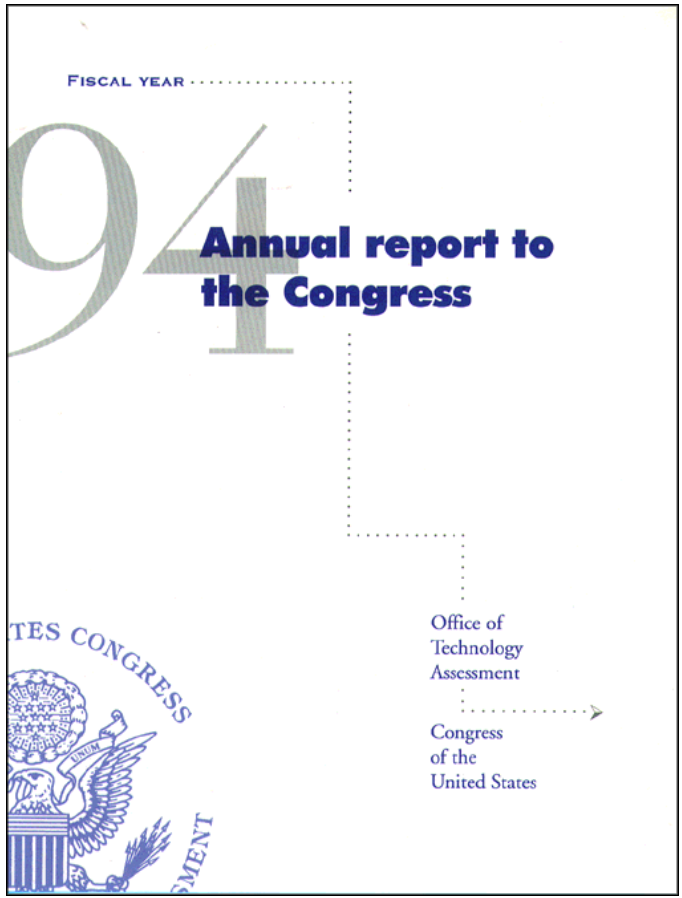
Annual Report to the Congress: Fiscal Year 1994

March 1995

OTA-A-544



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TAB CHAIRMAN'S

Edward M. Kennedy

IT HAS BEEN MY DISTINCT PLEASURE to serve again as OTA's Chairman during the 103d Congress.

My association with this agency goes back to its earliest days. I still feel a great deal of pride and excitement about the work the agency does. OTA continues to produce a steady stream of advice for the Congress—advice which always can be counted on to be competent, objective, and useful. This advice also has been impressive since it helps us with technology on a broad range of topics, such as education, defense, medicine, and transportation.

In a time when some have come to question the value of OTA, my own opinion is that without OTA the Congress will be a less informed place, making decisions knowing less, which is a position that few of our constituents would support. For a relatively small sum, OTA arms Members of Congress with high-quality advice on issue of enormous magnitude and cost—it's a bargain in my book.

I look forward to a continued association with OTA and its advisors, and to a vigorous future.

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TAAC CHAIRMAN'S

Neil E. Harl

IT HAS BEEN MY PLEASURE TO SERVE as the Chairman of the Technology Assessment Advisory Council during the past Congress. I would like to extend my particular thanks to Dr. Jim Hunt, who has served so ably as the Vice Chairman, and who will now succeed me as Chairman.

OTA is a unique resource to the Congress. In a period where some are questioning its value, I would like to extend my personal regards to the organization. OTA manages to put out a steady stream of high-quality analysis which is objective, thorough, and reliable.

As Congress faces a multitude of complex issues of public policy for the remainder of the 1990s, I hope it will continue to support this organization, which will be more needed than ever.

Roger C. Herdman

DURING FISCAL YEAR 1994 OTA underwent a sweeping restructuring that to some extent had been foreshadowed by events in FY 1993. The proposal for this restructuring was developed through extensive consultation with OTA staff at all levels. The organizational plan approved by OTA's Technology Assessment Board streamlined OTA's research activities from nine programs to six. This move followed similar streamlining in FY 1993, when three divisions were merged into two, and all administrative functions were placed under the direction of OTA's assistant directors to eliminate separate operations management.

A number of objectives have been achieved by this restructuring. OTA has responded to legislative branch budget policy by creating substantial economies by eliminating about 35 to 40 percent of senior management positions; these savings amount to approximately $1.3 million annually. Also, the restructuring has permitted maintenance of "critical mass" during maximum workloads. In addition, eliminating a number of internal boundaries and establishing a culture of collaboration and sharing has improved cross-program and cross-discipline cooperation and reinforcement. It has become easy to recruit project teams from throughout the agency based on desirable skills and experience, regardless of the program home of any individual staff member; this has moved OTA toward matrix management. Also, larger research units provide greater diversity and enhance the capacity for staff to participate in multiple projects simultaneously. The result of all this is a more efficient and, of course, less expensive organization. There is further renewal in the agency in that seven of the current nine senior managers are new in their jobs, and the two who continue as program directors have new responsibilities insofar as their programs are changed and enlarged through restructuring.

FOCUS ON TECHNOLOGY

In 1994 the Appropriations Committees **asked** OTA to consider ways in which the agency could focus more sharply on science and technology and ensure that work did not stray into other fields where it might duplicate the efforts of other support agencies. OTA responded promptly to these instructions from the Committees, designing a three-part approach that was approved by OTA's board on June 23, 1994.

- First, OTA strengthened the analysis that staff always undertake in preparing proposals to be taken to the Technology Assessment Board on work requested by Committees of Congress. Staff are required to review proposed responses to Committee requests in order to specify what technological applications and what societal impacts of such applications would be involved in the study and be included in the final report. Staff must identify what sections of OTA's enabling statute, P.L. 92-484, would support the proposed work. This analysis is set forth in a "technology page" included prominently in all proposals submitted to the Board for approval. In this way, staff and management identify and specify the technology content, and the Board is assured that this step has been undertaken and can review the documentation in the course of deciding on the appropriateness of the work for OTA. All proposals after the June Board meeting have included this "technology page." This has been helpful in focusing attention on the science and technology content of OTA work.

- Second, to improve the understanding of the Appropriations Committees and to enable them to better review and assess OTA's performance, the Committees were formally invited to a meeting of the Board staff with OTA and to a regular Board meeting. Staff of the Committees attended these meetings.

- Third, to expand requesting Committee understanding of OTA's role among the support agencies and to improve and refine requesters' focus on OTA as a science and technology agency, several brochures and other materials were prepared and made widely available in Congress.

PROCUCTIVITY LEVEL HIGH

In this time of change and restructuring, OTA succeeded in maintaining traditional levels of output. OTA delivered 51 publications to Congress, including 22 assessments, 27 background papers, and two administrative documents, and :estified 38 times before Congressional Committees. OTA ılso provided numerous special briefings and expert advice. As ɔf September 30, 1994, 44 studies approved by the Technol-ɔgy Assessment Board and nine special responses were in ɔrogress. OTA's reports for the year covered the usual wide :ange of subject matter, and included a number which could ɔe singled out as particularly of interest and use to Congress ınd the nation:

IN A TIME OF CHANGE AND RESTRUCTURING, OTA SUCCEEDED IN MAINTAINING TRADITIONAL LEVELS OF OUTPUT

- The second of two studies on multinational corporations and the U.S. technology base was completed. The assessment provided careful analysis of the impact of multinational corporate policy on the development of technologies and high-technology manufacturing in this country and the linkage of foreign investment policy and trade balances, particularly in the case of Japan.
- As the health reform debate heated up over the course of the second session of the 103d Congress, OTA took an in-depth look at the strengths and weaknesses of economic projections in reports on understanding estimates of expenditures under health reform and questioned the reliability of such estimates and the likely validity of assumptions on the use of system technologies on which economic models are based.
- At the request of the Appropriations Committees, OTA also prepared a report on the Social Security Administration's massive computer procurement strategy. In essence, the report noted that SSA had not developed the service plan to effect the maximum value from the intelligent work station/local area network technical solution proposed. The Committees have held up some funding pending better descriptions and planning from SSA.
- OTA investigated information security and privacy in network environments. This study took issue with the formulation of the federal decision regarding the "clipper chip" solution and probed the appropriateness of

federal decisions that may have an effect on private industrial capacity to develop security and to compete outside of the United States if federal governmental access to transmissions has been built into hardware.

- OTA issued a report on managed health care and competitive health care markets.
- A series of reports examined a variety of issues with respect to technologies underlying, and methods of control of, weapons of mass destruction.
- And the most recent in a series of OTA reports analyzing defense industry conversion assessed the potential for civil-military integration.

Many other reports could be highlighted in the areas of technology covered by OTA, including energy, the environment, health, international security, transportation, education, information technologies and telecommunications, and industrial competitiveness. We see complex issues involving science and technology continuing to come before Congress and the American people—issues that will need thoughtful, careful analysis. We look forward to continuing to serve as a shared resource for the Senate and the House, the Majority and the Minority, to help frame issues, to help inform the debate, and to provide useful options for resolution of the issues.

Organization and operations

THE PROFOUND TECHNOLOGICAL AND SCIENTIFIC advances affecting all facets of the nation's future—from economic competitiveness in the new global economy, to the challenges of new communication technologies, to the changing needs of national security—are placing unprecedented and complex policy issues before Congress. The Office of Technology Assessment (OTA), a congressional support agency created by the Technology Assessment Act of 1972 [86 Stat.797], provides Congress with objective and extensive analyses of these issues.

With an analytical staff representing every major field of science and technology, OTA works directly for congressional committees. The small agency (about 200 employees) has two analytical divisions: 1) Industry, Commerce, and International Security; and 2) Health, Education, and the Environment. They include assessments grouped in the areas of energy, transportation, and infrastructure; industry, telecommunications, and commerce; international security and space; education and human resources; environment; and health.

Administrative offices support the analytical work of the agency. These offices handle budget and finance, contracts, information services, personnel, telecommunications and information systems, building services, and publishing.

The Congressional and Public Affairs Office handles much of OTA's congressional and press liaison work, relations with the Technology Assessment Board, and relations with the Technology Assessment Advisory Council. OTA publications are widely disseminated on Capitol Hill and are publicly available in both electronic and paper formats. Electronic versions of OTA publications, information about the agency, and news about work in progress are accessed by thousands of users worldwide. The agency's Information Center provides public access to the full collection of OTA

publications, including an on-line index, and the Publications Distribution Office handles public dissemination of OTA publications. (General information about OTA and availability of OTA publications is listed on page 60.)

OTA is governed by a 12-member bipartisan congressional Technology Assessment Board of six Senators and six Representatives, equally divided by party. In addition, a distinguished council of 10 leaders from science and technology, business and industry, and education provides advice.

OTA undertakes assessments at the request of any congressional committee Chairman. The Chairman may request the work personally, on behalf of a Ranking Minority Member, or on behalf of a majority of committee Members. The OTA Board may also request work, as can OTA's Director. In practice, most assessments are requested by the Chairman and the Ranking Minority Member of a committee, and many are supported by more than one committee. The Technology Assessment Board makes the final decision on whether OTA can proceed with an assessment and reviews all reports prior to their release.

