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BRIEFING
FOR U.S. DELEGATES
TO
THE WHITE HOUSE CONFERENCE
ON SCIENCE & ECONOMICS RESEARCH
RELATED TO
GLOBAL CHANGE

WEDNESDAY, APRIL 11, 1990
3:00 - 4:00 PM
ROOSEVELT ROOM

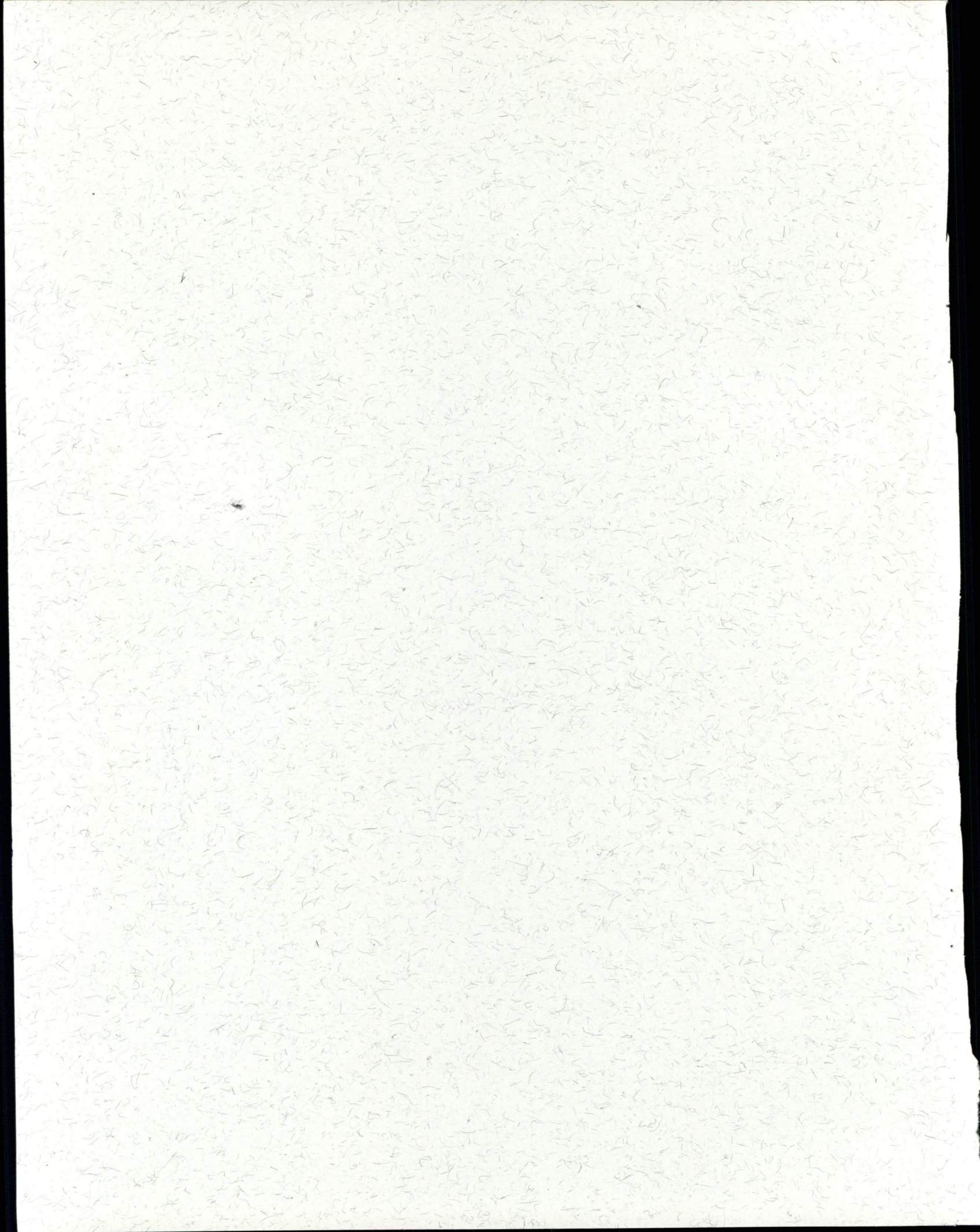


**THE WHITE HOUSE CONFERENCE
ON SCIENCE AND ECONOMICS RESEARCH
RELATED TO GLOBAL CHANGE**

April 17-18, 1990

Washington, D.C.







THE WHITE HOUSE CONFERENCE
ON SCIENCE AND ECONOMICS RESEARCH
RELATED TO GLOBAL CHANGE

April 17-18, 1990
Washington, D.C.





**PRE-CONFERENCE MATERIAL
FOR DELEGATES**



Printed on Recycled Paper



April 5, 1990

Dear Colleague:

On behalf of President Bush, we are honored that you will be coming to the United States April 16-18 to serve as a delegate to the White House Conference on Science and Economics Research Related to Global Change.

By contributing your country's expertise in identifying the critical needs in the fields of science and economics research, you will advance international cooperation and understanding in dealing with the uncertainties of global change.

The United States welcomes a free and open discussion of the science and economics research issues related to global change. As co-chairmen of the Conference, we look forward to joining you in that effort.

Yours Sincerely,

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

Michael J. Boskin
Chairman
Council of Economic Advisers

Michael R. Deland
Chairman
Council on Environmental
Quality



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OVERVIEW OF THE CONFERENCE

GOALS AND OBJECTIVES OF THE CONFERENCE:

President George Bush invited the Heads of State from seventeen nations and the leadership of the E.C. and the OECD to send ministerial-level delegations to the White House Conference on Science and Economics Research Related to Global Change. The Conference is designed to bring together government leaders in science, economics, energy, and the environment concerned with the central research issues of Global Change. The Conference is designed to advance understanding of Global Change phenomena, to enhance international cooperation, and to build the basis for future efforts among nations to integrate more fully science and economics research into the policy process. The Conference adds a new dimension to the international dialogue on Global Change — the proposition that economics, both analysis and research on economic policy and economic consequences, is an essential link between the science of Global Change and policy alternatives. Science and economics research can also serve to identify and develop technologies and policy instruments that relax the tension between growth and Global Change, allowing for greater progress on both fronts. To address these broad goals, the Conference will:

- **Focus on science and economics research** issues relevant to policy on Global Change,
- **Address important next steps to substantially enhance and broaden international understanding** of science and economics research issues that relate to Global Change,
- **Highlight the special role that economics plays** in integrating the science of Global Change with the policy process,
- **Demonstrate linkages between science and economics research** and domestic and international policy processes, and
- **Seek to take the initial steps to implement joint international science and economics research efforts.**

The Conference is conceived as an integral part of the ongoing international process to understand the science of and policy options relating to global environmental issues. The need to improve substantially understanding of both the science and economics of Global Change has been noted by many world leaders. The Conference, therefore, focuses on science and economics research issues as a complement to the ongoing Intergovernmental Panel on Climate Change (IPCC) and other international forums that seek to address the issue of Global Change. It is hoped that the results of the Conference will contribute to the IPCC process and other ongoing international debates and actions.

The Conference focuses on "Global Change," an area of research concerned with understanding the fundamental processes that govern the Earth system functions. Global Change encompasses such diverse and interrelated issues as ozone depletion, greenhouse gases, climate change, food security, water supply, sea level changes, wetlands, deforestation, biodiversity, population change, and energy demand.

The Conference will provide a forum for international leaders to address the complex science and economics research issues central to the policy process, including:

- How well can we predict temperature trends in the decades ahead?
- How "good" are our global scale models, such as models to predict temperature changes?
- How well can we predict the interconnections between global environmental change and the resulting social and economic impacts?
- What are the economic consequences of adapting to or mitigating Global Change?
- How "good" are the models used to assess these economic consequences and their impact on the well-being of humanity?

By addressing such questions, it is hoped that the nations might pledge to enhance joint international research efforts that focus on rapid improvement of both scientific and economic knowledge and development of the necessary infrastructure to implement such efforts.

To address these complex and interrelated issues, President Bush invited heads of state from a small group of nations to send delegations led by ministerial-level officials. The Conference was conceived with the idea that a representative group of countries would be invited to participate. Their selection was based on the simple criteria that the meeting should include countries or organizations of countries that have substantial populations, large land masses, industrialized economies, heavy future energy needs, major research infrastructures, or have provided international leadership on issues related to climate and Global Change. These countries and organizations were selected:

1. Australia
2. Brazil
3. Canada
4. Federal Republic of Germany
5. France
6. India
7. Indonesia
8. Italy
9. Japan
10. Mexico
11. Netherlands
12. Nigeria
13. Norway
14. Poland
15. Soviet Union
16. United Kingdom
17. Zaire
18. European Community
19. OECD

THE EXPECTED RESULTS OF THE CONFERENCE

The Conference will provide an opportunity to address the science and economics research issues related to Global Change in the context of the policy process. To accomplish these goals, the Conference will focus on and seek to promote:

- A substantially *enhanced understanding* of science, economics, and environmental research agenda central to the needs of future Global Change policy development.
- A *substantive understanding of the uncertainties* in both science and economics knowledge of changes in the global environment of the planet.
- *Increased mutual understanding* of and sensitivity to the substance of science and economics research between both of those research communities.
- *Increased sensitivity* by the two research communities to the policy needs evolving in such areas as environmental and energy policy, and vice versa.
- A *solid* and well implemented science and economics *research effort* as a prerequisite for a complement to evolving efforts by nations to address the international policy questions of global environmental changes.
- A communication *network among national leaders* concerned with, and responsible for, the research and policy agenda related to Global Change. More particularly, this Conference provides a "first-ever" opportunity to forge a partnership between the science and economics research communities and the policy-makers.

To provide a vehicle to focus on these vital issues, the Conference will include two Plenary Sessions and several concurrent Working Groups, which will address the three major themes of the Conference:

- The Science and Economics Research Challenge
- Integrating Science and Economics Research in the Policy Process
- Building a Partnership for Science and Economics Research

The Conference is expected to produce a Co-Chairmen's Report, which will outline the deliberations of the Conference and set forth common actions designed to expand research and cooperation among nations.

As President Bush stated in his invitation letter, "It is my hope that the expertise, experience, and data available in our respective countries can be brought together in a more integrated and coherent fashion. By working together, our nations can enhance international cooperation in these vital areas and contribute to the success of the ongoing IPCC process."



PRELIMINARY DELEGATION LIST

Current as of April 4, 1990; 12:00 Noon

BRAZIL

(tentative)

Name	Title
Jose Lutzenberger	Environment Secretary
Jose Goldemberg	Science Secretary

CANADA

(tentative)

Name	Title
Lucien Bouchard	Federal Environment Minister
Derek Burney	Ambassador to the U.S.
Dr. Ann White	Director, Canadian Global Change Program
Dr. Arthur W. May	President, the Natural Science and Engineering Research Council

FEDERAL REPUBLIC OF GERMANY

(confirmed)

Name	Title
Professor Dr. Klaus Töpfer	Federal Minister for Environment, Nature Protection and Nuclear Safety
Dr. Gebhard Ziller	State Secretary, Ministry for Research and Technology
Dr. Wilhelm Knittel	State Secretary, Ministry for Transportation
Baldur Wagner	Assistant Secretary, Federal Chancellery
Dr. Mario Graf von Matuschka	Assistant Secretary, Foreign Ministry
Dr. Horst Glatzel	Deputy Assistant Secretary, Federal Chancellery
Walter Lötz	Deputy Assistant Secretary, Ministry of Economics
Professor Dr. Ansgar Vogel	Deputy Assistant Secretary, Ministry for Environment, Nature Protection, and Nuclear Safety
Dietrich Kupfer	Director, Office of International Cooperation, Ministry for Environment, Nature Protection and Nuclear Safety
Professor Dr. Hartmut Grossl	Scientist, Max Planck Society, Hamburg

FRANCE

(tentative)

Name	Title
Minister Hubert Curien	Minister of Research and Technology
Minister Brice Lalonde	Secretary of State for the Environment
Jean Audouze	Science Advisor to the President
Claude Alegre	Special Advisor to the Minister of Education
Ambassador Jean Ripert	Ministry of Foreign Affairs (Environment)
Yves Martin	Chairman of the Interministry Committee on Greenhouse
Madame Borione	Ministry of Foreign Affairs
Andre LeBeau	General Director of the Meteorological Center
M. Nasse	Ministry of Economy and Budget
Sylvie Faucheux	Professor of Economy at Paris I

INDIA

(tentative)

Name	Title
Ms. Maneka Gandhi	Minister of State for Environment and Forests
Vasant Gowarikar	Secretary of Department of Science and Technology
Mahesh Prasad	Secretary of Ministry of Environment and Forests
Dr. A.P. Mitra	Director General of Council for Science and Industrial Research

INDONESIA

(confirmed)

Name	Title
Prof. Dr. Ing. B.J. Habibie	Minister of State for Research and Technology; Chairman of the Agency for the Assessment and Application of Technology
Prof. Dr. Samaun Samadikun	Chairman of the Indonesian Institute of Science
Prof. Dr. John A. Katili	Deputy Chairman of the National Research Council
Prof. Dr. Gunawan Satari	Permanent Secretary, Ministry of State for Research and Technology
Mr. Poedji Kuntarso, MA	Director General for Foreign Economic Relations; Ministry of Foreign Affairs
Prof. Dr. Rustam Didong	Deputy Chairman (Economics), National Development Planning Agency
Prof. Dr. Harsono Wiryosumarto	Deputy Chairman (Technology Development); Agency for the Assessment and Application of Technology
Prof. Dr. S.B. Joedono	Assistant Minister (Industry, Energy and Mining), Office of the Coordinating Minister for the Economy, Finance, Industry and Development Supervision
Dr. M. Alwi Dahlan	Assistant Ministry (Population), Office of the Minister of State for Population and the Environment
His Excellency Abdulrachman Ramly	Ambassador of the Republic of Indonesia to the United States of America

ITALY

(tentative)

Name	Title
Hon. Adolfo Battaglia	Minister of Industry, Head of Delegation
Prof. Umberto Colombo	Director of the National Agency for Nuclear and Renewable Energies
Prof. Giuseppe Biorci	Vice President of the National Research Council
Prof. Giuseppe Bianchi	Director General for Energy Sources, Ministry of Industry
Prof. Antonio Praturlon	President of the CNR Committee on Geological Sciences
Prof. Roberto Frassetto	CNR Institute of the Dynamics of Great Masses
Prof. Emilio Gerelli	Economic Counselor to the Minister of Environment
Dr. Corrado Clini	Director General for Pollution Prevention, Ministry of Environment
Prof. Guido Visconti	Department of Physics, University of L'Aquila
Dr. Giovanni Sacco	Vice Director General of Treasury, Ministry of Treasury

MEXICO

(tentative)

Name	Title
Lic. Patricio Chirinos	Secretary of Urban Development and Ecology
Dr. Jose Sarukhan	Rector, National Autonomous University
Dr. Herminio Blanco	Undersecretary for Foreign Commerce, Secretariat of Commerce and Industrial Development
Ing. Alberto Escofet	Undersecretary for Energy, Secretariat of Energy, Mines and Parastatal Industries
Lic. Jose Angel Gurria	Undersecretary for International Financial Affairs, Secretariat of the Treasury
Fis. Sergio Reyes	Undersecretary for Ecology
Amb. Alberto Szekely	Legal Counsel, Secretariat of Foreign Affairs
Dr. Julian Adem	Director, Center for Atmospheric Studies, National Autonomous University
Dr. Manuel Ortega	Director General, National Council for Science and Technology
Hector Santana	Staff Aide to Secretary Chirinos

THE NETHERLANDS

(tentative)

Name	Title
Hans Alders	Minister for Housing, Physical Planning and Environment
Dr. B.C.J. Zoeteman	Deputy Director-General for Environment
Dr. Pier Vellinga	Coordinator for National Climate Programs
N.D. Van Egmond	Director for Chemistry and Physics, State Institute for Public Health and Environmental Hygiene
I.G. Roos	Directorate-General for European Cooperation, Ministry of Foreign Affairs
Dr. H.M. Fijnaut	Director of the Royal Dutch Meteorological Institute
Dr. A.P.M. Baede	Head of the Department for Dynamical Meteorology
D.F.W.T. Pietermaat	Environmental Coordinator in the Directorate-General for Energy, Ministry of Economic Affairs
Prof. J.B. Opschoor	Professor of Ecology, Free University, Amsterdam

NORWAY

(confirmed)

Name	Title
Kristin Hille Valla	Minister of Environment
Einar Steensnaes	Minister of Education and Research
Ambassador Kjeld Vibe	Norwegian Ambassador to the United States
Oddmund Graham	Secretary General, Ministry of Environment
Kaare Bryn	Director General, Ministry of Foreign Affairs
Dr. Tore Olsen	Director General, Ministry of Education and Research
Per M. Bakken	Coordinator, Air Pollution, Ministry of Environment
Lorents Lorentsen	Director of Research, Central Bureau of Statistics
Professor Dr. Ivar Isaksen	University of Oslo
Leif Westegaard	Science Officer, Norwegian Embassy in Washington

THE OECD

(tentative)

Name	Title
Robert Cornell	Deputy Secretary-General
William L. Long	Director for Environment
John Ferriter	Deputy Executive Director, International Energy Agency
Andrew Dean	Administrator, Department for Economic Affairs and Statistics
George Kowalski	Head of the Division of Economic Analysis, International Energy Agency

POLAND

(tentative)

Name	Title
Jan Janowski	Deputy Prime Minister; Head of the Office of Scientific and Technological Progress
Andreyewski	Deputy Minister of the Environment
Tadeusz Diem	Deputy Minister of Education
Rybicki	Central Planning Office
Kazimierz Duchowski	Department of Economic Cooperation, Ministry of Foreign Affairs
Wiackowski	Chairman, Parliamentary Commission on Environmental Protection
Stakel	Professor, Polish Academy of Sciences
Sadowski	Institute of Metallurgy and Water Management
Włodzimierz Bojarski	Senator
Jan Kinast	Polish Ambassador to the United States

SOVIET UNION

(tentative)

Name	Title
Nikolay P. Laverov	Chairman of the USSR State Committee on Science and Technology
Yuriy A. Izrael	Chairman of the State Committee on Hydrometeorology
V.F. Kostin	Deputy Chairman, State Committee for Nature Protection
Aleksander A. Metalnikov	Deputy Chairman, State Committee for Hydrometeorology
A.A. Troitsky	Deputy Chairman, State Planning Committee
V.M. Kotliakov	Director, Institute of Geography, USSR Academy of Sciences
Yu. L. Golubev	Assistant to Chairman, State Committee for Hydrometeorology
Yu. V. Vakajuk	Chief, Division of Global Geophysical Problems, Climate Change and Economic Consequences, State Committee for Hydrometeorology
Yu. V. Pikhanov	State Committee for Hydrometeorology, Department of International Cooperation
Mrs. N. Yu. Vail	State Department Committee for Hydrometeorology, Department of International Cooperation

UNITED KINGDOM

(tentative)

Name	Title
David Trippier RD, JP, MP	Minister for the Environment and Countryside
Sir John Fairclough	Chief Scientific Adviser, the Cabinet Office
Sir Crispin C.C. Tickell, GCMG, KCVO	United Kingdom Permanent Representative to the United Nations
Dr. John T. Houghton CBE	Director-General, Meteorological Office
J.G. Odling-Smee	Deputy Chief Economic Adviser; HM Treasury
Dr. David J. Fisk	Chief Scientist, Department of Environment
Dr. W. David Evans	Chief Scientist, Department of Energy
Dr. Eileen Buttle	Secretary, Natural Environment Research Council

UNITED STATES OF AMERICA

(confirmed)

Name	Title
Nicholas F. Brady	Secretary of the Treasury
Manuel Lujan, Jr.	Secretary of the Interior
Clayton Yeutter	Secretary of Agriculture
Robert A. Mosbacher	Secretary of Commerce
Admiral James D. Watkins (Ret)	Secretary of Energy
William K. Reilly	Administrator, Environmental Protection Agency
Richard H. Truly	Administrator, National Aeronautics and Space Administration
John A. Knauss	Under Secretary of Commerce for Oceans and Atmosphere; and Director, National Oceanic and Atmospheric Administration
Erich Bloch	Director, National Science Foundation
Richard Schmalensee	Member, Council of Economic Advisers

ZAIRE

(tentative)

Name	Title
Citoyen Lobo Kanza Kanza	Secretary of State (Deputy Minister); Ministry of Environment and Conservation of Nature



CONFERENCE CO-CHAIRMEN BIOGRAPHIES

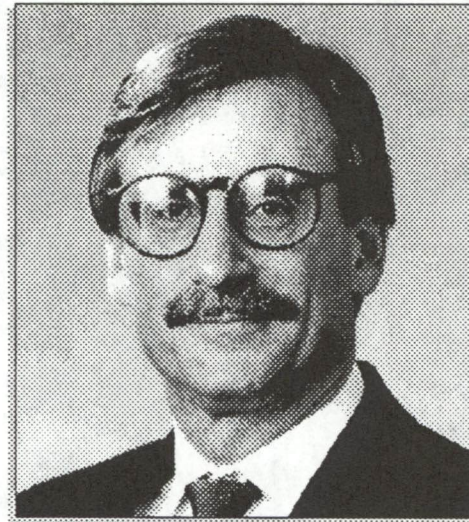
MICHAEL J. BOSKIN

D. ALLAN BROMLEY

MICHAEL R. DELAND



Michael J. Boskin
Chairman
President's Council of
Economic Advisers



Michael J. Boskin is the Chairman of the President's Council of Economic Advisers. He was appointed to this post by the President on February 2, 1989, following unanimous confirmation by the Senate. As Chairman, he provides economic analysis and advice directly to the President and assists in formulating national economic policies. Dr. Boskin is on leave from Stanford University, where he is the Burnet C. and Mildred Finley Wohlford Professor of Economics, and was the founder and Director of the Center for Economic Policy Research. He is also on leave as a Research Associate of the National Bureau of Economic Research.

Dr. Boskin is the recipient of numerous professional awards and citations, ranging from the Chancellor's Award and the Department Citation as outstanding undergraduate at the University of California in 1967 and the first National Tax Association Outstanding Doctoral Dissertation Award in 1971 to the Abramson Award for Outstanding Research from the National Association of Business Economists in 1987 and Stanford University's Distinguished Teaching Award in 1988. He is the author of more than 80 books and articles in the areas of government spending, tax theory and policy, public debt, Social Security, retirement patterns and behavior, U.S. saving behavior, capital formation, U.S. economic growth, and the economic status of the elderly.

Dr. Boskin received his B.A. degree with highest honors in 1967 from the University of California at Berkeley, where he received his M.A. in 1968 and his Ph.D. in 1971.

Previously, Dr. Boskin had served as a consultant and adviser to the White House, Department of Health and Human Services, Treasury Department, National Science Foundation, and other government agencies, and various congressional committees.

Dr. Boskin is a member of the Economic Education Committee of the American Economic Association. He and his wife Chris moved to Washington, D.C. from California. They both enjoy skiing and tennis.



D. Allan Bromley
Assistant to the President
Science and Technology

D. Allan Bromley is Assistant to the President for Science and Technology and Director of the Office of Science and Technology Policy (OSTP) in the Executive Office of the President. He is on leave from his former position as Henry Ford II Professor of Physics at Yale University, where he was founder and Director of the A.W. Wright Nuclear Structure Laboratory.

One of the world's leading nuclear physicists, he has carried out pioneering studies on both the structure and dynamics of nuclei and is considered the father of modern heavy ion science, one of the major areas of nuclear science. He has also played major roles in the development of accelerators, of detection systems, and in computer-based data acquisition and analysis systems. An outstanding teacher, over the past two decades his laboratory at Yale graduated more Ph.D.'s in experimental nuclear physics than any other institution worldwide. He has published over 450 papers in science and technology as well as edited eighteen books and has received numerous honors and awards, including the National Medal of Science.

For more than two decades, Dr. Bromley has been a leader in the national and international science and science policy communities. As Chairman of the National Academy's Physics Survey in the early 1970s, he contributed in a central way to charting the future of that science in the subsequent decade. As President of the American Association for the Advancement of Science, the world's largest scientific society, and the International Union of Pure and Applied Physics, the world coordinating body for that science, he has been one of the leading spokesmen for U.S. science and for international scientific cooperation.

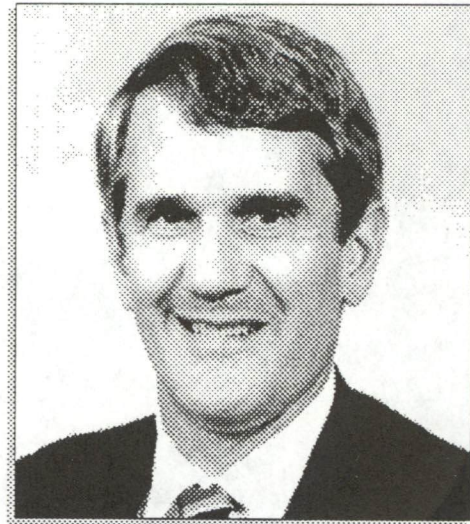
Prior to his present appointment, Dr. Bromley served as a member of the White House Science Council throughout the Reagan Administration and as a member of the National Science Board in 1988-1989. As the U. S. chairman for both the Gandhi-Reagan, Indo/U.S. and the Sarney-Reagan, Brazil/U.S. Science and Technology Initiatives, he led four Presidential missions to conduct negotiations for bilateral cooperation in science and technology.

Born in Westmeath, Ontario, Canada, he received the B.Sc. degree with highest honors in 1948 in the Faculty of Engineering at Queen's University, Ontario, Canada. He received the M.Sc. degree from Queen's University in 1950 and the Ph.D. degree from the University of Rochester in 1952, both degrees in nuclear physics. He subsequently has been awarded ten honorary degrees from universities in Canada, France, Germany, Italy, South Africa, and the United States.

Dr. Bromley is married to the Former Patricia J. Brassor, and they have two children, David John and Karen Lynn.



Michael R. Deland
Chairman
White House Council
on Environmental Quality



Michael R. Deland was appointed by President Bush to be Chairman of the White House Council on Environmental Quality on August 1, 1989, following unanimous confirmation by the United States Senate. In this capacity he serves as environmental adviser to the President as well as Director of the Office of Environmental Quality which oversees the development of environmental policy, interagency coordination of environmental quality programs and environmental data acquisition and assessment. In addition, Mr. Deland is responsible for overseeing implementation of the National Environmental Policy Act.

Prior to Mr. Deland's appointment as CEQ Chairman, he was the New England Regional Administrator for the U.S. Environmental Protection Agency (EPA). In that capacity, from 1983 to 1989, he administered the federal government's programs dealing with air and water pollution control, hazardous waste management, drinking water, toxic substances, radiation, and pesticides.

Mr. Deland was counsel at Environmental Research and Technology, Inc., a national firm headquartered in Concord, Massachusetts from 1976 to 1983. While in the private sector, Mr. Deland published numerous papers and articles, including the Regulatory Focus monthly column in *Environment, Science and Technology*. Between 1971 and 1976, Mr. Deland served in EPA's Office of Regional Counsel in New England (Region I) in several capacities, including Chief of the Agency's Legal Review Section and Chief of the Enforcement Branch.

Mr. Deland received his Bachelor of Arts degree from Harvard College in 1963 and served as an officer in the U.S. Navy before obtaining his law degree from Boston College in 1969. He is a member of the Massachusetts Bar and the American Bar Association and its Natural Resources Committee. Mr. Deland was President of the Business Associates Club (Boston) from 1981 to 1982 and is a former Director of the Environmental Lobby of Massachusetts and the Center for Environmental Intern Programs, a national non-profit organization headquartered in Boston.

Mr. Deland has received numerous awards and citations, including the Massachusetts Audubon Society Award for his leadership in cleaning up Boston Harbor and the New England Environment Leadership Award for the New England Environmental Network. In 1987, he was honored as "Environmentalist of the Year" by the Massachusetts Association of Conservation Commissions. In March of 1989, he was awarded the National Wildlife Federation's Special Achievement Award for his role in prompting the cleanup of Boston Harbor, for his efforts at protecting valuable fishing areas from off-shore oil drilling, and for his early endorsement of environmentally-based growth controls on Cape Cod. Mr. Deland resides in Washington with his wife Jane and three children.



U.S. Delegation Biographies

As part of the Conference handout materials, we are preparing an information/reference booklet which will include:

- one-page narrative biography of each delegate
- an 8" x 10" photograph of each delegate
- the delegate's organization's logo/seal

The biographies, logos and photographs of the U.S. delegation included in this section are representative of the materials we are seeking from each foreign delegation member.

Please provide this information to the White House Conference as soon as possible.



Nicholas F. Brady
Secretary
Department of the Treasury



Nicholas F. Brady became the 68th Secretary of the Treasury on September 15, 1988.

Secretary Brady served in the United States Senate from April 20, 1982 through December 27, 1982. During that time he was a member of The Armed Services Committee and the Banking, Housing and Urban Affairs Committee.

In 1984 President Reagan appointed Secretary Brady Chairman of the President's Commission on Executive, Legislative and Judicial Salaries. He has also served on the President's Commission on Strategic Forces (1983), the National Bipartisan Commission on Central America (1983), the Commission on Security and Economic Assistance (1983), and the Blue Ribbon Commission on Defense Management (1985). Most recently, Secretary Brady chaired the Presidential Task Force on Market Mechanisms (1987).

Secretary Brady's career in the banking industry spans 34 years. He joined Dillon, Read & Co., Inc. in New York in 1954, rising to Chairman of the Board. He has been a Director of the NCR Corporation, the MITRE Corporation, and the H.J. Heinz Company, among others.

He has also served as a trustee of Rockefeller University and a member of the Board of the Economic Club of New York. He is a member of the Council on Foreign Relations, Inc. He is a former trustee of the Boys' Club of Newark.

Mr. Brady was born April 11, 1930 in New York City. He was educated at Yale University (B.A., 1952) and Harvard University (M.B.A., 1954). He and his wife, Katherine, have four children.



Manuel Lujan, Jr.
Secretary
Department of the Interior



POLITICAL

President George Bush selected Manuel Lujan, Jr., who had just completed a 20-year career in the House of Representatives, to be his Secretary of the Interior. He was sworn in on February 3, 1989.

The 46th Secretary of the Interior, Lujan was first elected to the House of Representatives from New Mexico in 1968. When he left the Congress on January 3, 1989, he ranked 15th in seniority among all Republicans and 52nd in seniority among all House members.

A member of the House Interior and Insular Affairs Committee since 1969, Lujan was its second ranking Republican. The Committee has jurisdiction over all activity in the U.S. Department of the Interior as well as the Nuclear Regulatory Commission. Lujan was also the senior Republican on the Energy and Environment Subcommittee.

Lujan was the Vice-Chairman of the House Science, Space and Technology Committee. As senior Republican, Lujan was a member of all subcommittees, including Space Science and Applications which has oversight over NASA.

PERSONAL

Born May 12, 1928 in San Ildefonso, New Mexico. Raised in Santa Fe where Lujan's father, Manuel Lujan, Sr., served three elected terms as Mayor.

A graduate of the College of Santa Fe with a B.A. degree, Lujan also attended St. Mary's College in California.

Prior to entering Congress, the Secretary was a partner in a family insurance and real estate business with three offices in New Mexico. His brother, Edward Lujan, is the managing partner of the business.

Married to the former Jean Couchman of Santa Fe, the Lujans have four children; Terra Everett, Jay, Barbara and Jeff. Secretary and Mrs. Lujan maintain residences in both Washington, D.C. and Albuquerque.

LEGISLATIVE

Economy in Government: Lujan was a Congressional leader in the battle against wasteful government spending. *"The effort to stop inflation boils down to a fight against needless government intervention and spending,"* stated Lujan.

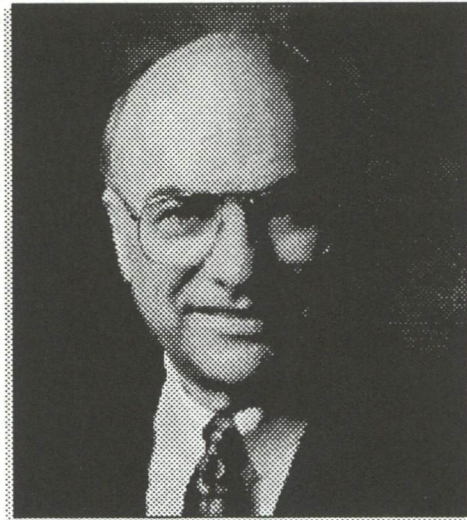
Environmental Protection: Lujan has co-sponsored seven major environmental protection bills including the Clean Air Act of 1970 and the Clean Water Act. More recently, Lujan successfully sponsored legislation setting aside more than 600,000 acres of New Mexico land as wilderness areas, ensuring its beauty and enjoyment for future generations.

Education: Lujan strongly supported student loan programs in the public and private sectors. His work led to New Mexico adopting a student loan program that is a model for other states.

Technology: Lujan believes strongly that scientific research is the key to our future. *"Science and technology can help us meet the challenges of the 21st century,"* said Lujan.



Clayton Yeutter
Secretary
Department of Agriculture



Clayton Yeutter was sworn in as the 23rd United States Secretary of Agriculture on February 8, 1989.

Yeutter's career includes distinguished public and private-sector service in agricultural policy development, law, economics, marketing and trade.

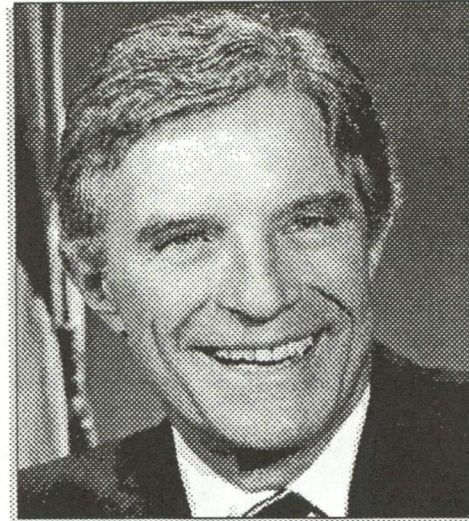
From July 1985 until shortly before his new cabinet appointment, Yeutter served as U.S. Trade Representative. His previous USDA posts include Assistant Secretary for International Affairs and Commodity Programs from March 1974 to June 1975, Assistant Secretary for Marketing and Consumer Service from January 1973 to March 1974 and Administrator of the Consumer and Marketing Service from October 1970 to December 1971.

Yeutter's other career highlights: President and Chief Executive officer, Chicago Mercantile Exchange, July 1978 to June 1985; senior partner, law firm of Nelson, Harding, Yeutter & Leonard, Lincoln, Nebraska, April 1977 to June 1978; Deputy U.S. Special Trade Representative, June 1975 to February 1977; Director, University of Nebraska Mission in Colombia (a large agricultural technical assistance program), September 1968 to October 1970; executive assistant to the governor of Nebraska, January 1966 to September 1968; faculty member, Department of Agricultural Economics, University of Nebraska, January 1960 to January 1966; operator of a 2,500 acre farming-ranching-cattle feeding enterprise in central Nebraska, 1957-1975; and enlistee, later commissioned officer, U.S. Air Force, 1952-1957.

Yeutter was graduated with high distinction from the University of Nebraska in 1952 with a Bachelor of Science degree in animal husbandry. In 1963, he obtained his law degree from the same university, graduating *cum laude* and ranked first in his class. In 1966, he received his Ph.D. in agricultural economics, again from the University of Nebraska, and was named outstanding graduate student in the program.

Yeutter is a former member or chairman of many private and public-sector boards of directors, councils and trusteeships, including: the President's Export Council; the Chicago Association of Commerce and Industry; the Chicago-Tokyo Bank; the U.S. Meat Export Federation; the Chicago Council on Foreign Relations; the Farm Foundation, Oak Brook, Illinois; Tri-Valley Growers, San Francisco, California; and ConAgra, Inc., Omaha, Nebraska.

Yeutter was born in Eustis, Nebraska, December 10, 1931. He and his wife, Jeanne Vierk Yeutter, have four children. He retains ownership of his Nebraska farm, which is currently operated by a tenant. Yeutter's permanent home is in Lincoln, Nebraska, but he currently resides in McLean, Virginia.



Robert A. Mosbacher
Secretary
Department of Commerce

Nominated Secretary of Commerce by President-Elect George Bush on December 6, 1988. He was confirmed 100-0 by the United States Senate on January 31, 1989.

Formerly:

Chief Executive Officer and Chairman of Mosbacher Energy Company

Director of Texas Commerce Bancshares, Houston, Texas

Director, Enron Corporation, Houston, Texas

Director, New York Life Insurance Company, New York

Past Chairman of the National Petroleum Council

Charter member and past Chairman of the All American Wildcatters Association

Member of the Executive Committee and Board of Directors of the American Petroleum Institute

Past Chairman of the Mid-Continent Oil and Gas Association

Twice Past Chairman of the Board of Visitors of the Texas M.D. Anderson Cancer Institute

Former member of Board of Trustees of the Texas Heart Institute

Former National Trustee, Boys Clubs of America Southwest Region

Past Active Trustee of the Aspen Institute for Humanistic Studies

Member of Washington Roundtable and Co-Chair of Houston Roundtable of the Center for Strategic and International Studies

National Finance Chairman for George Bush for President

National Finance Chairman of the Fund for America's Future

Chairman of Victory 88'

Co-Chairman of the Republican National Finance Committee

Member of the Executive Committee for Reagan-Bush

National Finance Chairman for the President Ford Committee in 1976

Won both the North American and World Sailing Championships in the Olympic classes (Dragon and Soling)

Won the Southern Ocean Racing Circuit

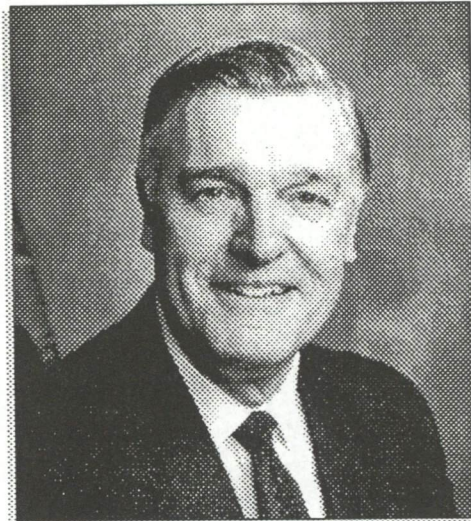
Won the Gold Cup twice

Born in White Plains, New York, Mosbacher has lived in Houston, Texas since 1948. He graduated from Washington and Lee University in Lexington, Virginia in 1947.

Mosbacher is married to the former Georgette Paulsin and is the father of four (Diane, Robert Jr., Kathryn and Lisa) and grandfather of five. The Mosbachers reside in Washington, D.C.



James D. Watkins
Secretary
Department of Energy



James David Watkins was nominated by the President to be the sixth Secretary of Energy on January 20, 1989. Admiral Watkins was confirmed by the United States Senate and sworn into office on March 1, 1989.

Admiral Watkins was born in California on March 7, 1927, and claims the city of Pasadena as his home. A 1949 graduate of the U.S. Naval Academy, his tours as flag officer included Chief of Naval Personnel; Commander of the Sixth Fleet; Vice Chief of Naval Operations; and Commander-in-Chief of the Pacific Fleet. Admiral Watkins was selected by President Reagan to become the 22nd Chief of Naval Operations on June 30, 1982. His military decorations include several Distinguished Service and Legion of Merit medals, the Bronze Star with combat "V" and other medals, campaign and service ribbons, and decorations from many foreign nations.

Following his retirement on June 30, 1986, Admiral Watkins devoted his time to issues regarding America's youth, and worked with a number of philanthropic organizations to establish a national program for personal excellence. He also served as a member of advisory boards in both the education and energy fields and has received several honorary doctorates and public service awards.

In October 1987, Admiral Watkins was appointed Chairman of the Presidential Commission on the Human Immunodeficiency Virus (AIDS) Epidemic, submitting the Commission's final report to the President on June 24, 1988.

Admiral Watkins received his master's degree in mechanical engineering in 1958, and is a graduate of the reactor engineering course at the Oak Ridge National Laboratory. He was selected by Admiral Hyman G. Rickover to enter the Navy's nuclear-powered submarine program in 1959, and was qualified as an Engineering Officer of the Watch at one of the Navy's land-based reactor plants. He served for three years in the Atomic Energy Commission as Admiral Rickover's assistant for Naval Nuclear Propulsion and later, in a variety of assignments associated with the management of the nuclear navy. These assignments included Commanding Officer of a nuclear-powered submarine and Executive Officer of the world's first nuclear-powered cruiser.

Admiral Watkins married Sheila Jo McKinney of San Diego, California, in 1950. They have six children: Katherine Watkins Coopersmith, Laura Jo Watkins Kauffmann, Susan, Charles, James Jr., and Edward. Admiral and Mrs. Watkins have eight grandchildren.



William K. Reilly
Administrator
Environmental Protection Agency



William Kane Reilly was sworn in as Administrator of the U.S. Environmental Protection Agency by President Bush on February 8, 1989. The President announced his appointment on December 22, 1988, and officially nominated him on January 20, 1989. The U.S. Senate unanimously confirmed his nomination on February 2, 1989.

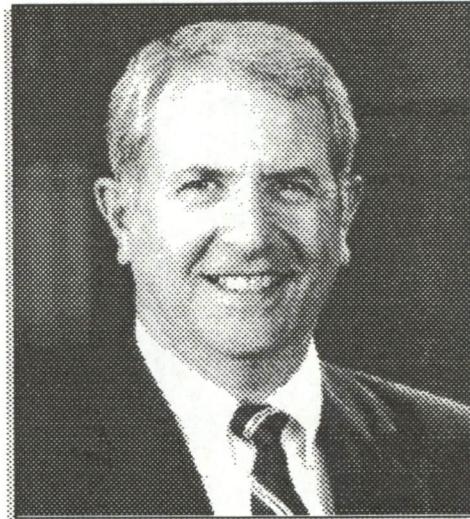
Prior to becoming EPA Administrator, Reilly held five environment-related positions during the previous two decades. He was President of World Wildlife Fund-U.S. (1985-1989) and President of the Conservation Foundation (1973-1989). Those two organizations joined in a formal affiliation in 1985 and Reilly became President of both organizations. He was Executive Director of the Task Force on Land Use and Urban Growth from 1972-1973. From 1970 to 1972, he was on the staff of the President's Council on Environmental Quality and, from 1968 to 1970, was Associate Director, Urban Policy Center and the National Urban Coalition. He also served as Chairman of the Natural Resources Council of America, an association of all major conservation groups, from 1981-1983.

During his presidency of World Wildlife Fund-U.S., Reilly intensified his mission, the protection of the diversity of life on earth. Between 1961 and 1989, the organization supported 1,371 wildlife and endangered habitat projects in 103 countries. At the Conservation Foundation, he continued its long-standing interest in land programs and initiated new programs in environmental dispute resolution, water toxic substances control, and urban conservation and energy. In 1976, Reilly began a program advocating direct cooperation between business leaders and conservationists in resolving polarizing issues in resources and environmental policy, which resulted in several major consensus-building policy dialogues, including the National Groundwater Policy Forum and the National Wetlands Policy Forum.

Reilly has written and lectured extensively on environmental issues, has served on the boards of various private and public sector organizations and received the Horace Albright Medal for his contributions to national parks and the Alfred B. LaGasse Medal for his contributions to environmental progress.

An alumnus of Yale University, Reilly holds a law degree from Harvard University and a master's degree in urban planning from Columbia University. He was born in Decatur, Illinois on January 26, 1940, grew up in Fall River, Massachusetts, and served as a U.S. Army captain (1966 to 1967).

He is married to Elizabeth "Libbie" Bennet Buxton Reilly. They have two daughters, Katherine Buxton Reilly, age 19, and Margaret Mahalah Reilly, age 14. The family resides in Alexandria, Virginia.



Richard H. Truly
Administrator
National Aeronautics and
Space Administration

Richard H. Truly became the eighth Administrator of NASA on July 1, 1989. One day earlier, he concluded his naval career of more than 30 years, retiring as a Vice Admiral, United States Navy. He is the first astronaut to head the nation's civilian space agency.

Truly became NASA's associate administrator for space flight on February 20, 1986. In this position, he led the painstaking rebuilding of the Space Shuttle program. This was highlighted by NASA's celebrated "return to flight" on September 29, 1988, when Discovery lifted off from Kennedy Space Center, Florida, on the first Shuttle mission in almost three years.

Before returning to NASA, the former Shuttle astronaut served as the first commander of the Naval Space Command, Dahlgren, Virginia, established October 1, 1983. His career in the U.S. Navy began in 1959, when he was commissioned an ensign. This coincided with his graduation from Georgia Institute of Technology, which he attended as a Naval R.O.T.C. midshipman and earned a bachelor's degree in aeronautical engineering.

Following flight school, he was designated a naval aviator in 1960. His initial tour of duty, Fighter Squadron 33, was aboard USS Intrepid and USS Enterprise, and he made more than 300 carrier landings. From 1963 to 1965, he was a student and then instructor at the U.S. Air Force Aerospace Research Pilot School, Edwards Air Force Base, California.

In 1965, Truly became one of the first military astronauts selected to the Air Force's Manned Orbiting Laboratory program in Los Angeles, California, and transferred to NASA as an astronaut in August 1969. He served as capsule communicator for all three of the manned Skylab missions in 1973 and the Apollo-Soyuz mission in 1975. As a naval aviator, test pilot, and astronaut, Truly has logged over 7,500 hours in numerous military and civilian jet aircraft.

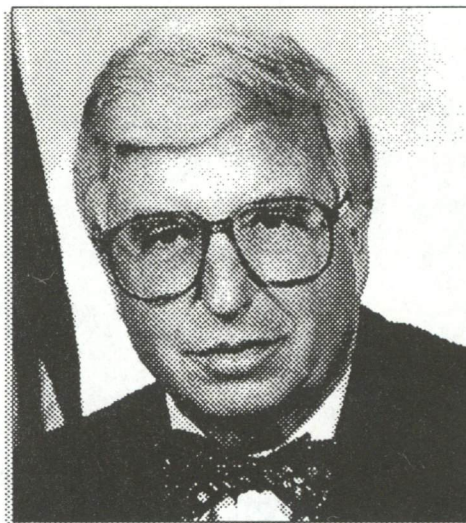
He was pilot for one of the two-man crews that flew the 747/Space Shuttle Enterprise approach and landing test flights during 1977. He then served as backup pilot for STS-1, the first orbital test of the Shuttle. His first flight in space was November 12-14, 1981, as pilot of Space Shuttle Columbia (STS-2), significant as the first manned spacecraft to be reflown in space. His second flight (STS-9, August 30-September 5, 1983) was as commander of Space Shuttle Challenger, the first night launch and landing in the Shuttle program.

On January 18, 1989, Truly was awarded the Presidential Citizen's Medal by President Reagan. His NASA awards include two NASA Distinguished Service Medals, the NASA Outstanding Leadership Medal, two NASA Exceptional Service Medals, and NASA Space Distinguished Service Medal, the Defense Superior Service Medal, two Legions of Merit, the Navy Distinguished Flying Cross, and the Meritorious Service Medal.

Truly was born in Fayette, Mississippi, on November 12, 1937 and attended school in Fayette and Meridian, Mississippi. He is married to the former Colleen (Cody) Hanner of Milledgeville, Georgia. They have three children: Mike, Dan and Lee, and three grandchildren: Ashley, Courtney and Peter.



John A. Knauss
Under Secretary
Department of Commerce



John A. Knauss, Under Secretary for Oceans and Atmosphere and Administrator of the Department's National Oceanic and Atmospheric Administration (NOAA), took office August 7, 1989.

A noted oceanographer and educator, Knauss was a professor of oceanography at the Graduate School of Oceanography at the University of Rhode Island (URI). He also served as dean of the URI Graduate School of Oceanography from 1962 to 1987, and as the university's provost for marine affairs from 1969 to 1982.

Knauss has been a member of two presidential commissions on marine affairs: the Commission on Marine Science, Resources, and Engineering (the Stratton Commission) in 1967 to 1968 and the National Advisory Committee on Oceans and Atmosphere (NACOA), 1978 to 1985. He served as Chairman of NACOA from 1981 to 1985. He has been President of the Association of Sea Grant Program Institutions, Chairman of the Ocean Science Committee of the National Academy of Sciences/National Research Council, and Chairman of the Marine Division of the National Association of State Universities and Land-Grant Colleges.

He has served as President of the oceanographic section of the American Geophysical Union (AGU), Vice President of the Marine Technology Society (MTS), Vice Chairman of the American Association for the Advancement of Science's (AAAS) Atmospheric and Hydrospheric Sciences Section, and a council member of the American Meteorological Society. He was a co-founder of the Law of the Sea Institute and served on its governing board from 1965 to 1976 and 1981 to 1987. He has been elected a fellow of the AAAS, the AGU, and the MTS.

Knauss graduated from Massachusetts Institute of Technology (B.S., 1946), the University of Michigan (M.S., 1949), and the University of California, Scripps Institution of Oceanography (Ph.D., 1959).



Erich Bloch
Director
National Science Foundation

Erich Bloch was confirmed by the Senate to be Director of the National Science Foundation on August 6, 1984. As Director, he is responsible for an agency charged with strengthening the national scientific and engineering research potential and with improving science and engineering education at all levels. The Foundation has an annual budget exceeding \$1.7 billion and the annual award of 12,000 to 14,000 grants for research in all fields of natural, social sciences, and engineering.

Before joining NSF, Mr. Bloch was a corporate Vice President for Technical Personnel Development at IBM Corporation, which he joined in 1952 as an electrical engineer. During his career at IBM, Mr. Bloch was the engineering manager of IBM's STRETCH supercomputer system in the late 1950's and early 1960's. In 1962, he headed development of the Solid Logic Technology program, which provided IBM with microelectronic technology for its System/360 computer. Subsequently, Mr. Bloch was appointed a vice president of the company's Data Systems Division and general manager of the East Fishkill facility, which is responsible for the development and manufacture of semiconductor components used in IBM's product line. He was elected an IBM vice president in 1981.

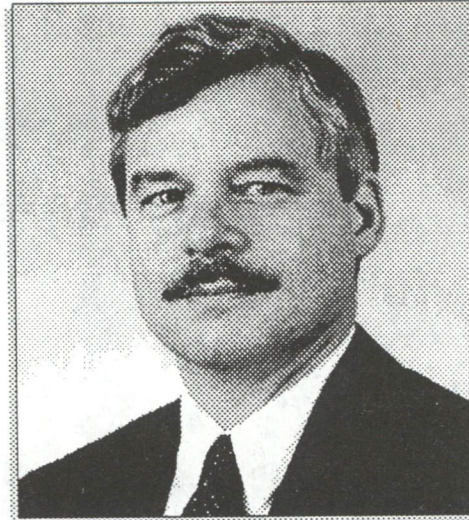
From 1981 to 1984, Mr. Bloch served as Chairman of the Semi-conductor Research Cooperative, a group of leading computer and electronics firms that fund advanced research in universities and shares in the results, and was the IBM representative on the board of the Semiconductor Industry Association.

In February 1985, Mr. Bloch was awarded the National Medal of Technology by President Reagan. The award was made for his part in pioneering developments related to the IBM/360 computer that revolutionized the computer industry. In 1989, Mr. Bloch was the recipient of the IEEE United States Activities Board Award for Distinguished Public Service and the IEEE 1990 Founders Medal. He also received honorary Doctorate of Engineering degrees from the Colorado School of Mines, the University of Notre Dame, and Rensselaer Polytechnic Institute; honorary Doctorate of Science degrees from the University of Massachusetts at Amherst, George Washington University, State University of New York at Buffalo, the University of Rochester, Oberlin College, and Washington College; and an honorary Doctorate of Science and Engineering degree from the Ohio State University.

He is a member of the National Academy of Engineering and is a Fellow of the American Association for the Advancement of Science and of the Institute of Electrical and Electronics Engineers and a member of its Computer Society. He received his education in electrical engineering at the Federal Polytechnic Institute of Zurich, Switzerland, and a Bachelor of Science degree in electrical engineering from the University of Buffalo in 1952.



Richard Schmalensee
Council of Economic Advisers
Office of the President



Richard Schmalensee is a Member of the Council of Economic Advisers. He has primary responsibility for the analysis of microeconomic and regulatory policy. Dr. Schmalensee is on leave from the Massachusetts Institute of Technology (MIT), where he is the Gordon Y. Billard Professor of Economics and Management.

Dr. Schmalensee's research and teaching have focused on industrial organization and on anti-trust and regulatory policy. He has written numerous articles in professional journals and is the author of three books and co-author of three others. He has extensive consulting experience on anti-trust and regulatory matters. He has served on the editorial boards of several economics journals, is co-editor of the *Handbook of Industrial Organization*, and is founding editor of the MIT Press *Regulation of Economic Activity* monograph series. Dr. Schmalensee has also served on various committees of the American Economic Association and the Econometric Society, of which he is a Fellow.

Dr. Schmalensee attended the public schools of Belleville, Illinois and received his B.S. (Economics, Politics and Science; 1965) and Ph.D. (Economics; 1970) degrees from MIT. Prior to joining the MIT faculty in 1977, he taught at the University of California, San Diego. He is married to the former Diane Hawk; they have two sons.



HOTEL/TRANSPORTATION/LOGISTICS

Dr. Franmarie Keel

White House Conference on Global Change

Suite 615

1019 19th Street, N.W.

Washington, D.C. 20036

Phone: (202) 653-5980

Fax: (202) 653-2034

Telex: 249118SDAVISUR

Telemail (OMNET): GLOBAL.CHANGE

HOTEL

The White House Conference is being held at:

The J.W. Marriott Hotel
1331 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
Telephone: 202-393-2000

- The White House Conference has reserved rooms for each official delegation member. **Charges for the hotel room April 16th and 17th, 1990 and for Conference meals served April 17 and 18, 1990, will be paid for by the White House Conference.**
- Hotel room check-in is 3:00 p.m. Conference registration begins at 12:00 noon, Sunday, April 15, for delegates arriving in Washington early. Registration will continue Monday all day and until 12:00 noon on Tuesday, April 17. Special arrangements should be made with White House Conference coordinators for early or late arrivals/departures and check-in.
- To cover any personal incidental expenditures (such as telephone calls, charges at the hotel restaurants and gift shops, and additional room service), each delegation member must present *one* of the following upon registration at the hotel to guarantee incidentals:
 - credit card (American Express, VISA, Master Card, Diners Club, JCV)
 - a letter received by April 14th, 1990 from the delegation's embassy stating embassy will cover its delegation's incidentals prior to delegation's departure from the hotel

TRANSPORTATION

- Delegations will be met by White House Conference personnel at Washington National Airport, Washington Dulles Airport, Baltimore-Washington International Airport, and Andrews Air Force Base and will be escorted to the hotel beginning Sunday, April 15.
- White House Conference personnel meeting flights can be identified by a White House Conference sign. Delegations arriving in Washington domestically will be met at the gate. International arrivals will be met at the exit of the mobil lounge at the entrance to U.S. Immigration and Customs.
- Procedures have been established by the Conference to assist in the facilitation of U.S. Customs.

- Transportation will be provided for delegations' return to those designated airports after the close of the Conference Wednesday, April 18, through Thursday evening, April 19.
- All transportation for official Conference events held outside of the J.W. Marriott Hotel will be provided by the White House Conference.
- All airline arrival and departure times must be confirmed as soon as possible with the White House Conference at 202/653-5980.
- Please inform the White House Conference immediately if flight plans change at departure (i.e. cancelled flight, family emergency, etc.)

SPECIAL REQUIREMENTS

- Any special room, bed, dietary, or medical requirements should be forwarded to White House Conference coordinators as soon as possible.

MISCELLANEOUS

- Simultaneous interpretation in Russian, Spanish, and French will be provided during the Conference meetings.
- Please note the dinner at the State Department, on Tuesday, April 17, is business attire.

**WHITE HOUSE CONFERENCE ON SCIENCE AND ECONOMICS
RESEARCH RELATED TO GLOBAL CHANGE**

Delegate Travel Accommodation Registration

PLEASE PRINT OR TYPE

Name: _____

Title: _____

Country Delegation: _____

HOTEL ACCOMMODATIONS:

In order to facilitate your registration upon arrival at the Conference site at the J.W. Marriott Hotel, it will be necessary to provide the information requested in this form. The White House Conference provides each delegate with a hotel room from check-in April 16th to check-out on April 18th. The J.W. Marriott Hotel requires guarantee of payment for incidentals, such as telephone, room service, gift shop, laundry, restaurants, etc., with cash, a credit card or a Letter of Guarantee from your Embassy. A Letter of Guarantee should include delegate's name, check-in date, Embassy Financial Officer, and any stipulations, and must be received by April 14, 1990.

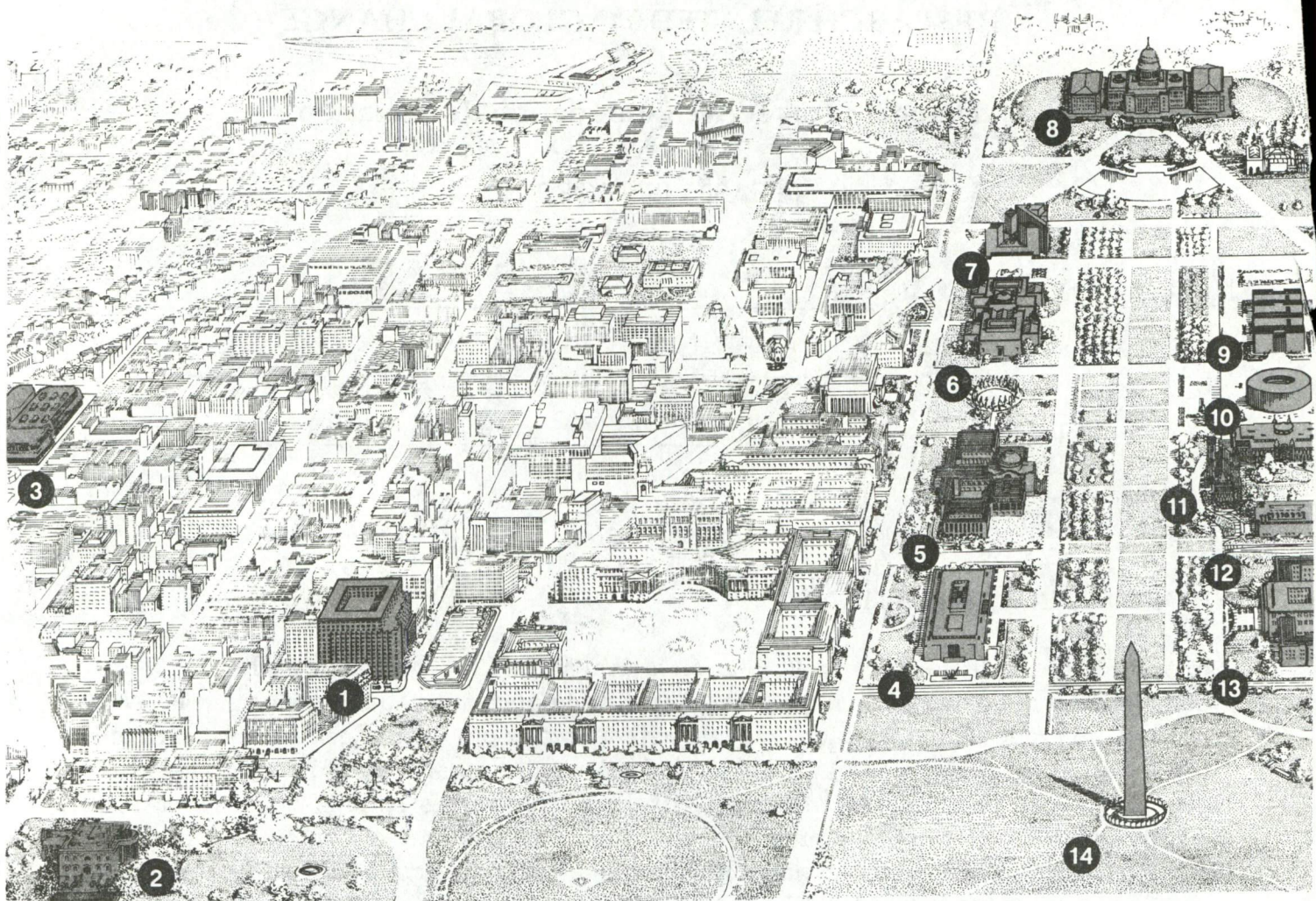
Credit Card # _____ Expiration Date: _____

Type (*American Express, Visa, Master Card, Diners Club, JCV*): _____

Name as it appears on card: _____

Signature: _____ Date: _____

This should be completed and sent by fax (202-653-2034) to Susan Thoren at the White House Conference in Washington, D.C., or delivered by April 12th to 1019 19th Street NW, Suite 615, Washington D.C. 20036

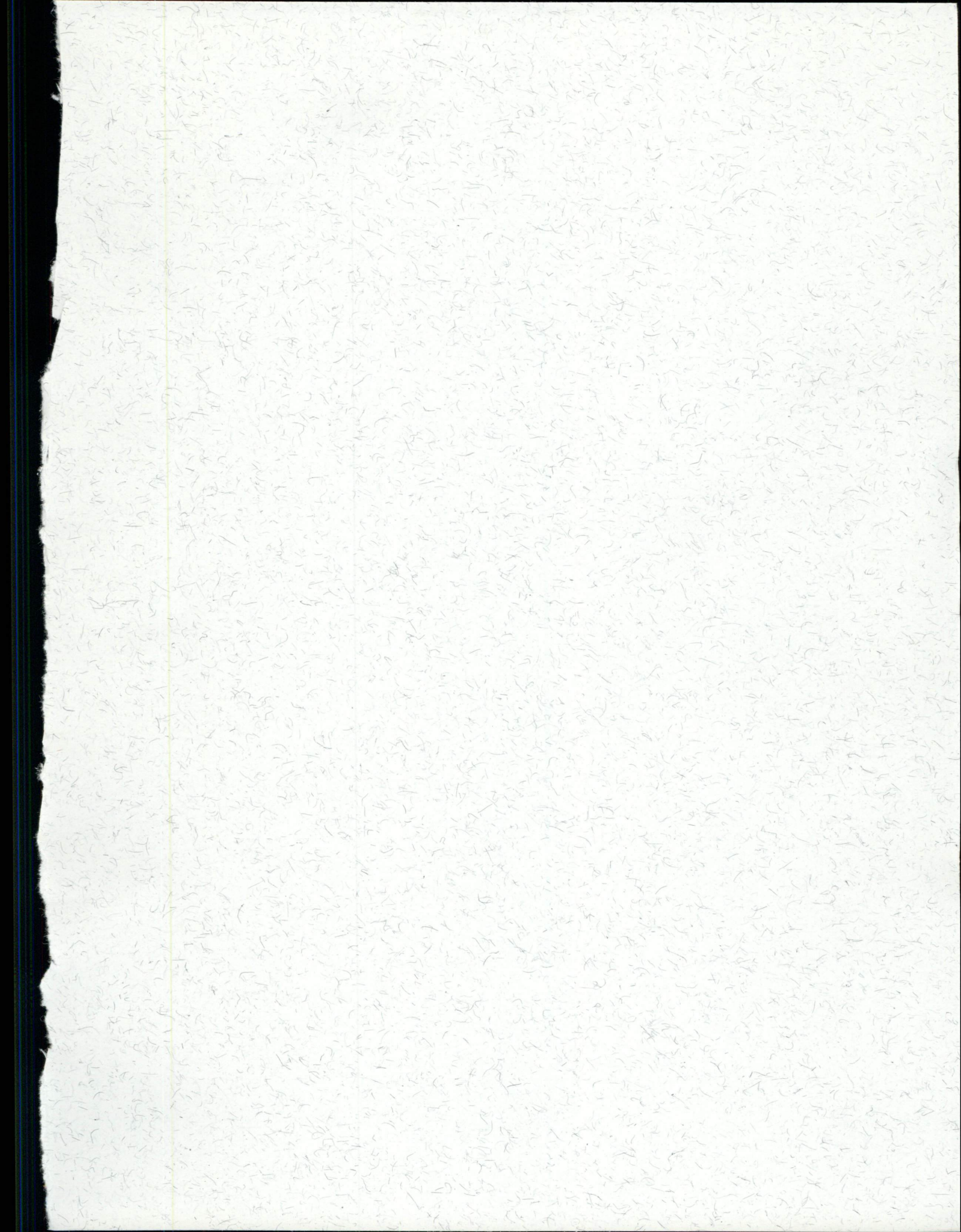


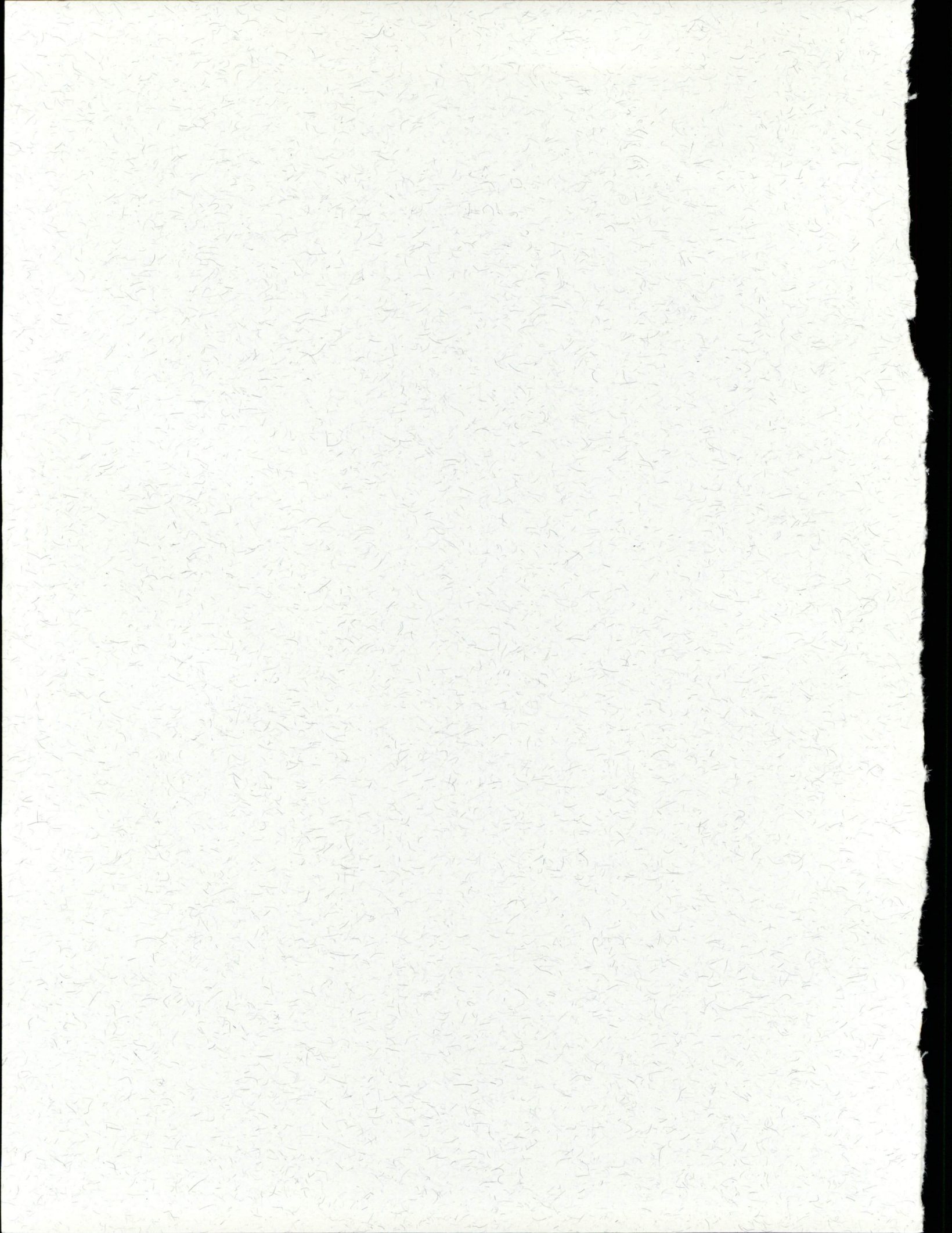
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|--------------------------------------|-------------------------------|
| 1. JW Marriott Hotel | 8. United States Capitol |
| 2. The White House | 9. Air and Space Museum |
| 3. Convention Center | 10. Hirshhorn Museum |
| 4. Museum of American History | 11. Smithsonian "Castle" |
| 5. Natural History Museum | 12. Freer Gallery |
| 6. National Gallery of Art | 13. Department of Agriculture |
| 7. National Gallery of Art East Wing | 14. Washington Monument |



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THE WHITE HOUSE CONFERENCE
ON SCIENCE & ECONOMICS RESEARCH



Briefing for U.S. Delegates
to
The White House Conference on Science and Economics Research
Related to Global Change

Wednesday, April 11, 1990
3:00 - 4:30 p.m.
Roosevelt Room

Dr. D. Allan Bromley, Co-chairman
Mr. Michael R. Deland, Co-chairman
Dr. Robert W. Corell, Conference Director
Dr. Franmarie Keel, Conference Coordinator
Dr. Nancy Maynard, OSTP
Dr. Howard Gruenspecht, CEA
Mr. David Struhs, CEQ
William D. Harris, William Harris Company (DOB: 6/25/47)
Rick (Richard) Davis, Black, Manafort Stone & Kelly (DOB 8/9/57)
Dr. Fred Bernthal, NSF
John Weiss, Senior Analyst, CIA (DOB: 3/21/58)
Richard Stakem, Dir. of Global Issues, CIA (DOB: 6/16/48)
Ahmed Meer, White House Conference Office (DOB: 1-5-39)

Delegates and/or their representatives

Secretary Clayton Yeutter
Administrator William K. Reilly
John Knauss, NOAA
Erich Bloch, National Science Foundation
Richard Schmalensee, Council of Economic Advisers
Fred Bernthal, National Science Foundation
J. Clarence Davies, EPA
Len Fisk, NASA
Colleen Getz
Charles Hess, Department of Agriculture
Richard Porter, Department of the Treasury
John Schrote, Department of the Interior
J. R. Spradley, Department of Commerce

AGENDA

Briefing for U.S. Delegates
to
The White House Conference on Science and Economics Research
Related to Global Change

Wednesday, April 11, 1990
3:00 - 4:30 p.m.
Roosevelt Room

1. Strategy and U.S. Participation in the Conference
 - Dr. D. Allan Bromley, Assistant to the President for Science and Technology
2. Review of the U.S. Position on Policy Matters Concerning Global Change
 - Dr. Frederick M. Bernthal, Deputy Director, National Science Foundation
3. The White House Conference in the Context of International Meetings on Global Change -- Past, Present, and Future
 - Dr. Bernthal
4. Review of Conference Agenda and Logistics
 - Dr. Robert W. Corell, Conference Director and Assistant Director for Geosciences, National Science Foundation
 - Dr. Franmarie Keel, Conference Coordinator
5. Delegate Affairs
 - Ahmed Meer, Conference Coordinator for Foreign Delegations and Senior Science Adviser, Department of State
 - Country Briefings

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8. For Future Insert (Test of Pres. Ltr to Delegates)
9. Media Questions and Answers
10. Schematics of Conference Plenaries and Breakouts
11. U.S. Response to Conference Questionnaire ✓
12. Climate Change Paper
13. For Future Insert (Info Packett to Foreign Embassies)
14. For Future Insert (Brochure on Global Stewardship)
15. For Future Insert (Charter for Conference)
16. For Future Insert (Statement of Principles)
17. Secretary Baker's Speech to the IPCC, January 30, 1989
18. IPCC Executive Summary
19. IPCC Policymakers' Summary
20. Draft Report of CEA Task Force on Economic Costs
21. Environmental Portion of the Economic Declaration of the Paris Summit, July 16, 1989
22. Fact Sheet on the President's Initiatives, U.S.-U.S.S.R. Summit at Malta, December 4, 1989
23. "The Economy and the Environment," Chapter 6, Economic Report of the President
24. For Future Insert (Reilly Article)
25. For Future Insert

PRELIMINARY AGENDA
FOR
THE WHITE HOUSE CONFERENCE
ON
SCIENCE AND ECONOMICS RESEARCH RELATED
TO
GLOBAL CHANGE

April 17-18, 1990
Washington, D.C.

MONDAY - APRIL 16, 1990

12:00 pm **Early Registration**

J.W. Marriott Hotel
1331 Pennsylvania Avenue
Washington, D.C.

1:00 pm **Pre-Conference Luncheon**

Hosted by Ronald Roskens, Administrator
Agency for International Development

7:00 pm **Reception**

National Air and Space Museum
Independence Ave., Washington, D.C.

Hosts:

Robert A. Mosbacher, Secretary of Commerce
Richard H. Truly, Administrator of NASA
Martin Harwit, Director, National Air
and Space Museum

TUESDAY, APRIL 17, 1990

8:00 am **Continental Breakfast**

9:30 am **PLENARY SESSION I** (Moderator: Michael J. Boskin)

Welcoming Remarks:

Nicholas F. Brady - Secretary of the Treasury

Welcome: President George Bush

Goals and Expectations for the Conference -

D. Allan Bromley

TUESDAY, APRIL 17, 1990 (Continued)

Opening Remarks by Visiting Delegate -

J. Janowski, Deputy Prime Minister of Poland

11:00 am **PLENARY SESSION II** (Moderator: Michael R. Deland)

Theme I Presentation:

"The Science and Economics Research Challenge" - D. Allan Bromley

Theme II Presentation:

"Integrating Science and Economics Research in the Policy Process" - Michael J. Boskin

Theme III Presentation:

"Building Partnerships for Science and Economics Research" - Michael R. Deland

12:00 pm **Luncheon**

Speaker: William Reilly, Administrator,
Environmental Protection Agency

1:45 pm **WORKING GROUP SESSIONS**

Working Group Session I:

Two Visiting Delegates serve as Co-Chairmen of each of the A, B, and C Working Groups

Working Group Session II:

Two Visiting Delegates serve as Co-Chairmen of each of the A, B, and C Working Groups

5:30 pm **Working Group Sessions End**

6:00 pm **Reception** at the National Academy of Sciences Building, hosted by Frank Press, President of the National Academy of Sciences and Robert White, President of the National Academy of Engineering

8:00 pm **Dinner** in the Diplomatic Suite of the State Department

IPCC Address - Bert Bolin, Chairman, IPCC

WEDNESDAY, APRIL 18, 1990

8:00 am **Continental Breakfast**

9:00 am **WORKING GROUP SESSIONS**

Working Group Session III:

Two visiting Delegates serve as Co-Chairmen
of each of the A, B, and C Working Groups

11:00 am **Working Group Session IV:**

Three United States Delegates serve as
Chairmen of the A, B, and C Working Groups

12:00 pm **Luncheon**

Speaker: Admiral James D. Watkins, Secretary
Department of Energy

1:45 pm **CONCLUDING SESSION** (Moderator: D. Allan Bromley)

Review of Co-Chairmen's Report

Michael R. Deland for
the Conference Co-Chairmen

Closing Remarks - President George Bush

3:00 pm **Conference Ends**

OVERVIEW OF THE CONFERENCE

GOALS AND OBJECTIVES OF THE CONFERENCE:

President **George Bush** invited the Heads of State from seventeen nations and the leadership of the E.C. and the OECD to send ministerial-level delegations to the White House Conference on Science and Economics Research Related to Global Change. The Conference is designed to bring together government leaders in science, economics, energy, and the environment concerned with the central research issues of Global Change. The Conference is designed to advance understanding of Global Change phenomena, to enhance international cooperation, and to build the basis for future efforts among nations to integrate more fully science and economics research into the policy process. The Conference adds a new dimension to the international dialogue on Global Change — the proposition that economics, both analysis and research on economic policy and economic consequences, is an essential link between the science of Global Change and policy alternatives. Science and economics research can also serve to identify and develop technologies and policy instruments that relax the tension between growth and Global Change, allowing for greater progress on both fronts. To address these broad goals, the Conference will:

- **Focus on science and economics research** issues relevant to policy on Global Change,
- Address important next steps to substantially **enhance and broaden international understanding** of science and economics research issues that relate to Global Change,
- **Highlight the special role that economics plays** in integrating the science of Global Change with the policy process,
- **Demonstrate linkages between science and economics** research and domestic and international policy processes, and
- Seek to take the initial steps to **implement joint international science and economics research efforts.**

The Conference is conceived as an integral part of the ongoing international process to understand the science of and policy options relating to global environmental issues. The need to improve substantially understanding of both the science and economics of Global Change has been noted by many world leaders. The Conference, therefore, focuses on science and economics research issues as a complement to the ongoing Intergovernmental Panel on Climate Change (IPCC) and other international forums that seek to address the issue of Global Change. It is hoped that the results of the Conference will contribute to the IPCC process and other ongoing international debates and actions.

The Conference focuses on "Global Change," an area of research concerned with understanding the fundamental processes that govern the Earth system functions. Global Change encompasses such diverse and interrelated issues as ozone depletion, greenhouse gases, climate change, food security, water supply, sea level changes, wetlands, deforestation, biodiversity, population change, and energy demand.

The Conference will provide a forum for international leaders to address the complex science and economics research issues central to the policy process, including:

- How well can we predict temperature trends in the decades ahead?
- How "good" are our global scale models, such as models to predict temperature changes?
- How well can we predict the interconnections between global environmental change and the resulting social and economic impacts?
- What are the economic consequences of adapting to or mitigating Global Change?
- How "good" are the models used to assess these economic consequences and their impact on the well-being of humanity?

By addressing such questions, it is hoped that the nations might pledge to enhance joint international research efforts that focus on rapid improvement of both scientific and economic knowledge and development of the necessary infrastructure to implement such efforts.

To address these complex and interrelated issues, President Bush invited heads of state from a small group of nations to send delegations led by ministerial-level officials. The Conference was conceived with the idea that a representative group of countries would be invited to participate. Their selection was based on the simple criteria that the meeting should include countries or organizations of countries that have substantial populations, large land masses, industrialized economies, heavy future energy needs, major research infrastructures, or have provided international leadership on issues related to climate and Global Change. These countries and organizations were selected:

1. Australia
2. Brazil
3. Canada
4. Federal Republic of Germany
5. France
6. India
7. Indonesia
8. Italy
9. Japan
10. Mexico
11. Netherlands
12. Nigeria
13. Norway
14. Poland
15. Soviet Union
16. United Kingdom
17. Zaire
18. European Community
19. OECD

THE EXPECTED RESULTS OF THE CONFERENCE

The Conference will provide an opportunity to address the science and economics research issues related to Global Change in the context of the policy process. To accomplish these goals, the Conference will focus on and seek to promote:

- A substantially *enhanced understanding* of science, economics, and environmental research agenda central to the needs of future Global Change policy development.
- A *substantive understanding of the uncertainties* in both science and economics knowledge of changes in the global environment of the planet.
- *Increased mutual understanding* of and sensitivity to the substance of science and economics research between both of those research communities.
- *Increased sensitivity* by the two research communities to the policy needs evolving in such areas as environmental and energy policy, and vice versa.
- A *solid* and well implemented science and economics *research effort* as a prerequisite for a complement to evolving efforts by nations to address the international policy questions of global environmental changes.
- A communication *network among national leaders* concerned with, and responsible for, the research and policy agenda related to Global Change. More particularly, this Conference provides a "first-ever" opportunity to forge a partnership between the science and economics research communities and the policy-makers.

To provide a vehicle to focus on these vital issues, the Conference will include two Plenary Sessions and several concurrent Working Groups, which will address the three major themes of the Conference:

- The Science and Economics Research Challenge
- Integrating Science and Economics Research in the Policy Process
- Building a Partnership for Science and Economics Research

The Conference is expected to produce a Co-Chairmen's Report, which will outline the deliberations of the Conference and set forth common actions designed to expand research and cooperation among nations.

As President Bush stated in his invitation letter, "It is my hope that the expertise, experience, and data available in our respective countries can be brought together in a more integrated and coherent fashion. By working together, our nations can enhance international cooperation in these vital areas and contribute to the success of the ongoing IPCC process."

A Statement of The
Context and Challenges Facing the
White House Conference
on Science & Economics Research
Related To
Global Change

**SCIENCE AND ECONOMICS RESEARCH
FOR GLOBAL STEWARDSHIP**

Global stewardship is our shared responsibility and our shared *opportunity*. We must manage the Earth's natural resources in ways that assure the sustainability of humanity on this planet and in ways that maximize our potential for growth and opportunity for all. Global stewardship is a continuing process of political, economic and social decision-making that meets the needs of the present generation while expanding the opportunities of future generations.

Global stewardship will become a dominant scientific, economic and environmental issue of the 21st century. The experience of the past 45 years has shown that growth can be achieved only through the synergy of democratic political institutions and market economic systems. But just as democratic institutions are expanding, our ability to grow could be limited by changes in our already stressed environment. Solutions must be found which will protect the quality of our natural environment while allowing for the economic growth necessary to sustain and improve the living standards of a growing world population.

For perhaps the first time in human history, we now understand that our progress depends on *accounting* for our environmental resources and using them wisely. A new understanding of complex environmental systems is emerging. This understanding means that we are now called upon to create new directions for our creative energies and technologies. *Global stewardship is the key.*

To exercise effective stewardship, we must advance our knowledge of natural and human systems. We must create solutions that join economic growth with sound management of our environment. Meeting this challenge will require an integration of scientific, economic, and environmental concerns—an integration which moves global stewardship and human sustainability to center stage.

We need new tools to effectively evaluate how to respond to global environmental changes. Science and economics research can provide some of the tools needed to understand and properly manage our changing planet. Global change is concerned with such diverse but interrelated issues as ozone depletion, greenhouse gases, climate change, food security, water supply, sea level changes, wetlands, deforestation, biodiversity, population changes, and energy demands. A common ingredient in each of these issues is the level of uncertainty about the scale at which these changes are occurring and humanity's relative contribution to the change. There is also uncertainty regarding the social and economic consequences of change itself and of policy measures which might be taken to address it. As global stewards we must address these uncertainties by increasing our scientific and economic knowledge and take justifiable actions to manage global change...with due consideration given to the uncertainties which exist.

Therefore, the challenges of global stewardship require agreement in these three areas:

- Science and economics uncertainties—research challenges;
- Strategies for and challenges to integrating economics and science research; and
- Building better international partnerships for economics and science research.

Our existence depends on our ability to draw sustenance from the natural world while supporting the systems that regenerate that world. Building an integrated program of economics and science research is the step we must take today. Global stewardship is not a fixed state but a process of change in which environmental and economic values are brought into balance to meet human needs and to expand human prospects. Let us join together and accept the challenge of Global Stewardship.

George Bush

REPORT.410

THE WHITE HOUSE
WASHINGTON, D.C.

The White House Conference
ON
Science and Economics Research Related to Global Change
DRAFT OF CO-CHAIRMEN'S CONFERENCE REPORT

GOALS AND OBJECTIVES OF THE CONFERENCE:

A White House Conference, initiated by President George Bush, on Science and Economics Research Related to Global Change was held in Washington, D.C., April 16-18, 1990. Conference Co-Chairmen were, the Chairman of the President's Council of Economic Advisers, Dr. Michael J. Boskin, the Assistant to the President for Science and Technology, Dr. D. Allan Bromley, and the Chairman of the White House Council on Environmental Quality, Mr. Michael R. Deland. Seventeen nations and the leadership of the E.C. and the OECD sent ministerial-level delegations to the Conference (See Appendix I for a List of Delegates). The Conference sought to add a integrating focus for international thought on Global Change, by introducing the concept of "Global Stewardship", and by adding a new dimension to the international dialogue on Global Change - the proposition that economics, both analysis and research on broad economic policy and on economic consequences of policy options, is an essential link between the science of Global Change and policy alternatives.

GLOBAL STEWARDSHIP

(INSERT GLOBAL STEWARDSHIP TEXT HERE)

THE CONFERENCE AGENDA

To address the substantive Conference goals, the agenda focussed the presentations and discussions on:

- o Science and economics research issues relevant to policy on global change,
- o Important next steps that substantially enhance and broaden international understanding of science and economic research issues that relate to global change,
- o The special role that economics plays in integrating the science of Global Change with the policy process,
- o Demonstrating linkages between science and economics research results and both domestic and international policy processes, and
- o Framing the initial steps towards strategies for implementing joint international science and economics research efforts.

Tuesday
April 10, 1990
1:15 pm

The Conference focussed on "Global Change," a scope of research interests that evolved out of the sciences that are concerned with understanding the fundamental processes that govern the way the global Earth system functions. Global Change encompasses such diverse and interrelated issues as ozone depletion, greenhouse gases, climate change, food security, water supply, sea level changes, wetlands, deforestation, biodiversity, population changes, and energy demands.

The Conference was conceived as an integral part of the on-going international process to understand the science of and policy options relating to global environment issues. The need to substantially improve understanding of both the science and economics of global change has been noted by virtually all world leaders. The Conference, therefore, focused on scientific and economic research issues as a complement to the on-going Intergovernmental Panel on Climate Change (IPCC) and other international forums that seek to address the research agenda for Global Change.

The Conference provided a forum of international leaders to address a variety of complex science and economics research issues central to the policy process, for example:

- How well can we predict temperature trends in the decades ahead?
- How "good" are our global-scale models, such as models to predict temperature changes?
- How well can we predict the interconnections between global environmental change and the resulting social and economic impacts?
- What are the economic costs of adapting to or mitigating global change?
- How "good" are the economic models used to compute these costs?

By having ministerial-level discussions of such questions, it was hoped that nations might join together to enhance cooperative international research programs that focus on rapid improvement of both scientific and economic knowledge.

To address these complex and interrelated issues, ministerial-level delegations were invited to the Conference from a representative group of nations. The Conference was conceived with the idea that a small representative group of countries would participate. Their selection was based on the simple criteria that the meeting should be modest in size and include countries or organizations of countries that have substantial populations, large land masses, industrialized economies or heavy future energy needs, major research infrastructures, or have provided international leadership on issues related to climate and global change. A representative group of countries was selected, including:

1. Australia
2. Brazil
3. Canada
4. Federal Republic of Germany
5. France
6. India
7. Indonesia
8. Italy
9. Japan
10. Mexico
11. Netherlands

Tuesday
April 10, 1990
1:55 pm

12. Nigeria
13. Norway
14. Poland
15. Soviet Union
16. United Kingdom
17. Zaire
18. European Community
19. OECD

CONFERENCE PLENARY AND WORKING GROUP SESSIONS

The Conference Plenary and Working Group Sessions provided an opportunity for delegates to address the critical science and economics research issues related to Global Change. The agenda was designed to provide a forum to:

- o Substantially increase collective understanding of the critical scientific, economic, and environmental research agenda central to the needs of future global change policy development.
- o Identify the uncertainties in both scientific and economics knowledge critical understanding changes in the global environment of the planet.
- o Increase mutual understanding of and sensitivity to scientific and economic research efforts between both of those research communities.
- o Increase sensitivity by the two research communities to the policy needs in the environmental and energy arena, and visa versa.
- o Foster the concept of the importance of a solid and well implemented scientific and economics research effort, as a pre-requisite for and parallel complement to, the evolving efforts by nations to address the international policy questions of global environmental changes.
- o Enhance communications and establish a broader "network" of among national leaders, concerned with and responsible for, the research and policy agenda related to global change. The Conference sought to provide a forum to forge partnerships between the scientific and technical research communities and the policy-makers.

To provide a vehicle to focus on these vital issues, the Conference Program was designed around a balance between several Plenary Sessions and concurrent Working Groups that addressed three major themes:

- o Theme I: The Science and Economics Research Challenge
- o Theme II: Integrating Science and Economics Research in the Policy Process
- o Theme III: Building Partnerships for Science and Economics Research

PLENARY SESSIONS

Tuesday
April 10, 1990
1:55 pm

The program for the Conference was divided into three broad components: (i) One half day of Opening Plenary Sessions, (ii) two half days of Working Groups Sessions, and (iii) a half day of integrating and Summary Plenary Sessions.

OPENING PLENARY SESSIONS

Opening: The Conference was opened with a presentation by Secretary of the Treasury, Nicholas F. Brady. The welcome addressed focused on _____ Include Summary of Brady's Remarks.

Address by President George Bush: The President of the United States, George Bush spoke to the Conference and his central messages was _____. Include a Summary of President Bush's Speech. Full Text of the President's Speech is appended in Appendix A.

Remarks by _____, Delegate from _____. The Honorable _____, from _____, provided the Conference with a visiting delegation perspective on the Conference, during which _____ Include a Summary of his remarks. Include full text if available in the Appendices.

Central Themes of the Conference: The Three Conference Co-Chairmen gave major addresses on the three Conference Themes, the purpose of which was to outline the central issues of the Conference and to provide a focus on each Theme for the Working Group Sessions. The full text of these three speeches is appended in Appendix B.

Theme I: The Science and Economics Research Challenge. Dr. D. Allan Bromley —
— Include a Summary of Bromley's Speech—

Theme II: Integrating Science and Economics Research in the Policy Process.
Dr. Michael J. Boskin — Include a Summary of Boskin's Speech—

Theme III: Building Partnerships for Science and Economics Research.
Mr. Michael R. Deland — Include a Summary of Deland Speech—

Visiting Delegations Perspectives on the Themes. Three delegates formed a Panel to discuss the Themes and to give several visiting delegations views on the Themes of the Conference.

- o Foreign Delegate - Include Short Summary Here
- o Foreign Delegate - Include Short Summary Here
- o Foreign Delegate - Include Short Summary Here

(Include full text if available in Appendices)

MAJOR ADDRESSES

There were two major addresses given during the Conference Luncheons.

- o Admin. William Reilly - Include a Summary of that Address
- o Sec. James D. Watkins - Include a Summary of that Address

Thursday
April 10, 1990
1:55 pm

The full text of both of these addresses is included in Appendix C.

WORKING GROUP SESSIONS

The Conference agenda was organized so that delegates were divided into three Working Groups (Working Groups A, B, and C), each of which consisted of a mix of ministerial-level delegates from science, economics, and the environment agencies of government, and in some cases from energy agencies. All countries were represented in each Working Group. The list of Working Groups is contained in Appendix D. Four Working Group Sessions met sequentially, two on Tuesday afternoon of April 17 and two on Wednesday morning of April 18. The first sessions were devoted to the three Conference Themes and the fourth was designed as a session to integrate the discussions and to prepare a written summary of the Working Group deliberations as a contribution to the Co-Chairmen's Conference Report. Those reports are summarized herein.

Working Group A: Summary Report of Working Group "A"

Working Group B: Summary Report of Working Group "B"

Working Group C: Summary Report of Working Group "C"

SUMMARY PLENARY SESSIONS

SUMMARIES OF CONCLUDING ADDRESSES AND PRESENTATIONS

- 1.) **Foreign Delegations Summary of Conference:** Three visiting delegates reviewed the results of the Conference from their perspective, a summary of those remarks follow. _____Include the comments here. (Include full text if available in Appendices)
- 2.) **Working Group Leader Summaries of the Conference:** The three Working Groups gave summaries of their deliberations, a summary of which follows. _____Include it here. (Include full text if available in Appendices)
- 3.) **Conference Co-Chairmen Summaries of the Conference:** The three Conference Co-Chairmen outlined their summary views on the Conference, a summary of those comments follow. _____Include those here. (Include full text if available in Appendices)
- 4.) **Closing Remarks by President George Bush:** The President of the United States, George Bush presented his closing remarks to the Conference. _____Include a Summary of President Bush's Speech. Full Text of the President's Remarks is appended in Appendix A with the Opening Address.

SUMMARIES OF PROPOSALS FOR ACTION OFFERED DURING THE CONFERENCE

The delegates of the Conference concluded that several specific actions, developed during the Conference should be addressed in the period immediately after the Conference. These include:

- 1.) The Working Groups considered a proposal by the U.S. to endorse the principles contained in a "Charter for Cooperation in Science and Economics Research Related to Global Change", the draft of which is contained in Appendix E. The general consensus of the Conference was _____Include the specific results of discussions on this topic here.

Tuesday
April 10, 1990
1:55 pm

including any recommended action steps.

- 2.) The U.S. proposed an initiative designed to initiate international and jointly sponsored research "centers" that focus research on the science and economics of global change. The purpose of these centers, which might be called International Institutes for Research on the Science and Economics of Global Change, is to develop internationally recognized "Center of Excellence" where both resident and visiting scholars address key research topics that contribute research results to the international policy process. A draft of the U.S. proposal is contained in Appendix F. The Working Groups discussed this proposal and concluded _____ Include the results of those discussions here.
- 3.) The U.S. proposed an initiative to increase communications among nations engaged in research on global change. The U.S. proposal suggested that nations join together in what might be called a "Global Change Communications Network". The proposal suggested that a joint effort be undertaken that builds on the available technology for data and information transfer, electronic mail, and other telecommunications technologies. A draft of the concept is enclosed in Appendix G. The Working Groups discussed this matter and concluded that _____ Include the results of those discussions here.
- 4.) The U.S. proposed that the Conference consider endorsing a "Statement of Principle" for developing an international Strategy for Cooperation in Scientific and Economic Research in Global Change. The draft "Statement" is attached in Appendix H. The "Statement of Principles" outlines the basis for developing a strategy among nations for a cooperative international effort to implement joint scientific and economics research programs, including sharing of scientific and economic data, coordinating the development of international global observing systems, and facilitating joint research efforts to substantially improve the capabilities of models to predict controlling global and regional environmental process (i.e. GCM's). The "Statement" outlines the essential ingredients for an overall strategy to implement cooperative research internationally. The focus would be on research efforts that can be substantially enhanced by joint efforts that build on the expertise, experience, and data available of each participating country. The U.S. suggested that if the "Statement of Principles" is endorsed by the Conference, then a Task Team of interested nations would prepare a Draft Strategy, within a few months, for consideration by government agencies responsible for implementing Global Change research programs and projects. The proposal suggested that such a Strategy then could lead to what might be called, an "International Global Change Research Program". The proposal suggested that such a more fully coordinated international research effort could substantially assist the on-going policy debate and could support other up-coming international meetings, such as the IPCC and the Second World Climate Conference. The proposal builds upon existing discussions initiated by the International Council of Scientific Unions (ICSU) during its recent Annual Meeting in Lisbon, in October, 1989. The proposal is intended to fully facilitate the implementation of the research programs of the World Climate Research Program (WCRP), the International Geosphere-Biosphere Program (IGBP), and others. The Working Groups considered the proposal and concluded _____ Include the results of the Working Group discussions here.
- 5.) Other proposals - include here.

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APPENDIX A

PRESIDENTS TWO SPEECHES
(To be Added at Conference)

Tuesday
April 10, 1990
1:55 pm

LUNCHEON SPEECHES
(By Wm. Reilly and James Watkins)
(To be Added at Conference)

Tuesday
April 10, 1990
1:15 pm

WORKING GROUPS MEMBERSHIP LISTS
(To be Added at Conference)

Tuesday
April 10, 1990
1:55 pm

**CHARTER FOR COOPERATION
in the
Science and Economics Research Related to Global Change***

Government officials of Science, Economics, and the Environment from eighteen nations, the European Community (EC), and the Organization for Economic Cooperation and Development (OECD) gathered in Washington, D.C. on April 16-18, 1990, to attend a White House Conference on Science and Economics Research Related to Global Change. The Conference was designed to address important next steps for substantially enhancing and broadening international understanding of science and economic research related to Global Change. The delegates to the Conference noted that:

WHEREAS:

- o Scientific evidence demonstrates that the Earth and its environment are changing on time and spacial scales unknown to humankind,
- o Scientific uncertainty remains as to the contributions made by natural variability in Earth system processes and those made by impacts from anthropogenic sources, hence limiting the ability of science to predict, with acceptable accuracy, the future behavior of the Earth system.
- o Gaps in scientific understanding substantially limit the abilities of nations to determine the economic and societal impacts of global changes in the environment,
- o World leaders are considering unprecedented postures and actions to address the potential economic and social implications of these changes, and
- o These national and international developments, taken in total, have placed global environmental issues central on the agenda of international affairs.

THEREFORE:

The nations gathered at the White House Conference on Science and Economics Research Related to Global Change will seek to:

- o Increase and coordinate their science and economics research programs with internationally planned research efforts,
- o Work together to develop national science and economic research programs that complement and contribute to a coherent international effort,
- o Work to enhance existing international mechanisms for planning and implementing science and economics research programs, and to foster, when necessary and appropriate new mechanisms to foster cooperation among the world's governments and international agencies,
- o Work toward full participation of all nations in the formulation, refining, and implementation of the science and economics research agenda,
- o Encourage the nations of the world to contribute resources and personnel to the research agenda in measure and kind reflecting national capabilities,

Tuesday
April 10, 1990
1:55 pm

- o Collaborate with other nations in support of education, training, and human resources development that is focussed on the research agenda and that supports full participation by developing countries, and
- o Work toward developing cooperative access to pertinent research facilities and research data and information by all nations and toward developing indigenous research activities relevant to the global environment change research program in all participating nations.

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Tuesday
April 10, 1990
1:55 pm

APPENDIX G

GLOBAL CHANGE COMMUNICATIONS NETWORK CONCEPT PAPER

Tuesday
April 10, 1990
1:35 pm

STATEMENT OF PRINCIPLES
FOR
IMPLEMENTATION STRATEGIES FOR COOPERATIVE RESEARCH PROGRAMS

Tuesday
April 10, 1990
1:55 pm

APPENDIX I

LIST OF DELEGATIONS
(To be Added at Conference)

Tuesday
April 10, 1990
1:55 pm

As of 4/9; Noon

HEADS OF DELEGATIONS

COUNTRY	NAME OF DELEGATE	TITLE
Australia	Neal Blewett	Minister for Trade Negotiations
Brazil	Jose Lutzenberger (Tentative)	Secretary of Environment
Canada	Lucien Bouchard	Federal Environment Minister
Federal Republic of Germany	Klaus Toepfer	Federal Environment Minister
France	Hubert Curien	Minister of Research & Technology
India	Maneka Gandhi	Min. of State for Environment
Indonesia	B.J. Habibie	Min. of State for Res. & Tech.
Italy	Adolfo Battaglia	Minister of Industry
Japan	Ishimatsu Kitagawa	Minister of Environment
Mexico	Patricio Chirinos	Sec. of Urban Dev. & Ecology
Netherlands	Hans Alders	Minister of Environment
Nigeria	Maj. Genl. Mamman Kontagora	Minister of Works and Housing
Norway	Kristin Hille Valla	Minister of Environment
Poland	Jan Janowski	(also Head of S&T Cooperation) Deputy Prime Minister
Soviet Union	Nikolay Laverov	Chmn. St. Cmte. Sci. & Tech.
United Kingdom	David Trippier	Minister for Environment
United States	Nicholas Brady	Secretary of Treasury
Zaire	Citoyen Lobo Kanza Kanza	Depty. Minister of Environment
European Community (EC)	**Laurens Jan Brinkhorst	Director-General for Environment
OECD	Robert Cornell	Deputy Secretary-General

**Some confusion between EC and Irish. We now have 14 names; also indications that delegation head might be Filippo Maria Pandolfi, Commissioner (Vice President) in charge of Science, Research and Development.

**Heads of Delegation/Minister-level
Reception/Photo-up**

Australia	Neal Blewett	Member of Parliament, Minister for Trade Negotiations
Brazil	Jose Lutzenberger	Environment Secretary
	Jose Goldemberg	Science Secretary
Canada	Lucien Bouchard	Federal Environment Minister
	Jak Epp	Federal Energy Minister
France	Hubert Curien	Minister of Research and Technology
	Brice Lalonde	Secretary of State for the Environment
Germany	Professor Dr. Klaus Topfer	Federal Minister for the Environment, Nature Protection and Nuclear Safety
India	Ms. Maneka Gandhi	Minister of State for Environment and Forests
Indonesia	Prof. Dr. Ing. B.J. Habibie	Minister of State for Research and Technology; Chairman of the Agency for the Assessment and Application of Technology
Italy	Hon. Adolfo Battaglia	Minister of Industry, Head of Delegation

Japan	Ishimatsu Kitagawa	Minister of State, Director General of Environment Agency
	Shigeto Nagano	Parliamentary Vice Minister of Science and Technology
Mexico	Lic. Patricio Chirinos	Secretary of Urban Development and Ecology
Netherlands	J.G.M. Alders	Minister, Ministry of Housing, Physical Planning and Environment
Nigeria	Major General Mamman Kontagora	Minister of Works and Housing
	Gordian Ezekwe	Minister of Science and Technology
Norway	Kristin Hille Valla	Minister of Environment
	Einar Steensnaes	Minister of Education and Science
Poland	Jan Janowski	Deputy Prime Minister; Head of the Agency for Science and Technological Progress and Application
U.S.S.R.	Nikolay Pavlovich Laviorov	Chairman of the U.S.S.R. State Committee on Science and Technology
	Juriy Antonievich Israel	Chairman of the U.S.S.R. State Committee on Hydrometeorology
United Kingdom	David Trippier RD, JP, MP	Minister for the Environment and Countryside

Zaire

Citoyen Lobo Kanza Kanza

Secretary of State (Deputy
Minister); Ministry of
Environment and Conservation
of Nature

EC

Laurens Jan Brinkhorst

Director-General for
Environment, Nuclear Safety
and Civil Protection

Padraig Flynn

Irish Minister for
Environment

OECD

Robert Cornell

Deputy Secretary-General

PRELIMINARY
DELEGATION LIST

CURRENT AS OF
APRIL 10, 1990; 3:00 P.M.

