

Subject Guide on Science Advice and the Presidency By Tess Gibson

Primary Sources:

Books

Bromley, D. Allan. *The President's Scientists: Reminiscences of a White House Science Advisor*. New Haven, CT: Yale University Press, 1994.

The memoirs of George H.W. Bush's science advisor. Bromley comments on the extraordinary length of time it takes to accomplish anything in Washington. He believes this problem results from the "balkanization" of Congress that resulted in far too many committees and subcommittees with no rational distribution of responsibilities. Bromley recommends streamlining the committee structure, implementation of a two year budget cycle and longer terms for members of Congress.

Bush, Vannevar. *Pieces of the Action*. New York, NY: William Morrow and Company, Inc., 1970.

Part memoir, part philosophical treatise, this book is an engaging read. Bush began his career at Tufts, spent 25 years at MIT, directed the Carnegie Institute, Chaired the National Advisory Committee for Aeronautics, and directed the Office of Scientific Research and Development during World War II. Bush promotes the idea that well funded basic scientific research is necessary for the success of business which, in turn, causes the economy to grow and enables the government to assist the citizens who need it. Bush's Memex was an early attempt to automate human memory. While he is often given credit for having predicted the advent of hypertext in his 1945 article "As We May Think" it is now argued by some that was not, after all, the godfather of computing. Bush gives an insiders perspective on the development of science policy and research trends in the first half of the twentieth century.

Golden, WilliamT. *Science Advice to the President*. Washington, D.C.: AAAS Press, 1993.

This collection of essays by eleven presidential science advisors provides valuable insight into the advisory process and its influence on policy. Additional essays by political scientists, historians and scientists further illuminate the difficulties and successes of the science advisory mechanism.

Killian, James Rhyne. *Sputnik, Scientists, and Eisenhower: A Memoir of the First Special Assistant to the President for Science and Technology*. Cambridge, MA: MIT Press, 1977.

Killian argues that if the federal government had released more information to the public about the progress of our satellite program, the reaction to Sputnik would not have been so severe. Whether this is true or not cannot be proven but this book is an excellent memoir by the first person to hold the title Special Assistant to the President for Science and Technology. Filled with personal anecdotes and fascinating stories of the workings of government at its highest levels, Killian provides an insiders view. The book includes a chapter on recommendations for improving the science advisory process.

Kistiakowsky, George Bogdan. *A Scientist at the White House: The Private Diary of President Eisenhower's Special Assistant for Science and Technology*. Cambridge, MA: Harvard University Press, 1976.

Reingold, Nathan. *Science in Nineteenth Century America: A Documentary History*. New York, NY: Hill and Wang, 1964.

This is a fascinating collection of correspondence between American scientists in the nineteenth century. The editor states in his introduction that he is attempting to discover and analyze the origins of our contemporary (1964) state of science. The most relevant nugget is found in the text of a speech made by Henry A. Rowland delivered at the second annual meeting of the American Physical Society in 1899. In his speech Rowland argues that rather than paying ignorant physicians to stand by and watch loved ones die, the government should be supporting scientific research that will discover the causes and cures for disease.

Wiesner, Jerome B. *Where Science and Politics Meet*. New York, NY: McGraw-Hill, 1965.

Government Documents

Bibliography of Studies and Reports on Science Policy and Related Topics, 1945-1985: Report. prepared for the Task Force on Science Policy, Committee on Science and Technology, House of Representatives, 99th Congress, Second Session.

This bibliography covers forty years of major science reports and studies since the Bush report and is an essential reference for research in this topic. Included are references to congressional hearings, reports by congressional support agencies such as the General Accounting Office, and a bibliography of historical studies covering federal research agencies since 1945. This volume is required reading for those wishing to trace the development of science policy in the United States.

Bush, Vannevar. *Science: The Endless Frontier. A Report to the President on a Program for Postwar Scientific Research. July 1945*. Washington, D.C.: National Science Foundation, 1960.

Bush's report emphasizes the following: That scientific progress is essential for the war against disease, for national security, and for the public welfare. He argues that scientific talent must be renewed and that the veil of secrecy should be lifted from wartime research so that new applications can be found. Bush believed the government has a duty to promote the flow of new knowledge by supporting basic research and that an agency should be established to supplement research in universities and research institutes. It is interesting to note that Bush believed this agency should recognize that freedom of inquiry should be preserved. This report is critical in understanding the links between science and government in the twentieth century.

Conduct of Scientific Work under United States Government. January 18, 1909, 60 Cong., 2 Sess. H.R. Doc. 1337.

This is a 1909 report made by a committee established by the National Academy of Science at the request of Congress. The purpose of the committee was to determine ways to consolidate or

eliminate the numerous bureaus within the various government departments in order to reduce redundancy and waste.

