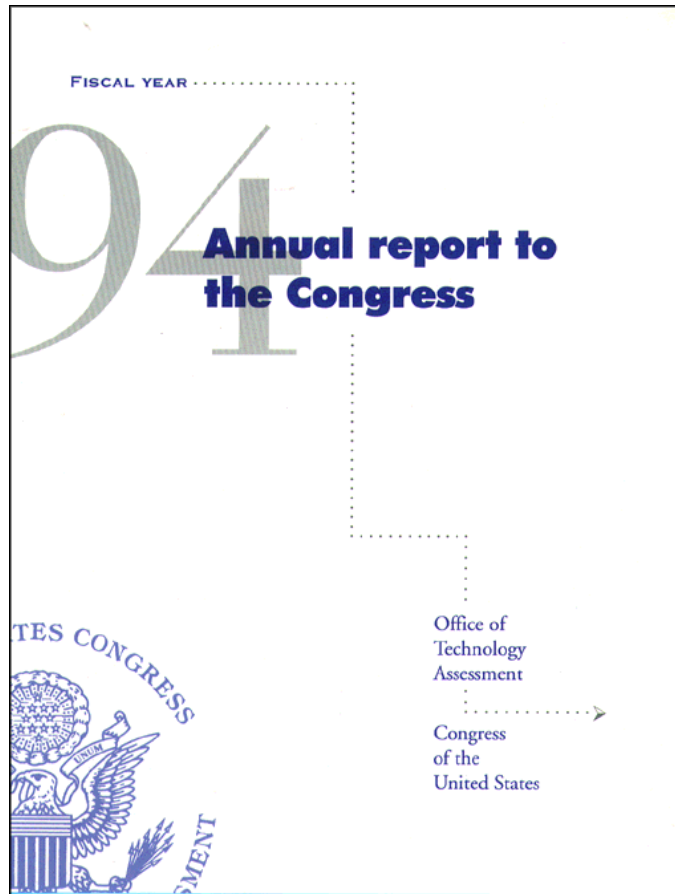


*Annual Report to the Congress: Fiscal Year  
1994*

March 1995

OTA-A-544



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## 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.

**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.

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.

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 testified 38 times before Congressional Committees. OTA also provided numerous special briefings and expert advice. As of September 30, 1994, 44 studies approved by the Technology Assessment Board and nine special responses were in progress. OTA's reports for the year covered the usual wide range of subject matter, and included a number which could be singled out as particularly of interest and use to Congress and the nation:

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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

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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 programs: Energy Transportation, and Infrastructure; Industry, 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



- 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  
*Requested 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  
*Requested 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  
*Endorsed by:*  
House Committee on Public Works and Transportation, Subcommittee on Aviation
- Multinationals and the U.S. Technology Base  
*Requested by:*  
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 by:*  
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 by:*  
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 by:*  
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 Affairs
- Universal Health Insurance and Uninsured People: Effects on Use and Cost
  - Requested by:*  
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?
  - Requested by:*  
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
  - Requested by:*  
Senate Committee on Labor and Human Resources
- The Department of Defense Kuwait Oil Health Fire Risk Assessment (The "Persian Gulf Veterans' Registry")
  - Requested 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
  - Requested 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
  - Requested by:*  
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](ftp://otabbs.ota.gov), login as *anonymous*, password is your e-mail address; publications are in the /pub directory
- Telnet: [otabbs.ota.gov](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](mailto: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](mailto:netsupport@ota.gov)

E -MAIL L I S T S E R V E R

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](mailto: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](mailto: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 titles 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-105. 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 ammunition 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. Bowsheer 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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\*CHASE N. PETERSON, TAAC MEMBER



## Staff as of September 1994

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**Barbara Linkins, Executive Assistant**  
**Kerry Kemp, Managing Editor**  
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 Jacqueline Keller, Research Analyst  
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 Mary Laschober, Senior Analyst  
 Justin Latus, Research Analyst  
 Carolyn Martin, Secretary/Word Processor

Robert McDonough, Senior Analyst  
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Frances Hemingway, Senior Finance Analyst :  
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Carrie Miller, Accounting Technician