Additions: Netherlands confirmed
Revised Japanese names
India confirmed/additional names
Zaire final names
Brazil additional name
OECD additional name
Poland confirmation
FRG name change

AUSTRALIA

(tentative)

<u>Name</u>	<u>Title</u>
Neal Blewett	Member of Parliament, Minister for Trade Negotiations
Professor Ralph Slatyer	Chief Scientist, Department of Prime Minister and Cabinet
Dr. McGregor Tegart	Secretary, Australian Science and Technology Council
Alan Brown	First Assistant Secretary, Department of Foreign Affairs and Trade
Nelson Quinn	First Assistant Secretary, Department of Arts, Sport, Environment, Tourism and Territories
Dr. John Zillman	Director, Bureau of Meteorology
Rod Shogren	Assistant Secretary, Treasury
Robert Allan	Acting Assistant Secretary, Department of Primary Industries and Energy
(Official from Department of Industry, Technology and Commerce)	
Michael Lumb	Victorian State Government

April 10, 1990

BRAZIL

(tentative)

Name

Title

Jose Lutzenberger

Environment Secretary

Jose Goldemberg

Science Secretary

Marcos Gianetti

Fonseca, National
Secretary of Planning,
Ministry of Economics

April 10, 1990

CANADA

(tentative)

<u>Name</u>	<u>Title</u>
Lucien Bouchard	Federal Environment Minister
Jak Epp	Federal Energy Minister
Dr. Geraldine Kenney Wallace	Chair, Science Council of Canada
Dr. Arthur W. May	President, Natural Sciences and Engineering Research Council
Dr. Anne White	Chair, Canadian IGBP Committee
Liz Dowdswell	Assistant Deputy Minister, Atmospheric Environment Service, Environment Canada
Judith Maxwell	Chair, Economic Council of Canada
Mr. Olton	Assistant Deputy Minister, Energy Policy Department of Energy Mines and Resources
George Anderson	Assistant Deputy Minister, Department of Finance
His Excellency Derek Burney	Ambassador to the United States

April 10, 1990

EUROPEAN COMMUNITY

(tentative)

<u>Name</u>	<u>Title</u>
Laurens Jan Brinkhorst	Director-General for Environment, Nuclear Safety and Civil Protection
Jurgen Henningsen	Director for Environmental Quality and Natural Resources
Michael Emerson	Director for Economic Evaluation of Community Policies, Directorate- General for Economic and Financial Affairs
Philippe Bourdeau	Director for Environment and Non-Nuclear Energy Sources, Directorate- General for Science, Research and Development
Stanley Johnson	Director for Energy Policy, Directorate- General for Energy
David Wright	Central Advisory Group, Secretariat-General of the Commission

April 10, 1990

FEDERAL REPUBLIC OF GERMANY

(confirmed)

<u>Name</u>	<u>Title</u>
Professor Dr. Klaus Topfer	Federal Minister for the Environment, Nature Protection and Nuclear Safety
Dr. Gebhard Ziller	State Secretary, Ministry for Research and Technology
Dr. Heinz Sandhager	Director General, Federal Ministry of Transport
Baldur Wagner	Assistant Secretary, Federal Chancellery
Dr. Mario Graf von Matuschka	Assistant Secretary, Foreign Ministry
Dr. Horst Glatzel	Deputy Assistant Secretary, Federal Chancellery
Walter Lotz	Deputy Assistant Secretary, Ministry of Economics
Professor Dr. Ansgar Vogel	Deputy Assistant Secretary, Ministry for Environment, Nature Protection, and Nuclear Safety
Dietrich Kupfer	Director, Office of International Cooperation, Ministry for Environment, Nature Protection and Nuclear Safety
Professor Dr. Hartmut Gross	Scientist, Max Planck Society, Hamburg

April 10, 1990

FRANCE

(tentative)

<u>Name</u>	<u>Title</u>
Hubert Curien	Minister of Research and Technology
Brice Lalonde	Secretary of State for the Environment
Jean Audouze	Science Advisor to the President
Claude Alegre	Special Advisor to the Minister of Education
Ambassador Jean Ripert	Ministry of Foreign Affairs (Environment)
Yves Martin	Chairman of the Interministry Committee on Greenhouse
Delphine Borione	Ministry of Foreign Affairs
Andre LeBeau	General Director of the Meteorological Center
Philippe Nasse	Ministry of Economy and Budget
Sylvie Faucheux	Professor of Economy at Paris I

April 10, 1990

INDIA

(confirmed)

<u>Name</u>	<u>Title</u>
Mrs. Maneka Gandhi	Minister of State for Environment and Forests
Mahesh Prasad	Secretary of Ministry of Environment and Forests
Dr. A.P. Mitra	Director-General, Council for Science and Industrial Research
Prabhakar Menon	Deputy Permanent Representative to the United Nations
Lalit Man Singh	Deputy Chief of Mission, Indian Embassy in Washington
Anil Kumar	Economics Minister, Indian Embassy in Washington
J.P. Gupta	Science Counselor, Indian Embassy in Washington

April 10, 1990

INDONESIA

(confirmed)

Name

Title

Professor Dr. Ing. B.J. Habibie

Minister of State for
Research and Technology;
Chairman of the Agency
for the Assessment and
Application of Technology

Professor Dr. Samaun Samadikun

Chairman of the
Indonesian Institute of
Sciences

Professor Dr. John A. Katili

Vice Chairman of the
National Research Council

Professor Dr. Gunawan Satari

Permanent Secretary,
Office of the Minister of
State for Research and
Technology

Mr. Poedji Kuntarso, MA

Director General for
Foreign Economic
Relations; Ministry of
Foreign Affairs

Professor Dr. Rustam Didong

Deputy Chairman for
Economic Affairs,
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Planning Agency

Professor Dr. Harsono Wirjosumarto

Deputy Chairman for
Technology Development;
Agency for the Assessment
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Technology

Professor Dr. S.B. Joedono

Assistant Minister IV
(Industry, Energy and
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Coordinating Minister for
the Economy, Finance,
Industry and Development
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INDONESIA

(continued)

Name

Title

Dr. M. Alwi Dahlan

Assistant Minister I
(Population), Office of
the Minister of State for
Population and the
Environment

His Excellency Abdulrachman Ramly

Ambassador of the
Republic of Indonesia to
the United States of
America

ITALY

(tentative)

<u>Name</u>	<u>Title</u>
Hon. Adolfo Battaglia	Minister of Industry, Head of Delegation
Professor Umberto Colombo	Director of the National Agency for Nuclear and Renewable Energies
Professor Giuseppe Biorci	Vice President of the National Research Council
Professor Giuseppe Bianchi	Director General for Energy Sources, Ministry of Industry
Professor Antonio Praturlon	President of the CNR Committee on Geological Sciences
Professor Roberto Frassetto	CNR Institute of the Dynamics of Great Masses
Professor Emilio Gerelli	Economic Counselor to the Minister of Environment
Dr. Corrado Clini	Director General for Pollution Prevention, Ministry of Environment
Professor Guido Visconti	Department of Physics, University of L'Aquila
Dr. Giovanni Sacco	Vice Director General of Treasury, Ministry of Treasury

April 10, 1990

JAPAN

(tentative)

Name

Title

Ishimatsu Kitagawa

Minister of State,
Director General of
Environment Agency

Shigeto Nagano

Parliamentary Vice
Minister of Science and
Technology

Koji Watanabe

Deputy Minister, Ministry
of Foreign Affairs

Tadashi Yasuhara

Director General,
Planning and Coordination
Bureau, Environment
Agency

Sousaburo Okamatsu

Director General,
Industrial Location and
Environmental Protection
Bureau, Ministry of
International Trade and
Industry

Jun Yoshikawa

Deputy Director General,
Coordination Bureau,
Economic Planning Agency

Yuji Ikeda

Deputy Director General,
United Nations Bureau,
Ministry of Foreign
Affairs

Keiichi Yokobori

Executive Director,
Research Institute of
International Trade and
Industry, Ministry of
International Trade and
Industry

Hiroto Ishida

Deputy Director General,
Director General's
Secretariat, Science and
Technology Agency

Dr. Michio Hashimoto

Special Advisor to the
Minister, Environment
Agency

April 10, 1990

MEXICO

(tentative)

<u>Name</u>	<u>Title</u>
Lic. Patricio Chirinos	Secretary of Urban Development and Ecology
Dr. Jose Sarukhan	Rector, National Autonomous University
Dr. Herminio Blanco	Undersecretary for Foreign Commerce, Secretariat of Commerce and Industrial Development
Ing. Alberto Escofet	Undersecretary for Energy, Secretariat of Energy, Mines and Parastatal Industries
Lic. Jose Angel Gurria	Undersecretary for International Financial Affairs, Secretariat of the Treasury
Fis. Sergio Reyes	Undersecretary for Ecology
Amb. Alberto Szekely	Legal Counsel, Secretariat of Foreign Affairs
Dr. Julian Adem	Director, Center for Atmospheric Studies, National Autonomous University
Dr. Manuel Ortega	Director General, National Council for Science and Technology
Hector Santana	Staff Aide to Secretary Chirinos

April 10, 1990

THE NETHERLANDS

(confirmed)

<u>Name</u>	<u>Title</u>
J.G.M. Alders	Minister, Ministry of Housing, Physical Planning and Environment
Dr. B.C.J. Zoeteman	Deputy Director-General, Directorate-General for Environment, Ministry of Housing, Physical Planning and Environment
Dr. H.M. Fijnaut	Director-in-Chief, Royal Netherlands Meteorological Institute, Ministry of Transport and Public Works
Dr. Pier Vellinga	Director, National Climate Change Programme, Directorate-General for Environment, Ministry of Housing, Physical Planning and Environment
N.D. van Egmond	Director, Environment, National Institute for Public Health and Environmental Protection
Dr. P.A.J. Tindemans	Director, Analysis and Evaluation, Directorate-General for Science Policy, Ministry of Education and Science
Professor Hans Opschoor	Chairman, Advisory Council for Research on Nature and Environment
Dr. P. Winsemius	Director, McKinsey and Company

NETHERLANDS

(continued)

D. Pietermaat

Environmental
Coordinator, Directorate-
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Ministry of Economic
Affairs

I.G. Roos

Principal Assistant of
Director, Economic
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Ministry of Foreign
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NIGERIA

(tentative)

NAME

TITLE

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Minister of Works and
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Gordian Ezekwe

Minister of Science and
Technology

Dr. Bukar Shais

Chairman of Federal
Environmental Protection
Agency

Dr. E. O. Aina

Director and Chief
Executive of Federal
Environmental Protection
Agency

Dr. J. A. Adejokun

Director, Department of
Meteorological Services,
Ministry of Aviation

Professor Tudor

Director of Nigerian
Institute of
Oceanographic and Marine
Research

(one unnamed official from Ministry of Justice)

Alhaji Ahmed Abubakar

Director General, Federal
Ministry of Finance and
Economic Development

NORWAY

(confirmed)

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Kristin Hille Valla	Minister of Environment
Einar Steensnaes	Minister of Education and Science
His Excellency Kjeld Vibe	Norwegian Ambassador to the United States
Oddmund Graham	Secretary General, Ministry of Environment
Kaare Bryn	Director General, Ministry of Foreign Affairs
Dr. Tore Olsen	Director General, Ministry of Education and Research
Per M. Bakken	Coordinator, Air Pollution, Ministry of Environment
Lorents Lorentsen	Director of Research, Central Bureau of Statistics
Professor Dr. Ivar Isaksen	University of Oslo
Leif Westegaard	Science Officer, Norwegian Embassy in Washington

April 10, 1990

THE OECD

(confirmed)

Name

Title

Robert Cornell

Deputy Secretary-General

John Ferriter

Deputy Executive
Director, International
Energy Agency

Bill L. Long

Director for Environment

George Kowalski

Senior Advisor for Energy
Economics and Head of the
Economic Analysis Staff,
International Energy
Agency

Andrew Dean

Head, General Economic
Division, Economic and
Statistics Department

Michael W. Moynihan

Head of the Washington
Publications and
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<u>Name</u>	<u>Title</u>
Professor Jan Janowski	Deputy Prime Minister, Head of the Office of Scientific and Technological Progress and Application
Professor Dr. Roman Andrzejewski	Deputy Minister of the Environment
Dr. Tadeusz Diem	Deputy Minister of National Education
Dr. Marcin Rybicki	Deputy Minister, Central Planning Office
Kazimierz Duchowski	Director of the Office III, Ministry of Foreign Affairs
Professor Stanislaw Wiackowski	Chairman, Parliamentary Commission on Environmental Protection
Dr. Wlodzimierz Bojarski	Member of the Senate Commission on National Economy
Professor Maciej Sadowski	Institute of Meteorology and Water Management
Professor Leszek Starkel	Polish Academy of Sciences
His Excellency Jan Kinast	Polish Ambassador to the United States

* All English speaking

April 10, 1990

SOVIET UNION

(confirmed)

<u>Name</u>	<u>Title</u>
Nikolay Pavlovich Laviorov	Chairman of the U.S.S.R. State Committee on Science and Technology
Juriy Antonievich Israel	Chairman of the U.S.S.R. State Committee on Hydrometeorology
Artem Andreevich Troizkiy	Deputy Chairman of the U.S.S.R. State Planning Committee
Victor Fedorovich Kostin	Deputy Chairman of the U.S.S.R. State Committee on Nature Protection
Alexandr Petrovich Metalnikov	Deputy Chairman of the U.S.S.R. State Committee on Hydrometeorology
Vladimir Mihailovich Kotliakov	Director of the Institute of Geography, U.S.S.R. Academy of Sciences
Juriy Vladimirovich Vakaluyk	Chief, Division of Global Geophysical Problems, Climate Change and Economic Consequences, State Committee on Hydrometeorology
Juriy Leonidovich Golubev	Assistant to the Chairman, State Committee on Hydrometeorology
Boris Vladimirovich Pihanov	State Committee on Hydrometeorology, Department of International Cooperation
Nataliy Jur'yevna Vail	State Committee on Hydrometeorology, Department of International Cooperation

April 10, 1990

UNITED KINGDOM

(tentative)

<u>Name</u>	<u>Title</u>
David Trippier RD, JP, MP	Minister for the Environment and Countryside
Sir John Fairclough	Chief Scientific Adviser, the Cabinet Office
Sir Crispin C.C. Tickell, GCMG, KCVO	United Kingdom Permanent Representative to the United Nations
Dr. John T. Houghton CBE	Director-General, Meteorological Office
J.G. Odling-Smee	Deputy Chief Economic Adviser; HM Treasury
Dr. David J. Fisk	Chief Scientist, Department of Environment
Dr. W. David Evans	Chief Scientist, Department of Energy
Dr. Eileen Buttle	Secretary, Natural Environment Research Council

UNITED STATES OF AMERICA

(confirmed)

<u>Name</u>	<u>Title</u>
Nicholas F. Brady	Secretary of the Treasury
Manuel Lujan, Jr.	Secretary of the Interior
Clayton Yeutter	Secretary of Agriculture
Robert A. Mosbacher	Secretary of Commerce
Admiral James D. Watkins (Ret)	Secretary of Energy
William K. Reilly	Administrator, Environmental Protection Agency
Richard H. Truly	Administrator, National Aeronautics and Space Administration
John A. Knauss	Under Secretary of Commerce for Oceans and Atmosphere; and Director, National Oceanic and Atmospheric Administration
Erich Bloch	Director, National Science Foundation
Richard Schmalensee	Member, Council of Economic Advisers

April 10, 1990

ZAIRE

(tentative)

Name

Title

Professor Lobo Kanza-Kanza

Secretary of State,
Department of the
Environment and
Conservation of Nature

Professor Ilashi Ushwengo

Economic Counselor,
Bureau of the President
of the Republic

Citizen Mankota Ma Mbaele

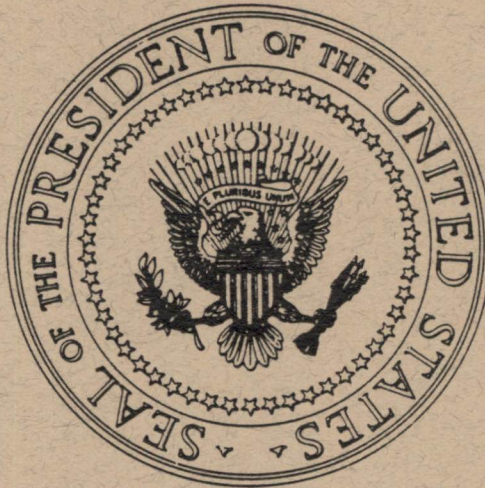
President-Delegue General
Chief Executive Officer,
Zairian Institute for the
Conservation of Nature,
Department of the
Environment and
Conservation of Nature

Citizen Logo Yvara Loy

Special Secretary to the
Secretary of State,
Department of the
Environment and
Conservation of Nature

Reilly speech
is in here,
too.

President's two
speeches are
in this book.



THE WHITE HOUSE CONFERENCE
ON SCIENCE AND ECONOMICS RESEARCH
RELATED TO GLOBAL CHANGE

April 17-18, 1990
Washington, D.C.

PLENARY PRESENTATIONS



THE WHITE HOUSE CONFERENCE
ON SCIENCE & ECONOMICS RESEARCH



The following is a compilation of plenary session and luncheon speeches delivered at The White House Conference on Global Change April 17-18, 1990:

- Welcoming Remarks - Nicholas F. Brady, Secretary of the Treasury
- Introductory Remarks - President George Bush
- Goals and Expectations for the Conference - D. Allan Bromley, Assistant to the President for Science and Technology
- Remarks by Visiting Delegate - Jan Janowski, Deputy Prime Minister of Poland, Director of the State Office for Science and Technology Development
- Uncertain Change: The Scientific and Economic Research Challenge - D. Allan Bromley, Assistant to the President for Science and Technology
- Economics and Global Change: Links to the Policy Process and Science Research - Michael J. Boskin, Chairman, President's Council of Economic Advisers
- Breaking Down the Barriers: Building Partnerships for a Better Future - Michael R. Deland, Chairman, President's Council on Environmental Quality
- Global Change: A Commitment to Action - William K. Reilly, Administrator, U.S. Environmental Protection Agency
- Luncheon Speech of Admiral James D. Watkins, U.S. Navy (Retired), U.S. Secretary of Energy
- Review of the Co-Chairmen's Report - presented by Michael R. Deland on behalf of the Conference Co-chairmen
- Closing Remarks by President George Bush

TREASURY NEWS



Department of the Treasury • Washington, D.C. • Telephone 566-2041

FOR RELEASE UPON DELIVERY
EXPECTED AT 9:30 A.M.

OPENING REMARKS TO
WHITE HOUSE CONFERENCE ON SCIENCE AND ECONOMICS
RESEARCH
RELATED TO GLOBAL CHANGE
TUESDAY, APRIL 17, 1990

Good Morning. I am pleased to welcome this distinguished assembly of delegates to the White House conference on global change.

This is the first international conference to bring together experts in the disciplines of economics, science and the environment. Over the next two days we will have the opportunity to explore and discuss the relationship of these disciplines to the issue of global change.

We meet here to acknowledge and explore our common interest in improving and preserving the environment in the face of ever-increasing demands placed on it by the forces of expanding populations, economic growth and development and technological advances. We have gathered here because we recognize that success in managing global environmental issues will only be attained when we have developed coherent policies which fully integrate environmental solutions with economic realities. Only when we have achieved this integration of science and economics can we be assured that we are pursuing policies in the best interest of the peoples of the world.

Our challenge is made all the greater by a lack of consensus among experts as to the true nature, rate and extent of changes in the global climate projected for the future. We cannot resolve these issues in the next two days, but we can advance and clarify the world's understanding of the relationship between the scientific and economic aspects of the environmental challenges we face.

Our work here is the natural extension of work we have already begun in other forums. Our purpose is to complement the efforts of the Intergovernmental Panel on Climate Change as it

strives to identify what is known and what is still uncertain in the science of global change.

Here in the United States President Bush has taken the lead in focusing national attention on global climate change issues-- "We face," he said, "The prospect of being trapped on a boat that we have irreparably damaged -- not by the cataclysm of war, but by the slow neglect of a vessel we believed to be impervious to our abuse."

The Bush Administration has formulated general guidelines on issues concerning global change. First, nations can't afford to wait for a final resolution of the scientific uncertainties before they act. Second, while we wait for scientific advances, nations should take those actions already justified on economic and other grounds. Third, any action considered should be specific, focused on a clear goal, and cost-effective. Fourth, the most effective actions will be those that both protect the environment and allow continued economic development.

Here in the United States we are pursuing this policy framework with concrete actions. The President has asked Congress for \$1 billion in the next fiscal year to study global change. We estimate this represents more than half of all the money spent on global change research worldwide. A key element of this research is an ambitious 15-year program to gather more accurate data. This includes plans to develop new polar orbiting satellites that will improve our understanding of oceans, clouds and land masses.

The U.S. National Oceanic and Atmospheric Administration of the Department of Commerce also supports a range of work in international climate monitoring and modeling, under The World Meteorological Organization -- work that holds the potential for greater accuracy in predictions of climate trends.

The United States is committed to phasing out chlorofluorocarbons by the year 2000. The U.S. Environmental Protection Agency is working with industry to find alternatives to CFC's and to control emissions of carbon tetrachloride and methyl chloroform. EPA has also extended its assistance to several developing countries who are seeking to reduce their CFC emissions, in conformance with the Montreal Protocol.

By the year 2050, well over half of greenhouse gas emissions are expected to come from developing countries. It is clear that these countries must be a part of any solution to global climate problems. The United States has urged their attention to these issues -- and we welcome developing countries to this conference. We have sought to promote the integration of environmental considerations into the lending programs of the World Bank and the regional development banks. We have encouraged the completion of environmental impact assessments for projects financed by the banks.

At the September 1989 annual meetings of the World Bank and IMF, President Bush called for more emphasis on the environment in national policy making, especially in promoting energy efficiency and conservation and greater protection of tropical forests.

In keeping with the President's instructions, U.S. officials have pursued environmental reforms with the OECD, World Bank, the regional development banks, the UNEP and UNDP. In addition, the U.S. has strongly advocated an environmental emphasis for the programs of the European Bank for Reconstruction and Development. The United States has also supported the use of debt-for-nature swaps to preserve forests and wetlands. In the recent past, such swaps have been signed in Ecuador, Costa Rica, the Philippines, and Madagascar. A swap recently arranged in Zambia will help protect two of Africa's most important wetlands. While the dollar amounts involved in these swaps have been small, an important principle has been established. We have encouraged the World Bank to play a more active role in facilitating these swaps. We hope the Bank will do so. We believe debt-for-nature swaps can be used more innovatively to help address climate change issues.

As these initiatives demonstrate, economic issues are intrinsically and inextricably linked to environmental concerns. We wish to preserve the environment to improve and sustain a certain quality of life for all the peoples of the world. But we must recognize that a great part of that quality of life also rests on economic development and growth. It is largely through economic growth that we can bring the nations of the world freedom from hunger, lower infant mortality, longer life expectancy and liberation from oppressive poverty. Thus we must carefully balance and evaluate the relationship between proposals to address global climate change and economic activities and policies.

Our meetings here can make a valuable contribution to establishing a common understanding and assessment of the issues. Let us work together to establish a consensus that will allow us to advance our ability to make the important decisions in the future. Let us reach agreement on areas of opportunity for cooperative action in scientific and economic research. Let us plan to integrate scientific and economic research into the policy process. Let us begin to build partnerships for pursuing that research. If we can achieve agreement on these issues we will have taken an important step towards meeting the challenge of global climate change.

And as we pursue these goals, let us do so in the spirit of the words spoken by an American Indian chief, "We do not inherit the earth from our ancestors; rather, we borrow it from our children."

I welcome you and look forward to what we can achieve together.

oOo

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release

April 17, 1990

REMARKS BY THE PRESIDENT
IN THE OPENING ADDRESS
TO THE WHITE HOUSE CONFERENCE ON SCIENCE
AND ECONOMICS RESEARCH RELATED TO GLOBAL CHANGE

The Grand Ballroom
The J.W. Marriott Hotel
Washington, D.C.

10:06 A.M. EDT

THE PRESIDENT: Thank you very much. Please be seated, and welcome. Thank you very much for the welcome. I apologize for the slight delay in there. Thank you, Secretary Brady, and members of the U.S. delegation, members of my Cabinet and the cochairmen of this conference, Michael Boskin and Allan Bromley; Michael Deland. And I'm pleased to welcome this international field of distinguished high-level officials -- experts all on the environment, economics, science and energy. Welcome to the White House Conference on Global Change.

Two months ago I had the honor of addressing the Intergovernmental Panel on Climate Change. And let me recognize Bert Bolin who is here, IPCC Chairman, here with us this morning. I see this conference helping to accelerate the IPCC's agenda as it searches for understanding of some very critical questions, broadening the dialogue by exploring the link between scientific research and economic analysis in the study of global change.

And of course, this conference is itself another sign of the growing importance of the environment on the international agenda. Here in the United States we've moved one step closer to a great victory for the environment, strengthening our own clean air statutes, already the world's toughest, with a comprehensive package of new clean air initiatives.

Ten months ago we renewed momentum lost in legislative stalemate for 12 years. Just this month, a clean air package cleared the United States Senate with House action hopefully possible in May. We're moving forward on clean air legislation because it is in America's interest. But like so many of the environmental issues that concern us, we aren't the only beneficiary of a better environment.

When it comes to the environment, we are learning that local actions can have global consequences. Understanding the effects of our actions on our Earth system is the first step to a sound environment. And the subject that led me to invite all of you here is just exactly that.

I want to speak just briefly this morning so you can get on about your work. But I want to speak about what we can do over the course of the next couple of days to advance our understanding of global change. This conference will help in three ways. First, it provides an opportunity to help sort out the science on this complex issue, to start with what we know about the Earth, and this home we share. About the factors, natural as well as man-made, that cause our environment to change, and to work from what we know toward answers to the many uncertainties that abound.

Perhaps it's not surprising when the subject is global

MORE

change that the debate often generates more heat than light. Some of you may have seen two sides -- on one of our talk shows on Sunday respected men debating global change. One scientist argued that if we keep burning fossil fuels at today's rate, and I quote, "By the end of the next century, Earth could be nine degrees Fahrenheit warmer than today." And the other scientist saw no evidence of rapid change and warned against a drastic reordering of our economy that could cause us, in his words, "to end up the impoverished nation awaiting a warming that never comes." Two scientists, two diametrically opposed points of view. Now, where does that leave us?

What we need are facts, the stuff that science is made of. A better understanding of the basic processes at work in our whole world -- better Earth system models that enable us to calculate the complex interaction between man and our environment. And that's why I've asked Congress, our Congress, to approve a 60 percent increase in our budget for the global change research program -- an aggressive research program for which we budgeted more than \$1 billion in 1991 to reduce the uncertainties surrounding global change. To advance the scientific understanding we need if we are to make decisions to maximize benefits and minimize the unintended consequences.

The second way this gathering can advance our understanding is to address the economic factor and environmental questions. We know that cleaning up our environment costs money -- a lot of money -- and we know it means changes in the way we work and live. Here, in the United States, we're already making those changes, moving forward on clean air, planting trees through our "America the Beautiful" initiative, and working with other nations to find ways to halt deforestation, phasing out the use of CFCs, encouraging conservation, exploring alternative sources of fuel and energy, and market-based incentives for pollution control.

And yet, as we move forward, all of us must make certain we preserve our environmental well-being and our economic welfare. We know that these are not separate concerns. They are two sides of the same coin. Recognizing this fact is in the interest of every nation here today. It's in the interest of the developed world, and the developing world alike.

Let me focus for just a moment on the developing world. In a climate of poverty or persistent economic struggle, protecting the environment becomes a far more difficult challenge. Cold statistics don't begin to capture the harsh realities that are at stake. Development doesn't mean just another point in the gross national product, the GNP; it's measured in human lives, an end to hunger, lower infant mortality, longer life expectancy. Not just quality of life, but life itself.

Environmental policies that ignore the economic factor, the human factor, are destined to fail. But there's another reason to consider the economic factor when the issue is the environment. There is no better ally in service of our environment than strong economies. Economies that make possible the increased efficiencies that enable us to make environmental gains. Economies that generate the new technologies that help us arrest and reverse the damage that we've done to our environment. We need new economies that allow us to make vital investments in our common future.

And that brings me to the third way this conference contributes to a net gain in knowledge. The fact that it provides us the opportunity to form a partnership between nations and across the many disciplines represented here. Few subjects offer a greater challenge to the understanding of man than global change. And yet, too often the different disciplines focusing on this question have worked in isolation with little interchange of ideas, analysis, information.

This conference is a new departure because it brings

together environmentalists and economists, experts on energy and science to search for common ground. To search the expertise each discipline can bring to this difficult and demanding concern. And this new partnership must bind nations as well. The fact of the matter is, no one nation acting alone can safeguard our Earth environment. Success requires a sense of global stewardship, an understanding that it is the Earth that endures, and that all of us are no more than tenants in temporary possession of a sacred trust.

For the next two days, you, in essence, will be grappling with the questions, the fundamental questions of global stewardship; questions of global consequence. I know there's a debate raging out there, but I am confident that this approach that brings all of you experts together is the way to go.

I thank you very much for joining us here. I will be over after digesting the product of your work tomorrow, to have a few more words to say. But from the bottom of my heart, I thank you for coming. There have been a lot of these environmental conferences around the world, but this one, I think, approaches the fundamentals. And we are fortunate to have here in America you experts from all around the world.

Thank you for coming. I look forward to hearing the results of your work. God bless you all. Thank you very much. (Applause.)

END

10:17 A.M. EDT

**EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506**

GOALS AND OBJECTIVES OF THE CONFERENCE

**D. ALLAN BROMLEY
Assistant to the President for Science and Technology
Executive Office of the President**

**White House Conference
on Science and Economics Research
Related to Global Change
Washington, D.C.
April 17, 1990**

I would like to add my welcome to those of Secretary Brady and President Bush. Working together with you, we look forward to very real accomplishments over the next two days. In a moment, I will describe what the President views as some of the objectives of the conference.

GLOBAL STEWARDSHIP

But first let me elaborate briefly upon the conference's theme, that of Global Stewardship. As President Bush has stated, Global Stewardship is not a fixed state. It is a process of continual change that balances environmental and economic values to meet human needs and expand human prospects.

Global Stewardship is a complex, multifaceted concept, yet I believe that it can be summed up in remarkably succinct fashion. On December 22, 1968, as the crew of Apollo 8 became the first humans to leave Earth orbit and head toward the Moon, they turned their frail spacecraft back toward the Earth and took the first photographs of our planet from deep space. I firmly believe that thousands of years in the future perhaps the one most lasting thing for which our age will be remembered will be those photographs. They show the Earth as a beautiful blue and white sphere floating quietly in the immense blackness of space. They emphasize that this planet is mankind's common heritage. It is ours to cherish; it is ours to destroy. We are all truly in this together.

We will achieve Global Stewardship in the same way that we achieve scientific knowledge -- through careful study of the environment and of ourselves, coupled with effective and timely action. We must come to understand the extent and limits of the resources available to us on this planet. And we must come to understand how humans can use those resources in a sustainable fashion to achieve a more prosperous and productive future.

We are not here to make a global warming policy. That will emerge from the broad array of research and policy reviews now ongoing. Rather, we are here to try to determine what will be required in order that such policies be based on sound scientific understanding and that they be both technologically and economically feasible.

THE LINK BETWEEN SCIENCE AND POLICY

Much has been written and said during the past few months about the scientific understanding of global change and about policy responses to global environmental concerns. But conspicuous by its absence in almost all of these discussions has been a careful and detailed analysis of the economic causes or consequences of global change. For example, we will talk at length over the next two days about various ways of taking out insurance policies against possible adverse

effects of global warming. But there are good insurance policies and bad ones, and we very much need the input and expertise of economists to discriminate between them.

In a very real sense, we should perhaps look on economics as the glue that binds scientific understanding of global change phenomena to the policies -- both national and international -- that we adopt to address this issue.

In general, the social sciences -- economics, psychology, sociology -- must be an integral part of any approach to the understanding of global change. Even when the physical and biological aspects of a problem are understood, all too often agreement is lacking on the underlying social, behavioral, and economic causes and consequences of an action. This conference will focus as much on these aspects of global change as on the purely scientific aspects. In this way, we hope to add a new dimension to the international dialogue on global change.

GOALS OF THE CONFERENCE

As President Bush noted, the foundation of this conference is what we do know and what we do not know about the science and economics of global change. At a more detailed level, we seek to determine which uncertainties might be reducible in the foreseeable future and which are not, and to understand how scientific uncertainties affect our economic modeling and vice versa.

The conference is designed to achieve several other objectives. Among them are the following:

- o To increase the mutual understanding and sensitivity of the scientific and economic research communities to each other's needs and to the needs of the policy makers who look to them for guidance.
- o To foster a solid and well-implemented international research effort that can address the scientific, economic, and policy questions of global change, drawing on the expertise, experience, and data of all the world's nations.
- o To forge a worldwide communications network among the researchers and policymakers concerned with global change.

REVIEW OF THE AGENDA

To achieve these objectives, the conference is organized around three themes.

- o The science and economics research challenge.
- o Integrating science and economics research in the policy process.

- o Building a partnership for science and economics research.

Later this morning, I shall speak on the first of these themes. My cochairmen Michael Boskin and Michael Deland will speak on the second and third.

Following those presentations, the agenda calls for us to divide into three Working Groups that will then meet in four sequential sessions. Each of the Working Groups will have about 25 members, with roughly equal representation from the three disciplines of science, economics, and the environment.

The first three Working Group sessions will be devoted to the three themes of the conference. The fourth will be devoted to integration of the discussions and preparation of a summary report of each Working Group's deliberations.

These summaries will form part of a Cochairmen's report, which we would suggest as the primary product of the conference. In this report, we would expect to outline the deliberations of the conference and set forth agreed-upon common actions designed to expand research and cooperation among nations.

CONCLUSION

This conference is only one of many national and international actions being taken to address issues of global change. We must therefore seek to integrate the accomplishments of the next two days into these ongoing efforts -- and, in particular, into the deliberations of the IPCC, the international research programs of the World Meteorological Organization and International Council of Scientific Unions, and the programs of individual countries focused on the global environment. At the same time, we will work to coordinate the many activities now going on in the United States and abroad. They will all be stronger if carried forward in a unified, coherent fashion.

We want to emphasize that the President has instructed us from the outset of our planning to design this conference with a primary goal of complementing, strengthening, and supporting the entire IPCC process, which he considers to be the central and appropriate forum for our joint efforts toward understanding of, and responding to, the questions of Global Stewardship.

Louis Pasteur wrote that, "Science knows no country because knowledge belongs to humanity and is the torch which illuminates the world." We will be the carriers of that torch for the next two days. And we must keep it burning as we leave to face the great challenges that lie ahead.

Remarks by Visiting Delegate: Jan Janowski

Deputy Prime Minister of Poland,

Director of the State Office for Science and Technology Development

WHC 4-17-90

DRAFT COPY CHECK AGAINST DELIVERY

Mr. President & Ladies Gentlemen:

Allow me to begin by expressing, on behalf of the government of the Republic of Poland, our sincere appreciation for inviting Polish delegation to participate in this important conference, for hospitality of the American government and the American people.

I think that our feelings in this respect are shared by other participants. Poles perceive ties between us and the American people to be particularly close. A monument in front of our hotel, dedicated to the hero of both nations, Kazimierz Pulaski, a Pole who gave his life for independence for independence of this great country, is but one example of that. Almost every Polish family has got relatives living in America.

Today, when Poland and other countries of East and Central Europe rejoin the commonwealth of free nations, we look to America with trust and hope.

Recent experiences have confirmed our belief that America was right in her attachment to the ideas of freedom, democracy and human rights and in her conviction that there was a co-dependence between democracy and effective market economy.

Moreover, these experiences proved that democracy and healthy economy were of crucial importance for the protection of the environment.

In not so distant past, previous Polish governments have not encouraged concern for the natural environment. The attitude of our society, which demanded more information and direct participation in the economic decision making, has stimulated our democratic revolution.

The so-called command economy, with its one-sided concept of industrialization, has proven to be damaging, both from the point of view of increasing living standards as well in guaranteeing the quality of life. In the planning process, it did envisage possibilities to provide adequate financial resources for environmental protection and repair of already existing damages. The degradation of our environment and public health is as a sad legacy of that policy.

The disintegration of totalitarian systems creates conditions for international cooperation in a new, unprecedented dimension.

It also depends on Western Civilizations, whether they decide to make available new technologies to overcome the negative affects of global change. To this end, we deem it imperative to build new international alliances in order to jointly adjust to new circumstances.

DRAFT COPY CHECK AGAINST DELIVERY

In our opinion, the fact that this conference has been convened demonstrates that America feels particularly responsible for the future of the world. This future clearly has to be our common concern and responsibility.

Mr. President,

I think that your initiative to stage today's conference and ponder upon a question: "How are we to achieve necessary economic development without damaging the earth and life, which are a gift of God to us?" , has come at the right moment.

You have kindly invited us to **reflect jointly** on scientific and economic research connected to the Global Change.

The implications of the Green House Effect are clear to everybody. It is also evident that there is a need to protect the ozone layer. Attempts to lower environmentally harmful emissions, however, have encountered certain barriers. One of them are the costs involved.

Allow me to use the example from my own area of research as a scientist and engineer. It is possible nowadays to dramatically reduce the negative ecological effects of steel production. It is feasible but very costly. The cost of special equipment to protect environment constitutes approximately 25% of the total costs involved in the technological process of steel production. Similar dilemmas exist in other areas.

I think that we should consider how to better utilize the results of basic scientific research for the purposes of environmental protection engineering. It is possible that such results already exist or will become available in the foreseeable future.

When W. H. Carothers conducted research on molecular structures he had clearly not thought of the invention of nylon. When C. Shannon, working at the Bell Laboratories, advanced his theory of communications, numerous practical applications of his abstract ideas were not yet recognized.

Therefore, I think that it would be advisable to carefully examine the results of basic scientific research to determine possibilities of their practical use in constructing totally new equipment and obtaining new technologies, which would serve the purposes of environmental protection at a greatly reduced cost. This is a problem which pervades me and my Polish colleagues since in our country technological innovation advances much slower than elsewhere.

As far as I know, also in other countries of East and Central Europe, there exist a disturbing discrepancies between the results of basic scientific research and the pace and scope of their practical technical implementation.

DRAFT COPY CHECK AGAINST DELIVERY

Due to a difficult economic situation in Poland, a country which has implemented drastic measures aimed at curbing inflation, we are not able at this moment to take up obligations to reduce carbon dioxide emissions, as suggested during the ministerial conference in Noordwijk in November of last year. CO2 emissions reduction remains, however, one of our major goals and it will be taken into consideration the process of implementing restructurization of our economy. In the current situation US help through debt-to-environmental protection investment swap would be of significant importance. I believe that the American administration would consider this issue in a favorable way.

Mr. President,

International cooperation is of fundamental importance for effective response to Global Change. Therefore, we welcome by lateral efforts in this area, such as Polish/American project to improve environmental conditions in Krakow and other projects in which countries like Sweden, United Kingdom, Federal Republic of Germany, as well as EEC and other partners participate.

The Polish side can provide significant contribution to the research conducted on the international scale, by the: (1) International Institute for Applied System Analysis, (2) The Intergovernmental Panel on Climatic Change and (3) IGBP - Global Change Program and others.

Bearing in mind Polish experiences, I would like to advance the following message to other countries, which find themselves at the comparable level of development:

- Wherever there is economic growth, environmental protection is possible
- Wherever there is poverty, competition for resources is much greater
- We cannot reduce our options to a misguided choice between
- *****economical growth and environmental protection

Our country, despite great economic difficulties, sees a necessity of sustainable development as a basic aim of our economy.

- Leaders of developing countries should promote economic growth through most effective means, and should include ecological considerations in their economic policy decisions.

Ladies and Gentlemen,

I think that we can expect this conference to promote our common interest in economic development, so that we can:

- further the growth of welfare of all nations,
- provide the protection of our global resources,
- lay down a common program of research that would serve the purposes of the previously stated goals,

Thank you for your attention,

**UNCERTAIN CHANGE:
THE SCIENTIFIC AND ECONOMIC RESEARCH CHALLENGE**

D. ALLAN BROMLEY
Assistant to the President for Science and Technology
Executive Office of the President

White House Conference
on Science and Economics Research
Related to Global Change
Washington, D.C.
April 17, 1990

The global environment has been changing throughout human history, and indeed throughout the entire history of our planet. At the peak of the last ice age 18,000 years ago -- just a few thousand years before the first substantial human civilizations came together in the river valleys of the Middle and Far East -- a glacier over two kilometers high covered much of the northern United States and Europe. Sea level was 100 meters lower than at present, so that the future sites of many of today's port cities were perched on the edges of deep ravines. Then, rather abruptly about 10,000 years ago, the world warmed, the ice retreated, and sea level rose to about its present level. These natural changes in the Earth's climate have occurred throughout its history, and they will continue to occur in the future.

During the past century, human society has entered into a new and momentous relationship with the global environment. For the first time in history, we have become a geological agent capable of influencing our entire planet. We have altered the face of the Earth by clearing forests, building cities, and converting wild lands to agriculture. We have changed the composition of the Earth's atmosphere by burning fossil fuels, expanding agriculture, and producing and releasing industrial compounds. We have embarked on an enormous, virtually unplanned, planetary experiment that poses unprecedented challenges to our wisdom, our foresight, and our scientific capability.

The first theme of this White House Conference is the scientific and economic research challenge related to global change. Properly speaking, global change encompasses not only global warming but such issues as ozone depletion, the adequacy of food and water supplies, changes in sea level, deforestation, levels of biodiversity, and population change. Indeed, any of these issues could turn out to be more serious in terms of human impact than global warming. Yet much of the world's attention has focused on the possibility of increased global temperatures, and that will inevitably be the main topic of discussion at this conference.

SCIENTIFIC KNOWN AND UNKNOWN

In light of the Earth's daunting complexity, it is easy to be overwhelmed by how much we do not know about the Earth's components and how they interact. But it is always important to keep in mind how much we do know about the Earth and our influence on it.

We know, based on a sophisticated set of chemical measurements, that humans have raised the level of carbon dioxide in the atmosphere by 25 percent since preindustrial times. This is the single largest impact that our species has had on the planet. We know that atmospheric levels of methane have doubled over the same period. We know that chlorofluorocarbons produced by human beings are catalytically destroying ozone in the atmosphere above Antarctica and possibly elsewhere around the globe.

By analyzing sediments and ice cores, geoscientists have traced levels of atmospheric gases and temperatures many thousands of years into the past. Using large computers, researchers have modeled the complex eddies and flows of the global atmosphere with considerable accuracy. These are all remarkable accomplishments.

Based on this work, scientists now generally agree that continued loading of the atmosphere with greenhouse gases could lead to global warming. However, neither computer models nor paleoclimatic data have been able to specify with any certainty the magnitude, rate, or timing of any future warming.

General circulation models will continue to improve in the future as computer power increases, as the modeling of the Earth system becomes more sophisticated, and as more complete data inputs become available. For example, coupled ocean-atmosphere models will shed more light on the possible regional effects of climate change. Also, an important example of better data inputs is the very recent demonstration that satellite measurements are capable of providing precise temperature data over the entire globe at various levels in the atmosphere.

We will also learn more about Earth's past climates by continuing to study the geological and paleoecological record. But in general we should probably expect incremental rather than revolutionary advances in our understanding of global change over the next 10 years.

Another area of consensus concerns global temperatures: scientists now generally agree that the planet has warmed up by about 0.5 C during the past century. But very few scientists would claim that they are yet able to determine whether any of that warming can be attributed to an enhanced greenhouse effect or whether it represents a natural fluctuation. We are also only beginning to understand what the impacts of a potential warming might be on agricultural productivity, sea level changes, biological productivity in the oceans, shifting vegetation patterns, storm patterns and severity, droughts, and the like.

Furthermore, we are totally unable, with present models, to make reliable climate predictions on the regional and local bases that are essential to improved understanding of these impacts. This difficulty arises partly from the fact that we have, at present, neither the computer capacity and speed, nor the resources, necessary to reduce the grid size and increase the number of model levels in the atmosphere, both of which are essential to regional predictions. Current grid sizes inevitably average over the climatic effects of mountain ranges and of such oceanic features as the Gulf Stream.

THE SCIENTIFIC RESEARCH CHALLENGE

There are several other outstanding difficulties in understanding and modeling the Earth's climate. Perhaps the most notable involve the Earth's clouds, oceans, and ice. Until recently, geoscientists did not even know whether clouds warm or cool the

Earth. It is still uncertain whether the increased cloudiness associated with a warmer Earth would augment or counteract a greenhouse effect. It depends on the nature and altitude of the clouds.

Regarding the oceans, we know that only about half of the carbon dioxide released through fossil fuel combustion and deforestation remains in the atmosphere. For many years, essentially all researchers assumed that the rest was being sequestered in the oceans, but recent studies indicate that no more than a quarter probably ends up there. Where does the rest go? We appear to have lost 25 percent of our anthropogenic carbon emissions. We still have not located this missing carbon, although some suggest that it is in temperate latitude biomass.

Finally, we still do not fully understand how the world's ice caps and other major bodies of ice would respond to greenhouse forcing. Present models predict that warming should be intensified at high latitudes, leading to some melting of ice and a higher sea level. But recent observations indicate instead an increase in ice accumulations.

It has not escaped notice that six of the hottest years in the last century in the United States occurred in the 1980s, and some have associated this with the greenhouse effect. But over this same decade, precise satellite temperature measurements have shown that away from the actual surface, where a number of perturbations are expected, there was no change whatsoever in global average temperatures. While the northern hemisphere showed a slight increase in temperature, the southern one showed a corresponding decrease, and the major fluctuations globally were associated with the El Nino phenomenon in the Southern Pacific. We need to understand these surface temperature perturbations much better than we do at present.

There is growing suspicion from the paleoecological data -- but as yet no more than that -- that the atmosphere-ocean interface may harbor the possibility of surprises. It bears emphasis that the top 3 meters of the ocean surface contains the same thermal energy as the entire atmosphere. If it should turn out that relatively small, and not as yet understood, mechanisms could trigger ocean circulation patterns from one stable configuration to another, the potential impacts could be large. We need a careful program of observing and monitoring the Earth to detect any such surprises caused by our emission of greenhouse gases.

In general, we must remain aware of the potential for surprises. The development of the ozone hole over Antarctica was such a surprise. The hole develops through a mechanism that was not included in earlier models of ozone destruction, although scientists quickly came to understand how it formed and have incorporated that understanding into their models.

What the ozone hole has demonstrated beyond question, however, is that, contrary to long-held assumptions, our atmosphere is not so large, nor its inertia so great, that human activities cannot affect it on human time scales. Human release of

chlorofluorocarbons, combined with unique meteorological conditions, has indeed created the ozone hole in only a few decades at most.

In recent years, a number of scientists have compared the Earth, in its complexity, to a living organism. The comparison is certainly apt in this regard: as much as we still have to learn about the nature of life, about how it developed and where it is going, we have as much to learn about the nature of the Earth.

THE ECONOMIC RESEARCH CHALLENGE

The comparison is apt in another sense. The behavior of human beings, economically and politically, will be a major determinant of future changes in the global environment. My cochairmen will be speaking in a moment about some of the work that has been done on the economics of global change and about the many economic questions that remain to be answered.

But I would emphasize that in many cases these economic questions are of even greater importance -- and much farther from resolution -- than the scientific questions. Science-based models of global change need economic trends as inputs. Yet these economic inputs are often so uncertain that they hamstring the model results. For example, one recent analysis was able to conclude only that emissions of carbon dioxide in the year 2050 are likely to be between 1.5 and 12 times what they are today. We must find ways to reduce such uncertainties or, if they are unavoidable, to accommodate them in our projections.

A major influence on future economic trends is the state of technology. To take the case of emissions, for example, the development of more efficient power plants, biomass and solar energy, inherently safe nuclear reactors -- even something as mundane as lower cost and more efficient insulation -- could both reduce emissions and increase our flexibility when deciding on policies related to global change. In essence, we can hedge our bets on the possibility of future global warming by investing in these technologies today.

Technology development is also crucial if we are to be fully prepared for the possibility of global change. Basic and applied research on ecosystems, agriculture, water supplies, and other important environmental and societal systems can demonstrate both the ability of society to adapt to different climates and the pressure points where adaptation becomes prohibitively expensive. Furthermore, the technologies that emerge from such research -- such as plants that grow under a wider variety of climatic conditions -- will have great benefits even if the climate does not change.

The future of technology is as difficult to forecast as economic trends. Yet new technologies will inevitably reshape our world in the coming decades -- just as they have throughout the twentieth century -- and we must explore the possible ways in which this will affect the global environment.

One way to increase the reliability of economic and technological forecasts -- and I see this as a major goal of this conference -- is to increase the sensitivity of both scientists and economists to each other's data needs. We must agree upon the uncertainties in our scientific understanding that cause the greatest uncertainties in our economic models, and vice versa. In this way, resources can be focused on reducing the uncertainties of greatest importance.

By working together to understand both the scientific and economic aspects of global change, we will be better able to assess the costs not only of action but of inaction. We will enable all nations to respond sooner and more effectively to the possibility of different climates. And we will build a flexibility into our environmental stewardship that will serve us well no matter how climate changes.

U.S. RESEARCH PROGRAMS

Returning for a moment to our scientific understanding, the U.S. government is now engaged in a large-scale, integrated program to develop the scientific knowledge that will guide our future policy decisions and contribute to those of all nations. That program is known as the U.S. Global Change Research Program and was established through a working group of our interagency Committee on Earth Sciences.

As the President noted earlier, his Administration has requested over \$1 billion in funding for this program during our next fiscal year. Such a request for what is admittedly a long-term and complex research program demonstrates the President's very real commitment to dealing decisively with the possibility of global change.

CURRENT ACTIONS

It is clear that we and other nations are accelerating research in the face of uncertainty. But what bears emphasis as being even more important is decision making in the face of uncertainty. We are not -- despite our best efforts -- going to achieve scientific certainty about global change in the near future. Yet we must move forward on the basis of the information available to us.

The Bush Administration has already instituted a number of policies that will reduce greenhouse emissions while being fully justified for other reasons. I think of them as an "insurance policy" against possible adverse effects of global warming. Among these policies are the following:

- o The United States is committed to phasing out the manufacturing and use of CFC's by the year 2000 to protect the stratospheric ozone layer -- ahead of the requirements of the Montreal protocol -- provided safe substitutes are available. If not controlled, CFC's would account for as much as 25 percent of the enhanced greenhouse forcing over the next century.

- o The Clean Air Act now being debated in Congress will provide for substantial reductions in the emissions of greenhouse gases by fostering more efficient use of energy. It has been estimated that the acid rain provisions of this legislation alone will have an effect comparable to that of removing fully one fifth of the U.S. automotive fleet (22 million automobiles) from our highways for a period of 10 years.
- o The U.S. Department of Energy is developing a National Energy Strategy that will focus, in particular, on an aggressive commitment to energy conservation and on the development of non-fossil-fuel sources of energy.

These initiatives address the source component of the greenhouse gas question; turning to the sink component, this country is again taking concrete steps.

- o The U.S. Department of Agriculture is proposing to plant a billion trees on private land across America, trees that will eventually absorb 13 million tons of carbon annually.
- o Diplomatic discussions are being conducted aimed at protecting the remaining tropical forests through such mechanisms as debt-for-nature swaps.

An underlying theme in all of the United States' policies related to global change is that they be based on the best possible science and that they be technically and economically sound. These are criteria that we will continue to apply as we consider policies in the future. We will do ourselves a great disservice if we adopt premature policies that later prove to be unnecessary or counterproductive.

INTERNATIONAL RESEARCH PROGRAMS

As I mentioned in my opening remarks, the President has instructed us to design this conference to complement and support the Intergovernmental Panel on Climate Change by emphasizing the importance of economic as well as scientific considerations in the development of global change policies. The United States supports the IPCC process as an appropriate international approach to the global understanding and response to a question that knows neither national nor political boundaries.

At the same time, we would like this conference to be a contributing factor to the development of an international research program that can provide us with the knowledge, both scientific and economic, needed to understand and respond to global change. The first of the three Working Group sessions will give us an opportunity to explore the dimensions of the scientific and economic research challenge and sketch the outlines of an international program of science and economic research related to global change.

CONCLUSION

We face a great challenge in the next two days. We must merge science and economics with policy to a degree that has not been done before. The uncertainties that surround us are daunting. But humans have never been hindered -- at least not for long -- by uncertainties. The explorers who we know from history did not let uncertainties stand in their way. Rather, they saw uncertainties as opportunities, and in following those opportunities they opened new worlds.

Let me close with a brief vignette about one of those explorers. The year after next we will be celebrating the 500th anniversary of Columbus's discovery of the new world, an event of unsurpassed importance in world history. As might be expected, Columbus was an astute observer of the natural world. While he was anchored off the coast of Jamaica, Columbus noted in his journal that it rained for about an hour every afternoon. Columbus also pointed out that the same thing used to occur in the Canary and Azores Islands, but that the rain had stopped since the trees on those islands were cut down. In other words, Columbus was one of the first people to observe the effects of human beings on climate.

I think it very appropriate that Columbus should have done so, because he was engaged on a great voyage of discovery, and today we find ourselves engaged on a similar voyage. We are changing the world in ways that it has never been changed before. And yet human beings, by their very nature, cannot help but change the world.

We have no reason to fear such changes. But we must keep our eyes open, and try to understand where we are going, and change course when we have good reasons to do so. We need not sail blindly into our future. But we must keep moving forward if we are to achieve the complementary goals of an economically healthy and environmentally sound world.

THE CHAIRMAN OF THE
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON

Economics and Global Change:
Links to the Policy Process and Science Research

Michael J. Boskin
Chairman
President's Council of Economic Advisers

April 17, 1990

Good morning. Let me add my own welcome to those you have already received. In my role as Chairman of the President's Council of Economic Advisers, I regularly confront a diverse set of economic issues involving monetary, budget, regulatory, and trade policies. While all of these are important, global change and our response to it may be just as economically significant in the long run. Beginning an international effort to coordinate and enhance science and economics research related to global change, as we hope to do here today, is an essential step toward making the idea of global stewardship a reality. In this area, as in the others each of us confront every day, knowledge and understanding are critical to sound decision-making.

The United States comes to this conference as a leader in environmental action in both the domestic and global arenas. The President's recent Clean Air proposal, which broke a logjam that blocked Congressional action in this critical area for more than a decade, his tree planting initiative, and his support of solar and conservation research and development are examples of his strong commitment to the environment -- a commitment that is shared by the American people. The President is looking forward to signing a sound Clean Air bill that meets his key environmental objectives -- even though such a bill would impose costs of about \$20 billion annually on the U.S. economy when its provisions are fully phased in.

We have a similar strong commitment to protect the global environment. The United States was the first nation to ban the use of CFCs as aerosol propellants -- over a decade ago -- and we have since been in the vanguard of efforts to implement and strengthen the Montreal Protocol on ozone-depleting substances. We strongly support the integration of environmental concerns into the programs of the international institutions -- including the World Bank.

Many countries have yet to adopt or are only now adopting the stringent environmental controls on automobile and industrial emissions that have been in place in the United States for many years. The President is continuing this leadership. For example, his Clean Air proposals will dramatically reduce acid rain, even though our most recent scientific studies show much less severe impacts on U.S. forests and lakes than those apparent in other parts of the world.

This conference reflects our interest in resolving the major scientific and economic uncertainties that surround debates about global change policy and our concern with the economic and human consequences of proposed mitigation measures. In light of U.S. leadership in environmental policy, attempts to portray expressions of this interest and concern as a delaying tactic are clearly misplaced. Rather, these interests and concerns reflect view that realistic and responsible leadership means seeking out and adopting sensible policies -- policies that recognize that both economic growth and environmental quality are important to human well-being.

The extensive U.S. experience with environmental regulation has shown clearly -- and sometimes painfully -- that one cannot design policies that will produce both a healthy environment and a sound economy without careful, integrated use of science and economics research. Careful use of all available information is nowhere more important than in the context of possible global warming induced by human activities. The development and evaluation of climate models, an area where much progress has been made but many uncertainties remain, falls clearly within the purview of the physical sciences. But it is important to recognize that economics plays a critical role in determining the inputs and interpreting the outputs of these climate models, as well as in evaluating the consequences of alternative policy responses.

On the input side, we all know that no model can produce results that are better than the data and assumptions on which they rest. Emissions of the multiple greenhouse gases associated with human activities depend on the overall level of economic activity, its division across sectors of the economy, and on the choice of technology within each sector. Global emissions forecasts on the time-scale needed here -- several decades -- thus require extraordinarily detailed, long-term economic forecasts for many nations. I know well how hard it is to forecast the GNP of a single nation a year

or two ahead, and I share with all economists in the audience the knowledge of how much harder it is to make sector-by-sector forecasts for many nations decades in the future. As a humbling exercise, think back to the early 1970s and ask yourselves whether any forecaster -- economist or not -- predicted that emissions of carbon dioxide by the OECD countries would be stable from 1973 to 1985. Reliable forecasts of future climates certainly require advances in the earth sciences, but they also require advances in our ability to forecast emissions of greenhouse gases.

Economics also plays a critical role in evaluating the consequences of the output of climate models -- that is, in assessing the costs of adapting to any possible future warming. We know that most of the world's economic activity, certainly well over 90 percent, would not be directly affected by any widely-discussed climate change scenarios. Automobiles can be produced as efficiently in warm weather as in cold weather, after all. Detailed analysis of those sectors that could be affected is necessary for estimation of adaptation costs, but little of this has been done. Preliminary U.S. studies show surprisingly small agricultural impacts of widely-discussed climate change scenarios -- plus or minus a few billion dollars as of the middle of the next century. We are aware of very little systematic work on the impacts of sea level change, human health effects (if any), or the effects of possible climate change on forestry, fisheries, water resources, or biodiversity. Technological progress will likely have a strong effect on the costs of any necessary adaptation, but forecasting the rate and direction of technical change over a half-century or more is extremely difficult.

Finally, economic analysis is essential to the evaluation of the economic costs and human consequences of taking actions to curb net emissions of the main greenhouse gases. Detailed studies support the conclusion that CFCs can be phased out at relatively low cost. At the other end of the analytical spectrum, almost nothing appears to be known about the costs of reducing methane or nitrous oxide emissions from agriculture -- or even about how such reductions might efficiently be obtained. Preliminary studies of the costs of large-scale forestation and its impact on atmospheric carbon dioxide have produced a wide range of estimates.

Perhaps the most-studied aspect of the economics of global change -- at least in the U.S. -- is the economic cost of reducing carbon dioxide emissions. The oil shocks of the

1970s have shown us that these emissions can be stabilized, as they were in the U.S. and the OECD as a whole between 1973 and 1985, or even reduced. But this history also makes plain the cost: slower economic growth and rising unemployment. Maintaining a constant or declining emissions profile on a more permanent basis may well require correspondingly greater economic dislocation. Available studies suggest that it would cost at least 1 percent of annual U.S. GNP, or perhaps several times that amount, to meet widely-discussed CO₂ reduction targets and that economic growth could slow significantly. Much more work needs to be done to develop and refine national and global economic models that can assess these costs and to analyze more carefully the possible contributions of new energy technologies. However, the cost estimates obtained so far make clear the importance of doing that work, for other nations as well as ours, so that potentially important economic and human consequences can be adequately considered in decision-making.

It is worth a few minutes, I think, to discuss the importance of costs and economic growth. Those who are most fearful of possible future global warming are often impatient with discussions of mitigation costs. They sometimes contend that no price is too high to pay for actions that might prevent even the slightest warming. With respect, my view of the concept of global stewardship is much broader -- and does not allow me to agree.

When the costs of a policy are small relative to the size of the overall economy, as a CFC phaseout by the industrialized nations would likely be, it may be adequate to think about those costs in purely monetary terms. But when costs are large enough to be measured in percentages of GNP or in significantly slower economic growth, that simply will not do. Let us remember that half the world's people today still have a life expectancy of less than 60 years. In much of the world, the reality of infant mortality is grim: ten of every 100 babies born die before they reach their first birthday. In the poorest nations of Africa and parts of Southeast Asia, a healthy life cannot be taken for granted -- not when there is only one physician for nearly 18,000 people.

Current emissions projections suggest that India, China, and other developing countries will become increasingly dominant sources of carbon dioxide and other greenhouse gas emissions over the coming decades. For developing countries, slower economic growth does not mean making do with last year's model car -- rather, it is a goal worth life itself to

many. Those of us who have made it to the top of the economic mountain must be careful not to create obstacles that would prevent others from making the same climb. Global stewardship requires us to consider the health and nutrition of the earth's children, not just the temperature of their environment. We must find policies that will bequeath to them both a healthy environment and a sound world economy capable of sustained growth. And we must recognize that these goals are not inevitably in conflict: rising incomes both increase concern for the environment and provide resources that can be used to protect it.

It is also important to recognize that the world economy has grown increasingly integrated. Economic progress in the developing countries depends to a significant extent on the performance of the industrialized economies. The IMF has estimated that a 1 percentage point reduction in the growth rate of the industrialized nations results in a 1/2 percentage point reduction in the growth rate in the developing world. Therefore, emissions curbs that slow growth in industrialized nations can damage developing economies even if the developing world is not immediately asked to curb its own greenhouse emissions. International economic linkages and the reality of a changing distribution of emissions must both be carefully considered to insure that we do not inadvertently drift in directions that have little impact on the composition of the world's atmosphere but cause real, human suffering in the developing world.

Please understand -- I am not arguing that we should be unconcerned about possible global warming, or that no actions to limit greenhouse emissions make sense. My point is simply that the stakes are high in terms of the well-being of real human beings, as well as in terms of the global environment. We face complex decisions with potentially huge consequences. It would be irresponsible to pretend that the huge uncertainties we face do not exist. It would be equally irresponsible not to invest in research that can reduce those uncertainties.

To this point, I have emphasized a division of labor between science and economics. There is also a clear need for cross-fertilization between the disciplines in the setting of research priorities for each of them. Thus, for instance, in order for economists to set research priorities for improving emissions forecasting, they must learn from scientists what components of those forecasts have the greatest impact on climate model predictions. Conversely,

economists can suggest which components of climate change predictions have the greatest potential human importance.

Technology is another key intersection between science and economics research. New technologies hold the prospect of lowering the costs of both human adaptation to global change and of emissions reductions. Technologies with strong economic potential, such as recent advances in gas turbine technology that significantly increase the efficiency of the conversion from fossil energy to electrical energy are particularly valuable. The world wants real answers, not symbolic commitments. Technology research in science and economics holds the potential to provide such answers.

Science alone can serve to identify technical possibilities, but economics plays a key role in assessing the prospects of individual technologies in the marketplace and their speed of adoption. Both science and economics have a role to play in assigning research priorities among potential technologies that may lower the costs of reducing greenhouse gas emissions and of coping with possible warming -- as well as in forecasting the likely cost and availability of promising future technologies.

Almost 200 years ago, Thomas Malthus argued that the industrialized nations would be unable to feed a geometrically growing population with a fixed supply of land. Only twenty years ago, the neo-Malthusian notion that worldwide shortages of fuels and materials posed imminent and insurmountable limits to growth was widely discussed. Time has proven both these forecasts to be hollow. New technologies and progress have circumvented what had appeared to be impenetrable barriers to human progress. I am optimistic and confident that human progress will not be halted by global change, or by the sensible policy actions that we take to address it. Instead, I believe we can and will meet this new challenge and that we will give our children a better world than our parents gave us.

But this will not happen automatically. We have much work to do to understand better the choices we face and to develop new technologies to improve those choices. We can do this work most effectively and expeditiously if we work together. There are many challenges awaiting us. There is a wide variance of opinion surrounding the costs and future availability of particular nuclear, solar, and biomass alternatives to fossil fuels. The extent of possibilities for cost-effective conservation are also controversial. Possible adaptation technologies have barely been explored,

even though many believe that some degree of global change is inevitable. We can all lament the crudity of current world-scale long run economic forecasts, and the limited depth of our understanding of linkages between the developed and developing economies. And I have not even mentioned the science uncertainties outlined by Dr. Bromley.

Doesn't it make sense to get the research community together to discuss these matters? Of course, consensus will not be immediate. We can start by identifying the key reasons that researchers differs, and then concentrate resources on these areas. In this regard, the establishment of one or more international institutes devoted to a program of science and economics research on global change might serve to enhance our efforts significantly.

I look forward to attending future meetings of scientists, economists, and environmentalists, not only to marvel at how much we have all learned, but also to hear scientists, economists, and environmentalists say that our generation met the challenge of global change wisely and that economic growth continued in all the nations of the world.

**"BREAKING DOWN THE BARRIERS:
BUILDING PARTNERSHIPS FOR A BETTER FUTURE"**

REMARKS OF MICHAEL R. DELAND, CHAIRMAN
PRESIDENT'S COUNCIL ON ENVIRONMENTAL QUALITY

OPENING THE

WHITE HOUSE CONFERENCE ON SCIENCE AND ECONOMICS RESEARCH
RELATED TO GLOBAL CHANGE

WASHINGTON, D. C.

APRIL 17, 1990

GOOD MORNING AND AGAIN WELCOME TO THE WHITE HOUSE
CONFERENCE.

WE ARE MEETING HERE TODAY ON VERY SERIOUS BUSINESS. THE POPULAR PRESS OFTEN CHARACTERIZES THE POSSIBLE EFFECTS OF GLOBAL CHANGE IN THE MOST DIRE TERMS: RISING SEA LEVELS, ADVANCING DESERTS, EXPOSURE TO HARMFUL SOLAR RAYS, FOOD AND ENERGY SHORTAGES, THE LOSS OF BIOLOGICAL DIVERSITY. MAN'S IMPACT ON THE GLOBAL ENVIRONMENT HAS BEEN LIKENED TO AN ENORMOUS "EXPERIMENT," OF UNCERTAIN OUTCOME. MY TWO COCHAIRMEN HAVE AMPLIFIED ON THE SCIENTIFIC UNCERTAINTIES AND THE ECONOMIC DOUBTS ASSOCIATED WITH THAT EXPERIMENT. WITH A LITANY LIKE THAT, ONE IS REMINDED OF THE OBSERVATION OF THE AMERICAN FILM DIRECTOR, WOODY ALLEN, WHO SAID... "MORE THAN AT ANY TIME IN HISTORY, MANKIND TODAY FACES A CROSSROADS. ONE PATH LEADS TO DESPAIR AND UTTER HOPELESSNESS, THE OTHER TO TOTAL EXTINCTION. LET US PRAY THAT WE HAVE THE WISDOM TO CHOOSE CORRECTLY..." BUT SERIOUSLY, THE PUBLIC IS WORRIED AND THE PUBLIC'S WORRIES MUST BE OUR OWN.

FROM MY VANTAGE POINT, AS THE PRESIDENT'S WHITE HOUSE ENVIRONMENTAL ADVISOR, THE CHALLENGES CONFRONTING US ARE INDEED DAUNTING; BUT OUR RESULTING CONCERN IS TEMPERED BY A FULL MEASURE OF GOOD NEWS.

THE FACTS ARE PLAIN: WHILE TODAY'S ENVIRONMENTAL CHALLENGES ARE UNSURPASSED, NEVER BEFORE IN HUMAN HISTORY HAVE WE BEEN SO CAPABLE OF ANTICIPATING AND RESPONDING TO THOSE CHALLENGES.

AS MANY OF YOU MAY KNOW, THIS SUNDAY, APRIL 22, IS THE TWENTIETH ANNIVERSARY OF "EARTH DAY," A DAY OF NATIONAL AND INTERNATIONAL REFLECTION ON GOD'S GIFT OF NATURE, AND OUR PLACE IN IT. MUCH HAS CHANGED SINCE EARTH DAY 1970, AND IN THESE CHANGES I SEE GREAT HOPE FOR THE FUTURE:

- WE HAVE SEEN THE GROWTH OF THE ENVIRONMENTAL ETHIC, A SENSITIVITY REACHING FROM THE HEARTS OF INDIVIDUAL PEOPLE TO THE VERY HIGHEST LEVELS OF GOVERNMENT.
- WE HAVE PROVEN THAT THE LINKAGE BETWEEN ECONOMIC DEVELOPMENT AND ENVIRONMENTAL DEGRADATION CAN BE BROKEN. IT IS POSSIBLE TO GROW ECONOMICALLY AND REDUCE POLLUTION AT THE SAME TIME.
- FINALLY, AND MOST IMPORTANT, WE HAVE BEGUN TO REDEEM THE TWENTIETH CENTURY BY REJECTING THE NARROW VIEWS OF NATION-STATES, IN FAVOR OF MORE UNIVERSAL VALUES. WE ARE SEEING THE BEGINNINGS OF A GLOBAL STEWARDSHIP FOR GLOBAL QUALITY OF LIFE.

TWENTY YEARS AGO, WE WERE DIVIDED AND LIMITED IN SO MANY WAYS. YET, AS OUR VIEW OF THE WORLD HAS GROWN AND MATURED, SO

HAS OUR ABILITY TO BRUSH AWAY OBSTACLES THAT DIVIDE US FROM EACH OTHER.

AS OUR WILLINGNESS TO WORK TOGETHER HAS GROWN, SO TOO HAS OUR ABILITY TO ACT. FROM COMPUTERS TO TELECOMMUNICATIONS TO SATELLITES CAPABLE OF MEASURING THE TEMPERATURE OF THE ENTIRE GLOBE, WE HAVE VASTLY IMPROVED OUR ABILITY TO COMMUNICATE, INTEGRATE AND UNDERSTAND. TECHNOLOGY ALONE CANNOT SOLVE OUR PROBLEMS BUT, MARRIED WITH IMAGINATION AND WILL, TECHNOLOGY WILL BE A MAJOR PORT OF OUR SOLUTIONS.

LET ME BE CANDID. THIS CONFERENCE WILL NOT LEAD TO UNANIMITY. WE HAVE DISAGREED ON THE QUESTION OF GLOBAL CHANGE, AND WE WILL DISAGREE AGAIN. BUT ON ONE POINT WE DO AGREE: THE NEED TO WORK TOGETHER -- OPENLY, DILIGENTLY, RESPECTFULLY -- IN OUR COMMON CAUSE. WE MUST INCREASE OUR UNDERSTANDING -- BOTH OF EACH OTHER AND OF OUR SHARED PROBLEMS. AND WE MUST ACT.

THERE ARE MANY COMMON-SENSE ACTIONS WE CAN TAKE -- IN FACT WE ARE TAKING ACTIONS -- WHICH WILL PERFORM "DOUBLE DUTY" -- IMPROVING THE QUALITY OF LIFE IN THE NEAR TERM, WHILE REDUCING THE EMISSIONS THAT MIGHT CAUSE GLOBAL CLIMATE CHANGE IN THE FUTURE. THE KINDS OF STEPS I HAVE IN MIND INCLUDE POLLUTION PREVENTION, PLANTING TREES, CLEANING UP OUR AIR, AND OFFERING ASSISTANCE TO DEVELOPING NATIONS.

FORGING AHEAD REQUIRES PARTNERSHIPS. FOR US, BUILDING PARTNERSHIPS SHOULD BE THE EASY PART. IT IS OUR BUSINESS. WE ALL KNOW FULL WELL THAT WE MUST BUILD COALITIONS TO ACHIEVE OUR GOALS.

CLEARLY, NO NATION, INSTITUTION OR WAY OF THINKING CAN ADDRESS SINGLE-HANDEDLY GLOBAL CHANGE. TO UNDERSTAND AND REACT TO GLOBAL CLIMATE CHANGE WE MUST REACH ACROSS INTELLECTUAL DISCIPLINES, AND ACROSS NATIONAL BORDERS.

JUST AS WE ARE BREAKING DOWN THE PHYSICAL, ECONOMIC AND POLITICAL BARRIERS BETWEEN OUR NATIONS, MEETING THE CHALLENGE OF GLOBAL CHANGE WILL REQUIRE BREAKING DOWN BARRIERS BETWEEN ENERGY, ECONOMICS AND ENVIRONMENTAL PERSPECTIVES. AS THE PRESIDENT HAS STATED, "GLOBAL STEWARDSHIP IS NOT A FIXED STATE BUT A PROCESS OF CHANGE." ACCELERATING THAT PROCESS OF CHANGE IS THE PURPOSE OF THIS CONFERENCE.

WE ALREADY HAVE CONSIDERABLE EXPERIENCE IN BUILDING AND USING EFFECTIVE PARTNERSHIPS. FOR EXAMPLE, DR. BROMLEY DESCRIBED THE U.S. GLOBAL CHANGE RESEARCH PROGRAM, OUR COUNTRY'S EFFORT TO INCREASE INTERDISCIPLINARY AND INTERAGENCY COOPERATION IN GLOBAL CHANGE RESEARCH.

ANOTHER EFFECTIVE PARTNERSHIP IS THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE. DR. BERT BOLIN HAS HELPED TO MAKE THE IPCC

THE INTERNATIONAL FORUM FOR ASSESSING THE NATURE, EXTENT AND POSSIBLE RESPONSES TO GLOBAL CLIMATE CHANGE. THE IPCC INVOLVES SCIENTISTS AND GOVERNMENT OFFICIALS FROM ALL OVER THE WORLD, SUPPORTED BY THE FINANCIAL AND DATA MANAGEMENT RESOURCES OF THE UNITED NATIONS ENVIRONMENT PROGRAMME, THE WORLD METEOROLOGICAL ORGANIZATION AND THE INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION. OUR WORK AT THIS CONFERENCE WILL ACCELERATE THE IPCC PROCESS, BY FOCUSING THE RESEARCH AGENDA AND BUILDING MECHANISMS FOR WORKING TOGETHER MORE EFFECTIVELY.

THIS CONFERENCE ALSO WILL EMPHASIZE A CONSTRUCTIVE ROLE FOR ECONOMIC PARTNERSHIPS INVOLVING GOVERNMENTS AND PRIVATE ENTERPRISE.

FOR EXAMPLE, BY HARMONIZING INTERNATIONAL TRADE RULES, THE 96-NATION GENERAL AGREEMENT ON TRADE AND TARIFFS (GATT) HAS CONTRIBUTED SIGNIFICANTLY TO A RISE IN THE GLOBAL STANDARD OF LIVING. THE WORLD BANK IS A MAJOR FORCE IN GLOBAL ECONOMIC DEVELOPMENT. ECONOMIC CONSULTATION AND COORDINATION HAS REACHED NEW HEIGHTS WITHIN THE EUROPEAN COMMUNITY AND AMONG THE "G-7" NATIONS. WE MUST FIND NEW WAYS OF USING SUCH ECONOMIC PARTNERSHIPS TO PROTECT THE GLOBAL ENVIRONMENT.

AND, CONSIDER THE EXTENT AND GROWTH OF NON-GOVERNMENTAL, PRIVATE SECTOR PARTNERSHIPS. NON-GOVERNMENTAL ORGANIZATIONS HAVE GROWN IN NUMBER AND IN SIZE AND ARE NOW REACHING AROUND THE GLOBE

TO SHARE HUMAN AND FINANCIAL RESOURCES IN CREATIVE WAYS. THE VERY EXISTENCE OF DEBT FOR NATURE SWAPS IS AN EXAMPLE OF THAT CREATIVITY.

THE RELATIONS BETWEEN BUSINESS AND THE ENVIRONMENT ARE CHANGING AS WELL. IN OUR COUNTRY AND ABROAD, BUSINESSES ARE RETOOLING TO CAPITALIZE ON ENVIRONMENTALLY-INDUCED ECONOMIC OPPORTUNITIES. JAPAN'S MINISTRY OF INTERNATIONAL TRADE AND INDUSTRY HAS ESTABLISHED A PROGRAM FUNDED AT \$60 MILLION IN 1990 FOR THE PURPOSE OF DEVELOPING ENVIRONMENTALLY-SUSTAINABLE TECHNOLOGIES. AMERICAN, JAPANESE AND EUROPEAN CORPORATIONS ARE SCRAMBLING TO ASSIST EASTERN EUROPEANS WITH THEIR MONUMENTAL CLEAN-UP CHALLENGE. PARTNERSHIPS AMONG GOVERNMENTS, SCIENTISTS AND INDUSTRY MADE IT POSSIBLE TO ACHIEVE AGREEMENT ON THE PHASE-OUT OF CFC PRODUCTION. ALL THIS MAY BE DRIVEN BY THE PROFIT MOTIVE, BUT CAPITALISTS BELIEVE THAT PRIVATE PROFIT CAN BE A TOOL FOR PUBLIC GOOD.

PARTNERSHIPS IN THE SHARING OF TECHNOLOGY ARE ESPECIALLY CRUCIAL. NATIONS WITH TECHNOLOGICAL AND ACADEMIC RESOURCES MUST FIND WAYS TO SHARE THOSE RESOURCES. FOR EXAMPLE, THE UNITED STATES IS WORKING WITH MEXICO TO FIND ALTERNATIVES -- COST EFFECTIVE ALTERNATIVES -- TO CFCs AND HALONS THAT MEET THE NEEDS OF MEXICAN INDUSTRY AND CONSUMERS. IN POLAND, WE ARE WORKING TO ENSURE THAT THE TECHNOLOGY TO BURN COAL MORE CLEANLY IS MADE AVAILABLE. AND IN HUNGARY, WE HAVE BEGUN WORK ON A REGIONAL

ENVIRONMENTAL CENTER THAT WILL SHARE KNOWLEDGE AND TECHNOLOGY WITH THE PUBLIC AND PRIVATE SECTORS.

IN ANY ENDEAVOR, IT IS IMPORTANT NOT TO CONFUSE MOTION WITH PROGRESS. MAKE NO MISTAKE: THE CREATION OF NEW PARTNERSHIPS IS NOT JUST AIMLESS MOTION. RATHER, IT REFLECTS A MORE MATURE UNDERSTANDING OF THE SCOPE OF OUR PROBLEMS AND HOW THEY MUST BE SOLVED.

IN THE EARLY DAYS OF ENVIRONMENTAL CONCERN, WE DISCOVERED SPECIFIC PROBLEMS IN SPECIFIC PLACES. FOR EXAMPLE, WE SAW SMOKE COMING OUT OF A STACK, AND WE CONTROLLED THAT STACK. THEN WE DISCOVERED THAT POINT-SOURCE SOLUTIONS MAY DISPERSE POLLUTION FROM A SPECIFIC LOCALE TO THE BROADER REGION, OR EVEN MANY HUNDREDS OF MILES AWAY. AND POINT-SOURCE SOLUTIONS MAY CREATE UNWANTED BYPRODUCTS AND SHIFT THE PROBLEM FROM AIR TO LAND.

RECOGNIZING THIS, WE SAW THE NEED TO ADDRESS POLLUTION AFFECTING ALL MEDIA -- AIR, WATER AND LAND. WE RECOGNIZED THE VALUE OF PREVENTING POLLUTION, RATHER THAN RESPONDING TO IT. WE DISCOVERED THE NEED TO UNDERSTAND THE INTERACTION OF MANMADE CHEMICALS WITH LARGE-SCALE CLIMATIC PROCESSES. WE BEGAN TO THINK ABOUT HOW MACRO-ECONOMIC BEHAVIOR AFFECTS THESE LARGE SYSTEMS. AND THEN, OF COURSE, WE BEGAN TO DEVELOP DIPLOMATIC EFFORTS TO DEAL WITH TRANSBOUNDARY EFFECTS. IN SHORT, OUR POLICIES EVOLVED AS OUR PERSPECTIVES BROADENED.

OUR WORK OVER THE NEXT TWO DAYS MUST INCORPORATE AN EVEN BROADER PERSPECTIVE. ECONOMIC ANALYSIS CAN HELP US UNDERSTAND THE COSTS OF ENVIRONMENTAL DAMAGE, AND MAY SHOW US THAT ADAPTING TO CHANGE COULD COST MORE THAN PREVENTING THAT CHANGE. SCIENTIFIC ADVANCES CAN HELP US SEE WHETHER AND HOW FAST OUR TECHNOLOGY MAY EVOLVE -- OR WHERE WE MUST FOCUS OUR EFFORTS TO ENSURE THAT IT DOES EVOLVE. DEALING WITH GLOBAL CHANGE MAY REQUIRE BROADER VISION AND GREATER INTEGRATION THAN ANY OTHER PROBLEM IN HUMAN HISTORY.

BUT WE HAVE A MODEL FOR THAT KIND OF VISION AND INTEGRATION AND WE SHOULD NOT LOSE SIGHT OF IT. THE MONTREAL PROTOCOL, SIGNED IN SEPTEMBER 1987, IS THE FIRST MULTI-LATERAL AGREEMENT TO CONTROL GLOBAL POLLUTION IN ANTICIPATION OF AN ENVIRONMENTAL PROBLEM. IT WAS THE OUTCOME OF CAREFUL, COMPLEX DISCUSSIONS, IN WHICH WE FIRST ACHIEVED AGREEMENT ON THE SCIENTIFIC AGENDA, AND THEN FORMED CROSS-CUTTING PARTNERSHIPS TO PERFORM AND REVIEW THE SCIENCE. THE SCALE OF UNCERTAINTY WAS GRADUALLY REDUCED. PARTNERSHIPS SPRANG UP BETWEEN GOVERNMENT BODIES, PRIVATE COMPANIES, SCIENTISTS AND ENVIRONMENTALISTS. A FRAMEWORK CONVENTION WAS NEGOTIATED AT VIENNA TO PROVIDE A STRUCTURE FOR POLICY ACTIONS, AND WHEN THE SCIENTIFIC AND ECONOMIC REALITIES EMERGED, A PROTOCOL WAS NEGOTIATED WITH SPECIFIC TARGETS AND PROVISION FOR FUTURE AMENDMENTS.

THAT PROCESS WORKED VERY WELL. WE WOULD BE FOOLISH TO DISREGARD IT.

IN THE LONG RUN, ALL OF US MUST UNDERSTAND THE ENVIRONMENTAL AND ECONOMIC IMPLICATIONS OF A CHANGING WORLD, AND WE MUST UNDERSTAND HOW BEST TO RESPOND. IN THE NEXT TWO DAYS, WE CAN FORGE THE PARTNERSHIPS THAT WILL ENHANCE THAT UNDERSTANDING. WE SHOULD STRIVE FOR AGREEMENT ON OVERALL GOALS, FOR TO BE EFFECTIVE, OUR EFFORTS MUST HAVE A COMMON DIRECTION. WE NEED TO REINFORCE OUR COMMUNICATION MECHANISMS BECAUSE SHARED PERSPECTIVES AND KNOWLEDGE OFFER HOPE FOR THE FUTURE. WE NEED TO LOOK BEYOND THE BORDERS OF OUR DISCIPLINES, FOR IF ECONOMISTS DO NOT UNDERSTAND THE NEEDS OF SCIENTISTS, AND SCIENTISTS DO NOT UNDERSTAND THE PERSPECTIVES OF ECONOMISTS, AND IF POLICYMAKERS DO NOT LISTEN CAREFULLY TO BOTH, OUR SOLUTIONS CANNOT BE COMPLETE.

IN THE FINAL ANALYSIS, IT IS PROGRESS THAT COUNTS. THE PROGRESS OF RESEARCH, THE PROGRESS OF DIPLOMACY, AND THE PROGRESS OF ACTION. PROGRESS THAT CAN ONLY EMERGE FROM THE PARTNERSHIPS THAT WE CAN BUILD OVER THE NEXT TWO DAYS. THAT IS OUR COMMON CHALLENGE.

THANK YOU.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D. C. 20460

THE ADMINISTRATOR

GLOBAL CHANGE: A COMMITMENT TO ACTION

Remarks by

WILLIAM K. REILLY

Administrator

U.S. Environmental Protection Agency

**WHITE HOUSE CONFERENCE ON SCIENCE AND ECONOMICS RESEARCH
RELATED TO GLOBAL CHANGE**

J.W. Marriott Hotel

Washington, DC

April 17, 1990

O YOU HAVE HEARD THIS MORNING ABOUT RESEARCH NEEDS --
SCIENTIFIC RESEARCH AND ECONOMIC RESEARCH

-- I AM HERE TO TALK ABOUT SOMETHING ELSE

-- I AM HERE TO TALK ABOUT ACTION: ACTION IN THE FACE OF
INCONCLUSIVE INFORMATION; POLICY-MAKING IN THE FACE OF
UNCERTAINTY

-- NEITHER WE IN THE UNITED STATES NOR THOSE OF YOU FROM
OTHER COUNTRIES WILL BE ABLE TO WAIT FOR TOTAL
ENLIGHTENMENT TO INFORM OUR POLICY DECISIONS

-- SO LET ME DESCRIBE SOME OF THE IMPORTANT ACTIONS WE CAN
TAKE -- WE ARE TAKING -- RIGHT NOW, EVEN AS WE
AGGRESSIVELY PURSUE THE SEARCH FOR ANSWERS TO CLIMATE
QUESTIONS

O FIRST, IT'S CLEAR THAT WE MUST WORK TOGETHER; NO ONE OF
OUR COUNTRIES IS ALONE, AND NONE CAN EFFECTIVELY
ADDRESS GLOBAL CLIMATE PROBLEMS APART FROM THE OTHERS

-- ACCORDINGLY, WE ATTACH GREAT VALUE TO OUR
INTERNATIONAL COLLABORATION

-- THE VEHICLE FOR THAT COLLABORATION IS THE IPCC -- THE
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

-- THE IPCC IS ASKING THE RIGHT QUESTIONS, IT IS PULLING
TOGETHER A GREAT DEAL OF RELEVANT INFORMATION, AND WE
IN THE UNITED STATES ARE PLAYING A KEY ROLE AS CHAIR OF
THE RESPONSE STRATEGIES WORKING GROUP

-- AMONG THE U.S. CONTRIBUTIONS TO THE IPCC PROCESS HAVE
BEEN TWO IMPORTANT REPORTS TO CONGRESS BY THE U.S.
ENVIRONMENTAL PROTECTION AGENCY, MY OWN AGENCY: ONE
ON EFFECTS, AND ANOTHER, STILL IN DRAFT, ON THE POLICY
OPTIONS FOR STABILIZING CLIMATE CHANGE

-- WE WILL CONTINUE TO DO THIS KIND OF TECHNICAL WORK AND
ANALYSIS TO HELP LAY THE GROUNDWORK FOR THE NEXT
PHASE OF THE IPCC PROCESS -- TREATY NEGOTIATIONS ON
CLIMATE CHANGE

- AND WE ENCOURAGE OTHER COUNTRIES, AS WELL, TO CONTINUE TO CONTRIBUTE TO THE GROWING BODY OF KNOWLEDGE AND INFORMATION
- THE UNITED STATES HAS ALSO PARTICIPATED IN THE FULL RANGE OF DISCUSSIONS THAT HAVE TAKEN PLACE ON THIS ISSUE, INCLUDING THE CONFERENCES IN CANADA, THE NETHERLANDS AND EGYPT
- O SECOND, WE MUST DEVOTE SUBSTANTIAL RESOURCES TO STRENGTHENING THE SCIENCE OF CLIMATE CHANGE AND TO BROADENING OUR KNOWLEDGE OF THE ECONOMIC IMPACTS
- SOUND SCIENCE IS CRITICAL TO CONSENSUS-BUILDING; WITHOUT IT, WE WILL HAVE ONLY CONTROVERSY AND CONFUSION
- PRESIDENT BUSH HAS PROPOSED A 57 PERCENT INCREASE IN FUNDING FOR GLOBAL CHANGE RESEARCH FOR THE NEXT FISCAL YEAR
- THIS INCLUDES A SUBSTANTIAL BOOST IN THE FUNDING FOR ATMOSPHERIC MONITORING BY THE SATELLITES OF NASA
- U.S. SCIENCE IS MAKING A CRITICAL CONTRIBUTION TO THE DEBATE ON GLOBAL CLIMATE CHANGE
- NOAA, NASA, NCAR, NAS, EPA, TO NAME A FEW, ARE FULLY ENGAGED IN ADVANCING OUR KNOWLEDGE AND IN CLOSING THE CIRCLE OF UNCERTAINTY
- A LONG-TERM COMMITMENT TO RESEARCH AND DEVELOPMENT CAN BRING DOWN THE COST OF EXISTING OPTIONS, AND DEVELOP NEW OPTIONS AS WELL
- AND DOING OUR HOMEWORK ON THE RANGE OF RESPONSE STRATEGIES AVAILABLE -- AND THE COST OF THESE OPTIONS -- IS ABSOLUTELY CRITICAL AT THIS JUNCTURE OF OUR DELIBERATIONS
- ECONOMICS HAVE NOT RECEIVED MUCH ATTENTION AT PREVIOUS MEETINGS ON CLIMATE CHANGE

- ECONOMIC ANALYSIS IS CRITICAL TO ENSURING THAT THE FRAMEWORK CONVENTION DISCUSSIONS WHICH WE HOPE WILL BEGIN AT THE END OF THE YEAR ARE PURPOSEFUL AND TO THE POINT
- IT IS CRITICAL TO ENSURING THAT THE MANY CONSEQUENCES ASSOCIATED WITH GLOBAL CHANGE ARE FULLY UNDERSTOOD AND ACCOUNTED FOR
- IT IS CRITICAL TO ENSURING THAT THE POLICIES AND PROGRAMS WHICH MAY ULTIMATELY BE DEEMED NECESSARY -- ESPECIALLY IF THEY ENTAIL SIGNIFICANT ECONOMIC DISRUPTIONS -- WILL BE POLITICALLY ACCEPTABLE
- IN SHORT, LAYING PROPER GROUNDWORK, DOING OUR HOMEWORK, BUILDING CONSENSUS, REDUCING CONFUSION AND CONTROVERSY TODAY, WILL SAVE TIME IN THE LONG RUN
- O THIRD, WE HAVE LEARNED MANY VALUABLE LESSONS ABOUT HOW TO PUT TOGETHER AN INTERNATIONAL RESPONSE TO A GLOBAL ENVIRONMENTAL ISSUE THROUGH OUR EFFORTS TO PROTECT THE STRATOSPHERIC OZONE LAYER, AND WE SHOULD PAY ATTENTION TO THESE LESSONS
- THE UNITED STATES FIRST ACTED TO REDUCE EMISSIONS OF OZONE-DEPLETING CHLOROFLUOROCARBONS IN 1978
- NINE YEARS LATER, THE MONTREAL PROTOCOL ESTABLISHED AN INTERNATIONAL REGIME REQUIRING A 50 PERCENT REDUCTION IN CFC PRODUCTION AND USE BY 1998
- MEANWHILE, THE DEVELOPMENT OF SUBSTITUTES IS PROCEEDING MUCH MORE RAPIDLY THAN WE HAD ANTICIPATED
- ALL OF THIS HAS COME ABOUT BECAUSE OF UNPRECEDENTED INTERNATIONAL COOPERATION, AND BUSINESS-GOVERNMENT COOPERATION, TO ADDRESS WHAT SCIENCE TELLS US IS A CLEAR AND PRESENT THREAT TO THE WELL-BEING OF OUR PLANET
- THE IMPORTANCE OF INTERNATIONAL AND INTERSECTORAL COOPERATION IS ONLY ONE OF THE LESSONS WE ARE LEARNING FROM THE OZONE DEPLETION MODEL. HERE ARE SOME OTHERS:

- PERIODIC ASSESSMENT AND REVISION IS IMPORTANT WHEN DEALING WITH ISSUES ON THE CUTTING EDGE OF SCIENCE
- SINCE THE PROTOCOL WAS SIGNED, THE LINK BETWEEN CFCS AND THE OZONE HOLE HAS BEEN CONFIRMED; AND NEW EVIDENCE INDICATES THAT OZONE DEPLETION IS MORE SEVERE AND OCCURRING AT A FASTER RATE THAN WAS ORIGINALLY THOUGHT
- AS A RESULT, WHEN THE PROTOCOL IS RENEGOTIATED THIS JUNE, WE HOPE AND EXPECT IT WILL BE STRENGTHENED TO REQUIRE A FULL PHASE-OUT OF CFCS BY THE END OF THE CENTURY
- NOW, I RECOGNIZE THAT THE CLIMATE CHANGE ISSUE INVOLVES EMISSIONS THAT ARE MORE FUNDAMENTAL TO THE BASIC OPERATION OF THE ECONOMY THAN CFC'S
- LESSON TWO: IT'S WISE TO TAKE WHAT SCIENCE GIVES YOU: A RESPONSE THAT IS SUPPORTED BY EXISTING KNOWLEDGE, AND THUS ABLE TO GENERATE CONSENSUS, IS PREFERABLE TO ONE THAT GOES BEYOND ACCEPTED SCIENCE AND GAINS ONLY LIMITED PARTICIPATION
- BY ADOPTING AN APPROACH BASED ON PERIODIC ASSESSMENT AND REVIEW, THE MONTREAL PROTOCOL HAS GATHERED WIDE INTERNATIONAL PARTICIPATION AND SUPPORT -- NOT ONLY FOR THE ORIGINAL PROTOCOL BUT ALSO FOR CURRENT EFFORTS TO STRENGTHEN THE TERMS OF THE AGREEMENT
- LESSON THREE: THE CONCERNS OF THE DEVELOPING NATIONS MUST BE ADDRESSED: INTERNATIONAL ENVIRONMENTAL PROBLEMS CANNOT BE SOLVED WITHOUT THEIR PARTICIPATION
- DEVELOPING COUNTRIES TODAY ACCOUNT FOR LESS THAN 15 PERCENT OF TOTAL CFC CONSUMPTION
- YET THEIR CONTINUED USE OF THESE CHEMICALS WOULD OFFSET EVEN A COMPLETE ELIMINATION OF OZONE-DEPLETING CHEMICALS IN THE DEVELOPED WORLD

- ALTHOUGH 23 DEVELOPING NATIONS HAVE SIGNED THE MONTREAL PROTOCOL, MANY OTHERS HAVE NOT, INCLUDING CHINA AND INDIA
- WAYS MUST BE FOUND TO ENSURE THAT THE ECONOMIC ASPIRATIONS OF THE WORLD'S POOREST PEOPLE ARE REALIZED, EVEN WHILE NATURE IS KEPT HEALTHFUL AND PRODUCTIVE
- THE MONTREAL PROTOCOL ADDRESSES THESE CONCERNS BY GIVING DEVELOPING COUNTRIES A TEN-YEAR GRACE PERIOD BEFORE THEY MUST BEGIN REDUCING CFC USE; AND BY COMMITTING THE DEVELOPED WORLD TO PROVIDING ASSISTANCE TO DEVELOPING NATIONS THAT JOIN THE PROTOCOL
- I SHOULD NOTE THAT ALONG WITH PROVIDING USEFUL LESSONS FOR ADDRESSING GLOBAL CHANGE, THE ELIMINATION OF CFC'S WILL, OF COURSE, ALSO HELP TO COMBAT CLIMATE CHANGE, FOR CFC'S ARE A SIGNIFICANT GREENHOUSE GAS
- O THE FOURTH ACTION I WANT TO MENTION IS PRESIDENT BUSH'S PROPOSAL FOR A MAJOR REFORESTATION INITIATIVE CALLED "AMERICA THE BEAUTIFUL," WHICH ANTICIPATES THE PLANTING OF ONE BILLION TREES A YEAR OVER THE NEXT 10 TO 15 YEARS
- THAT'S FOUR TREES PER PERSON IN THIS COUNTRY EACH YEAR
- WE ESTIMATE THAT THE TREES PLANTED UNDER THIS PROGRAM WILL ABSORB TWO TO FOUR PERCENT OF THE CARBON DIOXIDE NOW BEING EMITTED INTO THE ATMOSPHERE BY THE UNITED STATES
- O FIFTH, THE PRESIDENT HAS PROPOSED -- AND OUR CONGRESS IS ON THE VERGE OF ADOPTING -- A SIGNIFICANT STRENGTHENING OF OUR CLEAN AIR ACT
- THESE AMENDMENTS WILL REDUCE THIS NATION'S SULFUR DIOXIDE EMISSIONS FROM UTILITIES BY ABOUT HALF AND STABILIZE THEM AT THAT LEVEL; ALL FUTURE GROWTH OF ENERGY WILL HAVE TO OCCUR WITHIN THE CEILING OF THIS REDUCED SULFUR DIOXIDE EMISSION LIMIT

- THE NEW CLEAN AIR ACT WILL REDUCE NITROGEN OXIDE EMISSIONS BY AT LEAST TWO MILLION TONS A YEAR AND REDUCE HYDROCARBON EMISSIONS FROM VEHICLES BY 40 PERCENT
- VOLATILE ORGANIC CHEMICALS FROM INDUSTRIAL FACILITIES WILL DROP BY MORE THAN 30 PERCENT; AND TOXIC AIR EMISSIONS WILL BE REDUCED BY 75 TO 90 PERCENT
- THE PRESIDENT'S PROPOSALS ALSO ENCOURAGE THE DEVELOPMENT OF LESS-POLLUTING FUELS, SUCH AS COMPRESSED NATURAL GAS IN AUTOMOBILE FLEETS AND ETHANOL AND METHANOL FUELS IN PRIVATE AUTOMOBILES
- MANY OF THESE PROVISIONS WILL BRING ABOUT REDUCTIONS IN CARBON DIOXIDE AND OTHER GASES THAT CONTRIBUTE TO CLIMATE CHANGE
- FOR EXAMPLE, THE PROPOSED CAP ON TOTAL SULFUR DIOXIDE EMISSIONS ENCOURAGES UTILITIES TO UNDERTAKE MORE ENERGY EFFICIENCY; IT ALSO CREATES INCENTIVES FOR INDUSTRY TO BE MORE EFFICIENT
- THE PROPOSED CHANGES REDUCE CARBON MONOXIDE EMISSIONS, WHICH DECREASES THE LIFETIME OF METHANE;
- AND REDUCTIONS IN NITROGEN OXIDE AND VOLATILE ORGANICS GENERALLY REDUCE TROPOSPHERIC OZONE, ANOTHER CLIMATE-ALTERING GAS
- SIXTH ON OUR ACTION AGENDA, WE ARE PURSUING A VARIETY OF ENERGY CONSERVATION INITIATIVES, ALL OF WHICH ARE IMPORTANT IN COMBATTING CLIMATE CHANGE:
 - THE U.S. DEPARTMENT OF ENERGY IS IMPLEMENTING EFFICIENCY STANDARDS FOR MAJOR HOUSEHOLD APPLIANCES, SUCH AS DISHWASHERS, CLOTHES WASHERS AND CLOTHES DRYERS
 - OUR STATES ARE LOOKING AT WAYS TO GIVE UTILITIES INCENTIVES TO PROMOTE ENERGY EFFICIENCY, BY ALLOWING THEM TO PROFIT FROM CONSERVING ENERGY AS WELL AS SELLING ENERGY

- THE ELECTRIC POWER RESEARCH INSTITUTE ESTIMATES THAT THESE PROGRAMS COULD CUT OUR NATION'S ELECTRICITY NEEDS BY 20 PERCENT IN THE YEAR 2010
- SOME STATES, SUCH AS CALIFORNIA, ARE ALSO CHANGING THEIR BUILDING CODES TO INCREASE ENERGY EFFICIENCY IN NEW CONSTRUCTION; THE CALIFORNIA ENERGY COMMISSION ESTIMATES THAT ITS BUILDING STANDARDS WILL REDUCE ELECTRICITY USE BY SIX PERCENT IN THE YEAR 2007
- WE'RE ALSO VIGOROUSLY PURSUING AUTOMOBILE FUEL EFFICIENCY: THE ENERGY POLICY AND CONSERVATION ACT OF 1976 HAS INCREASED FUEL EFFICIENCY FOR OUR NEW CARS BY ABOUT 80 PERCENT IN THE LAST 13 YEARS
- FINALLY, WE ARE CONDUCTING RESEARCH ON VARIOUS FORMS OF NONFOSSIL ENERGY, INCLUDING RENEWABLES AND NUCLEAR; THE ADMINISTRATION HAS REQUESTED A 27 PERCENT INCREASE IN THE 1991 BUDGET FOR RENEWABLE ENERGY
- WE STILL HAVE A LONG WAY TO GO ON ENERGY CONSERVATION; AND WE WILL GO A LONG WAY
- I WANT TO MAKE SPECIAL MENTION OF JAPAN'S NEW CONCEPT FOR A PLAN OF RESEARCH AND DEVELOPMENT ON NEW TECHNOLOGIES; THIS PLAN LOOKS 100 YEARS AHEAD AND MAKES AMBITIOUS AND IMAGINATIVE COMMITMENTS
- THAT IS THE KIND OF INITIATIVE THIS CONFERENCE IS INTENDED TO ADDRESS AND CONSIDER
- O OVER THE PAST 20 YEARS, WE HAVE LEARNED A GREAT DEAL FROM OUR EXPERIENCE SINCE THE FIRST EARTH DAY IN 1970 USHERED IN THE ENVIRONMENTAL REVOLUTION
- MANY OF THESE LESSONS CAN BE APPLIED NOW TO ISSUES OF GLOBAL CLIMATE CHANGE
- FOR ONE THING, WE HAVE LEARNED THAT GREAT IMPROVEMENTS ARE POSSIBLE WITH COMMITMENT AND SUSTAINED INVESTMENT

- THE GAINS WE HAVE MADE IN REDUCING AIR AND WATER POLLUTION IN THIS COUNTRY ARE MEASURABLE, THEY ARE SIGNIFICANT, AND THEY ARE INDISPUTABLE
- IN EVERY MAJOR CATEGORY OF AIR POLLUTION EXCEPT NITROGEN OXIDES, EMISSIONS ON A NATIONAL BASIS HAVE EITHER LEVELED OFF OR DECLINED SINCE 1970
- EMISSIONS OF PARTICULATES ARE DOWN 64 PERCENT; SULFUR OXIDES, DOWN 25 PERCENT; VOLATILE ORGANICS, DOWN 29 PERCENT; CARBON MONOXIDE, DOWN 38 PERCENT; AND LEAD, A MAJOR SUCCESS STORY THANKS TO OUR SWITCH TO UNLEADED GASOLINE, DOWN 96 PERCENT
- WE BEGAN TO CONTROL AUTOMOBILE TAILPIPE EMISSIONS IN 1970. BACK THEN, I DON'T RECALL ANYONE WHO ADVOCATED ANYTHING CLOSE TO THE 96 PERCENT REDUCTION WE HAVE SINCE ACHIEVED
- AND THE PENDING CLEAN AIR ACT WILL BRING THE REDUCTIONS TO 98 PERCENT HYDROCARBON REMOVAL
- OVERALL WATER POLLUTION TRENDS ARE MORE MIXED BECAUSE OF POPULATION AND INDUSTRIAL GROWTH; BUT WE HAVE HAD SUBSTANTIAL SUCCESS IN REDUCING POLLUTANTS IN MANY SPECIFIC AREAS
- IN THE GREAT LAKES, FOR EXAMPLE, FECAL COLIFORM IS DOWN, NUTRIENTS ARE DOWN, ALGAE ARE DOWN, BIOLOGICAL OXYGEN DEMAND IS DOWN
- TWENTY YEARS AGO IT LOOKED DOUBTFUL THERE WOULD BE ANY FISH AT ALL IN LAKE ERIE; NOW THERE ARE PLENTY. OUR OWN POTOMAC RIVER WAS ONCE SO POLLUTED THAT PEOPLE WHO CAME INTO CONTACT WITH IT WERE ADVISED TO GET AN INOCULATION FOR TETANUS
- NOW ON A WARM DAY, IT BELONGS TO THE WINDSURFERS
- IF WE WORK TOGETHER, I AM CONFIDENT THAT OUR REMAINING ENVIRONMENTAL PROBLEMS, WHETHER LOCAL, NATIONAL, OR GLOBAL, CAN ALSO BE BROUGHT UNDER CONTROL

