1985, and is a staff member of the Clinic's Department of Cardiology. Prior to that time, she was Deputy Director of the Office of Science and Technology Policy at the White House, and until that appointment had been a Professor at The Johns Hopkins University School of Medicine and Hospital. Dr. Healy received her medical degree from Harvard Medical School in 1970. Her medical career continued at Johns Hopkins from 1976 to 1984, where she was Professor of Cardiology and Medicine, Director of the Coronary Care Unit, and Assistant Dean for Postdoctoral Programs and Faculty Development.

Dr. Healy is a member of the Institute of Medicine of the National Academy of Sciences. She is the immediate Past President of the American Heart Association and a former President of the American Federation for Clinical Research.

### **PETER W. LIKINS**

Peter W. Likins is President of Lehigh University. His professional career began as a development engineer with the Jet Propulsion Laboratory, California Institute of Technology in 1958. In 1964 he joined the faculty at the University of California, Los Angeles, where in time he became Professor of Engineering and later, Associate Dean. Dr. Likins received his Ph.D. in engineering mechanics from Stanford in 1965. In 1976 he became Professor and Dean of Columbia University, serving until 1980, when he became Provost of the University. In 1982 he was named President of Lehigh.

### **THOMAS E. LOVEJOY**

Thomas E. Lovejoy is the Assistant Secretary for External Affairs, The Smithsonian Institution. His previous experience includes service as a research assistant at the University of Pennsylvania, 1971-74, after receiving his Ph.D. in biology from Yale University in 1971; as Executive Assistant to the Science Director and as Assistant to the Vice President for Resources and Planning of the Academy of Natural Sciences, 1972-73; as the Vice President for Science of the World Wildlife Fund-U.S., 1973-87; and as Executive Vice President, 1985-89.

Dr. Lovejoy is President of the Society for Conservation Biology.

### **WALTER E. MASSEY**

Walter E. Massey has been the Vice President of the University of Chicago for Research and for Argonne National Laboratory since 1984. He has also been Professor of Physics at the University since 1979.

Dr. Massey previously served as a physics instructor at Morehouse College, 1958-59; and after receiving his Ph.D. in physics from Washington University in 1966, as a staff physicist with the Argonne National Laboratory until 1968; as Assistant Professor of Physics, University of Illinois, Urbana, 1968-70; Associate Professor of Physics and Dean of the College, Brown University, 1975-79.

He is Vice President, and President-elect of the American Physical Society and is the Past President and Chairman of the American Association for the Advancement of Science.

### **JOHN P. MCTAGUE**

John P. McTague is Vice President - Research, Ford Motor Company, and has served in that position since 1986.

In 1983 Dr. McTague was appointed Deputy Director of the Office of Science and Technology Policy, becoming Acting Science Advisor to the President and Acting Director of OSTP in 1986. Prior to that, he was Chairman of the National Synchrotron Light Source Department, Brookhaven National Laboratory, 1982-83. He was Professor of Chemistry and a member of the Institute of Geophysics and Planetary Physics, University of California, Los Angeles, 1970-82. Dr. McTague began his professional career as a member of the Technical Staff, North American Aviation Science Center, on receiving his Ph.D. in physical chemistry from Boston University, and remained there until 1970. He is U.S. Chairman of the U.S. Japan Joint High Level Advisory Panel on Cooperation in Research and Development in Science and Technology.

### **DANIEL NATHANS**

Nobel Laureate Nathans is Professor of Molecular Biology and Genetics at The Johns Hopkins University Medical School and Senior Investigator of the Howard Hughes Medical Institute. He has been on the faculty of The Johns Hopkins University Medical School since 1962.

After receiving his Medical Degree from Washington University in 1954, he served as Medical Resident at the Columbia-Presbyterian Medical Center in New York, 1955, 1957-59; as Clinical Associate at the National Cancer Institute, 1955-57, and Guest Investigator in biochemistry at the Rockefeller University, 1959-62.

Dr. Nathans received the Nobel Prize in Physiology or Medicine in 1978 for his research with enzymes that cut DNA into specific pieces, one of the basic tools of genetic engineering.

## **DAVID PACKARD**

David Packard has been Chairman of the Board of the Hewlett-Packard Co. since 1972. Mr. Packard received his B.A. and B.S.E.E. degrees from Stanford University in 1934 and 1939, respectively.

His professional experience includes service as an engineer with the Vacuum Tube Engineering Department, GE Co., 1936-38; co-founder and partner, the Hewlett-Packard Co., 1939-47; President, 1947-64; and Chairman and Chief Executive Officer, 1964-69. Prior to his present position, Mr. Packard served as U.S. Deputy Secretary of Defense from 1969-71.

Mr. Packard received the Vannevar Bush Award of the National Science Board in 1987 and the President's National Medal of Technology and the Presidential Medal of Freedom in 1988.

## **HAROLD T. SHAPIRO**

Harold T. Shapiro has been President of Princeton University since 1988.