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Lola Craw, Payroll/Benefits Officer  
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Susan Hoffmeyer, Graphic Designer  
Linda Long, Electronic Dissemination  
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William Moore, Production Editor  
J. Christine Onrubia, Senior Designer  
Bonnie Sparks, Electronic Publishing  
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Brenda Hahn, Systems Support Analyst  
Philip Jackson, Assistant Manager  
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John Warren, Systems Technician

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" Paul Starr, Contracts and Legal Specialist  
Greg Joyce, Senior Procurement Specialist

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Pamela Barnard, Reference Librarian  
Nancy Bennett, Information Specialist  
Sandra Massengill, Information Technician  
Debra McCurry, Assistant Manager  
" Linda Trout, Librarian

➤ **INFORMATION MANAGEMENT  
AND BUILDING SERVICES**

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Theodore Williams, Publications  
Distribution Technician

➤ **BUILDING SERVICES**

" Kevin McNair, Building Services Supervisor  
Robert Raines, Clerk/Courier

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Janet Hammond, Resident Nurse

➤ **CONFERENCE CENTER**

Edie Grandstaff, Coordinator  
Sean Copeland, Assistant Coordinator

➤ **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."

#### B L U E P E N C I L A W A R D S

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

#### T H E M O R R I S K . U D A L L F E L L O W S H I P P R O G R A M

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

C O N G R E S S I O N A L F E L L O W S H I P I N H E A L T H P O L I C Y

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.

> F E L L O W, 1 9 9 3 - 9 4

Gerard Ferguson, Biological and Behavioral Sciences Program

> F E L L O W S, 1 9 9 4 - 9 5

Cynthia Palmer, Health Program

Rochelle Rollins, Health Program

## Advisory panel members\*

ENERGY, TRANSPORTATION, AND  
INFRASTRUCTURE PROGRAM

➤ **ADVANCED AUTOMOTIVE**  
TECHNOLOGY PROJECT

Don Kash, *Chairman*  
Hazel Chair of Public Policy  
Institute of Public Policy  
George Mason University

Steve Barnett, Principal  
Global Business Network

Ron Blum, Senior Auto Analyst  
Research Department  
International Union United Auto Workers

Tom Cackette, Chief Deputy Officer  
California Air Resources Board

Malcolm R. Currie, Chairman  
M-B Resources, Inc.

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**

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\*Affiliations 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

Robert W. Baker  
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*  
Associate Director  
Russian Research Center  
Wellesley College

Margaret Bowman, Director  
Environmental Program for  
Central & Eastern Europe  
Environmental Law Institute

· Robert W. Campbell, Professor  
· Department of Economics  
· Indiana University

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

· Robert Ebel, Senior Associate  
· Energy Security Program  
· Center for Strategic & International Studies

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

: Richard Jacobs, President  
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“ Richard A. Liroff, Director  
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· Princeton University

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· Spears & Associates

➤ RENEWABLE ENERGY  
TECHNOLOGY: RESEARCH,  
DEVELOPMENT AND  
COMMERCIAL PROSPECTS

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President  
Resources for the Future

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SF Services, Inc.

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Sun Earth, Inc.

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Sheet Metal Workers International

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Solarex

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State of Maine

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John Kennedy, Product General Manager,  
Space Systems, Allied-Signal Aerospace  
and Advanced Applications  
Los Angeles Division

Alden Meyer, Director  
Climate Change and Energy Program  
Union of Concerned Scientists

Roberta Nichols, Manager, Electric Vehicle  
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Mike Nicklas, President  
Innovative Design

Dale Osborn, Vice President  
Kenetech/U.S. Windpower, Inc.

Bruce Pasternak, Senior VP.I Energy Practice  
Booz, Allen, and Hamilton

Maria Richter, Principal, Independent  
Power Industry and Latin American  
Project Finance  
Morgan Stanley & Company, Inc.

Victor Shaio, President  
New Energy Corporation of Indiana

Scott Sklar, Executive Director  
Solar Energy Industries Association

Carl Weinberg  
Weinberg Associates

Robert H. Williams, Senior Research  
Scientist, Center for Energy and  
Environmental Studies  
Princeton University

Kurt E. Yeager, Senior Vice President  
Technical Operations  
Electric Power Research Institute

➤ SAVING ENERGY IN U.S.  
TRANSPORTATION

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Stanford University

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Purdue University

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Consumers Federation of America

Robert deHaan, Director of Engineering  
Amana Refrigeration Company

Daniel A. Dreyfus, Director of Civilian  
Radiation Waste Management  
U.S. Department of Energy

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Alan Miller, Executive Director  
Center for Global Change  
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New England Electric System

Maxine Savitz, Director  
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Allied-Signal Aerospace

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Carolina Power & Light Company

Richard Tracey, Director of Engineering  
Services  
Ryland Homes

B.C. Waycaster, VP and General Manager  
Hydrocarbons & Energy Department  
Dow Chemical

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Battelle Pacific Northwest Labs

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Pacific Gas and Electric Enterprise

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Energy and Environmental Markets  
Honeywell, Inc.