Farrand, Max. *Records of the Federal Convention of 1787*. New Haven, CT: Yale University Press, 1911-1937.

This three volume set compiles records from the convention. Debates over the role of government in the scientific process are included.

National Resources Committee. *Research: A National Resource: Relation of the Federal Government to Research. Report of the Science Committee to the National Resources Committee*. Washington, D.C.: United States Government Printing Office, 1938.

This report offers a picture of the federal government's involvement in research in the late 1930s.

Richardson, J.D. *Compilation of the Papers and Messages of the Presidents, 1789-1897*.

Washington, D.C., Published by Authority of Congress, 1900, 10 vols.

This is a very important source to refer to in determining the scientific policies various presidents initiated or tried to initiate.

Steelman, John R. *Science and Public Policy: A Report to the President by the President's Scientific Research Board*. Washington, D.C.: United States Government Printing Office, 1947. Reprinted by Arno Press, New York, NY, 1980.

This report was commissioned by President Truman in 1946. In 1948 the president used five of the report's recommendations as the basis for his proposed national science policy.

United States Congress, House of Representatives. *The Future of Science, Hearing Before the Task Force on Science Policy of the Committee on Science and Technology*. 2 May 1985, 99th Congress, First session.

This report contains some fascinating testimony from a wide cross section of scientists, attorneys, corporate executives and medical experts regarding the future of science and technology.

United States Congress, House of Representatives. *Oversight of the Office of Science and Technology Policy: Hearing Before the Subcommittee on Science, Research, and Technology of the Committee on Science, Space, and Technology*. 17 February 1988, 100th Congress, Second Session.

An important collection of testimony before the subcommittee.

United States Congress, House of Representatives. *The Relationship of Industrial Basic and Applied Research to Government Science Policy*. 23, 24 April 1985, 99th Congress, First Session.

Transcripts of testimony given by science experts and industry executives about the relationship between government and science.

United States Congress, House of Representatives. *Scientific Fraud and Misconduct and the Federal Response, Hearing Before a Subcommittee of the Committee on Government Operations*. 11 April 1988, 100th Congress, Second Session.

An important resource into the history of government efforts to curb misconduct in the federally funded scientific community.

.Reports

Carnegie Commission on Science, Technology, and Government. *Science, Technology, and Government for a Changing World: The Concluding Report of the Carnegie Commission on Science, Technology, and Government*. New York, NY: The Commission, 1993.

This report is a collection of brief essays written by members of the commission. It focuses on linking scientific progress to societal goals, strengthening the federal infrastructure, and improving regulatory decision making. Many of the points made in the Smith work are repeated here.

Shapley, Willis. *Research and Development in the Federal Budget: FY 1978*. Washington, D.C.: American Association for the Advancement of Science, 1978.

Written by the director of the re-established White House Office of Science and Technology, this report describes the major decisions to be made regarding research and development for FY 1978. The rationale of the administration's science and technology policy is also explained.

United Nations Educational, Scientific and Cultural Organization. *National Science Policies of the U.S.A.: Origins, Development and Present Status*. Paris, France: 1968.

This is an excellent report covering the development of science policy from the colonial period to the mid twentieth century. Numerous facts and figures are given as are many citations to relevant documents. A perfect starting point to research this topic.

Secondary Sources

Ames, Mary. *Outcome Uncertain: Science and the Political Process*. New York, NY: Communications Press, 1978.

Ames analyzes several case studies that show increasing government involvement in science over time. These include the Manhattan Project, SST development, nuclear power plants, and saccharin studies. Through her analysis, Ames explains the process of government involvement and proposes changes to the science/government relationship that she argues will result in improvement.

Barfield, Claude E. *Science Policy from Ford to Reagan: Change and Continuity*. Washington, D.C.: American Enterprise Institute for Public Policy Research, 1982.

Analyzes the research and development strategies of the Ford, Carter, and Reagan administrations and argues for broad, long-term federal support for basic research because the private sector is unwilling to make large investments in research that does not produce corresponding returns. The government must, therefore take responsibility for the advancement of general scientific knowledge. This book contains the text of some related government documents and numerous references to others.

Cox, Donald W. *America's New Policy Makers: The Scientists' Rise to Power*. Philadelphia, PA:

Chilton Books, 1964.

Cox presents a popular history of the rise of American science in government to 1964. In the first part of the book, Cox relates the history of the relationship of science to government. Readers interested in that subject will want to read the Dupree work listed below. In part two, Cox delves into the questions that result from the “invasion of the political arena by scientists.” Some of these questions are still being asked today.

Dupree, A. Hunter. *Science in the Federal Government: A History of Policies and Activities to 1940*. Cambridge, MA: Harvard University Press, 1957.

Dupree presents a chronological history of government involvement in science from the Constitutional Convention to 1940. He provides valuable political context for the actions taken by the major players from Benjamin Franklin to Franklin D. Roosevelt. This book is essential reading for anyone conducting research into United States science policy.

Gilpin, Robert and Christopher Wright, eds. *Scientists and National Policy-Making*. New York, NY: Columbia University Press, 1964.

This collection of ten essays focuses on the role of scientists in the development of national science policies. Essays by Don K. Price and Christopher Wright are particularly useful for science policy researchers.

Jasanoff, Sheila. *The Fifth Branch: Science Advisors as Policymakers*. Cambridge, MA: Harvard University Press, 1990.

This book is devoted to the analysis of policy decisions in which science advice played a significant role. Jasanoff critiques the two most commonly accepted views of controlling science through regulatory agencies: the “democratic” approach, which views public participation as the means to prevent abuses, and the “technocratic” approach which looks at scientists as validators of policies involving intricate technical content. The book includes enlightening case studies.

Kleinman, Daniel Lee. *Politics on the Endless Frontier: Postwar Research Policy in the United States*. Durham, NC: Duke University Press, 1995.

Kleinman argues that the methods by which research policies are established has a profound impact on society and speaks directly to society’s priorities and values. He explores the nature of science policy within the context of the genesis of the federal research system after World War II. The book includes some important tables outlining research expenditures and the development of organizations and government agencies that deal with science policy issues.

Lakoff, Sanford A., ed. *Knowledge and Power: Essays on Science and Government*. New York, NY: The Free Press, 1966.

This collection of essays explores the relationships between science, government, knowledge, and power. One essay describes the development of NASA while another profiles the President’s Science Advisory Committee. Other essays explore the need for government support of basic research and the idea of science as a service to society. All of the essays are well footnoted with references to the relevant primary documents.

Miller, Jon D. *The American People and Science Policy: The Role of Public Attitudes in the Policy Process*. New York, NY: Pergamon Press, 1983.

This book reports on a study conducted to establish the proportion of the population who pay attention to science policy, determine the social composition of the group and its growth over time. The introductory chapter provides background on the National Science Foundation.

Nyce, James M., Kahn, Paul. *From Memex to Hypertext: Vannevar Bush and the Mind's Machine*. Boston, MA: Academic Press, 1991.

A collection of essays regarding Bush's Memex. Some writers discuss Bush's legacy while others review the literature on this sometimes controversial man. This is a good resource to use when looking for citations to what others have written about Bush.

Primack, Joel R., von Hippel, Frank. *Advise and Dissent: Scientists in the Political Arena*. New York, NY: Basic Books, Inc., 1974.

Primack and von Hippel explore the uses and limitations of science advisors and argue convincingly that studies are sometimes used as an excuse for government inaction. The book emphasizes the decline of influence of scientists in government that occurred after World War II and the fact that by 1972 government support for science and technology was substantially decreased, resulting in economic stagnation for scientists and a reduction in research opportunities. The authors argue that scientists should become public interest activists and cite Rachel Carson, Linus Pauling, and Hans Bethe as examples of scientists who were able to bring important issues to the public forum. A useful appendix describes the establishment and abolishment of some of the federal government's science offices.

Smith, Bruce L. R. *American Science Policy Since World War II*. Washington, D.C.: The Brookings Institution, 1990.

Smith writes that just after World War II scientists and politicians reached an informal consensus on how science could best serve the nation and how the government could best support science. This consensus involved federal support for basic research and the evolution of the government research establishment. Smith argues that the consensus dissolved under pressures created by the Vietnam War and that since that time, the nation has struggled to reestablish shared beliefs about the goals and methods of science policy. This book includes a chapter on science policy in the Reagan era and concludes with recommendations for development of science policy. Some of these include dissolving regulatory gridlock, strengthening universities, and revitalizing government research. The work is well footnoted.

Smith, Bruce, R. *The Advisers: Scientists in the Policy Process*. Washington, D.C.: The Brookings Institution, 1992.

Discusses the effects of scientists on the policy process. A good resource for more current opinion.

Solingen, Etel, ed. *Scientists and the State: Domestic Structures and the International Context*. Ann Arbor, MI: University of Michigan Press, 1994.

This collection of case studies examines the relationship of science to government in nine countries. Bruce L.R. Smith addresses the development of science-government interaction in the United States and discusses recent trends as well as possible future developments.

Wang, Jessica. *American Science in an Age of Anxiety: Scientists, Anticommunism, and the*

Cold War. Chapel Hill, NC: The University of North Carolina Press, 1999.

Wang argues that during the period from 1945 to 1950, American scientists both formally established their political power and discovered its limits. She analyzes the relationship of science to government in the early Cold War years and argues that the post World War II environment required scientists to abandon their far-reaching goal of changing the relationship between science and society and instead became increasingly reliant on internal negotiations with government agencies in order to achieve more limited policy goals. This book is important as an examination of the changing role between government and science in the immediate postwar years.

Wilson, John T. *Academic Science, Higher Education and the Federal Government 1950-1983*.

Chicago, IL: The University of Chicago Press, 1983.

This book provides useful context for the formation of the National Science Foundation and insights into the relationship between science and government in the Nixon, Carter, and Regan administrations.

Zachary, G. Pascal. *Endless Frontier: Vannevar Bush, Engineer of the American Century*.

Cambridge, MA: MIT Press, 1999.

This is the only biography of Vannevar Bush, considered by many to be the father of modern computing. Bush played an important role in the development of science policy during World War II and after.

Articles

Anderson, Frederick R. "Improving Scientific Advice to Government." *Issues in Science and Technology* 19, no. 3 (Spring 2003) [article online] (accessed 11 July 2003) available from WilsonSelect Plus.

Anderson writes that the recent reforms in methods used to select and operate 'independent' expert panels have done more harm than good. Interest groups use considerable resources to try to influence the composition of these panels.

Kalil, Thomas. "A Broader Vision for Government Research." *Issues in Science and Technology* 19, no. 3 (Spring 2003) [article online] (accessed 11 July 2003) available from WilsonSelect Plus.

Argues that R&D is underutilized as an instrument of national policy because of under funding. The author encourages university faculty to identify under funded research areas, develop a research agenda, and seek support from foundations and government agencies.

Mooney, Chris. "Political Science: The Bush Administration Snubs Its Science Adviser." *American Prospect* 12, no. 21 (3 December 2001): 28-29. [database online] (accessed 23 June 2003); available from WilsonSelect Plus.

The author provides a brief history of the relationship between science and the White House and argues that by lowering the status of the national science advisor from Assistant to the President to Federal Government Official, the Bush White House is signaling that it will not be dictated to by scientists.

“Nondefense R&D Would Take a Hit in Proposed FY 2004 Budget.” *Issues in Science and Technology* 19, no.3 (Spring 2003): 23-26 [article online] (accessed 11 July 2003) available from WilsonSelect Plus.

This article provides facts and figures that show while the Bush administration’s FY 02 budget would increase R&D funding by 4.4%, the majority of those funds would go to support defense development and homeland security research.

Peckerar, Martin. “Addressing the Myths of Science and Public Policy in the United States.” *IEEE Technology and Society Magazine* 22, no. 1 (Spring 2003): 23-34.

The author describes the three myths of science and public policy: 1) The myth of the economic value of science. 2) The myth of the research university. 3) The myth of the extraneous government. This is a thought provoking, interesting article that encourages the government to get out of technological entrepreneurship and leave it to the private sector.

Rosenstock, Linda. “Attacks on Science: The Risks to Evidence-Based Policy.” *American Journal of Public Health* 92, no. 1 (January 2002): 14-18 [article online] (accessed 11 July 2003) available from WilsonSelect Plus.

The author argues that the point at which science ends and policymaking begins has become indistinct and needs to be redefined.

World Wide Web Resources

American Association for the Advancement of Science: <http://www.aaas.org>

Founded in 1848, the AAAS promotes science around the world through education and leadership. AAAS established the Center for Science, Technology, and Congress in 1994. The center provides information to Congress on current science and technology issues and assists the scientific community in working with Congress. The center publishes the newsletter, *Science and Technology in Congress*. This is an excellent resource for maintaining awareness of current issues in science and technology policy. The newsletter is available full-text on the center’s website.

Center for Science and Technology Policy: <http://policy.gmu.edu/ctr/cstp.htm>

George Mason University’s Center for Science and Technology Policy facilitates the exchange of information between the foreign affairs, science and technology, and trade sectors. The center focuses on topics such as technology infrastructure in developing nations, integrating international trade and technology policies, and conflict management in high-tech trade.

Center for Science and Technology Policy Research: <http://sciencepolicy.colorado.edu>

The center’s mission statement reads, “The center conducts research, education, and outreach to improve the relationship between societal needs and science and technology policy.” The center conducts research in many areas, including global climate change and society, and interdisciplinary approaches to integrating value and ethics with science. The center offers a graduate certificate in science and technology policy.

The National Academies: <http://www.nationalacademies.org>

The National Academy of Science was established by President Lincoln in 1863. It has expanded to include the National Research Council (1916), National Academy of Engineering (1964), and the Institute of Medicine (1970). The purpose of the Academies is to address critical issues and give advice to the government and the people.

North Carolina State University Program on Science, Technology, and Society:

<http://www.ncsu.edu/chass/mds/psts.html>

This program seeks to explore the ways in which science and technology influence modern values and vice versa. The page includes useful links to publications, and relevant sites in government, industry, and the non-profit sector.