Dr. Shapiro's previous academic experience has been with the University of Michigan, first after receiving his Ph.D. in economics from Princeton University in 1964, as an Assistant Professor of Economics in 1964. His career progressed from Associate Professor, 1967-70; Professor, 1970-76; Chairman of the Department of Economics, 1974-77; Professor of Economics and Public Policy, 1977; Vice President for Academic Affairs, 1977-79.

Dr. Shapiro was President of the University of Michigan from 1980 until 1987. He has served as a member of many industrial, governmental and academic boards and commissions.

## MINUTES

### PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY (PCAST)

FEBRUARY 3, 1990

CAMP DAVID, MARYLAND

10:30 A.M. - 1:00 P.M.

#### CLOSED SESSION

PCAST Members Attending: Dr. Norman Borlaug; Dr. Solomon Buchsbaum; Dr. Charles Drake; Dr. Ralph Gomory; Dr. Bernadine Healy; Dr. Peter Likins; Dr. Thomas Lovejoy; Dr. Walter Massey; Dr. John McTague; Dr. Daniel Nathans; Mr. David Packard; Dr. Harold Shapiro.

Government Attendees: President George Bush; Mr. John Sununu, Chief of Staff and Assistant to the President; Mr. Richard Darman, Director of the Office of Management and Budget; Dr. Michael Boskin, Chairman of the Council of Economic Advisers; Mr. Michael Deland, Chairman of the Council on Environmental Quality; Dr. D. Allan Bromley, Assistant to the President for Science and Technology, and Chairman of PCAST.

The meeting began with an introduction by Dr. Bromley, followed by brief opening remarks by the President. The President stressed the importance of science and technology to the nation and his desire to have a strong science advising mechanism. Dr. Bromley then introduced each member of the PCAST and asked them to briefly comment on some of the issues that they saw as important to American science and technology.

The introductions were followed by a discussion of three specific topics of particular interest to the President.

1. Science and technology and economic growth: The importance of science and technology to the economic strength and growth of the country, as well as to social welfare, was discussed at length. Issues covered included innovation in manufacturing technology; examples of successful translation of scientific developments to economic good, such as the semiconductor industry and biotechnology; the impact of the variety of federal policies on the R&D base; and the role of government laboratories and research-intensive universities in the innovation process.

2. Mathematics and science education: The President expressed great concerns about education in mathematics and science. The need for a well-educated work force, well-grounded in analytical and logical capabilities developed through mathematics and scientific training was stressed by several members of PCAST. Also discussed was the importance of maintaining a talent base of scientists and engineers,

who make the discoveries in the basic research laboratories and serve as major agents of technology transfer. Concerns were expressed about a declining interest in careers in science and technology, including biology and medicine, and some of the factors that may be contributing to this declining interest. Although it was recognized that a number of specific programs are being undertaken by the federal government, particularly within the National Science Foundation and the Department of Education, it was also noted that Mr. Bush's identification of education as a presidential issue elevated its importance and visibility at a broad national level.

3. Environmental science and global change: The President expressed his concern about the environment and the issue of global change. Uncertainties regarding the extent and the timing of possible future climate changes, as well as some of the reasons for the diversity of opinion among the scientific community on the magnitude of the problem at the present time, were discussed. Comments were made about the models that are the basis of many of the predictions, the need for further research and direct data acquisition. Other aspects of global change, such as the problems of biological diversity were mentioned. The kinds of action that might be taken to address these problems, on a national and multinational basis, will require considerable and careful evaluation.

Finally, there was a general discussion on science advising to the President and the importance of a mechanism for coordination of science and technology initiatives and policies across the many government agencies involved in science. The role of Dr. Bromley and the members of PCAST in this process were commented upon.

The President adjourned the meeting at approximately 1:30 p.m.

Minutes Approved:

  
D. Allan Bromley

Date:

May 9, 1990

## MINUTES

### PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY (PCAST)

MARCH 22-23, 1990

WASHINGTON, D.C.

PCAST Members Attending: Dr. Allan Bromley; Dr. Bernadine Healy; Dr. Solomon Buchsbaum; Dr. Charles Drake; Dr. Ralph Gomory; Dr. Peter Likins; Dr. Thomas Lovejoy; Dr. Walter Massey; Dr. John McTague; Dr. Daniel Nathans; Mr. David Packard.

Government Attendees: President George Bush; Gov. John Sununu; Mr. Richard Darman.

OSTP Staff: Dr. William Phillips; Dr. Thomas Ratchford; Dr. Eugene Wong; Dr. James Wyngaarden; Dr. Judith Bostock; Dr. Karl Erb; Dr. Nancy Maynard; Ms. Michelle Van Cleave.

Department of Defense: Honorable Don Atwood

CIA Staff: Dr. Gordon Oehler; Dr. John Weiss

Public: Approximately 10 people attended the open session.