- TWENTY YEARS AGO ENVIRONMENTALISTS BELIEVED THAT THE ECONOMICS WOULD ALWAYS BE AGAINST US; ENVIRONMENTAL REGULATORS BELIEVED THAT, TOO
- SINCE THEN, WE HAVE LEARNED THAT WE NEED TO ARRANGE A MARRIAGE BETWEEN ENVIRONMENTAL AND ECONOMIC CONSIDERATIONS
- WE NEED TO INTEGRATE ECONOMIC POLICY WITH ENERGY POLICY WITH ENVIRONMENTAL POLICY
- AND WE NEED TO PROVIDE THE RIGHT ECONOMIC INCENTIVES TO PROMOTE ENVIRONMENTAL PROTECTION
- THE SAME FLEXIBLE, MARKET-BASED SYSTEMS THAT HAVE PROVED EFFECTIVE IN PRODUCING GOODS AND SERVICES CAN ALSO HELP PROTECT THE ENVIRONMENT
- THE ACID RAIN PROVISIONS OF THE PRESIDENT'S CLEAN AIR ACT PROPOSALS ARE AN EXAMPLE OF THE USE OF MARKET INCENTIVES TO ACHIEVE ENVIRONMENTAL GAINS AT THE LOWEST COST
- THE PRESCRIPTIVE, COMMAND-AND-CONTROL APPROACH OF THE ORIGINAL CLEAN AIR ACT WAS SUCCESSFUL UP TO A POINT -- AS INDICATED BY THE IMPROVEMENTS IN AIR QUALITY I JUST MENTIONED
- BUT THIS APPROACH IS MUCH MORE DIFFICULT TO APPLY TO DIFFUSE, DIVERSE SOURCES OF POLLUTION -- SUCH AS MANY OF THOSE THAT CONTRIBUTE TO CLIMATE CHANGE
- TO GET AT THESE SOURCES, WE SEE THE NEED TO INCORPORATE MARKET INCENTIVES INTO THE NEW CLEAN AIR LAW -- TO SEND A SIGNAL TO THE MARKETPLACE THAT "THE ENVIRONMENT IS AN ISSUE THAT WON'T GO AWAY; YOU'D BE WISE TO ADDRESS IT"

- UNDER THE NEW LAW, ELECTRIC UTILITIES EMITTING HIGH AMOUNTS OF SULFUR DIOXIDES WILL BE GIVEN ALLOWANCES DESIGNED TO REDUCE THEIR SULFUR DIOXIDE EMISSIONS BY ABOUT HALF; THEY WILL BE FREE TO BUY EMISSION ALLOWANCES FROM OTHERS IF CUTTING BACK ON EMISSIONS WOULD COST MORE THAN THE ALLOWANCES DO
- ON THE OTHER HAND, THE COMPANIES COULD REDUCE EMISSIONS SO FAR THAT THEY WOULD BE ABLE TO BANK OR SELL THEIR EXTRA ALLOWANCES; AND THEY'LL BE FREE TO PURSUE THE CHEAPEST METHOD OF POLLUTION CONTROL -- ENERGY CONSERVATION, DIFFERENT FUELS, NEW TECHNOLOGY, LITTLE MEN IN THEIR SMOKESTACKS WEARING MITTENS -- PROVIDED ONLY THAT THEY GET THE POLLUTION REDUCTIONS THE COUNTRY NEEDS
- EPA WILL SIMPLY MONITOR EMISSIONS AND MAKE SURE THAT FOR EVERY TON OF SULFUR DIOXIDE EMITTED, A POLLUTER HAS THE REQUIRED ALLOWANCE
- AND OVER THE PAST 20 YEARS, WE ALSO HAVE LEARNED THAT THERE IS A POTENTIALLY CRITICAL ROLE FOR TAX POLICY IN ENVIRONMENTAL PROTECTION
- MANY NATIONS HAVE BEEN EXPERIMENTING WITH TAX INCENTIVES AND DISINCENTIVES TO REDUCE EMISSIONS RELATED TO CLIMATE CHANGE
- IN THIS COUNTRY, WE ARE TAXING CFC'S, AND WE WILL TAKE IN \$400 MILLION FROM THIS TAX THIS YEAR, \$5 BILLION OVER THE NEXT FIVE YEARS
- (I SUSPECT THAT THIS IS THE HIGHEST TAX IMPOSED ON ANY GREENHOUSE GAS, ANYWHERE)
- WE ALSO HAVE LEARNED OVER TWO DECADES OF ENVIRONMENTAL PROGRAMS, AS I MENTIONED WITH RESPECT TO CFCS, THAT THE SPECIAL NEEDS OF DEVELOPING COUNTRIES MUST BE ADDRESSED
- WE IN THE UNITED STATES WILL HELP TO DO THIS, AND SO MUST THE MULTILATERAL AID AND LENDING INSTITUTIONS

-- WE WILL CONTINUE AND STRENGTHEN OUR PROGRAMS OF TECHNOLOGY TRANSFER, AND WE WILL STRONGLY EMPHASIZE THE WORK OF OUR INTERNATIONAL ENVIRONMENTAL TECHNICAL TRANSFER ADVISORY BOARD, SET UP TO ADVISE EPA ON THESE VERY TIMELY ISSUES

-- TECHNOLOGY TRANSFER AND TECHNICAL ASSISTANCE PROGRAMS TO DEVELOPING COUNTRIES ARE IMPORTANT OPTIONS FOR ENCOURAGING THE ADOPTION OF ENERGY EFFICIENCY AND RENEWABLE ENERGY TECHNOLOGIES

-- BUT THE DEVELOPING NATIONS THEMSELVES MUST BE WILLING TO PARTICIPATE; THEY CANNOT HAVE A PASS -- THEY MUST BE PART OF THE SOLUTION

-- THEIR FOREST POLICIES AND THEIR ENERGY POLICIES MUST CHANGE; THEY MUST BE WILLING TO PURSUE DEVELOPMENT THAT IS SUSTAINABLE, DEVELOPMENT THAT IS ENVIRONMENTALLY SOUND

-- AND FINALLY, FROM 20 YEARS OF EXPERIENCE WE HAVE LEARNED THAT WE MUST BE FLEXIBLE IN OUR SEARCH FOR SOLUTIONS

-- RATHER THAN INSISTING ON TIGHTLY PRESCRIBED, "QUICK-FIX" REMEDIES, WE MUST SET LONG-TERM GOALS AND ALLOW NATIONS AND INDUSTRIES THE SPACE TO WORK OUT SOLUTIONS BEST SUITED TO THEIR PARTICULAR SITUATION

-- THE IPCC PROCESS WILL LET US TAKE A LONGER-TERM PERSPECTIVE ON CLIMATE CHANGE, THROUGH ITS EXCHANGE OF INFORMATION ON THE SCIENCE, THE ECONOMICS AND THE ENVIRONMENTAL EFFECTS

O IN SUMMARY, THEN, MY CENTRAL MESSAGE TO YOU TODAY IS THIS:

-- WHILE THE IPCC PROCESS IS DOING ITS WORK, MANY OTHER THINGS CAN BE DONE TO REDUCE EMISSIONS RELATED TO CLIMATE CHANGE THAT ARE GOOD PUBLIC POLICY REGARDLESS OF ANY ASSUMPTIONS WE MIGHT MAKE ABOUT THE DEGREE OR TIMING OR CONSEQUENCES OF CLIMATE CHANGE

- WE WILL CONTINUE AND STRENGTHEN OUR PROGRAMS OF TECHNOLOGY TRANSFER, AND WE WILL STRONGLY EMPHASIZE THE WORK OF OUR INTERNATIONAL ENVIRONMENTAL TECHNICAL TRANSFER ADVISORY BOARD, SET UP TO ADVISE EPA ON THESE VERY TIMELY ISSUES
- TECHNOLOGY TRANSFER AND TECHNICAL ASSISTANCE PROGRAMS TO DEVELOPING COUNTRIES ARE IMPORTANT OPTIONS FOR ENCOURAGING THE ADOPTION OF ENERGY EFFICIENCY AND RENEWABLE ENERGY TECHNOLOGIES
- BUT THE DEVELOPING NATIONS THEMSELVES MUST BE WILLING TO PARTICIPATE; THEY CANNOT HAVE A PASS -- THEY MUST BE PART OF THE SOLUTION
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- THE IPCC PROCESS WILL LET US TAKE A LONGER-TERM PERSPECTIVE ON CLIMATE CHANGE, THROUGH ITS EXCHANGE OF INFORMATION ON THE SCIENCE, THE ECONOMICS AND THE ENVIRONMENTAL EFFECTS
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 - WHILE THE IPCC PROCESS IS DOING ITS WORK, MANY OTHER THINGS CAN BE DONE TO REDUCE EMISSIONS RELATED TO CLIMATE CHANGE THAT ARE GOOD PUBLIC POLICY REGARDLESS OF ANY ASSUMPTIONS WE MIGHT MAKE ABOUT THE DEGREE OR TIMING OR CONSEQUENCES OF CLIMATE CHANGE

- THE UNITED STATES IS TAKING MANY SUCH "CLIMATE CONSCIOUS" STEPS; I'VE SUMMARIZED THEM
- THE MEASURES ALREADY UNDERWAY, INCLUDING THE PHASEOUT OF CFCS, REFORESTATION AND CONSERVATION, WILL REDUCE THE U.S. CONTRIBUTION OF CLIMATE-ALTERING GASES BY MORE THAN 15 PERCENT BELOW WHAT THEY OTHERWISE WOULD HAVE BEEN BY THE YEAR 2000
- MEANWHILE RESEARCH ON GLOBAL CHANGE, ON THE LIKELY EFFECTS OF SUCH CHANGE, AND ON THE COSTS AND CONSEQUENCES OF POLICY MEASURES IS NECESSARY TO GUIDE FUTURE ACTIONS; WE ARE INTENSELY PURSUING SUCH RESEARCH AND ENCOURAGE OTHER NATIONS TO JOIN US
- THE IPCC HAS SET A MODEL FOR SUCH COOPERATION; LET'S GIVE IT A CHANCE TO COMPLETE ITS WORK
- O CLEARLY, THE GLOBAL CLIMATE IS A MATTER OF PROFOUND IMPORTANCE
- THE ENVELOPE THAT SUSTAINS LIFE IS VERY THIN; THOSE OF YOU WHO CAME TO THIS CONFERENCE BY AIRPLANE FLEW ABOVE 90 PERCENT OF THE EARTH'S ATMOSPHERE
- AND, AS WE HAVE SEEN WITH THE ANTARCTIC OZONE HOLE, THE ATMOSPHERE IS FRAGILE AND VULNERABLE TO DESTABILIZATION BY HUMAN ACTIVITY
- MORE THAN AT ANY PREVIOUS MOMENT IN HUMAN HISTORY, NATURE AND NATURAL SYSTEMS ARE IN HUMAN HANDS, DEPENDENT ON HUMAN EFFORTS
- OUR SITUATION TODAY GIVES A NEW MEANING TO STEWARDSHIP, AND A NEW SIGNIFICANCE TO THE CONCEPT OF GLOBAL ENVIRONMENTAL COOPERATION
- WE ARE COMMITTED TO ACTION TO ADDRESS THE PROBLEM OF CLIMATE CHANGE

-- FOR 20 YEARS, THE UNITED STATES HAS BEEN A LEADER ON ENVIRONMENTAL ISSUES -- AND WE INTEND TO CONTINUE THIS LEADERSHIP

-- WE ARE LOOKING FORWARD TO WORKING WITH YOU -- AND THE ENTIRE INTERNATIONAL COMMUNITY -- ON THE CHALLENGES THAT LIE AHEAD

-- THANK YOU

DOE

NEWS

Speech of Admiral James D. Watkins, U.S. Navy (Retired)
U.S. Secretary of Energy
before
The White House Conference
on
Science and Economics Research Related
to Global Change
Wednesday, April 18, 1990

Good afternoon, ladies and gentlemen. It is a pleasure to have the opportunity to speak to you on energy policy as it relates to the theme of this conference, including scientific and economic research, decision-making strategies, energy technologies, and future partnerships.

The production and consumption of energy is obviously a primary contributor to carbon dioxide emissions worldwide, and is at the focus of a number of other environmental concerns. Yet energy is also the primary contributor to worldwide economic growth and development. If we are to achieve economic growth in an environmentally sound fashion, we must develop and deploy energy technologies that contribute to the global stewardship that President Bush has eloquently called for.

Over the past day and a half, you have had the opportunity to hear from many of the leading figures in the U.S. government, from the President on down. Dr. Allan Bromley has described the scientific knowns and unknowns in the science of climate change, and the research challenges that lie before us. Secretary Brady and Michael Boskin have described our efforts to integrate scientific and environmental considerations with economic programs. Michael Deland has described the partnerships the United States and other countries are forging to protect our global environment. Yesterday at lunch, Bill Reilly of our Environmental Protection Agency detailed specific steps already being taken by the United States that will help ameliorate the threat of global climate change.

We have also heard a number of impressive presentations from other delegations to this Conference.

- o I found the Japanese vision of "New Earth 21" particularly compelling. Their action program for the 21st century is truly progressive and comprehensive, with stages of environmental responses keyed to increases in basic understanding and the development of improved energy technologies.
- o I think we can all also agree with the call for stronger efforts and cooperation in scientific and economic research, coupled with investments in technology development and international technology transfer.
- o And the working group that I participated in yesterday afternoon was very impressed with OECD efforts to develop economic simulation models that will provide more sophisticated cost estimates of various emission control alternatives. This latter program of cooperative economic research is a very positive step towards new and necessary analytical tools. I think it deserves the wholehearted support of this Conference.

All these themes find strong resonances with the underlying intellectual framework that we are developing for future U.S. energy policy. The development of this framework--our first comprehensive National Energy Strategy--is an effort of the entire U.S. government that is being coordinated by the Department of Energy which I head. We have provided each delegation here with a copy of an Interim Report on the development of this Strategy, and your embassies here in Washington were briefed on that Interim Report earlier this month.

Our new National Energy Strategy represents a real departure from past efforts, both in its scope and in its execution. Like

the IPCC process, the National Energy Strategy is based on the following key elements:

- o Broad participation by interested parties as a basis for building public understanding of the issue and consensus on the outcome;
- o Careful assessment of the underlying science and technology and the costs of response options;
- o Robust analysis of the impacts of our policies on our domestic economy and on international economic, trade, and development goals.

Success in integrating these components into a consolidated framework is crucial to both efforts. In the case of the IPCC, we need to lay a comprehensive foundation for continued future action, action to which the United States is fully committed. And our success in developing a comprehensive National Energy Strategy will be crucial to the U.S. ability to address global climate change issues.

One of the principal differences in scope between our developing National Energy Strategy and previous energy planning exercises is the integration of environmental and economic policy with energy policy. For many years, the energy-environmental policy debate in the United States has been polarized and unproductive. We have attempted to resolve perceived conflicts between energy and environment in a piecemeal manner--leaving the field open for narrow interests to dominate the agenda. The United States has not been uniquely afflicted by such a lack of connection between energy and environment. Yesterday, Deputy Prime Minister Janowski gave a moving description of the sad legacy left behind in Eastern Europe from a one-dimensional approach to energy production.

The National Energy Strategy we are building will provide a frame of reference for the United States to examine its policy options, taking into full account their potential effects of our choices on the environment, on energy supplies, and on the

economy. The integration of these elements into a unified strategy may give us the foresight to avoid past mistakes in energy and industrial planning.

At the core of our National Energy Strategy is a process of public consultation that is without precedent in U. S. energy planning. The public record established by this process so far is the result of 15 public hearings, nearly 400 invited presentations, and over 1000 written submissions. More public hearings and much more public comment will take place before we conclude this process at the end of this year. This approach to the National Energy Strategy has served a number of purposes.

- o The first purpose served has been public education. By the time we are through, there should be a fresh appreciation of the fact that there are no easy answers or quick fixes to the problems we face in the energy and environmental arenas.
- o The second purpose has been to define the major issues with clarity. Already a range of views--frequently contradictory but often surprisingly convergent--has been offered concerning possible solutions.
- o Finally, we believe that our approach to the National Energy Strategy is laying the foundation of public consensus necessary to make the Strategy an action plan.

Let me share with you four key points that we have learned so far in assessing the public record. They are: respecting the environment, improving energy efficiency, securing future energy supplies, and building strong foundations in science, technology, and education.

- o There is a clear public consensus in the United States that energy and environmental policies must be mutually sustaining. Our economic well-being cannot be sustained if the environment is in ruins. And only a vibrant economy will make available the investment

needed to achieve the environmental quality that Americans are demanding.

o The desirability of energy efficiency from both an environmental and economic point of view is clear. The key questions in improving energy efficiency are:

- What is achievable and at what cost?
- Who needs to be involved?
- How can the federal government facilitate progress?

I believe that greater energy efficiency will be achieved only if a large number of players act in concert. The U.S. government has already begun to move aggressively to pursue energy efficiency improvements, and I think it is fair to characterize our efforts in this area as some of the first concrete results from our National Energy Strategy process. Our accomplishments to date include:

- Announcement of a new set of energy efficiency and renewables initiatives in January of this year. These initiatives, if fully implemented, will reduce expected U.S. carbon dioxide emissions by the end of this decade.
- Strong encouragement for State governments to create incentives for utilities to treat energy conservation on an equal par with energy supply. Our private Electric Power Research Institute estimates that such incentives could cut U.S. electricity needs by 20 percent before the year 2010.
- Increases in automobile efficiency standards that will be in addition to the 80 percent gain in fuel efficiency for new cars that we have achieved over the last 13 years.
- Significantly increased refrigerator efficiency standards promulgated last December and improvements in other appliance efficiency standards that are now under review.

o In addition to improved energy efficiency, ensuring future supplies of energy for our U.S. economy are a major source of public concern. There are some very

difficult decisions ahead for the United States regarding energy supply--decisions that cannot be postponed much longer. As one example, electricity demand in the United States--which has consistently tracked economic growth--will likely grow by about 100 billion watts within the next decade. At this point in time, only 40 percent of the needed capacity to meet this demand is either under construction or the object of firm plans. How will the remaining 60 percent be supplied? No one knows yet.

- o Finally, maintaining U.S. vitality in fundamental science and engineering research, strengthening U.S. education, and building new capabilities in technology transfer are perceived by a wide swath of the U.S. public as key for assuring both our energy future and our broader future as a leading nation in the world.

I would like to focus for a minute on the critical role of scientific and engineering research in responding to global change.

Dr. Bromley mentioned yesterday an interagency committee in the U.S. government called the Committee on Earth Sciences, or CES. CES has become a paradigm of national and international cooperation in dealing with both scientific certainties and uncertainties of global change. Every agency of the U.S. federal government has joined forces to put in place comprehensive and multidisciplinary research programs addressing global change. As the President told you yesterday, he has pledged more than one billion dollars to this program for the next year. These funds will support international research activities including the study of global ocean circulations and the launching of satellites to observe and analyze the earth system. Just last week I visited the NASA scientists in Alabama who have developed a promising new method to accurately record atmospheric temperatures from satellite-based instruments. If verified, the method may give us an excellent global thermometer of the earth's atmosphere and remove the guesswork out of whether we are entering a warming or a cooling trend.

The CES Program has highlighted the importance of clouds in a changing climate. Clouds may accelerate the rate of a possible warming or act to retard the process. My Department has joined other CES partners in starting a major research study to quantify the feedbacks of clouds in the climate system. Yesterday, you heard the President call for better Earth system models that enable us to calculate the complex interaction between man and our environment. The Department of Energy is rising to this challenge by placing our arsenal of sophisticated supercomputers at the service of global change research. We have just placed on-line the most powerful Cray-2 supercomputer in the world and are making it available to the scientific community for climate modeling. We are forcing the pace of climate change prediction with a program to increase computing speeds by a factor of ten thousand. And we are building the data management systems to handle the vast amounts of data from satellites, research ships and ground-based instruments.

Of course, research simply to study the problems of global climate change is not enough. At the heart of any regime of cost-effective actions to address the threat of global warming will be a panoply of new technologies--technologies both to provide the services we demand and to supply energy to end-use technologies more efficiently than in the past. Focusing efforts at scientific discovery on areas of potentially high, if long-range, economic payoff is a principal mission of my department.

For example, it is clear that finding ways to more efficiently use our fossil fuels, especially in the near-term, will be an essential ingredient of any strategy to attenuate carbon dioxide emissions. Substituting natural gas for other fossil fuels is one approach to achieving such emission reductions. Another crucial resource on which we must focus is coal. In the United States we have set our national will and our technology expertise to the task of improving the efficiency and environmental acceptability of our coal use. We have done that through a \$5 billion commitment to demonstrating new clean coal technologies. Many of these technologies improve efficiencies by 20 to 40 percent compared to conventional ones and have the added benefits of reducing carbon dioxide, sulfur dioxide and nitrogen oxide emissions.

Nuclear energy emits no greenhouse gases. However, in many countries, including the United States, nuclear energy is beset with problems of public acceptance. I believe that every government has a major responsibility to address legitimate public concerns about nuclear energy. In the United States, we are working hard to develop safer, more cost-effective reactor designs and to resolve waste disposal issues.

Renewables also offer considerable promise of environmentally safe and secure energy. Indeed, renewables have already served us well in the past in the form of biomass and hydroelectric energy. We can expect its role to expand, especially in key sectors such as transportation, residential, and commercial energy use. For example, alternative fuels--based in part on agricultural crops--will play an increasing role in protecting our urban air quality in a manner that also promotes energy security. In 1988, the renewables share of U.S. energy production was 5 percent. In the longer run, solar, wind, and additional hydroelectric resources will provide additional inexpensive, sustainable energy needed to meet the demands of economic growth.

In our search for new technologies, we must look at opportunities in all sectors and in all nations. The sources of greenhouse gas emissions are many and diverse--as diverse as our national economies. Virtually no major economic sector can be omitted from the list of contributors to greenhouse gas emissions, or the list of potential opportunity targets for technology development. Agriculture, energy production, petrochemicals, ferrous and nonferrous metals, pulp and paper, transportation and even electronics--all these areas have openings for sound and cost-effective emission reduction technologies.

I have described our domestic actions to maximize the opportunities available to us to deploy sound science and advanced technology in the effort to respond to global climate change. Many of you have similar actions underway in your nations. We are fortunate to have the opportunity during this Conference to share our experiences. If there is one underlying

theme which is common to all our discussions here, it has been that no one country alone can significantly impact global concentrations of greenhouse gases. For that matter, no one country alone can resolve the scientific uncertainties, monitor the global climate, or ensure the worldwide deployment of the technical expertise and technology needed to ensure global stewardship. Moving us closer to global stewardship will require intensified international cooperation--cooperation in our science and economic research programs, cooperation in providing technical information and training to the developing countries, and cooperation in assessing and implementing environmentally sound technologies.

As our discussions at this conference indicate, the time is ripe for the world community to commit its scientific and economic resources both to resolve the uncertainties and to develop the technologies needed to meet the challenge of global climate change. Several nations have proposed hemispheric or international research institutes that would focus on reducing scientific uncertainties about global climate. I think these are promising proposals.

Another theme that has come out is the need to develop an international strategy for forming a global partnership on climate issues. The IPCC is the starting point for developing that strategy, and I believe this conference has helped identify some key issues. Our discussions here have brought out the need to help developing and other countries achieve their rightful economic prosperity, while also ensuring that our common responsibilities for global stewardship are not compromised. Technology transfer will be essential to any global consensus addressing climate change.

Finally, our discussions have manifested the broad range of possible approaches to reducing greenhouse gas emissions. Some countries have indicated a commitment to taking certain response actions now, even in the face of the uncertainties. As Administrator Reilly indicated in his speech yesterday, the United States strongly supports taking action now in areas that make sense both for potential mitigation of greenhouse gases and

for promoting the sound economy needed to make progress on other environmental and social imperatives.

The President's Science Advisor, Dr. Allan Bromley, told us yesterday that one of the primary objectives of this conference was to increase mutual understanding and sensitivity of the international scientific and economic research communities to each other's needs and those of the policy makers who seek guidance from them. In this light, I think this conference has been a success. I am optimistic that a global consensus on responses--scientific, technological and economic--will result from the IPCC process. The remaining challenges facing us are significant. But the spirit of this Conference--forging ahead together to achieve the common goals of economic growth, environmental protection, and global stewardship--augurs well for the final success of the IPCC process.

Thank you.

REVIEW OF THE CO-CHAIRMEN'S REPORT

WHITE HOUSE CONFERENCE
ON SCIENCE AND ECONOMICS RESEARCH
RELATED TO GLOBAL CHANGE

Washington, DC -- April 18, 1990

presented by

MICHAEL R. DELAND, CHAIRMAN
PRESIDENT'S COUNCIL ON ENVIRONMENTAL QUALITY

CONFERENCE CO-CHAIRMEN:

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

Michael J. Boskin
Chairman, President's Council of Economic Advisers

Michael R. Deland
Chairman, President's Council on Environmental Quality

Colleagues and guests, good afternoon. I have been given an enormous privilege-- and an enormous challenge.

The privilege of presenting a summary report is enhanced by the fact that I represent not only myself, but also my two distinguished colleagues and Co-Chairs, Drs. Bromley and Boskin. We commend you for your unique talents and deep commitment to global stewardship, which have been so evident here this week. We have been honored and enriched by your attendance, and on behalf of the Co-Chairs, I am privileged to extend our thanks.

My enormous challenge this afternoon is no less than presenting our summary of the events of the past two-and-a-half days. Such a summary would be a challenge at any conference, but it is especially daunting in this instance, where the free, open and candid exchange of ideas goes on. No doubt the give-and-take continues even now, and will continue as you wend your way home.

As you should know by now, draft summaries of our working sessions have been circulated to every delegation, and will be provided to the press. We welcome your comments and suggestions to ensure that those summaries are faithful representations of our discussions.

The challenge of presenting the Co-Chairs' summary is also made difficult by the depth and breadth of your contributions, and the practical limits of time and space. We Co-Chairs have spoken a great deal about "integrating," "cross-fertilizing," or "coordinating" the very best thinking from a variety of disciplines: science, economics, energy and the environment. But we Co-Chairs are likely the first to do just that-- and under demanding time constraints as well. So I hope we have done justice to you; your comments on the Co-Chairs' report are as welcome as your other comments on the working group summaries.

Our agenda set several objectives. For example, we sought to focus more sharply the science and economic research issues relevant to policy on global change. We discussed what is known and the urgent challenge of what is unknown. Second, as Dr. Boskin and others outlined, we sought to highlight economic analysis as a tool to understand human inputs to global change from economic activity, the environmental impacts of global change, and the implications of potential responses. It has been said many times, but bears repeating, that this conference brought scientists and economists together for the first time for "cross-fertilization." Dr. Bromley described economics as "the glue" that binds scientific analysis to policy decisions, and indeed many delegates agreed on the need for better linkages between the science and economic disciplines and policy-makers.

Finally, and perhaps most important, we sought to frame the next steps for implementing joint international efforts to understand and respond to global change.

Those were our objectives. The Co-Chairs submit to you our belief that the conference successfully met those objectives. In addition, we were pleasantly surprised by the degree of consensus in the delegates' responses to the conference objectives.

As the delegates exchanged thoughts over the last two days, the area of greatest agreement was on the need for global stewardship. We speak with one voice that human actions can have a profound impact on our fragile and beautiful planet. Each of us has a special responsibility to ensure that those actions are wise and gentle. As I alluded in my remarks yesterday, we have begun to redeem the harmful legacy of the Twentieth Century by embracing more universal values: a global stewardship for global quality of life.

In this regard, we were most pleased to listen to the perspective of Dr. Jan Janowski, Deputy Prime Minister of the Republic of Poland, who very frankly evaluated his nation's present environmental and economic imperatives. Dr. Janowski urged us not to reduce our options to what he called a false choice between environmental protection and economic development.

There was a second area of unanimity, which in my opinion was one of the most useful accomplishments of the conference. In short, delegates from the United States and all nations reiterated in the strongest terms a commitment to continuing and accelerating those actions which make common sense now: that is, there are certain actions which offer known environmental benefits, which are known to have low or modest costs, and which we know will help stabilize or reduce the emissions of greenhouse gases. As representatives of our respective countries, we sell ourselves short if we do not recognize the pro-active contribution that we are already making.

In areas where there was less than total unanimity, there was nonetheless a stimulating and useful exchange of ideas. Dr. Bromley, Dr. Bolin and the scientists who assisted us in the working sessions provided an excellent review of what is known at this point, which can only be described as "the fundamentals."

Last evening we heard remarks by the distinguished Dr. Bert Bolin, chairman of the IPCC, who previewed the initial assessment of what will be a decades-long international research effort on global climate change. Dr. Bolin stressed the critical balancing act of policy-making in the face of uncertainty, and offered provocative comments on making decisions with the information provided to us by the current IPCC process.

In my remarks yesterday, I said that for our solutions to environmental challenges to be complete, scientists must listen carefully to the concerns and priorities of economists, and economists must to likewise with their scientific colleagues. In that context, the conference discussion identified remaining unresolved questions.

These begin with uncertainties about the phenomenon itself: for example, the role of clouds as an agent of warming or cooling, or the ocean-atmosphere interface. We agreed on the need to reduce uncertainties about the impact of global change on specific regions. We need better predictions of the rate of change -- especially for the southern hemisphere -- and to estimate the potential for sudden surprises. There is considerable uncertainty over the role of man-made sources of change versus ongoing natural sources of change and many questions about carbon dioxide "sinks."

Even if by waving some magic wand, we were to answer all of our questions about Earth systems, we still would have many questions about the impact of change on other systems-- both human and natural. How much change can our agricultural system adapt to, and at what rate? How will changes in solar radiation affect the productivity of the oceans? How will rapid climatic

changes affect biodiversity? So many scientific questions remain unanswered.

From our economist colleagues, we heard comments on the many uncertainties about human inputs, impacts and responses to global change. We do not fully comprehend either costs of action or the costs of inaction. We have no clear measures of the cost-effectiveness of competing options; we are unsure whether it will be cheaper to adapt to or prevent change. We heard that there are considerable differences among economists in different nations over how to model relationships between environmental and economic factors. The developing countries spoke about the human dimension of economic growth as a means of fulfilling the basic human needs of growing populations. I appreciated Dr. Boskin's reminder that we have difficulty predicting national GNP one year in advance, much less modeling global economic systems on the time scale of many decades. Economists need to develop ways to value things that do not have monetary value but which are precious to us all. We need to resolve uncertainty about economic factors in the evolution of technology.

Given our need for more knowledge, I believe there was genuine consensus on the need to accelerate scientific and economic research efforts to reduce these uncertainties.

There is also a need to coordinate better our ongoing scientific and economic research efforts at the national, regional and global levels. One concrete proposal which emerged from our discussions was that of enhancing the very mechanisms for communication among scientists and researchers -- a global change communications network, if you will. There is an enormous array of technology for sharing information and communicating around the globe. Let us use this technology it to its fullest extent. The benefits to all nations of improving access to the fruits of our research argues strongly for integrating existing networks, adding new networks and technologies such as voice mail, and extending access to many more nations and individuals.

From sharing our thoughts and insights about specific questions, our discussions turned to the need for integration across disciplines and across national boundaries. From the economics perspective, standard approaches exist for balancing benefits and costs of proposed actions, such as managing risk through insurance and diversification, flexibility in commitments, prudent decision-making and continuing research. It is crucial to integrate these approaches into the decision making process.

There is a need to establish research and other cooperative networks across national boundaries, between industrialized and developing nations, and across disciplines. No nation,

institution or discipline can address single-handedly the issue of global change, nor the challenge of harmonizing environmental and economic imperatives. We must not forget that developing nations can ill afford to devote scarce resources to addressing global climate change, when the press of poverty creates more urgent agendas. That fact creates a profound responsibility on the part of those nations which have climbed higher on the economic ladder to lend a helping hand.

Developing countries are under-represented in world scientific research efforts. That must change. New systems are needed for developing and sharing both basic science and emerging clean technologies, for if these new technologies are not created and shared, it is estimated that 80% of the world's population will continue to rely upon outdated and inefficient technology.

Other delegates stressed the need for and value of public education, including curriculum in both lower schools and in higher education. There is clearly a need for networking among similar organizations in different regions and among neighbors for managing shared resources. The Zairean example of regional efforts to protect and wisely manage African tropical forests should be replicated for other common resources. Finally, international monitoring and measurement of both environmental and economic parameters is necessary to establish baselines and to complement global modeling. For example, the development and

use of economic and environmental indicators is essential. The OECD was held out as an example of an organization which has undertaken important work in the assignment of values to natural resources.

While the IPCC is the forum for policy development, several countries suggested establishing regional or international cooperative research centers to provide bridges between researchers, between disciplines, and between academics and policymakers. Such centers would also reflect that global change, the subject of this conference, is broader than climate change and includes additional issues such as population growth, land degradation, wetlands, sea level rise, loss of biodiversity and changes in energy demand and use.

Research on these matters must be integrated to create models allowing us to understand and predict the effects of our actions. The USA proposed creation of international institutes for research in order to focus cross-national, cross-disciplinary efforts and resolve the uncertainties policy-makers face.

But there must be more to our deliberations than agreeing on a set of research questions and providing a vehicle for policy-makers to hear the answers to those questions. The challenge of global stewardship in the face of global change demands that we do more.

As President Bush stated in his opening remarks and on several occasions, research is no substitute for action. We find this to be a sentiment shared by almost all participants at this conference. We have provided during this conference a substantial number of suggested action items which require further elaboration. We have also been told of the actions many of your nations are taking, just as you have heard from us the many steps the United States is taking.

We spoke among ourselves, in our working sessions and in our many informal conversations, of the need for new partnerships to help us advance toward our common goals.

I spoke a few moments ago on our support for the concept of global stewardship. But we have no fundamental statement of what that concept means. I believe that it would serve all of our interests to consider the creation of a statement of principles on the meaning and focus of Global Stewardship. And while we have agreed on the existence of gaps in our understanding of global change, we have no overall plan for filling those gaps and answering those questions.

The Japanese delegation made a proposal, which stimulated much thought, on the creation of long-term over-arching plans to guide our efforts. The USA proposal, while somewhat more modest

by comparison, is still quite ambitious. A common research agenda, and international agreement on a plan of action for implementing that agenda would be a major step forward. We must provide a forum for developing such an agenda, for integrating the required research efforts into existing national and international programs. Our proposal is for development of a charter for cooperation in science and economics research related to global change. Such a charter could provide a blueprint for concerted action on every aspect of global change. The US has also offered to provide a venue -- later this year -- the first negotiating session of a framework convention on climate change. Our colleagues from the Federal Republic of Germany built upon this initiative by suggesting that the 1992 Brazil conference be used as the forum for the signing of a world climate convention.

That concludes the substance of my presentation. I only hope that I have done justice to the diversity and sophistication of the comments we have heard. This was an exceptional challenge and we look forward to your comments on this summary.

Let me reiterate on behalf of the Co-Chairs our thanks for your active and constructive participation in making this conference a success. We hope that in these working sessions, we have broken down some of the barriers that divide and limit us. Because in the final analysis, it is action that counts. Active

research, active diplomacy, and pro-active policies which blend scientific and economic realities.

Progress toward a better quality of life for all people is our goal. If we have any faith in the partnerships and integration which have been stimulated here this week, and we do, then I believe that progress is our mission and indeed our destiny.

Thank you.

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release

April 18, 1990

REMARKS BY THE PRESIDENT
IN THE CLOSING ADDRESS
TO THE WHITE HOUSE CONFERENCE
ON SCIENCE AND ECONOMICS RESEARCH
RELATED TO GLOBAL CHANGE

The J.W. Marriott

2:32 P.M. EDT

THE PRESIDENT: Thank you, ladies and gentlemen. Thank you, Dr. Bromley, very much. Dr. Boskin, Mr. Deland and Secretaries Watkins and Lujan of our Cabinet. Dr. Bolin, and distinguished delegates to this truly unprecedented conference.

After all of the hard work that's taken place here -- in what I know was an atmosphere of lively debate -- I would begin with thanks, and a moment of perspective: for your purpose here is profoundly important to the state of nature, and the fate of mankind. Your presence has offered hope for a new era of environmental cooperation around the world and the promise of a quieter, more thoughtful, more careful tenancy of nature's legacy to humanity.

You know, during these last two days we've listened and learned -- and I've been briefed thoroughly on some of the committee's works -- learned about Brazil's new initiatives to protect the Amazon rain forest, about Nigeria's plans to remove lead from gasoline, about Mexico's promising efforts to reduce the Mexico City air pollution.

A year ago I participated in an American education summit, and found the most productive sessions were those working groups. This conference was structured with that lesson in mind. So my thanks go to all the delegates who played such an integral role in those working groups -- particularly the foreign delegates who served as co-chairmen.

A growing sense of global stewardship prompted us to host this conference. It's a sense of stewardship shared by all of you and by the nations you represent. And it arises out of a natural sense of obligation. An understanding that we owe our existence, all that we know and are, to this miraculous sphere that sustains us. Somebody told me that the evening you had over at the museum brought this into very, very clear perspective when you heard from some of the NASA people.

Such stewardship finds expression in many ways -- from public demonstration to landmark legislation. But it is also rewarded in many ways, in moments unexpected and unforgettable. Nature's beauty has a special power -- a resonance that at once elevates the mind's eye, and yet humbles us as well.

Before nature, the works of humanity seem somehow small. We may build cathedrals, temples, mosques, monuments and mausoleums to great men and women and high ideals. And still we know we can build no monuments to compare with nature. Our greatest creations really can't equal God's smallest.

Yet as our tools and intellect advance, we've learned of our power to alter the Earth. We understand that small actions, taken together, can have profound global consequences for the environment we share and the humanity we share it with. The importance of global stewardship can be best understood in human terms.

We also recognize that ours is an increasingly prosperous planet with greater hopes now than ever before that more of our people, in every nation, may come to know an enduring peace and an unprecedented quality of life.

So we're called upon to ensure that the Earth's integrity is preserved and that mankind's prospects for prosperity, peace, and in some regions, even survival, are not put at risk by the unintended consequences of noble intentions.

That's the reason we've held this conference.

The minds at work here are among the very best we have and they are the best insurance that our actions are sound. We've gathered talent from around the world -- scientists, economists, environmentalists, energy ministers, policymakers -- to address the environmental and developmental future of the planet. An unprecedented cross-fertilization of disciplines and of nations. That alone, I think, is reason for hope.

But if diversity of perspective is expected, unity of purpose is crucial. In an atmosphere of uncertainty, we must foster a climate of goodwill and a stubborn hope that we might forge solutions without the excessive heat of politics.

Among all the challenges in our tenancy of this planet, climate change is, of course, foremost in your minds. We're leading the search for response strategies and working through the uncertainty of both the science and the economics of climate change. But there is one area where we will allow for no uncertainty -- and that is our commitment to action -- to sound analyses and sound policies.

To those who suggest we're only trying to balance economic growth and environmental protection, I say they miss the point. We are calling for an early new way of thinking to achieve both while compromising neither. By applying the power of the marketplace in the service of the environment.

And we cannot allow a question like climate change to be characterized as a debate between economists versus environmentalists. To say that this issue has sides is about as productive as saying that the Earth is flat. It may simplify things, but it just doesn't do justice to the facts or to our future. The truth is, strong economies allow nations to fulfill the obligations of stewardship. And environmental stewardship is crucial to sustaining strong economies. If we lose sight of the forest for the trees we risk losing both.

But above all, the climate change debate is not about research versus action, for we've never considered research a substitute for action. Over the last two days, you've heard, formally and informally, that the United States is already taking action to stabilize and reduce emissions through our clean air legislation, our use of market-based incentives to control pollution, our search for alternative energy sources, our emphasis on energy efficiency, our reforestation initiatives, and our technical assistance programs to developing nations.

These policies were developed to address a broad range of environmental concerns, in particular our phaseout of CFCs, the impact of our Clean Air Act on emissions, our tree-planting initiative, and other strategies will produce reductions in greenhouse gas emissions that will reach 15 percent in 10 years -- and considerably more later on.

We're also making a leading investment in climate change research -- absolutely essential because it will tell us what to do next. But what bears emphasis is that we are committed to domestic and international policies that are environmentally aggressive, effective, and efficient.

And we are deeply committed to an international partnership, through the IPCC process. We look forward to its interim assessment. And we would encourage a framework convention as a part of a comprehensive approach to address the system, sources, and sinks as a whole if a decision is made that environmental action is needed to reduce net emissions. We hope to provide a venue for the first negotiating sessions here in the United States.

And finally, here in conference working groups, we've offered four new ideas -- a charter for cooperation in science and economic research related to global change; possible creation of international institutes for research on the science and economics of global change; data and information transfers through a global change communications network; and a statement of principles for implementing international cooperation in scientific and economic research related to global change.

I call on you to support these suggestions. All of you here today understand climate change as one of many challenges in the call to global stewardship. Ozone depletion, water supply, ocean pollution, wetlands, deforestation, biological diversity, population change, hunger, energy demand -- in short, all the interrelated issues of the global environment. Each demands our attention. Each will have great impact.

And some we can predict, and regrettably and frankly, some can't be easily anticipated. But each has a human dimension we must never forget. Understand the choices we are making. They affect us all, but in profoundly different ways. We have many paths to choose from, and some of them are fraught with risk to precious and life-giving resources. Risk to geopolitical stability. And certainly, man-made limits to prosperity -- most painfully reflected in the hollow eyes of hungry children and their prospects for survival.

If developed nations ignore the growth needs of developing nations it will imperil us all. We know that even small changes in GNP growth rate often threaten adequate shelter, food, and health care for millions and millions of people. And to bear this in mind is no barrier to action. Those who have ascended the economic hill must break down the barriers to progress and assist others now making the climb. But this will only be possible if the nations of the world are linked in partnerships of every kind: scientific, economic, technical, agricultural, environmental.

Pollution is not, as we once believed, the inevitable by-product of progress. True global stewardship will be achieved not by seeking limits to growth, which are contrary to human nature, but by achieving environmental protection through more informed, more efficient, and cleaner growth.

Those who value environmental quality the most, should be the most ardent supporters of strategies that tap the power of free wills and free markets; strategies that turn human nature to environmental advantage. Equally, those who value economic development most highly should be the most ardent defenders of the environment, which provides the basis for a healthy economy. Efficient strategies are the only realistic hope for developing nations to save themselves from the mistakes that developed nations have already made.

And we have made mistakes. But over the past century, we've made tremendous progress in this country, especially in the last 20 years. In the United States, automotive emission controls have brought about a new generation of cars that emit only four percent as much pollution as the typical 1970 model. We've cut airborne particulates by 60 percent, carbon monoxide by about 40 percent, cut sulfur emissions, and virtually eliminated lead from the air -- all during a period of population growth and economic expansion. And now we want to share that knowledge -- our technologies, new processes, and pollution prevention techniques -- with the developing world.

Two decades ago, America -- holding to its birthright of free expression -- was home to a movement symbolized by Earth Day. It motivated President Nixon to sign into law a national policy to encourage productive and enjoyable harmony between man and the environment. And it set in motion a new sense of conscience that a few idealists hoped would change the world.

And it did. What began as an isolated American movement 20 years ago is now shared by over 130 countries on seven continents. And while many thought this experiment in environmental protection would prove impossible, that you couldn't maintain both a productive economy and a healthy environment, we've learned that economic prosperity and environmental protection go hand in hand. And we've learned that worldwide, united action is essential and possible, as the Montreal Protocol proved.

America and other nations must now extend an offered hand to emerging democracies in Eastern Europe and to developing societies around the world. In some, the raging fires of forests and grasslands burned for compelling but devastating economic reasons have been visible to astronauts in space. Other nations, in the struggle to support life, have been virtually stripped of the resources that sustain life.

And in Eastern Europe, whether through the tyranny of neglect or the neglect of tyrants, pollution has been unveiled as one of the Old World's cruelest dictators; an oppressor. Not man, but man-made.

In the majestic city of Krakow, that I visited a couple of years ago, monuments to great men, statues that survived countless invasions by kings and emperors, by Hitler and by Stalin, have been defaced by pollution; their medieval majesty reduced to shapeless lumps of stone.

If mankind's greatest creations cannot equal God's smallest, some may grieve that our greatest destruction is turned at times upon ourselves.

Let us neither grieve nor quarrel, but act on what we know can help, and act in good faith. Our challenge is global stewardship. To work together to find long-term strategies that will meet the needs of the entire world, and all therein.

Our convictions, and my sincere belief, is that environmental protection and economic growth, well-managed, complement one another. And that we can serve this generation while preserving the Earth for the next and all that follow. It is an uncommon opportunity we share. And so let us seize the moment. And together, we will succeed.

Thank you for what, I believe, is a significant contribution to environmental progress in the world. Thank you for coming our way. Thank you very much. (Applause.)

END

2:50 P.M. EDT

April 16, 1990

Dear Delegate :

I am pleased to welcome you as a delegate to the White House Conference on Science and Economics Research Related to Global Change. Many members of my Cabinet will be participating with you during this important meeting, and I have asked the principal White House advisers for science, economics, and the environment to serve as the co-chairs of the Conference. This unique integration of the major elements of my Administration is evidence of the U.S. desire to encourage the international dialogue on global change research. I am happy that you have accepted my invitation to join us.

I believe in the importance of exploring more fully the relationship that exists between the science and economic disciplines as they relate to the environment. Our hope is that this Conference will lead to increased international cooperation and partnership in global change research. In addition, we hope the Conference will complement ongoing international efforts, such as those of the Intergovernmental Panel on Climate Change, in developing an agenda for the future.

Because global change research is an important area of focus for my Administration, I have committed to a budget of over one billion dollars for a program of global change research for fiscal year 1991. I anticipate that you will receive an overview of our program during the Conference.

I hope your distinguished delegation will find this meeting to be an important step toward global stewardship of our earth's natural resources. The co-chairs and I look forward to a successful Conference.

Sincerely,

QUESTIONS AND ANSWERS

Q. WHY HAS CHINA NOT BEEN INVITED TO THE GLOBAL CHANGE CONFERENCE? WE HAVE SEEN A CABLE SENT OUT BY THE U.S. TO ITS EMBASSIES INDICATING "DELETE CHINA." WHY WAS THIS DONE?

A. We are still in a sensitive period in our relations with China. The internal situation there remains unsatisfactory, but we are seeing signs that the President's policy is working. Invitations to the Global Change conference were made in light of that policy.

The cable language reflects a clerical error.

Q. IS THERE A RIFT WITHIN THE ADMINISTRATION ON THE GLOBAL CHANGE ISSUE? DIDN'T WHITE HOUSE CHIEF OF STAFF SUNUNU CHANGE THE PRESIDENT'S RECENT SPEECH ON THE ENVIRONMENT TO "WATER DOWN" POSITIONS PREVIOUSLY AGREED TO WITHIN THE ADMINISTRATION?

A. There is no rift within the Administration. The Chief of Staff and involved agency and departmental heads, including William Reilly of EPA and Admiral James Watkins of DOE participated in the development of the strong environmental position reflected in the President's speech before the Intergovernmental Panel on Climate Change. This involved significant discussions on the staff level where one should expect varying viewpoints to be aired. The Administration stands solidly behind the policies and perspectives outlined in the President's remarks.

Q. DOES THE WHITE HOUSE CONSIDER THIS CONFERENCE IMPORTANT? IF SO, WHY IS THERE SO LITTLE ADVANCE INFORMATION AVAILABLE ON THE AGENDA AND SPECIAL SESSIONS? ARE YOU ENCOURAGING MEDIA COVERAGE?

A. Yes, this conference is very important to the Administration. The President formalized his idea for this conference during his Summit meetings with President Gorbachev on December 4, 1989, and later, on Monday, February 5, 1990, during his speech to the United Nations Intergovernmental Panel on Climate Change. The agenda is receiving priority attention within the Administration to assure that the proceedings reflect our most current understandings regarding the climate change issue. Information on the agenda, working group sessions, and opportunities for news media coverage will be provided shortly.

Q. WILL THIS CONFERENCE RESULT IN A RECOMMENDATION FOR LONG-TERM GOALS TO MEET CHALLENGES SUCH AS HOW THE MAJOR SECTORS OF THE U.S. ECONOMY--MANUFACTURING, AGRICULTURE, TRANSPORTATION, HOUSING AND ENERGY CAN BE REDESIGNED IN THE FUTURE SO THAT ECONOMIC CONCERNS DO NOT DESTROY NATIONAL AND GLOBAL ENVIRONMENTS?

A. The results of the conference will help the U.S. and representatives to the Intergovernmental Panel on Climate Change (IPCC) and other international global change meetings and forums, by providing information on issues relating to global change that have never been addressed. The topics will include: uncertain change, the research challenges of science and economics; integrating science and economic research in the policy process; and building international partnerships for science and economic research.

Q. WILL THIS CONFERENCE SERVE TO PROVIDE THE GROUNDWORK FOR NEW, COMPREHENSIVE LEGISLATION THAT WOULD CONTAIN THE FINDINGS OF THE CONFERENCE REGARDING THE NATURE AND SERIOUSNESS OF THE PRINCIPAL INTERNATIONAL ENVIRONMENTAL THREATS?

A. No, the conference was designed to bring together, for the first time, the disciplines of science and economic research related to global change. While this debate will lay the groundwork for future discussions, it is not intended to draft legislative proposals.

Q. DOES THE ADMINISTRATION HAVE A POSITION ON SEN. LEAHY'S PROPOSAL TO ESTABLISH AN OFFICE OF CLIMATE CHANGE IN USDA TO COORDINATE EFFORTS, SHARE INFORMATION AND HELP RESEARCH THE VIABILITY OF TEMPERATURE AND DROUGHT-RESISTANT PLANT STRAINS?

A. Not at this time. The President has just submitted a budget for Fiscal Year 1991. It includes over \$2 billion in new spending to protect the environment. Further, funding for the U.S. Global Change Research Program will increase by nearly 60 percent, to over \$1 billion. The President's commitment, by far the largest ever made by any nation, reflects the administration's determination to increase our understanding of the science of climate change. We do not believe this is the time to establish a new federal office.

Q. WILL THIS CONFERENCE ALLOW THE UNITED STATES TO LAUNCH A MULTI-PRONGED EFFORT TO MAKE EXPERTISE, TECHNOLOGY AND RESOURCES AVAILABLE TO HELP REVERSE THE RESOURCE DETERIORATION THAT IS UNDERMINING DEVELOPMENT PROSPECTS IN THE THIRD WORLD?

A. Yes, this conference will reinforce and complement the important work of the Intergovernmental Panel on Climate Change (IPCC). The President strongly believes the U.S. must do everything in our power to promote global cooperation, for environmental protection, economic growth, and for sustainable and environmentally sensitive development around the world. Economic growth and environmental integrity need not be contradictory priorities.

Q. NOW THAT THE BUSH ADMINISTRATION HAS RECOGNIZED THE GLOBAL CHANGE PROBLEM, IS THE ADMINISTRATION WILLING TO REVIEW ALL U.S. DEVELOPMENT ASSISTANCE, TRADE AND TAX POLICY, AND THIRD WORLD DEBT WITH AN EYE ON HOW THEY CAN STOP THE DESTRUCTION OF THE WORLD'S REMAINING TROPICAL FORESTS AND THE EXTINCTION OF COUNTLESS PLANT AND ANIMAL SPECIES?

A. Yes, for example, the Administration is constantly working through diplomatic channels for innovative measures like debt-for-nature swaps, to not only reduce global deforestation, but to reverse it. President Bush is looking toward options from a more scientific-oriented approach rather than an approach that could lead to an economic disaster. The President has said where there is economic strength, environmental protection is possible. But where there is poverty, the competition for resources gets much tougher. Therefore, President Bush strongly encourages an orderly, disciplined and rational approach to reconcile environmental protection with economic development without compromising either.

Q. WHEN WILL THE ADMINISTRATION PROVIDE A CLEAR MANDATE TO ALL GOVERNMENT AGENCIES TO ASSURE THAT ALL GOVERNMENT PROGRAMS GIVE PRIORITY ATTENTION TO GLOBAL ENVIRONMENTAL CONCERNS?

A. President Bush believes that we should make use of what we know. But in many cases we don't know what the economic ramifications are, nor do we know whether the science is there to support it. The Administration wants to do it right, and to be aggressive, but we do not want to encourage actions that are more politically driven than those derived from logical debate. The President's budget commitment is the largest ever made by any nation and reflects our determination to improve our understanding of the science of climate change.

Q. SINCE THIS CONFERENCE WILL COMBINE THE SCIENTIFIC, ECONOMIC AND ENVIRONMENTAL ISSUES, IS THE ADMINISTRATION LOOKING FOR NEW WAYS TO ALLOW FREE MARKET INCENTIVES TO HELP REDUCE POLLUTION THAT AFFECTS THE GLOBAL CLIMATE, SUCH AS EMISSIONS TRADING AND POLLUTION TAXES?

A. The President has said his goal is to create policy and agreements on action with the most creative and effective approaches. Whenever possible, we believe that market mechanisms should be applied and that our policies must be consistent with economic growth and free market principles in all countries. But measures such as the taxes tend to raise a lot of expectation without an proper analysis or preparation. Further, we believe it would be extremely expensive for the country, on top of all the things we're trying to do with child care and clean air.

Q. IN THAT SAME VEIN, THE VARIOUS FEDERAL SUBSIDIES TEND TO RESULT IN GROSS UNDER-INVESTMENT IN LOWER COST EFFICIENCY OPTIONS. FOR EXAMPLE, OF THE MORE THAN \$40 BILLION IN FEDERAL ENERGY SUBSIDIES, LESS THAN ONE PERCENT GOES TO ENERGY EFFICIENCY. WILL PRESIDENT BUSH CALL UPON THE CHAIRS OF THE CONFERENCE TO REVIEW SUCH SUBSIDIES?

A. No, however, we continue to work on a new comprehensive review and revision of our National Energy Strategy, with initiatives to increase energy efficiency and the use of renewable sources. These efforts are at the heart of a \$336 million Department of Energy program and are expected to produce energy savings through the year 2000 of over \$30 billion - while achieving significant pollution reduction.

Q. PRESIDENT BUSH HAS OSCILLATED BETWEEN A STRONGLY ENVIRONMENTALIST POSITION AND A MORE TRADITIONAL BUSINESS-ORIENTED VIEW. SINCE MOST OBSERVERS BELIEVE THAT THE BUSINESS AND CORPORATE COMMUNITY IS BECOMING MORE AND MORE GLOBAL IN NATURE, SHOULD THEY HAVE BEEN INCLUDED IN THE CONFERENCE?

A. This conference was designed to help the U.S. and other nations by providing information on research issues relating to global change that have not received such high level international focus.

However, with regard to industry, the President knows that it is important not to work in conflict but with our industrial sectors. That means moving beyond the practice of command, control and compliance and toward a new kind of environmental cooperation - toward an emphasis on pollution prevention, rather than mere mitigation and litigation.

Q. DOES THE TIMING OF THE CONFERENCE COINCIDE WITH BUDGET AND APPROPRIATION REQUESTS IN CONGRESS FOR PERTINENT AGENCIES SUCH AS NOAA, NASA AND EPA?

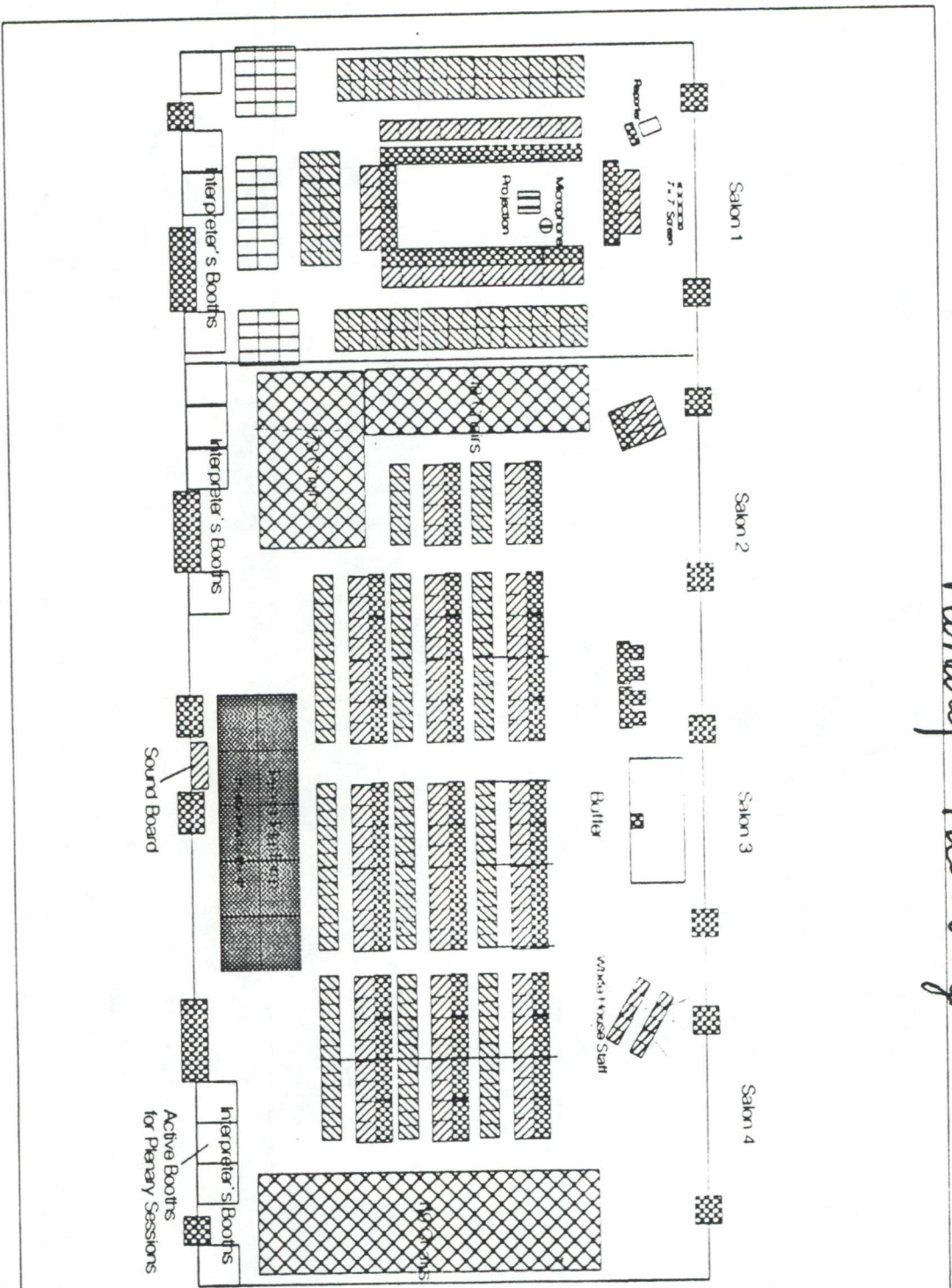
A. No, the President submitted his budget in late January. It includes over \$2 billion in new spending to protect the environment. The program will allow NASA and her sister agencies and all our international partners to move forward with the "Mission to Planet Earth". That will initiate the U.S. Earth Observing System in cooperation with Europe and Japan, to advance the state of knowledge about the planet we share.

Q. WORKING GROUP I OF THE IPCC ISSUED A DRAFT EXECUTIVE SUMMARY FOLLOWING ITS MARCH MEETING, WHICH MADE SOME CONSENSUS SCIENTIFIC CONCLUSIONS, INCLUDING PREDICTIONS OF FAIRLY SUBSTANTIAL GREENHOUSE WARMING BY THE YEAR 2020, ALONG WITH GLOBAL PRECIPITATION AND EVAPORATION INCREASES OF 3 PERCENT. THE IPCC SUMMARY ESTIMATES THAT BY 2070, GLOBAL TEMPERATURE INCREASE WILL BE A "BEST ESTIMATE" OF 3.5 DEGREES C HIGHER AND PRECIPITATION WILL BE 7% GREATER. THE SUMMARY ALSO PREDICTS THAT AREAS OF SNOW AND SEA ICE COVER WILL BE SMALLER. WHAT IS YOUR REACTION TO THE IPCC SUMMARY STATEMENT?

A. The conclusions are preliminary and are contained in a draft executive summary. They are currently being reviewed by hundreds of scientists around the world. The IPCC plans to adopt a consensus assessment report in late August of this year that will be presented to the United Nations Environment Program and the World Meteorological Organization in the Fall.

The White House Conference on Science and Economics Research Related to Global Change seeks to explore in more depth the integration of science and economic research in the policy process while attempting to build international partnerships for science and economic research.

Plenary Tuesday



The President's
White House Conference
On
Science & Economics Research
Related to Global Change

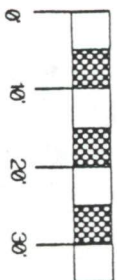
April 17-18, 1990

JW Marriott Hotel
Washington, DC

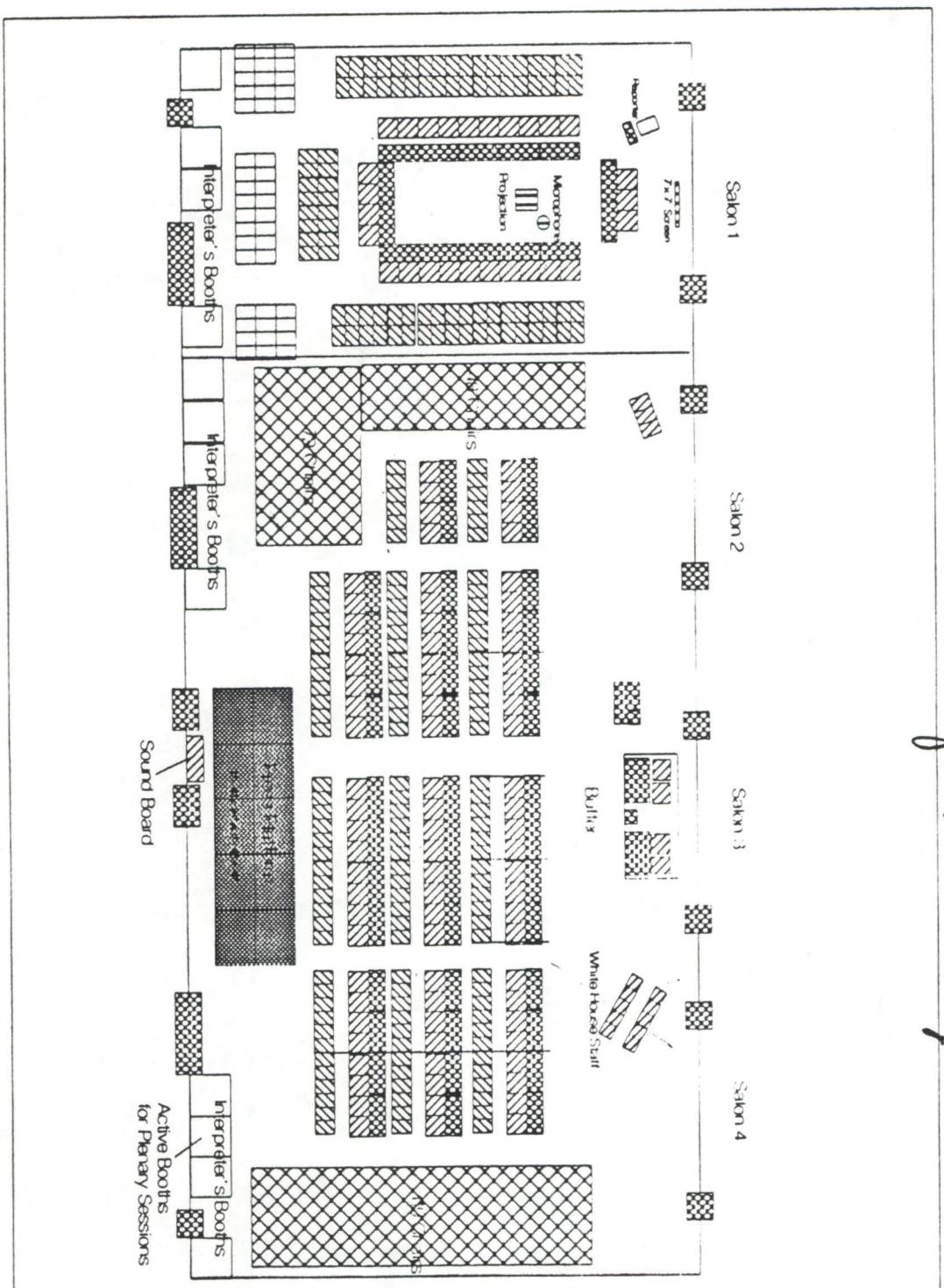
Setup for Plenary
Tuesday

by Robert Yates
& Associates, Inc

Scale: 1/8"=1'
April 10, 1990



Plenary Wednesday



The President's
White House Conference
On
Science & Economics Research
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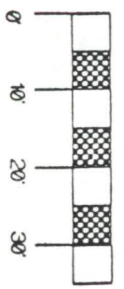
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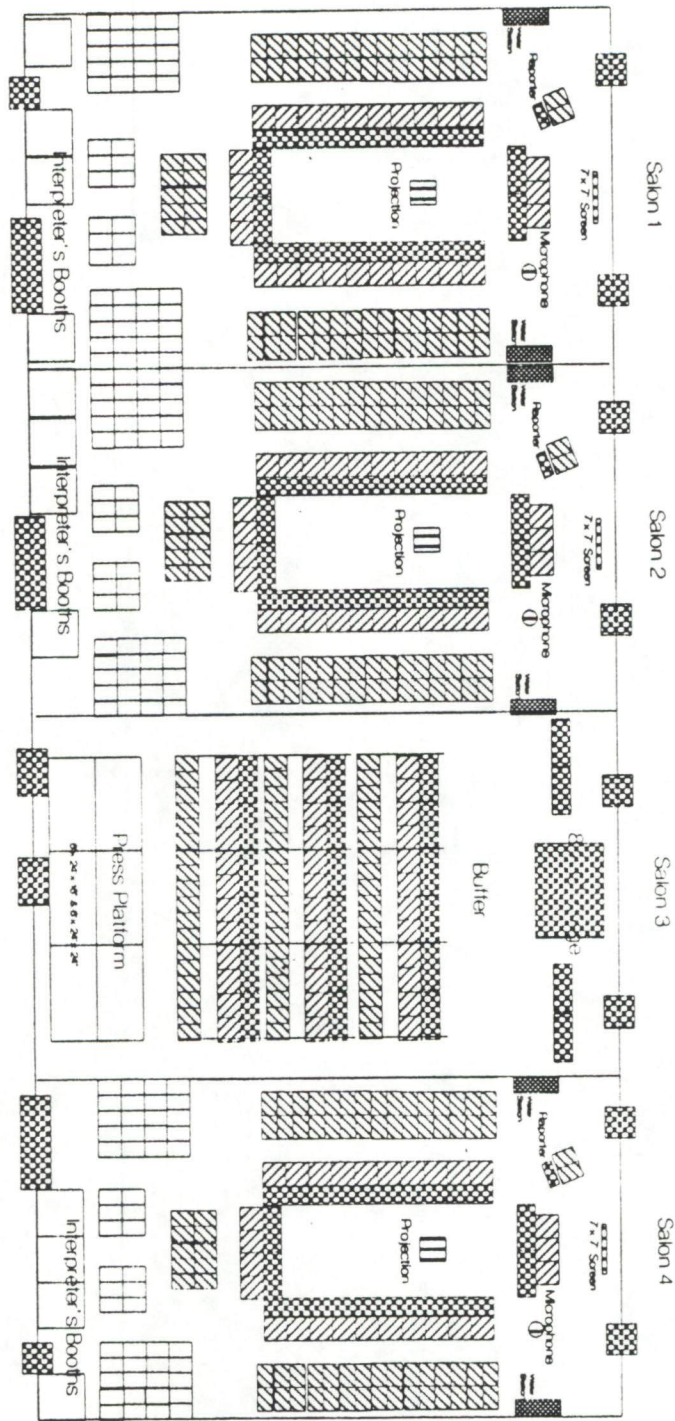
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