Most of OTA's work concentrates on in-depth assessments that take one to two years to complete. Drawing on past and current work, OTA also meets immediate congressional needs with a variety of analytical support such as briefings, testimony, and special reports.

FISCAL YEAR 1994 ACTIVITIES

OTA continues, as it has since 1972, to follow the agenda set by the requests from committees of Congress and approved by its bipartisan Technology Assessment Board "as an aid in the identification and consideration of existing and probable impacts of technological application (P.L. 92-484)." Each year sees a shifting array of issues in science and technology to which OTA must respond, and which require a consistent approach and the delivery of accurate, complete, nonpartisan information, analysis and conclusions that can serve as a foundation for congressional deliberations and actions. OTA's reports help the Congress in the preparation of specific legislation, in deliberating from a general background and base of information and knowledge, and in providing oversight and monitoring of executive branch programs.

During FY 1994, OTA delivered 51 formal publications to Congress, including reports, background papers, and administrative documents. As of September 30, 1994, 44 approved studies and nine special responses were in progress. An integral aspect of OTA's assessments includes providing expert advice, briefings, testimony, and results of OTA research to committees throughout the projects. The

following are examples of OTA projects that had a significant impact in areas that are of vital interest to the Congress:

- Major work has been delivered, and more is in process, about *proliferation of weapons of mass destruction*, including technologies for detecting, assessing the risk, and controlling proliferation, as well as technologies for counterproliferation, including preventive, active and passive measures.

- Congress's concern about the future of the *U.S. space launch industry* and the uses to which satellites might be put has spawned a number of projects to provide Congress with information on ways to structure approaches to this industry, a vital national security sector.

- Two reports have been released on *multinational corporations and the U.S. technology base*, exploring the role of multinational corporations in the development of technologies for American industry and the way that technology diffuses and is controlled through networks of multinationals and their subsidiaries. This analysis points out the major implications for U.S. trade and competitiveness of how and, most importantly, where advanced research is carried out and where the new technology is located. OTA continues to work on a related issue, *commercialization of emerging technologies,* and issues relevant to the conceptualization of a technology policy.

- In the 104th Congress, OTA's Energy Transportation, and Infrastructure Program will deliver work on *technological reshaping of metropolitan America.* New communications, information, and transportation production technologies have affected and will continue to affect the distribution and location of economic activity in America's cities and suburbs, and this in turn will need to be understood to direct the wise use of public and private transportation and other infrastructure investments. At the same time, *advanced automotive technologies* will play a role not only in urban and transportation policy but in energy and environmental policies as well.

- OTA's Education and Human Resources Program is looking at the technologies useful to *work-based learning and training* and how these might make a difference in the employability of America's youth, their preparation to use

THE PROFOUND TECHNOLOGICAL AND SCIENTIFIC ADVANCES AFFECTING THE NATION'S FUTURE PLACE UNPRECEDENTED AND COMPLEX POLICY ISSUES BEFORE CONGRESS

the technologies becoming so pervasive in the workplace, and the competitiveness of American industry. This program is also examining the full scope of *residential* design *technologies for elderly and disabled populations,* a study with particularly wide application. It has long been thought that facilities for these populations do not take full advantage of the technological potential for improvement in the care of patients.

- OTA's new Environment Program is more diverse than in the past, and its projects reflect this increased diversity. A great variety of impacts flow from the extensive nuclear contamination of the former Soviet Union, particularly in the Arctic, and this contamination of the waters of the northern oceans has major implications. An extensive assessment of the *Arctic and other regional impacts from Soviet nuclear contamination* is underway, examining a huge geographic area with severe contamination. Smaller projects undertaken include a look at the potential for *biological pest control* as the number of chemical pesticides available for agriculture diminishes.

- In support of health reform efforts which may be undertaken in the 104th Congress, OTA has delivered reports on *international differences in health technology, services and economics* and *identifying health technologies that work,* and has illuminated the strengths and usefulness of economic projections in reports on *understanding estimates of expenditures under health reform.* OTA is also researching impacts of *antibiotic-resistant bacteria.* The emergence of strains of common infectious bacteria that are resistant to all, or almost all, of the currently available antimicrobial drugs is becoming recognized as a significant threat to the public health. It is important for Congress to know the extent of this threat, the seriousness of the implications for health care, and the possible actions that might be taken to ameliorate the situation.

OTA's work in FY 1996 will continue to reflect the explicit needs of the committees of jurisdiction. The bipartisan, bicameral Technology Assessment Board will guide OTA's work with committees and shape the agency's agenda through the assessment proposal approval process. OTA serves as a shared resource for Congress, providing nonpartisan analysis of scientific and technological issues—issues intrinsic to all important policy issues-in a highly cost-effective way.

Industry, commerce, and international security division

The Industry, Commerce, and International Security Division comprises three research progams: Energy Transportation, and Infrastructure; Indstry, Telecommunications, and Commerce; and International Security and Space.

ENERGY, TRANSPORTATION, AND INFRASTRUCTURE are essential systems underpinning the nation's prosperity, security, and well-being. The Energy, Transportation, and Infrastructure (ETI) Program examines the role of technology in producing and using energy resources; designing, operating, and improving transportation systems; and constructing and maintaining infrastructure. Applications of materials to these issues, including the development of natural and manufactured material resources through extraction, processing, use, and recycling or waste management are also included in ETI's work. The program covers the export and import of energy, transportation, and infrastructure technologies, goods, and services, including energy fuels and efficiency. The program's work helps Congress develop policies for these systems that will sustain economic growth, global competitiveness, and international stability while minimizing adverse social, economic, and environmental impacts.

The Industry, Telecommunications, and Commerce (ITC) Program is responsible for assessments on technology and international industrial competitiveness, telecommunications and computing technologies, international trade, industry productivity, and related topics. ITC examines how technology affects the ability of U.S. industry to contribute to a healthy national economy. This includes consideration of the role of technology on competitiveness of U.S. industries in international markets; trade and economic development issues; the changing role of telecommunications and computing technologies in the nation's industry, commerce, and government; the effect of technology on the number and nature of employment opportunities in the U.S. economy; the effects of technological change on

jobs and training; and ways to ease adjustments in structural economic transitions brought about by technological change. The program also studies telecommunications regulation, information policy, and applications of information technology in the public sector.

OTA's work concerning technological aspects of national security, international security (as it concerns the U.S.), and space is pursued in the International Security and Space (ISS) Program. The program's security work focuses on implications of technology and technological change for national defense as well as international stability, arms control, arms proliferation, terrorism, and alliance relations. Assessments of issues related to the nation's defense industrial and technology base is an increasing part of ISS's work. The program's space work involves a broad range of issues, such as space transportation, earth observation, international cooperation and competition, exploration, use, and commercialization of space. The program's work has also ranged into areas such as law enforcement.

In FY 1994, the Industry, Commerce, and International Security Division published 13 assessment reports and six background papers.

- Global Change Research and NASA's Earth Observing System

  Requested by:
  House Committee on Science, Space, and Technology
  Senate Committee on Commerce, Science, and Transportation
  Senate Committee on Environment and Public Works
  House Committee on Appropirations, Subcommittee on Veterans Affairs, Housing and Urban Development, and Independent Agencies
  Senate Committee on Appropirations, Subcommittee on Veterans Affairs, Housing and Urban Development, and Independent Agencies
  House Permanent Select Committee on Intelligence

- Industry, Technology and the Environment

  Requested by:
  House Committee on Energy and Commerce
  House Committee on Foreign Affairs
  Senate Committee on Finance

- Technologies Underlying Weapons of Mass Destruction

  Requested by:
  Senate Committee on Foreign Relations
  Senate Committee on Governmental Affairs
  House Permanent Select Committee on Intelligence

- The Social Security Administration's Decentralized Computer Strategy

  Requested/y:
  House Committee on Appropriations

- Energy Efficiency in Federal Facilities: Update in Funding and Potential Savings

  Requested by:
  House Committee on the Budget

- Electronic Enterprises: Looking to the Future

  Requested by:
  House Committee on Science, Space, and Technology
  Senate Committee on Commerce, Science, and Transportation

- Export Controls and Nonproliferation Policy

Requested by:
Senate Committee on Foreign Relations
Senate Committee on Governmental Affairs

- Power Sources for Remote Arctic Applications

Requested by:
Senator Ted Stevens
Senator Frank Murkowski

- Fueling Reform: Energy Technologies for the Former East Bloc

Requested by:
Senate Committee on Environment and Public Works
House Committee on Foreign Affairs
House Committee on Energy and Commerce
Senate Committee on Foreign Relations

- Saving Energy in U.S. Transportation

Requcsted by:
Senate Committee on Governmental Affairs
Senate Committee on Energy and Natural Resources
House Committee on Energy and Commerce
House Committee on Science, Space, and Technology

- Information Security and Privacy in Network Environments

Requested by:
Senate Committee on Governmental Affairs

- Proliferation and the Former Soviet Union

Requested by:
Senate Committee on Foreign Relations
Senate Committee on Governmental Affairs

- Remotely Sensed Data: Technology, Management, and Markets

Requestcd by:
House Committee on Science, Space, and Technology
Senate Committee on Commerce, Science, and Transportation

- Civilian Satellite Remote Sensing: A Strategic Approach

Requested by:
House Committee on Science, Space, and Technology
Senate Committee on Commerce, Science, and Transportation

- Assessing the Potential for Civil-Military Integration: Technologies, Processes, and Practices

Requested by:
Senate Committee on Armed Services and its Subcommittee on Defense Technology, Acquisition, and Industrial Base
House Committee on Armed Services

- Federal Research and Technology for Aviation

Requested by:
House Committee on Science, Space, and Technology

Endorsedby:
House Committee on Public Works and Transportation, Subcommittee on Aviation

- Multinationals and the U.S. Technology Base

Requestedby:
Senate Committee on Commerce, Science, and Transportation
Senate Committee on Banking, Housing, and Urban Affairs

- Studies of the Environment Costs of Electricity

Requested by
House Committee on Science, Space, and Technology

- Virtual Reality and Technologies for Combat Simulation

Requested by:
House Committee on Armed Services
Senate Committee on Armed Services and its **Subcommittee on Defense Technology, Acquisition, and Industrial Base**

Health, education, and the environment division

The Health, Education, and the Environment Division comprises three programs: Education and Human Resources, Environment, and Health.

THE EDUCATION AND HUMAN RESOURCES (EHR) Program is responsible for studies of technologies for learning, and of science-grounded human resource topics. Education studies critically examine technologies of all kinds, for learners of all ages and abilities, and in all settings. Human resources studies deal with the costs, availability, effectiveness, and impacts of technologies in areas such as long-term care and disability services, housing for people with disabilities, and prevention of drug abuse.

The Environment (ENV) Program assesses scientific, technical, and policy issues related to the environment. Program areas include the use and conservation of renewable resources; pollution prevention, control, and remediation; and environmental health and risk management. Assessments have focused on such topics as agriculture; management of public lands; biological diversity; risk assessment methods and policy; air and water pollution; management of solid, hazardous, and nuclear wastes; and the effects of weather and climate change.

The Health (HLTH) Program's charter is reflected in three primary types of efforts: 1) assessments of specific clinical and general health care technologies, 2) studies of broader issues of health policy related to or with implications for technology, and 3) studies of applications, particularly to human health, of the biological and behavioral sciences (including biotechnology human molecular genetics, neurological sciences, and health-related behaviors). The program also is responsible for OTA's statutory, methodology oversight responsibilities regarding Vietnam veterans' health studies.

In addition, the division provides the staff work for the OTA Director's mandated responsibility to select and appoint members of the Prospective Payment Assessment Commission, the Physician Payment Review Commission, and the Advisory Panel on Alzheimer's Disease.

In FY 1994, the Health, Education, and the Environment Division published nine assessment reports and 21 background papers.

- Researching Health Risks

  Requested/y:
  House Committee on Energy and Commerce
  House Committee on Science, Space, and Technology

- Preparing for an Uncertain Climate, volume 1

- Preparing for an Uncertain Climate, volume 2

  Requested&
  Senate Committee on Environment and Public Works
  Senate Committee on Commerce, Science, and Transportation
  House Committee on Science, Space, and Technology

- International Health Statistics: What the Numbers Mean for the United States

  Requested by:
  House Committee on Ways and Means and its Subcommittee on Health

- Psychiatric Disabilities, Employment and the Americans with Disabilities Act

  Requested by:
  Senate Committee on Labor and Human Resources

  Endorsed by:
  House Working Group on Mental Illness and Health

- Testing and Assessment in Vocational Education

  Requested/y:
  House Committee on Education and Labor

- An Alaskan Challenge: Native Village Sanitation

  Requested by:
  Senator Ted Stevens, Member, Technology Assessment Board

- Understanding Estimates of National Health Expenditures Under Health Reform

  Requested by:
  Technology Assessment Board

- Technical Options for the Advanced Liquid Metal Reactor

  Requested by:
  House Committee on Energy and Commerce, Subcommittee on Energy and Power

- Wage Record Information Systems

- Climate Treaties and Models: Issues in the International Management of Climate Change

  Requested@
  Senate Committee on Environment and Public Works
  Senate Committee on Commerce, Science, and Transportation
  House Committee on Science, Space, and Technology

- Managed Care and Competitive Health Care Markets: The Twin Cities Experience

  Requested by:
  Technology Assessment Board

- Defensive Medicine and Medical Malpractice

  Requested by:
  House Committee on Ways and Means
  Senate Committee on Labor and Human Resources
  House Committee on Appropriations

- Technologies for Understanding and Preventing Substance Abuse and Addiction

  Requested/y:
  Senate Committee on Labor and Human Resources
  Senate Committee on Governmental Affairs
  House Committee on Government Operations

- Identifying Health Technologies That Work: Searching for Evidence

  Requested by:
  Senate Committee on Labor and Human Resources

  Endorsed by:
  Technology Assessment Board

- Perspectives on the Role of Science and Technology in Sustainable Development

  Requested by:
  House Committee on Foreign Affairs
  Senate Committee on Foreign AffFairs

- Universal Health Insurance and Uninsured People: Effects on Use and Cost

  Requested&
  Senate Committee on Labor and Human Resources

- Understanding Estimates of the Impact of Health Reform on the Federal Budget

  Requested by:
  Technology Assessment Board

- OTA Review:
  The Medical Follow-Up Agency

  Requested by:
  House Committee on Veterans' Affairs
  Senate Committee on Veterans' Affairs

- Public Information About Osteoporosis: What's Available, What's Needed?

  Requestedby:
  Senate Special Committee on Aging

- Tools for Evaluating Health Technologies—5 Background Papers

  1. Using Patients' Reports to Evaluate Medical Outcomes
  2. Large Administrative Database Analysis
  3. Large and Small Randomized Trials
  4. Meta-Analysis
  5. Clinical-Economic Trials

  &quested by:
  Senate Committee on Labor and Human Resources

- The Department of Defense Kuwait Oil Health Fire Risk Assessment (The "Persian Gulf Veterans' Registry")

  requeste by:
  Mandated under Public Law 102-585

- International Comparisons of Administrative Costs in Health Care

  Requested by:
  House Committee on Ways and Means and its Subcommittee on Health

- Mental Disorders and Genetics: Bridging the Gap Between Research and Society

  Rrquested by:
  House Committee on Appropriations
  House Committee on Energy and Commerce
  House Committee on Science, Space, and Technology
  House Committee on Veterans Affairs
  Senate Committee on Commerce, Science, and Transportation, Subcommittee on Science, Technology, and Space

- Health Care Technology and Its Assessment in Eight Countries

  Requested by:
  House Committee on Ways and Means and its Subcommittee on Health

- External Review of the Federal Centers for Disease Control and Prevention's HIV Prevention Programs

  Requestedby:t
  House Committee on Energy and Commerce, Subcommittee on Health and the Environment

OTA online

THE CONGRESSIONAL OFFICE OF TECHNOLOGY ASSESSMENT (OTA) has taken advantage of recent developments in information technologies to make its work widely available electronically. General information about the agency, electronic versions of OTA publications, and news about work in progress all are accessible online. You can retrieve this information in a variety of ways.

HOW TO ACCESS

OTA Online includes many common Internet features such as a World Wide Web (WWW) home page, an FTP collection of OTA report files and other information, and an electronic bulletin board (BBS) accessible via WWW or Telnet that permits file text searches. OTA Online is accessible through the following standard Internet tools:

- WWW: http://www.ota.gov
- FTP: otabbs.ota.gov, login as *anonymous,* password is your e-mail address; publications are in the /pub directory
- Telnet: otabbs.ota.gov, login as *public,* password is *public*

Additional features of the BBS are available through client software with a graphical user interface for Microsoft Windows. This software is available free through the WWWV home page or by contacting the OTA Telecommunications and Information Systems Office. (202) 228-6000, or e-mail sysop@ota.gov. Soon the BBS will be available via telephone dial-in access. Questions or comments on Internet services should be directed by e-mail to netsupport@ota.gov

E-mail Listserver

OTA also maintains a free electronic mailing list known as OTANEWS which allows anyone with access to electronic mail on the Internet to receive notices of all OTA reports upon their release. To subscribe to OTANEWS, address an electronic mail message to listserv@ota.gov. Leave the subject line blank. In the text of the message, type: subscribe otanews [your name]. For example, Jane Smith would type:

SUBSCRIBE OTANEWS JANE SMITH

After you have sent the message, you will receive confirmation that your subscription has been entered. If you encounter difficulties, send an e-mail message to postmaster@ota.gov

Work in progress

MORE THAN 44 PROJECTS WERE IN PROGRESS during fiscal year 1994. In addition, 24 new studies were undertaken.

This section lists the tides of assessments underway or in press, as of September 30, 1994. For a full description of these projects, please refer to the current "Assessment Activities," OTA-PC-1O5. This pamphlet is available from OTA by calling the Publications Distribution Office, (202) 224-8996.

INDUSTRY, COMMERCE, AND INTERNATIONAL SECURITY DIVISION

➢ *Energy, Transportation, and Infrastructure Program*

Advanced automotive technologies

Renewing our energy future: research, development and commercialization of renewable energy technologies

Reducing earthquake damage: research, development, and application

International collaboration in large science and technology projects

Cities, technology, and infrastructure

> *Industry, Telecommunications, and Commerce Program*

Commercialization of emerging technologies

Technology, jobs and productivity in the service economy

Information technology and the health care system

Wireless technologies and the national information infrastructure

Telecommunications technology and Native Americans: opportunities and challenges

Information technologies for control of money laundering

Global communications policy: issues and technology

Development and diffusion of innovative environmental technologies

- *International Security and Space Program*
  - Defense modeling and simulation
  - Proliferation of weapons of mass destruction
  - Assessing future space launch industry alternatives
  - Technologies for tracking ammuni tion and for controlling the inadvertent use of handguns
  - Countering proliferated weapons of mass destruction
  - International peace support operations

HEALTH, EDUCATION, AND THE ENVIRONMENT DIVISION

- *Education and Human Resources Program*
  - Teachers and technology
  - The human genome project and patenting human DNA sequences
  - Eligibility criteria for a federally mandated long-term care program
  - Technology and work-based learning
  - Residential design technologies for elderly and disabled populations
- *Environment Program*
  - New approaches to environmental regulation
  - Agriculture, trade and the environment
  - Aquaculture: food and renewable resources from U.S. waters
  - Biological pest control
  - Risks to students in school
  - OSHA's selection of control technologies and assessments of their impacts and costs
  - Arctic and other regional impacts from soviet nuclear contamination
  - Technologies to protect fish at dams
  - Technologies for testing and review of chemicals in commerce
  - An Assessment of the agricultural research system and conservation program
  - Safety of rotary kiln incineration systems at Superfund sites and possible alternative technologies
- *Health Program*
  - Regulatory and health assessment of dietary supplements
  - Monitoring of mandated veteran studies
  - Federal response to AIDS: congressional issues
  - Improving the distribution of the medical workforce
  - Technology, insurance, and the health care system
  - International differences in health technology, services and economics
  - Policy issues in the prevention and treatment of osteoporosis
  - Impacts of antibiotic-resistant bacteria
  - Appointment and monitoring of the Prospective Payment Assessment Commission and the Physician Payment Review Commission

Technology assessment advisory council*

THE TECHNOLOGY ASSESSMENT ADVISORY COUNCIL (TAAC) was established by OTA's statute, and members are appointed by OTA's Congressional Technology Assessment Board (TAB). The Council advises TAB and the Director on issues and other matters related to science, technology, and technology assessment.

JAMES HUNT, CHAIRMAN

Dr. Hunt is Distinguished Professor, Health Sciences Center, at the University of Tennessee in Memphis. He previously served as Chancellor of the Health Science Center and as the Dean of Medicine for the University. Prior to joining the University, he served as Chairman of the Department of Medicine at the Mayo Clinic.

MAX LENNON, VICE CHAIRMAN

Dr. Lennon is President and CEO of Eastern Foods, Inc., Atlanta, Georgia. Previously he served as President of Clemson University. He also served on the faculties of Ohio State University (Vice-President for Agricultural Administration and Executive Dean for Agriculture, Home Economics and Natural Resources), University of Missouri, and Texas Tech University.

LEWIS M. BRANSCOMB

Dr. Branscomb is the Albert Pratt Public Service Professor at Harvard's John F. Kennedy School of Government. He is a former executive of International Business Machines. Prior to joining IBM, he was the Director of the National Bureau of Standards.

HERBERT D. (TED) DOAN

Mr. Doan is a Partner with Doan Associates. He was Chairman and Founder of Doan Resources Corporation. He served as President of the Dow Chemical Company for nine years.

NEIL E. HARL

Dr. Harl is the Charles F. Curtiss Distinguished Professor of Economics at Iowa State University, where he has served on the faculty since 1964.

JOSHUA LEDERBERG

Dr. Lederberg was President of Rockefeller University, New York. He is the former Chairman of the Department of Genetics at Stanford University School of Medicine. He is a member of the National Academy of Sciences and is a Nobel Laureate in Physiology and Medicine.

THOMAS J. PERKINS

Mr. Perkins is the General Partner of Kleiner & Perkins in San Francisco. He held a number of positions with Hewlett Packard Company, most recently as Assistant Manager, Corporate Research Laboratories. He also served as Vice President, Marketing with Optics Technology, Inc. and as an Electrical Engineer with Sperry Corporation.

JOHN F. M. SIMS

Dr. Sims is Vice President for Marketing for Usibelli Coal Mine, Inc. He previously served as Director of the Office of Mineral Development with the Alaska Department of Commerce and Economic Development. Dr. Sims also taught Geological Engineering at the University of Alaska-Fairbanks.

L. DOUGLAS SMOOT

Dr. Smoot is Dean, College of Engineering and Technology, at Brigham Young University. He is also Director of the Advanced Combustion Engineering Research Center. He has been associated with the Brigham Young University since 1967. Dr. Smoot previously served as a visiting assistant professor at the California Institute of Technology and as an engineer with Lockheed Propulsion.

MARINA V.N. WHITMAN

Dr. Whitman is a Professor at the Institute of Public Policy Studies at the University of Michigan. Previously she served as the Vice President and Group Executive for Public Affairs Staffs Group at General Motors Corporation. She also served as Vice President and Chief Economist at General Motors. Prior to joining General Motors she taught at the University of Pittsburgh.

➢ STATUTORY MEMBERS

CHARLES A. BOWSHER

Mr. Bowsher is Comptroller General of the United States and Director of the U. S. General Accounting Office.

DANIEL MULHOLLAN

Dr. Mulhollan is Director of the Congressional Research Service, U.S. Library of Congress.

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➢ Conference Center

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➢ Service Center

Carlton Agee, Service Center Supervisor
Michael Brown, Technician

Awards and fellowship programs

IN THE MAY 15 ISSUE OF LIBRARY JOURNAL, the American Library Association's Government Documents Round Table announced their list of Notable Government Documents for 1994. Of the 20 federal government documents recognized, three were OTA reports:

P Harmful Non-Indigenous Species in the United States
Environment Program
Phyllis Windle, Project Director

- *Making Government Work: Electronic Delivery of Federal Services*
  Telecommunication and Computing Technologies Program
  Fred Wood, Project Director

- *Proliferation of Weapons of Mass Destruction: Assessing the Risks*
  International Security and Space Program
  Gerald Epstein, Project Director

The Government Documents Round Table selects those documents they consider to be the best of the government information sources produced in the previous year. These documents "expand our knowledge, enhance the quality of life, and/or contribute to an understanding of govern merit."

BLUE PENCIL AWARDS

The National Association of Government Communicators conducts the Blue Pencil Competition as an annual recognition of outstanding government communications projects and producers. Entries are judged on writing, editorial content, layout and design, achievement of purpose and cost effectiveness. This year two OTA reports were recognized in the competition:

- *Adult Literacy and New Technologies: Tools for a Lifetime*
  Science, Education, and Transportation Program
  Kathleen Fulton, Senior Analyst
  Second Place, Books for a Technical Audience Category

- *Biological Components for Substance Abuse and Addiction*
  Biological and Behavioral Sciences Program
  Kevin O'Connor, Project Director,
  Second Place, Publications for a Technical Audience Category

THE MORRIS K. UDALL FELLOWSHIP PROGRAM

The Udall Fellowship Program is awarded to up to six individuals each year for a one-year appointment at OTA. It was established in April 1991 by the Technology Assessment Board in honor of Morris K. Udall, retired congressman from Arizona who served 30 years in the House of Representatives and 18 years on the Technology Assessment Board. Qualified candidates must demonstrate exceptional ability in areas needed in OTA's work, such as the physical or biological sciences, engineering, law, economics, environmental and social sciences, and public policy. Candidates must have significant experience in technical fields or management or have completed research at the doctoral level.

- FELLOWS, 1993-94
  Dean Cheng, International Security and Space Program
  Betsy Gunn, Environment Program
  Lois Joellenbeck, Environment Program

- FELLOWS, 1994-95
  Elise Berliner, Health Program
  William Creager, Industry Telecommunications, and Commerce Program

CONGRESSIONAL FELLOWSHIP IN HEALTH POLICY

The Milbank Memorial Fund and OTA established the Congressional Fellowship in Health Policy in 1992 to be served at OTA beginning in September 1992. The program seeks candidates with substantial training and experience in research and a strong interest in health policy. The fellowship provides an opportunity for an individual of proven ability and considerable promise to work with OTA researchers to assist Congress in its deliberations of science and technology issues affecting our nation's health policy and to gain a better understanding of the ways in which Congress establishes national policy related to these issues.

The fund and OTA invited applications from individuals who have demonstrated ability in research on issues of health policy. Applicants should have doctorates in the social sciences or related areas or have terminal scientific or professional degrees and considerable training in research using the policy sciences.

> FELLOW, 1993-94

Gerard Fergerson, Biological and Behavioral Sciences Program

> FELLOWS, 1994-95

Cynthia Palmer, Health Program

Rochelle Rollins, Health Program

Advisory panel members*

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John DeCicco, Senior Research Associate
American Council for an Energy-Efficient Economy

Kennedy Digges, Consultant

Chris Flavin, Vice President for Research
Worldwatch Institute

Christopher Green, Director
Technology Research Partnerships
General Motors

David Greene, Senior Research Staff
Center for Transportation Analysis
Oak Ridge National Laboratory

Maurice Issac, Manager
Automotive Technical Programs
GE Automotive

Maryann Keller, Managing Director
Furman, Selz, Inc.

Gunnar Larsson, Vice President of Research
Department K-E/FO
Volkswagen AG

Robert Mull, Director
Partnership for a New Generation of Vehicles
Ford Motor Company

Nobukichi Nakamura, Project General Manager
Toyota Motors Corporation Service of North America

Peter T. Peterson, Director
Marketing Strategies & Product Applications
U.S. Steel

Daniel Roos, Director
Center for Technology, Policy & Industrial Development
MIT

Rhett Ross, Sales Manager/Engineer
Energy Partners

Dan Santini, Section Manager
Environmental & Economic Analysis Section
Argonne National Laboratories

"Affliations are at time of appointment to panel or workshop

Owen J. Viergutz, Executive Engineer
New Generation Vehicles
Chrysler Corporation

Margaret Walls, Fellow
Energy & Natural Resources Division
Resources for the Future

➢ Federal Efforts to Reduce Earthquake Damage

Gilbert F. White, *Chairman*
Professor
University of Colorado

Jesus Burciaga, Assistant Fire Chief
Los Angeles County Fire Department

Charles D. Eadie, Assistant Planning Director
City of Watsonville, California

Dean C. Flesner, VI, Operations
State Farm Fire and Casualty Company

I.M. Idriss, Professor
Department of Civil & Environmental Engineering
University of California, Davis

Cynthia Ingham, Assistant Director
Capital Programs
University of California, LA

Tom Jordan, Professor and Department Chair, Department of Earth, Atmospheric & Planets
Massachusetts Institute of Technology

Joseph Kelly, Senior Consulting Engineer
Port Authority of NY and NJ

Howard Kunreuther, Director of Risk Management Center
The Wharton School
University of Pennsylvania

Mike Lynch, Earthquake Program Manager
Department of Emergency Services
State of Kentucky

Steven A. Mahin, Professor
Earthquake Engineering Research Center
University of California at Berkeley

Diane F. Merten, Consultant

Joanne M. Nigg, Director
Disaster Research Center
University of Delaware

Dennis K. Ostrum, Consulting Engineer
Southern California Edison

Vernon H. Persson, Chief
Division of Safety of Dams
California Department of Water Resources

James Smith, Executive Director
Building Seismic Safety Council

Paul G. Somerville, Senior Associate
Woodward-Clyde Consultants

Robert S. Yeats, Professor
Department of Geosciences
Oregon State University

Nabih Youssef President
Nabih Youssef and Associates

➢ Federal Research and Technology for Aviation

Najeeb E. Halaby, *Chair*
Chairman
Safair International

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Executive Vice President, Operations
American Airlines, Inc.

William F. Ballhaus, Jr.
President
Martin Marietta Aero & Naval Systems

Robert A. Davis
Vice President, Engineering
Boeing Commercial Airplane Group

Donald D. Engen
President
AOPA Air Safety Foundation

Edmund S. Greenslet, President
ESG Aviation Services

David Haase, Executive Central Air Safety Chairman
Air Line Pilots Association

Jonathan Howe, Attorney
Zuckert, Scoutt, & Rasenberger

Noreene Koan, Chairperson
National Air Safety Committee
Association of Flight Attendants

Richard Livingston, Air Transportation Consultant

T. Allan McArtor, President
FEDEX Aeronautics Corporation

Clinton V. Oster, Jr., Professor
School of Public and Environmental Affairs
Indiana University

Willard G. Plentl, Jr., Director
Division of Aviation for North Carolina

Robert W. Simpson, Director
Flight Transportation Lab
Massachusetts Institute of Technology

Richard Swauger, Air Traffic Consultant

Patricia F. Wailer, Director
Transportation Research Institute
University of Michigan

➢ FUEL REFORM: ENERGY TECHNOLOGIES FOR THE FORMER EAST BLOC

Marshall Goldman, *Chairman*
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Wellesley College

Margaret Bowman, Director
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Environmental Law Institute

Robert W. Campbell, Professor
Department of Economics
Indiana University

William U. Chandler, Director
Advanced International Studies Unit
Pacific Northwest Laboratory

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Energy Security Program
Center for Strategic & International Studies

Charles K. Ebinger, Director, Energy Group
and Executive Vice President
International Resources Group

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Westinghouse Energy Central

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Robert H. Socolow, Director
Energy and Environmental Policy Center
Princeton University

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Spears & Associates

➢ RENEWABLE ENERGY TECHNOLOGY: RESEARCH, DEVELOPMENT AND COMMERCIAL PROSPECTS

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Art Brooks, President
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Elizabeth Hughes, Commissioner
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Space Systems, Allied-Signal Aerospace
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Project Finance
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➢ SAVING ENERGY IN U.S. TRANSPORTATION

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Richard Tracey, Director of Engineering Services
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Workshop on Advance Auto Safety

Workshop on Review of Federal Fusion Energy Program

Workshop on International Collaboration in Large Science Projects

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Carnegie Mellon University - Pittsburgh

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Rice University-CITI

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National Association of Manufacturers

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Massachusetts Institute of Technology

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Harvard Business School

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➢ INDUSTRY, TECHNOLOGY, AND THE ENVIRONMENT

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. Customer Satisfaction & Quality
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Director, Center for Study of Business &
: Baruch College

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: Store Operations
Sears

: Joel Rogers, Professor
Department of Sociology
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Organizing for AFSCME
: HUCTW / AFSCME

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9 to 5, National Association of Working

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New York University

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Computer Science Department
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Paul Davis, Manager
Corporate Research Defense and Technology Planning
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T.N. Dupuy President
The Dupuy Institute

John Englund, Past President and CEO
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Joseph P. Feary, CBS Project Scientist
Jet Propulsion Lab

Amoretta M. Hoedber, President
AMH Consulting

John D. Kettelle, Consultant

Frank Lanza, President & Chief Operating Officer
Loral Corporation

Creve Maples, Principle Investigator
Sandia National Laboratory

Jed Marti, Project Manager
SARCOS Research, Inc.

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Joanne Gabrynowicz, Associate Professor
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Center for Aerospace Sciences
University of Colorado

David Goodenough, Chief Research Scientist
Pacific Forestry Center
Forestry Canada

Donald Latham, Vice President
Loral Corporation

Cecil E. Leith, Physicist
Lawrence Livermore National Laboratory

John H. McElroy, Dean of Engineering
The University of Texas at Arlington

Molly McCauley Fellow
Resources for the Future

Earl Merritt, President
Space Systems Markets

Alan Miller, Director
Center for Global Change
University of Maryland-College Park

Raymond E. Miller, Professor
Department of Computer Science
University of Maryland

Kenneth Pedersen, Research Professor of International Affairs
School of Foreign Service
Georgetown University

David T. Sandwell, Geological Resources Division
Scripps Institute of Oceanography

Dorm Walklet, President
Terra Nova Corporation

Albert D. Wheelon, Consultant

➢ PROLIFERATION OF WEAPONS OF MASS DESTRUCTION

James E. Goodby, *Chairman*[1]
Distinguished Service Professor
Carnegie-Mellon University

James F. Leonard, Chairman,' Executive Director
Washington Council on Non-Proliferation

George Anzelon, Associate Division Leader
Lawrence Livermore National Laboratory

Will D. Carpenter, Consultant

Lewis A. Dunn, Assistant Vice President and Manager of Negotiations and Planning Division
Science Applications International Corporation

Randall Forsberg, Executive Director
Institute for Defense and Disarmament Studies

Thomas R. Fox, Director
Office of National Security Technology
Pacific Northwest Laboratories

Alan R Goldhammer, Director of Technical Affairs
Industrial Biotechnology Association

John M. Googin,[3] Senior Staff Consultant
Martin Marietta Energy Systems, Inc.

Robert G. Gough, Senior Member, Technical Staff
Sandia National Laboratories

Elisa D. Harris,[4] Senior Research Analyst
The Brookings Institution

Geoffrey Kemp, Senior Associate
Carnegie Endowment for International Peace

Joshua Lederberg,[5] Professor
The Rockefeller University

John W. Lewis, Professor
Center for International Security and Arms Control
Stanford University

Lee W. Mercer, Corporate Export Manager
Digital Equipment Corporation

Matthew S. Meselson, Professor
Department of Biochemistry and Molecular Biology
Harvard University

Stephen M. Meyer, Professor
Center for International Studies
Massachusetts Institute of Technology

Gary Milhollin, Director
Wisconsin Project on Nuclear Arms Control

Marvin M. Miller, Senior Research Scientist
Department of Nuclear Engineering
Massachusetts Institute of Technology

Janne E. Nolan, Senior Fellow-in-Foreign Policy
The Brookings Institution

William C. Potter, Director
Center for Russian and Eurasian Studies
Monterey Institute of International Studies

Barbara Hatch Rosenberg, Professor
Division of Natural Sciences
SUNY

Lawrence Scheinman,[6] Professor of Government and Associate Director
Peace Studies Program
Cornell University

Leonard S. Spector, Senior Associate
Carnegie Endowment for International Peace

Sergio C. Trindade, President
SE[2]T International, Ltd

Workshop on a National Strategy for Civilian Space-Based Remote Sensing

Workshop on Future **of Remotely Sensed Data**

Workshop on Geospatial Data: Agency Needs, Formats and Standards

Workshop on USGCRP and NASA's Earth Observation Systems

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[1] **Resigned March 22, 1993 to become Chief** U.S. **Negotiator for Safe and Secure Dismantlement of Nuclear Weapons.**

[2] **Panel member until June 1, 1993; Panel chair after June 1,1993.**

[3] **Deceased January 16, 1994.**

[4] **Resigned January 29, 1993 to join National Security Council staff.**

[5] **Ex-officio; Member of Technology Assessment Advisory Council.**

[6] **Resigned August 13, 1993 to become Counselor for Nonproliferation in the U.S. Department of Energy**

TELECOMMUNICATION AND COMPUTING TECHNOLOGIES PROGRAM

➢ ASSESSMENT OF INFORMATION TECHNOLOGY FOR CONTROL OF MONEY LAUNDERING

Randall Davis, Assistant Director
Artificial Intelligence Laboratory
Massachusetts Institute of Technology

Elroy Garcia, Jr., Assistant Special Agent in Charge
Operational Commander
Houston H. I. D.T.A.

W. **Douglas Johnson, Assistant Director Division of Banking**
Department of Banking and Finance
State of Florida

Robert M. McAllister, Vice President & Senior Associate Counsel
The Chase Manhattan Bank, N.A.

Bruce W. Porter, Associate Professor of Computer Science
Department Of Computer Sciences
University of Texas at Austin

Priscilla M. Regan, Assistant Professor
Department of Public & International Affairs
George Mason University

Joel Reidenberg, Associate Professor of Law
Fordham University School of Law

Robert Serino, Deputy Chief Counsel
Office of the Comptroller of the Currency
U.S. Department of Treasury

John Stern, Executive Vice President
Human Resources
Sony Electronics, Inc.

David Vogt, Assistant Director, Financial Crimes Enforcement
Network (FinCEN)
U.S. Department of Treasury

Sarah N. Welling, Professor of Law
College of Law
University of Kentucky

➢ ELECTRONIC ENTERPRISE: LOOKING TO THE FUTURE

Daniel Bell, ***Chairman***
Scholar-in-Residence
American Academy of Arts & Sciences

Marietta L. Baba, Acting Chair
Department of Anthropology
Wayne State University

James Beatty, President
National Consulting Systems

Jim Berm, Executive Director
Federation for Industrial Retention & Renewal

Kathleen Bernard, Director, External Programs
North Carolina Supercomputer Center

Willard R. Bishop, Jr., President
Willard Bishop Associates

Fred Block, Chairman
Department of Sociology
University of California, Davis

Bernie Campbell, Vice President
Information Services
Sonoco Products

Carl Cargill, Standards Strategist
Sun Microsystems, Inc.

Rev. William Cunningham Founder and Director
Focus HOPE

Irwin Dorros, Vice President
Technical Services
Bell Communications Research

Frank Emspak, Professor
University of Wisconsin, Madison
School for Workers

Sara Kiesler, Professor
Department of Social and Decision Sciences
Carnegie Mellon University

James L. Koontz, Chief Executive Officer
Kingsbury Corporation

Donald Lasher, President
Information Service Division
United States Automobile Association

Scott Loftesness, Group Vice President
Visa International

Glenn Smith, Manager
Strategic Technology Planning
United Parcel Service

Paul Vetter, Director
Information Services
Cone Mills Corporation

Mark Weiser, Chief Scientist and Manager
Computer Science Lab
Xerox Palo Alto Research Center

John Wohlstetter, Director
Technology Affairs
GTE Corporation

John Zysman, Professor
Department of Political Science
University of California, Berkeley

> Information Technology and the Health Care System

Clement J. McDonald, Chairman
Professor of Medicine
Director, Computer Science Research
Wishard Memorial Hospital

June C. Abbey Director of Research
Institute of Innovation
Shadyside Hospital

Lee B. Barrett, Assistant Vice President
Applied Technology
Aetna Life & Casualty

Stephen Deutsch, Professor
Labor Education and Research Center
University of Oregon

Elliott S. Fisher, Associate Professor
of Medicine
Dartmouth Medical School

Bonnie Guiton Hill, Dean
McIntire School of Commerce
University of Virginia

James A. Hazelrigs, Executive Director
Medical Database Commission
State of North Carolina

Susan Horn, Senior Scientist
Institute for Health Care Delivery Research
Intermountain Health Care

James C. Hunt, Distinguished Professor
Health Sciences Center
University of Tennessee

Lori Muhlstein, Market Manager
Health Care
Bell Atlantic Corporation

Nancy Milio, Professor of Health Policy &
Administration
University of North Carolina

John A. Nyman, Associate Professor
Institute for Health Services Research
University of Minnesota

Madison Powers, Senior Research Scholar
Kennedy Institute of Ethics
Georgetown University

Jane Preston, President
American Telemedicine Association

Marsha Radaj, VP Operations
Wiconsin Health Information Network

William C. Reed, Senior VP, Operations
Geisinger Health Care System

Bert Tobin, Executive Vice President
Benton International

Brad Ware
West Alabama Health Services

> Information Security and Privacy in Network Environments

James M. Anderson, Director of Security
Mead Data Central, Inc.

Alexander Cavalli, Director,
Research & Development
Enterprise Integration Division
Microelectronics and Compute] Technology

Dorothy E. Denning, Chair
Computer Science Department
Georgetown University

L. Dain Gary, Manager,
CERT Coordination Center
Software Engineering Institute
Carnegie Mellon University

Lee A. Hollaar, Professor of
Computer Science
Director of Campus Networking
The University of Utah

Burton S. Kaliski, Jr., Chief Scientist
RSA Laboratories

Stephen T. Kent, Chief Scientist
Security Technology
BBN Communications

Clifford A. Lynch, Director
Library Automation
University of California, Oakland

Simona Nass, President
The Society for Electronic Access

Jeffrey D. Neuburger, Attorney
Brown Raysman & Millstein

Susan Nycum, Attorney
Baker & McKenzie

David Alan Pensak, Principle Consultant
Computing Technology
E.I. DuPont de Nemours, Inc.

Richard M. Peters, Jr., Senior VP for
Corporate Development
Oceana

Joel R. Reidenberg, Professor
Fordham University School of Law

Thomas B. Seipert, Detective Sergeant
Portland Police Bureau

Willis H. Ware, Consultant
The RAND Corporation

➢ WIRELESS TECHNOLOGIES AND THE NATIONAL INFORMATION INFRASTRUCTURE

Alfred F. Boschulte, President & Chairman
NYNEX Mobile Communications
Company

Timothy J. Brennan, Professor
Policy Sciences & Economics
University of Maryland Baltimore County

Steven D. Dorfman, Senior Vice President
GM Hughes Electronics Corporation

" Francis J. Erbrick, Senior Vice President
. United Parcel Service

Susan G. Hadden,* Professor
: LBJ School of Public Affairs
The University of Texas at Austin

Ellwood R. Kerkeslager, Vice President
Technology & Infrastructure
AT&T

Rob Kling, Professor
Department of Information and
Computer Science
University of California, Irvine

: Jim Lovette, Principal Scientist
Communications Technology
. Apple Computer, Inc.

John Major, Senior VP and Director
Spectrum, Standards and Software
Management
Motorola, Inc.

Howard Miller, Senior Vice President
Broadcast Operations & Engineering
Public Broadcasting Service (PBS)

: Alex Netchvolodoff, VP, Public Policy
, Cox Enterprises, Inc.

Stewart D. Personick, Assistant VP
Information Networking Research
Bellcore

William W. Redman, Jr., Commissioner
. North Carolina Utilities Commission

W. Scott Schelle, Executive Vice President
American Personal Communications

Jim Strand, Executive Vice President
. Lincoln Telephone Company

William F. Sullivan, General Manager
. KPAX-TV, Missonli, MT

*Deceased.

Laurel L Thomas, Director of Telecommunications
Bloomsburg Telecommunications Consortium for Columbia, PA County and **Region**

Marilyn B. Ward, Division Commander
Communications Division and ComCenter
Orlando Police Department

Information Technology and the Health Care System Workshop on Consumer Issues

Information Technology and the Health Care System Federal Agency Workshop

Information Security and Privacy in Network Environments Federal Agency Workshop

Information Security and Privacy in Network Environments: Federal Context Workshop

Information Security Privacy in Network Environments Workshop on Commercial, Industry, and Research Perspectives

Workshop on Information Technologies for Analyzing Wire Transfers

Workshop on Privacy and Confidentiality in Payment Systems

Workshop on Wire Transfer in Money Laundering

Workshop on the Social Security Administration's Automation Program

Workshop on Wireless Technologies and the National Information Infrastructure

EDUCATION AND HUMAN RESOURCES PROGRAM

➢ HUMAN GENOME PROJECT AND PATENTING DNA SEQUENCES

LeRoy Walters, *Chair*
Director, Center for Bioethics
Kennedy Institute of Ethics
Georgetown University

Charles Auffrey, Project Director
Genethon, Evry, France

David Botstein, Professor and Chairman
Department of Genetics
Stanford University Medical Center

Robert M. Cook-Deegan, Senior Program Officer
National Academy of Sciences

Rebecca S. Eisenberg, Professor of Law
University of Michigan Law School

James F. Haley, Jr., Partner
Fish & Neave

Marilyn Hartig, Vice President
External Alliance and Technology
Bristol Myers Squibb

Max D. Hensley, VP, Intellectual Property
Gilead Sciences, Inc.

Thomas D. Kiley, Consultant

William A. Linton, III, Director
Center for Education and Lifelong Learning
KQED

Lita L. Nelsen, Director
Technology Licensing Office
Massachusetts Institute of Technology

Deborah Nickerson
Department of Molecular Biotechnology
University of Washington, Seattle

David A.A. Owen, Director
Industrial Collaboration and Licensing
Medical Research Council, UK

J. David Roessner, Professor
School of Public Policy
Georgia Institute of Technology

Joseph Straus, Professor
Max Planck Institute for Foreign and International Patent and Copyright
Munich, Germany

J. Craig Venter, President and Director
Institute for Genomic Research

Teri S. Willey, Associate Director
Office of Technology Transfer
Purdue Research Foundation

Ronald G. Worton, Geneticist-in-Chief
Department of Genetics
Hospital for Sick Children
Toronto, Canada

➢ Teachers and Technology

Allen Glenn, ***Chairperson***
Dean, College of Education
University of Washington, Seattle

Milton Chen, Director
Center for Education and Lifelong Learning
KQED

Chris Cross, President
Council for Basic Education

Molly Drake, **Director**
Alternate Teacher Preparation Program
University of Southern Florida, Tampa

Lee Ehman, Professor of Education
Indiana University, Bloomington

Geoffrey Fletcher, Interim Executive Deputy Commissioner for Curriculum, Assessment and Professional Development
Texas Education Agency

Allen **Glenn, Dean, College of Education**
University of Washington

Keith Heuttig, Board of Directors
National School Board Association
Valley School District, Hazelton, Indiana

Yolanda Jenkins, Education Specialist
Compaq Computers

Stanley Johnson, Science Teacher
Jefferson Junior HS, Washington, DC

Leslie Lemon Hunt, Second Grade Teacher
Beauvior Elementary School, Biloxi, MI

Louise McCarran, Regulatory Consultant

Henry R. Marockie, Superintendent of Schools
WV State Department of Education

Argelio B. Perez, Consultant

Dwight Prince, Principal
Robert E. Lee Elementary School, Long Beach, CA

Tom Snyder, President
Tom Snyder Productions

Adam Urbanski, President
Rochester Teachers Association, New York

Valerie J. Wilford, Media Specialist
Executive Director
Illinois Valley Library System

Art Wise, President
National Council for Accreditation of Teacher Education

Kristina Woolsey, Distinguished Scientist
Advanced Technology Group
Apple Computer

➢ Technologies for Understanding the Root Causes of Substance Abuse and Addiction

Patricia E. Evans, ***Chair***
Director of Research
BayView-Hunter's Point Foundation

Marilyn Aguirre-Molina, Assistant Professor
Department of Environmental and Community Medicine
Robert Wood Johnson Medical School

Jeffrey G. **Becker, Vice President**
Office of Alcohol Issues, The Beer Institute

Lawrence S. Brown Jr., Assistant Clinical Professor of Medicine
Harlem Hospital/College of Physicians and Surgeons, Columbia University

Mary **Edwards, Director**
Joy of Jesus, Camden House

Bernard Ellis, Jr., Consultant

Robbie Jackman, Assistant Commissioner
Department of Public Health
State of Tennessee

Sheppard Kelkam, Professor and Chairman
Department of Mental Hygiene
School of Hygiene and Public Health
The Johns Hopkins University

Herbert Kleber, Director,
Division on Substance Abuse
Department of Psychiatry
College of Physicians and Surgeons
Columbia University

George F. Koob, Member
Department of Neuropharmacology
The Scripps Research Institute

Mary Jeanne Kreek, Associate Professor
Dept. of Biology and Addictive Diseases
The Rockefeller University

John Lucas, President
John Lucas Enterprises

Spero Manson, Professor
Department of Psychiatry
National Center for American Indian and Alaska Native Mental Health Research
University Health Science Center

Roger Meyer, Vice President for Medical Affairs and Executive Dean
George Washington University Medical School

David F. Musto, Professor of Psychiatry
Child Studies Center, Yale University

Ruben Ortega, Police Chief
Salt Lake City, Utah

Sue Rusche, Executive Director
National Families in Action

Lawrence Wallack, Associate Professor
School of Public Health
University of California, Berkeley

Kenneth E. Warner, Professor and Chair
Department of Public Health Policy and Administration
School of Public Health
University of Michigan

Roger Wilkins, Clarence J. Robinson Professor of History and American Culture
George Mason University

Workshop on Commercial Biotechnology and Patenting Human DNA Sequences

Workshop on Eligibility Criteria for Long-Term Care

Workshop on Technology Implementation Projects: What Research Reveals About Teachers and Technology

ENVIRONMENT PROGRAM

} AGRICULTURE, TRADE AND THE ENVIRONMENT

Sandra Batie, Professor
Department of Agricultural Economics
Michigan State University

William L. Bryant, Chairman
W.L. Bryant Company

Anne Chadwick, Trade Policy Advisor
California Department of Food & Agriculture
The Chadwick Company

John M. Duxbury, Director
Agricultural Ecosystems Program
Cornell University

Peter Emerson, Senior Economist
Environmental Defense Fund

Dan Esty, Director
Center for Environmental Law and Policy
Yale University

David FrederickSon, President
Minnesota Farmers Union

Stephen R. Gliessman, Director
Department of Agroecology Program
University of California, Santa Cruz

Ralph W. F. Hardy, President
Boyce Thompson Institute

Robert Harness, VP for Regulatory Science
Agriculture Group, Monsanto Company

Robbin Johnson, Corporate Vice President
Department of Public Affairs
Cargill, Inc.

Jack Laurie, President
Michigan Farm Bureau

Alexander F. McCalla, Professor
Department of Agricultural Economics
University of California, Davis

Kitty Reichelderfer Smith, Director of
Polcy~ Studies
Henry A. Wallace Institute

Ann Veneman, Counsel
Patton, Boggs, and Blow

Justin R. Ward, Senior Resource Specialist
Natural Resources Defense Council

Cecil A. Watson, Farmer

Pete Wenstrand, Vice President
National Corn Growers Association

David Wheeler, Acting Division Chief
Environment, Infrastructure and
Agriculture Division
The World Bank

➢ AQUACULTURE: FOOD AND RENEWABLE RESOURCES FROM U.S. WATERS

Don Abt, Marine Biological Laboratory
Woodshole Oceanographic Institute

Jan Auyong, Project Manager
Mar Res Associates

John Bardach, Senior Marine Advisor
Environment and Policy Institute

Merry Camhi, Ecologist/Staff Scientist
Audubon Society

John S. Corbin, Manager
Aquiculture Development Program

Mike Freeze, Vice President
Keo Fish Farm, Inc.

Michael Hastings, Executive Director
Maine Aquiculture Innovation Center

Timothy K. Hennessy, President
Ekk Will Waterlife Resources

Bille Hougart, Vice President
Oceanic Institute

Robert Hulbrock, Aquiculture Coordinator
California Department of Fish and Game

Ann Kapuscinski, Associate Professor
Sea Grant College Program
University of Minnesota

Roy Martin, Executive Director
National Aquiculture Council
National Fisheries Institute

Joseph McCraren, Executive Director
National Aquaculture Association

Ted McNulty, Aquiculture Coordinator
Arkansas Development Finance Authority

David Ortman, Director, North West Office
Friends of the Earth

John Pitts, Consultant

Bradley H. Powers, Director
Aquiculture/Seafood Programs
National Association of Aquiculture Coordinators

Robert R Stickney, Professor
School of Fisheries
University of Washington

Hugh Warren, III, Executive Vice President
Catfish Farmers of America

> New Approaches to Environmental Regulations

Richard N.L. Andrews, Professor and Director, Environmental Management and Policy Program, Department of Environmental Sciences & Engineering
University of North Carolina-Chapel Hill

Donald A. Deieso, President & CEO
Metcalf & Eddy Inc.

E. Donald Elliott, Julien & Virginia Cornell Chair of Environmental Law & Litigation
Yale Law School

Deeohn Ferris, Consultant

Caren Glotfelty, Deputy Director
Office of Water Management
Department of Environmental Resources
State of Pennsylvania

Joseph Goffian, Senior Attorney
Environmental Defense Fund

Daniel S. Greenbaum, President
Health Effects Institute

Linda E. Greer, Senior Scientist
Natural Resources Defense Council

F. Henry Habicht II, Senior Vice President
Strategic/Environmental Planning
Safety-Kleen Corporation

Randy Johnson, Commissioner
Board of Hennepin County Commissioners
Minneapolis, MN

Howard A. Latin, Professor of Law and Justice John J. Francis Scholar
Rutgers University School of Law

Lester B. Lave, James H. Higgins Professor of Economics , Graduate School of Industrial Administration
Carnegie-Mellon University

Pat Leyden, Deputy Executive Officer for Stationary Source Compliance
South Coast Air Quality Management District

Steven B. Lovejoy, Professor
Department of Agricultural Economics
Purdue University

Warren R Muir, President
Hampshire Research Associates, Inc.

Helen Petrauskas, Vice President
Environmental and Safety Engineering
Ford Motor Company

Ernest S. Rosenberg, Director, External Affairs & Compliance Support
Health, Environment and Safety
Occidental Petroleum Corporation

> Preparing for an Uncertain Climate

Helen M. Ingram, Chairman
Director
Udall Studies in Public Policy
University of Arizona

Richard M. Adams, Professor of Resource Economics, Department of Agricultural and Resource Economics
Oregon State University

Vera Alexander, Dean
School of Fisheries and Ocean Sciences
University of Alaska

Michael J. Bean, Senior Attorney
Environmental Defense Fund

Margaret **Adela Davidson, Executive Director**
South Carolina Sea Grant Consortium

J. Clarence Davies, Director
Center for risk Management
Resources for the Future

Baruch Fischhoff, Professor
Engineering and Public Policy
Carnegie Mellon University

Michael H. Glantz, Program Director
Environmental Impacts Group
National Center for Atmospheric Research

George Hoberg, Assistant Professor
Political Science Department
University of British Columbia

Henry D. Jacoby, Director
Joint Program on the Science and Policy of Global Change
Massachusetts Institute of Technology

Walter Jarck, Corporate Director
Forest Resources
Georgia-Pacific Corporation

David N. Kennedy Director
Department of Water Resources
State of California

Jon Kuder, Executive Director
Association of State Wetlands Managers

Doug Maclean, Associate Professor
Department of Philosophy
University of Maryland-Baltimore

Jerry Mahlman, Director
Geophysical Fluid Dynamics Lab/NOAA
Princeton University

Barbara Miller, Senior Civil Engineer
Tennessee Valley Authority

Steve Peck, Director
Environmental Sciences Department
Electric Power Research Institute

Herman Shugart Chairman
Department of Environmental Sciences
University of Virginia

Phil Sisson, Director
Commodities and Economic Analysis Division
Quaker Oats Corporation

Don Wilhite, Director
International Drought Information Center
University of Nebraska

Gary Yohe, Professor
Department of Economics
Wesleyan University

> Researching Health Risks

Ronald W. Estabrook, Chair
Virginia Lazenby O'Hara Professor of Biochemistry
Department of Biochemistry
University of Texas Southwestern Medical Center

Eula Bingham, Vice President and Dean for Graduate Studies
Institute of Environmental Health
University of Cincinnati Medical Center

Thomas A. Burke, Assistant Professor
Department of Health Policy and Management
The Johns Hopkins University School of Hygiene and Public Health

Adam M. Finkel, Fellow
Center for Risk Management
Resources for the Future

Joseph H. Guth, Senior Project Scientist
Natural Resources Defense Council, Inc.

Oliver Hankinson, Associate Professor of Pathology, Laboratory of Biomedical and Environmental Sciences
University of California, Los Angeles

David Lilienfield, Senior Epidemiologist
The EMMES Corporation

Gilbert Omenn, Dean
School of Public Health and Community Medicine
University of Washington

Colin N. Park, Associate Scientist and Issues Manager
Health and Environmental Sciences
The Dow Chemical Company

David 1? hall, Consultant

Joseph V. Rodricks, Senior Vice President
Head, Health Sciences Department
ENVIRON International Corporation

Curtis C. Travis, Director
Center for Risk Assessment
Oak Ridge National Laboratory

James D. Wilson, Regulatory Issues Director
Environmental Safety and Health Staff
Monsanto Company

Lauren Zeise, Acting Chief and Senior Toxicologist, Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

Rae Zimmerman, Professor of Planning
Robert F. Wagner Graduate School of Public Service, New York University

➢ Russian Nuclear Con tam i nation Project

Robert P. Morgan, *Chairman*
Elvera & William Stuckenberg
Professor of Technology & Human Affairs
Washington University-St. Louis, MO

John F. Ahearne, Executive Director, Sigma Xi
The Scientific Research Society

James S. Allen, Manager
Advanced Programs
Georgia Tech Research Institute

Susan Eisenhower, Director
Center for Post Soviet Studies

" Murray Feshbach, Research Professor
Department of Demography
Georgetown University

: Paula Garb, Researcher
Social Science
: University of California-Irvine

Marvin Goldman, Professor Emeritus of Radiological Sciences
: University of California-Davis

Joshua Handler, Research Coordinator
Greenpeace

. Charles D. Hollister, Vice President and Senior Scientist
Woods Hole Oceanographic Institute

: Edway R. Johnson, President & CEO
E.R. Johnson Associates, Inc.

: John J. Kelley, Associate Professor
. Institute of Marine Science
. University of Alaska

. Malcom MacKinnon III, President
MacKinnon Searle Consortium, Ltd.

: Stephanie L. Pfirman, Associate Professor and Chair
" Department of Environmental Science
Barnard College

" Lydia V. Popova Director
Nuclear Ecology Program
Socio-Ecologica.l Union, Moscow

: Caleb Pungowiyi, Director
Inuit Circumpolar Conference

: William L. Templeton, Senior Research Advisor
. Pacific Northwest Labs

William R. Wiley, Senior VP
. Science & Technology Policy
" Battelle Memorial Institute

➢ OSHA's Choice of Control Technology and Estimation of Economic Impacts

John R. Froines, *Chair*
Director, Center for Occupational and Environmental Health
UCLA School of Public Health

Nicholas A. Ashford, Professor
Center for Technology, Policy and Industrial Development
Massachusetts Institute of Technology

Robert W. Crandall, Senior Fellow
Economic Studies Program
The Brookings Institution

Morton Corn, Professor
School of Hygiene and Public Health
The Johns Hopkins University-Baltimore

James S. HoIt, Senior Economist and Vice President for Research
Employment Policy Foundation

William P. Kelly VP and General Manager, Fibers Division
The Carborundum Company

Karl Kronebusch, Professor
La Follette Institute of Public Affairs
University of Wisconsin—Madison

Lester B. Lave, James H. Higgins Professor of Economics
Department of Economics
Carnegie-Mellon University

Thomas McGarity, William Stamps Farish Professor of Law, School of Law
University of Texas at Austin

John Mendeloff, Professor
School of Public and International Affairs
University of Pittsburgh

Stephen M. Rappaport, Professor of Occupational Health, Department of Environmental Sciences & Engineering, Occupational Safety & Health Educational Resource Center
University of North Carolina

Susan Rose-Ackerman, Henry R. Luce Professor of Jurisprudence
Yale School of Law

Margaret M. Seminario, Director
Dept Occupational Safety & Health
AFL/CIO

James W. Smith
Chief Economist (ret.) USWA

➢ Biological Pest Control Assessment

Katherine Reichelderfer Smith, *Chair*
Director, Policy Studies Program
Henry A. Wallace Institute for Alternative Agriculture

Paul A. Backman, Professor and Director
Biological Control Institute
Auburn University

Ring T. Carde, Professor
Department of Entomology
University of Massachusetts

Willard A. Dickerson, Plant Pest Administrator
North Carolina Department of Agriculture

Roger C. Funk, Vice President
Human & Technical Resources
The Davey Tree Expert Company

Harry J. Griffiths, Chairman
Entomological Services, Inc.

Judith A. Hansen, Superintendent
Cape May County Mosquito Extermination Commission-Cape May, NJ

Dennis L. IsaacSon, Program Director
Noxious Weed Control Section
Oregon Department of Agriculture

Deborah B. Jensen, VP Conservation Science & Stewardship
The Nature Conservancy

Tobi L. Jones, Special Assistant to Director "
Department of Pesticide Regulation
California Environmental Protection Agency

Peter M. Kareiva, Professor
Department of Zoology
University of Washington

Allen E. Knutson, Associate Professor and Extension Entomologist
Texas Agricultural Extension Service
Texas A&M University

James B. Kramer, Family Farmer
Hugoton, KS

David W. Miller, Vice President
Research & Development
EcoScience Corporation

Timothy L. Nance, Director
Eastern Operations
NTGargiulo L.P.

David O. TeBeest, Professor
Department of Plant Pathology
University of Arkansas

Jeffrey K. Waage, Director
International Institute of Biological Control
Ascot, Berks, United Kingdom

Michael E. Wetzstein, Professor
Department of Agricultural & Applied Economics
University of Georgia

David M. Whitacre, VP Development
Sandoz Agro, Inc.

Workshop on Agriculture, Trade and The Environment

Workshop on Biological Pest control: Role of the Private Sector

Workshop on Technologies to Benefit Shoreline Property and Rare Wildlife: An Atlantic Coast Example

Workshop on Risks to Students in School

HEALTH PROGRAM

➢ ASSESSING THE ASSUMPTIONS BEHIND HEALTH REFORM PROJECTIONS

Joseph P. Newhouse, *Chair*
Director, Division of Health Policy Research and Education
Harvard University

Stuart H. Altman, Dean
Florence Heller School, Brandeis University

Harold Cohen, President
Harold Cohen, Inc.

Karen Davis, Executive Vice President
The Commonwealth Fund

Tom J. Elkin, Assistant Executive Officer
Health Benefit Services
CalPERS

Deborah A. Freund, Director
Otis Bowen Research Center
Indiana University

Fernando A. Guerra, Director
San Antonio Metropolitan Health District

William Hsiao, Professor of Health System Economics, Department of Health Policy and Management
Harvard School of Public Health

Lawrence R. Klein, Professor of Economics
University of Pennsylvania

Woodrow Myers, VP for Medical Affairs
The Associated Group

Jack Rodgers, Senior Manager
Director of Health Policy Analysis
Price Waterhouse

Allen J. Sorbo, Principal
Tillinghast, A Towers Perrin Company

Gail R. Wilensky, Senior Fellow
Project HOPE

Michael C. Wolfson, Director General
Institutions and Social Statistics Branch
Statistics Canada, Ottawa

> Defensive Medicine and Medical Malpractice

Randall Bovbjerg, Chair
Senior Research Associate
The Urban Institute

John R. Ball, Executive Vice President
American College of Physicians

James Blumstein, Professor of Law
Vanderbilt University Law School

Troyen Brennan, Professor of Law and Public Health, Department of Health Policy and Management
Harvard School of Public Health

Brad Cohn, President
Physician Insurers Association of America

Edward David, Chairman
Maine Board of Registration in Medicine

Richard Frank, Professor
Health Services Research and Development Center
Johns Hopkins University

Pamela Gilbert, Legislative Director
Public Citizen Congress Watch

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Workshop on Impacts of Antibiotic Resistant Bacteria

Workshop on Eligibility Criteria for Federally Mandated Long-Term Care

Workshop on Issues in the Development and Marketing of an AIDS Vaccine

Workshop on IOM Medical Follow-Up Agency

Workshop on Mental Health and Substance Abuse

Office of Technology Assessment Act

PUBLIC LAW 92-484
92D CONGRESS, H.R. 10243
OCTOBER 13, 1972
AN ACT

TO ESTABLISH AN OFFICE OF TECHNOLOGY ASSESSMENT **for the Congress as an aid in the identification and consideration of existing and probable impacts of technological application; to amend the National Science Foundation Act of 1950; and for other purposes.**

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act maybe cited as the "Technology Assessment Act of 1972."

FINDINGS AND DECLARATION OF PURPOSE

SEC. 2. The Congress hereby finds and declares that:

(a) As technology continues to change and expand rapidly, its applications are-

1. large and growing in scale; and

2. increasingly extensive, pervasive, and critical in their impact, beneficial and adverse, on the natural and social environment.

(b) Therefore, it is essential that, to the fullest extent possible, the consequences of technological applications be anticipated, understood, and considered in determination of public policy on existing and emerging national problems.