1. The meeting agenda is at Enclosure 1.

Open Session: 9:00 A.M. - 12:00 NOON, MARCH 22, 1990

- 2a. Dr. Bromley called the meeting to order and made introductory remarks. He noted that selected OSTP speeches and testimony, biographical material for presenters, and other information were available to those attending.
- b. Dr. Bromley briefly discussed the need of the science and technology (S&T) community to get behind the President's S&T budget submission. He also pointed to the future need of achieving the best possible balance between very large S&T projects and small S&T investigators. He sketched the status of the revitalization of the Federal Coordinating Council for Science, Engineering and Technology (FCCSET). Dr. Bromley noted that PCAST, where appropriate, may want to parallel certain FCCSET efforts.
- c. Dr. Bromley discussed the upcoming White House Conference on "Science and Economics Research Related to Global Change." A brief discussion on this followed.

- d. Drs. Wong and Phillips were then introduced to the PCAST and other attendees.
3. Dr. Wong presented a briefing on High Performance Computing (HPC). (His viewgraphs and papers that he circulated to PCAST members are at Enclosure 2).
- a. Dr. Buchsbaum noted the importance of standards in HPC. A discussion on this followed.
  - b. Dr. Bromley noted the importance of involving schools in HPC in order to meet the President's education goals. He noted the President would like to hear from the PCAST on HPC. All agreed that computer education and education in areas using or related to computers need emphasis. Dr. Gomory stressed that the need involves all levels of education, including technical schools. Dr. Likins pointed out that business majors and others are important users of computers. Dr. Healy said that here is an issue that might gain good response if portrayed to students as a "grand challenge."
- Dr. Massey said that first year business students might use computers more than first year physics students use them.
- c. Dr. Bromley concluded this HPC session by asking the members for comments, especially those pertaining to the need for a PCAST HPC panel. A discussion followed, and agreement was reached on recommending establishment of a panel.
4. Dr. Phillips then presented a briefing on Materials Science and Engineering (his viewgraphs are attached as Enclosure 3). Dr. Gomory stated the need for industry to make its needs known before proceeding. Dr. Likins noted that high school teachers and counselors do not see materials as an area of study. Dr. Healy pointed out the importance of biomaterials. More discussion followed.
5. Dr. Bromley departed for a noontime presentation, and Dr. Healy assumed the chairman's duties. After a discussion, all agreed that PCAST and FCCSET work in materials science and engineering was needed.

Closed Session: 1:00 P.M. - 5:00 P.M., MARCH 22, 1990

- 6a. PCAST panel structure and personnel to serve on the panels were discussed at length.
- b. Preparations were made for the PCAST session with the President (see below).

- c. **Drs. Oehler and Weiss, Central Intelligence Agency, then presented a briefing. A discussion followed.**

**Closed Session: 9:00 A.M. - 12:00 NOON, MARCH 23, 1990**

- 7a. **Deputy Secretary of Defense Don Atwood presented the DoD's future R&D plans and budget required to meet expected threats to national security. He described the probable threats over the next decade and pointed out the importance of a strong S&T program. A discussion followed including DoD's view of increased funding for universities and dual-use technologies.**
- b. **Mr. Atwood and the members discussed the China Lake experiment and the future of the DoD laboratory system.**
- c. **Following Mr. Atwood's departure, a discussion began on the role of Federal agencies in mathematics and science education. All agreed that M&S education should be part of all panel work and that all panel draft terms of reference should be "scrubbed" to be certain education is addressed. Dr. Bromley noted the decreasing percentage of NSF and NIH grant applicants that are supported.**
- d. **Dr. Bromley next led a discussion of PCAST panel structure and the persons who might best serve on those panels. He commented on parallel work underway in FCCSET.**
- e. **Dr. Bromley led a discussion on agenda issues for future meetings. He called on all to think about long-term needs that PCAST could address. Dr. Healy suggested a PCAST panel could be helpful in the problem of drug abuse. Dr. Bromley stated his intention to have cabinet secretaries and heads of agencies address future PCAST meetings.**
- 8a. **President Bush arrived and greeted the PCAST. He recounted the Camp David PCAST meeting. Dr. Bromley recalled the President's interest in education and human resources, global warming and the environment, and the impact of science and technology on economic well-being. Some of the members told the President they were pleased to read his position on supporting generic and pre-competitive technologies.**
- b. **Dr. Bromley asked Dr. Gomory to lead a discussion in areas where the President had indicated an interest. One issue was materials science and technology, and Dr. McTague carried this topic further. Dr. Buchsbaum presented PCAST views on high performance computing and communications. The President asked about the issue of networking, and Drs. Buchsbaum and Gomory responded.**
- c. **Dr. Gomory then asked Dr. Massey to present PCAST views on mathematics and science (M&S) education. Dr. Massey congratulated the President on his**

education goals. He underlined the importance of improving M&S education across the board. Dr. Massey pointed out the contribution of science and technology to existing industries. He noted that PCAST believes there is a special need for science and technology to support manufacturing processes. Mr. Packard stressed the need to see science and technology as long-term efforts if they are to be helpful to industry.

- d. The President asked Mr. Darman to comment. Mr. Darman said he would greatly value the advice of the PCAST while he was in OMB. He discussed the S&T areas of agreement with Dr. Bromley and Gov. Sununu.
- 9. Dr. Bromley closed the meeting at 12:00 noon.

Minutes Approved:

  
D. Allan Bromley

Date:

