Past Science Advisors

Early Science Advisors
- Allan Bromley
  GHW Bush
- Jack Gibbons
  Clinton

Ed David
Nixon

Frank Press
Carter

Neal
Clinton

Jay Keyworth
Reagan

Jack Marburger
GW Bush
Threats to the future of U.S. Science and Technology

The University of Colorado
Boulder, CO
October 5, 2005

Neal Lane
James A. Baker III Institute for Public Policy
Department of Physics and Astronomy
Rice University
OUTLINE

• A personal journey
• How the White House works
• Four “threats” to science and technology and what a Science Advisor can do!
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• A personal journey
• How the White House works
• Four “threats” to science and technology and what a Science Advisor can do!
“Neal, how much did you say we need to spend on nanotechnology?”
It's a team effort!
Science and Technology are important to most Federal Agencies

The Executive Branch

with R&D agencies

U.S. President

Office of Management and Budget

Science Advisor
Office of Science and Technology Policy

Other boards, councils, etc.

NSTC

Major Departments

Homeland Security

Agriculture

Health and Human Services

Interior

Transportation

Defense
DARPA, ONR, AFOSR

Energy
NNSA

Commerce
NOAA
NIST

Independent Agencies

National Aeronautic and Space Administration

Environmental Protection Agency

Smithsonian Institution

Nuclear Regulatory Commission

Other agencies

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Other agencies
Examples of Public Policy Issues that Relate to Science and Technology

- Advances in science, engineering, and technology (R&D budget)
- Emerging technologies - National Nanotechnology Initiative
- Energy production and consumption
- National and Homeland security and counter-terrorism
- Environment – air/water, climate change, clean-up
- Storage of spent nuclear fuel and high level radioactive waste
- Information technology, computing, internet
- Health – Human genome, proteomics, cloning, stem cells, AIDS
- International cooperation in S&T (e.g., Carnegie G-8 meetings)
- Education and the technical workforce
- Space program
- Food safety, plant biotechnology (GMO’s)
- Policy on research misconduct
- Surprises!
Science and Technology are important to most Federal Agencies.

One job of the Science Advisor is to coordinate S&T activities across federal government.

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Science and Technology are important to most Federal Agencies.

One job of the Science Advisor is to coordinate S&T activities across federal government, including the White House:
- Domestic Policy Council
- National Economic Council
- National Security Council
- Council on Environmental Quality
- Office of Management and Budget
- Office of Vice President

Agencies involved in Science and Technology:
- Agriculture
- Health and Human Services
- Interior
- Transportation
- National Aeronautic and Space Administration
- Environmental Protection Agency
- Smithsonian Institution
- Nuclear Regulatory Commission
- Other agencies
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FOUR THREATS TO U.S. SCIENCE AND TECHNOLOGY

• MONEY TO FUND SCIENCE
• PEOPLE TO DO SCIENCE
• PUBLIC UNDERSTANDING OF SCIENCE
• RESPECT FOR THE INTEGRITY OF SCIENCE
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Research will get Squeezed in Future Budgets

Composition of the Proposed FY 2004 Budget
Total Outlays = $2,229 billion

- $2.6 trillion in FY06 (20% GDP)
- $75 billion
- $57 billion (<0.5% GDP)

Note: Projected Unified deficit is $307 billion.
FEB. '03 © 2003 AAAS
Outyear budget projections look grim!

R&D and Discretionary Outlays (Nondefense), 1962-2010
in billions of constant FY 2005 dollars

- Nondefense discretionary (left scale)
- Nondefense R&D (right scale)
FOUR THREATS TO U.S. SCIENCE AND TECHNOLOGY

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• RESPECT FOR THE INTEGRITY OF SCIENCE
Talented students have been coming from abroad to study science and engineering- but that trend may not continue!

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.
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What Do the American People Know?
(from survey done for NSF’s “SE Indicators” *)

- Plants produce oxygen
- Continents have been moving for millions of years
- Light travels faster than sound
- Earth goes around the sun
- Not all radioactivity is manmade

- Earliest humans did not live with the dinosaurs
- Earth takes one year to go around the sun
- Electrons are smaller than atoms
- Antibiotics do not kill viruses
- Lasers do not work by focusing sound waves

* From NSF (National Science Board) Science and Engineering Indicators 2002, chapt. 7
What Do the American People Believe?

(from various polls reported in NSF’s “SE Indicators” *)

- Psychic or spiritual healing - mind over body ( > 50%)
- ESP (50%)
- Haunted houses (>40%)
- Ghosts (40%)
- ET visits ( >30%)
- Astrology is scientific or “sort of” (40%)
- Evolution in schools
  - teach only evolution (20%)
  - teach with creationism (> 45%)
  - do not teach evolution at all (16%) > 60%

* From NSF (National Science Board) Science and Engineering Indicators 2002, chapt. 7
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RESPECT FOR THE INTEGRITY OF SCIENCE

The integrity of U.S. science has always been non-partisan

"Science, like any field of endeavor, relies on freedom of inquiry; and one of the hallmarks of that freedom is objectivity. Now, more than ever, on issues ranging from climate change to AIDS research to genetic engineering to food additives, government relies on the impartial perspective of science for guidance."

President George H.W. Bush, April 23, 1990

But something has changed:

A Statement – “Restoring Scientific Integrity in Policymaking”, calling attention to misrepresentation and misuse of science by some in the current Administration, was signed by 62 scientists, including many Nobel Laureates.
FOUR THREATS TO U.S. SCIENCE AND TECHNOLOGY

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Especially challenging in a post-9/11 world
Einstein had advice for scientists:

“Concern for man and his fate must always form the chief interest of all technical endeavors...in order that the creations of our mind shall be a blessing and not a curse to mankind. Never forget this in the midst of your diagrams and equations.”

(Albert Einstein, speech at Cal Tech, February 1931)
Einstein had advice for all of us:

“Everything that is really great and inspiring is created by the individual who can labor in freedom.”

(Albert Einstein, commencement Address to the graduates of Swarthmore, 1938 and quoted in Out of My Later Years, 1950)

Becomes a citizen of the United States - a true “Patriot Act”
Three American “Civic Scientists”

- Benjamin Franklin
  1706-1790

- Albert Einstein
  1879-1955

- Allan Bromley
  1926-2005
Thank you!