(c) The Congress further finds that:

1. the Federal agencies presently responsible directly to the Congress are not designed to provide the legislative branch with adequate and timely information, independently developed, relating to the potential impact of technological applications, and

2. the present mechanisms of the Congress do not and are not designed to provide the legislative branch with such information.

(d) Accordingly, it is necessary for the Congress to-

1. equip itself with new and effective means for securing competent, unbiased information concerning the physical, biological, economic, social, and political effects of such applications; and

2. utilize this information, whenever appropriate, as one factor in the legislative assessment of matters pending before the Congress, particular in those instances where the Federal Government may be called upon to consider support for, or management or regulation of, technological applications.

ESTABLISHMENT OF THE OFFICE OF TECHNOLOGY ASSESSMENT

SEC. 3. (a) In accordance with the findings and declaration of purpose in section 2, there is hereby created the Office of Technology Assessment (hereinafter referred to as the "Office") which shall be within and responsible to the legislative branch of the Government.

(b) The Office shall consist of a TechnologyAssessrnent **Board (hereinafter referred to as the "Board") which shall formulate and promulgate the policies of the Office, and a Director who shall carry out such policies and administer the operations of the Office.**

(c) The basic function of the Office shall be to provide early indications of the probable beneficial and adverse impacts of the applications of technology and to develop other coordinate information which may assist the Congress. In carrying out such function, the Offive shall:

1. identify existing or probable impacts of technology or technological programs;

2. **where possible, ascertain cause-and-effect relationships;**

3. identify alternative technological methods of implementing specific programs;

4. identifiy alternative programs for achieving requisite goals;

5. make estimates and comparisons of the impacts of alternative methods and programs;

6. present findings of completed analyses to the appropriate legislative authorities;

7. identiify areas where additional research or data collection is required to provide adequate support for the assessments and estimates described in paragraph (1) through (5) of this subsection; and

8. **undertake such additional associated activities as the appropriate authorities specified under subsection (d) may direct.**

(d) Assessment activities undertaken by the Office may be initiated upon the request of:

1. the chairman of any standing, special, or select committee of either House of the Congress, or of any joint committee of the Congress, acting for himself or at the request of the ranking minority member or a **majority of the committee members;**

2. the **Board; or**

3. the Director, in consultationwith the Board.

(e) Assessments made by the Office, including information, surveys, studies, reports, and findings related thereto, shall be made available to the initiating committee or other appropriate committees of the Congress. In addition, any such information, surveys, studies, reports, and findings produced by the Office maybe made available to the public except where-

1. to do so would violate security statutes; or

2. the **Board considers it necessary or advisable to withhold such information in accordance with one or more of the numbered paragraphs in section 552(b) of tide 5, United States Code.**

TECHNOLOGY ASSESSMENT BOARD

SEC. 4. **(a) The Board shall consist of thirteen members as follows:**

1. six Members of the Senate, appointed by the President pro tempore of the Senate, three from the majority party and three from the minority party;

2. **six Members of the House of Representatives appointed by the Speaker of the House of Representatives, three from the majority party and three from the minority party; and**

3. the Director, who shall not be a voting member.

(b) Vacancies in the membership of the Board shall not affect the power of the remaining members to execute the functions of the Board and shall be filled in the same manner as in the case of the original appointment.

(c) The Board shall select a chairman and a vice chairman from among its members at the beginning of each Congress. The vice chairman shall act in the place and stead of the chairman in the absence of the chairman. The chairmanshi, and the vice chairmanship shall alternate between the Senate and the House of Representatives with each Congress. The chairman during each even-numbered Congress shall be selected by the Members of the House of Representatives on the Board from among their number. The vice chairman durin, each Congress shall be chosen in the same manner from that House of Congress other than the House of Congress of which the chairman is a Member.

(d) The Board is authorized to sit and act at such places and times during the sessions, recesses, and adjourned periods of Congress, and upon a vote of a majority of its members, to require by subpoena or otherwise the attendance of such witnesses and the production of such books, papers, and documents, to administer such oaths and affirmations, to take such testimony, to procure such printing and binding, and to make such expenditures, as it deems advisable. The Board may make such rules respecting its organization and procedures as it deems necessary, except that no recommendation shall be reported from the Board unless a majority of the Board assent. Subpoenas maybe issued over the signature of the chairman of the Board or of any voting member designated by him or by the Board, and may be served by such person or persons as maybe designated by such chairman or member. The chairman of the Board or any voting member thereof may administer oaths or affirmations to witnesses.

DIRECTOR AND DEPUTY DIRECTOR

SEC. 5. (a) The Director of the Office of Technology Assessment shall be appointed by the Board and shall serve for a term of six years unless sooner removed by the Board. He shall receive basic pay at the rate provided for level III of the Executive Schedule under section 5314 of tide 5, United States Code.

(b) In addition to the powers and duties vested in him by this Act, the Director shall exercise such powers and duties as maybe delegated to him by the Board.

(c) The Director may appoint with the approval of the Board, a Deputy Director who shall perform such functions as the Director may prescribe and who shall be Acting Director during the absence or incapacity of the Director or in the event of a vacancy in the office of Director. The Deputy Director shall receive basic pay at the rate provided for level IV of the Executive Schedule under section5315 of tide 5, United States Code.

(d) Neither the Director nor the Deputy Director shall engage in any other business, vocation, or employment than that of serving as such Director or Deputy Director, as the case may be; nor shall the Director or Deputy Director, except with the approval of the Board, hold any office in, or act in any capacity for, any organization, agency, or institution with which the Office makes any contract or other arrangement under this Act.

AUTHORITY OF THE OFFICE

SEC. 6. (a) The Office shall have the authority, within the limits of available appropriations, to do all things necessary to carry out the provisions of this Act, including but without being limited to, the authority to -

1, make full use of competent personnel and organizations outside the Office, public or private, and form special ad hoc task forces or make other arrangements when appropriate;

2. enter into contracts or other arrangements as ma, be necessary for the conduct of the work of the Office with any agency or instrumentality of the United States, with any State, territory, or possession or any political subdivision thereof, or with any person, firm, association, corporation, or educational institution, with or without reimbursement, without performance or other bonds, and without regard to section 370$1 of the Revised Statutes (41 U.S.C. 5);

3. make advance, progress, and other payments which relate to technology assessment without regard to the provisions of section 3648 of the Revised Statutes (31 U.S.C. 529);

4. accept and utilize the services of voluntary and uncompensated personnel necessary for the conduct of the work of the Office and provide transportation and subsistence as authorozed by section 5703 of title 5, United States Code, for persons serving without compensation;

5. acquire by purchase, lease, loan, or gift, and hold and dispose of by sale, lease, or loan, real and personal property of all kinds necessary for or resulting from the exercise of authority granted by this Act; and

6. prescribe such rules and regulations as it deems necessary governing the operation and organization of the Office.

(b) Contractors and other parties entering into contracts and other arrangements under this section which involve costs to the Government shall maintain such books and related records as will facilitate an effective audit in such detail and in such manner as shall be prescribed by the Office, and such books and records (and related documents and papers) shall be available to the Office and the Comptroller General of the United States, or any of their duly authorized representatives, for the purpose of audit and examination.

(c) The Office, in carrying out the provisions of this Act, shall not, itself, operate any laboratories, pilot plants, or test facilities.

(d) The Office is authorized to secure directly from any executive department or agency information, suggestions, estimates, statistics, and technical assistance for the purpose of carrying out its functions under this Act. Each such executive department or agency shall furnish the information, suggestions, estimates, statistics, and technical assistance directly to the Office upon its request.

(e) On request of the Office, the head of any executive department or agency may detail, with or without reimbursement, any of its personnel to assist the Office in carrying out its functions under this Act.

(f) The Director shall, in accordance with such policies as the Board shall prescribe, appoint and fix the compensation of such personnel as may be necessary to carry out the provisions of this Act.

ESTABLISHMENT OF THE TECHNOLOGY ASSESSMENT ADVISORY COUNCIL

SEC. 7. (a) The office shall establish a Technology Assessment Advisory Council (hereinafter referred to as the "Council"). The Council shall be composed of the following twelve members:

1. ten members from the public, to be appointed by the Board, who shall be persons eminent in one or more fields of the physical, biological, or social sciences or engineering or experienced in the administration of technological activities, or who ma,be judged qualified on the basis of contributions made to educational or public activities;

2. the Comptroller General; and

3. the Director of the Congressional Research Service of the Library of Congress.

(b) The Council, upon request by the Board, shall—

1. review and make recommendations to the Board on activities undertaken by the Office or on the initiation chereof in accordance with section 3(d);

2. review and make recommendations to the Board on the findings of any assessment made by or for the Office; and

3. undertake such additional related tasks as the Board may direct.

(c) The Council, by majority vote, shall elect from its members appointed under subsection (a)(l) of this section a Chairman and a Vice Chairman, who shall serve for such time and under such conditions as the Council may prescribe. In the absence of the Chairman, or in the event of his incapacity, the Vice Chairman shall act as Chairman.

(d) **The term of office of each member of the Council appointed under subsection (a)(1) shall be four years except that any such member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term. No person shall be appointed a member of the Council under subsection (a)(l) more than twice. Terms of the members appointed under subsection (a)(1) shall be staggered so as to establish a rotating membership according to such method as the Board may devise.**

(e) 1. The members of the Council other than those appointed under subsection (a)(1) shall receive no pay for their services as members of the Council, but shall be allowed necessary travel expenses (or, in the alternative, mileage for use of privately owned vehicles and per diem in lieu of subsistence at not to exceed the rate prescribed in sections 5702 and 5704 of tide 5, United States Code), and other necessary expenses incurred by them in the performance of duties vested in the Council, without regard to the provisions of subchapter 1 of chapter 57 and section 5731 of title 5, United States Code, and regulations promulgated thereunder.

2. The members of the Council appointed under subsection (a)(l) shall receive compensation for each day engaged in the actual performance of duties vested in the Council at rates of pay not in excess of the daily equivalent of the highest rate of basic pay set forth in the General Schedule of section 5332(a) of title 5, United States Code, and in addition shall be reimbursed for travel, subsistence, and other necessary expenses in the manner provided for other members of the Council under paragraph (1) of this subsection.

UTILIZATION OF THE LIBRARY OF CONGRESS

SEC. 8. **(a) To carry out the objectives of this Act, the Librarian of Congress is authorized to make available to the Office such services and assistance of the Congressional Research Service as may be appropriate and feasible.**

(b) Such services and assistance made available to the Office shall include, but not be limited to, all of the services and assistance which the Congressional Research Service is otherwise authorized to provide to the Congress.

(c) Nothing in this section shall alter or modify any services or responsibilities, other than those performed for the Office, which the Congressional Research **Service under law performs for or on behalf of the Congress. The Librarian is, however, authorized to establish within the Congressional Research Service such additional divisions, groups, or other organizational entities as may be necessary to carry our the purpose of this Act.**

(d) Services and assistance made available to the Office by the Congressional Research Service in accordance with this section may be provided with or without reimbursement from funds of the Office, as agreed upon by the Board and the Librarian of Congress.

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