“ Eric R Zausner, President  
Strategic Performance Management

· **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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EMPLOYMENT PROGRAM

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EMERGING TECHNOLOGIES**

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· Sidney C. Chao, President and CEO  
· Hughes Environmental Systems, Inc.

· Robert Cook-Deegan, Director,  
Division of Biobehavioral Sciences and  
Mental Disorders  
· Institute of Medicine

· Mark Cunningham, Director  
· Buck Consultants

· Mark Eaton, President  
· JMC Ventures

· Robert T. Fraley, Group Vice President  
and General Manager  
· New Products Division  
· Monsanto Company

· Charles E. Harris, Chairman and CEO  
· Harris & Harris Group, Inc.

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Public Policy and Management  
· Carnegie Mellon University - Pittsburgh

Ken Kennedy, Director  
Center for Research Parallel Computation  
Rice University-CITI

Peter H. Mills, Chief Executive Officer  
US Display Consortium

William Morin, Director, Technology Policy  
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Mark Myers, Senior Vice President  
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Xerox Corporation

Walter H. Plosila, President  
Suburban Maryland/Montgomery County  
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SVG Lithography Systems, Inc.

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Professor of Business Administration  
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Carl Shapiro, Transamerica Professor of  
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University of California—Berkeley

Louis Tornatzky, Director,  
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Southern Growth Policies Board

Stephen Turner, CEO/President  
Oncor, Inc.

Les Vadasz, Senior Vice President  
Intel Corporation

➤ **INDUSTRY, TECHNOLOGY, AND  
THE ENVIRONMENT**

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President, Rensselaer Polytechnic Institute

Edgar Berkey, President  
National Environmental Technology  
Applications Corporation

Judith Dean, Associate Professor of  
Economics  
School of Advanced & International Studies  
Johns Hopkins University

Robert E. Driscoll, President  
U.S.-ASEAN Council for Business and  
Technology, Inc.

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Environmental Defense Fund

Harry L. Foster, Senior Economist  
Product Planning and Economics Staff  
General Motors

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National Wildlife Federation

Mary Kelly, Executive Director  
Texas Center for Policy Studies

Jeffrey Leonard, President  
Global Environment Fund

David S. Marsh, President  
Marsh Plating Corporation

Jessica T. Matthews\*, Vice President  
World Resources Institute

Robert S. McNamara, Trustee  
U.S.-Japan Foundation

J.A. Meyer, Senior Vice President  
Chevron Research & Technology Company

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\*Resigned April 1993.

T.C. Parsons, Executive Director  
Center for Industrial Services  
University of Tennessee—Nashville

Lawrence Ross, Director  
Center for Waste Reduction Technologies  
American Institute of Chemical Engineers

Martyn Riddle, Chief  
Environmental Unit  
International Finance Corporation

Paul Relis, Board Member  
California Integrated Waste  
Management Board

Maxine Savitz, Director  
Garrett Ceramic Components  
Allied-Signal Aerospace

Samuel A. Schulhof, Director  
Environmental Research Center  
General Electric Company

James Selover, Principal  
Selover Associates

Margaret Seminario, Director  
Department of Occupational  
Safety and Health  
AFL-CIO

John J. Sheehan, Legislative Director and  
Assistant to the President  
United Steelworkers of America

Sally Shelton, Former U.S. Ambassador of  
Eastern Caribbean Countries

► **TECHNOLOGY, JOBS AND  
PRODUCTIVITY**

Camille Cates Barnett, Consultant

Paul Barton, Director  
ETS Policy Information Center  
Educational Testing Service

Richard Bensigner, Executive Director  
AFL-CIO Organizing Institute

“ Linda Chavez Director  
Center for New American Community

· Peggy Connerton, Director  
: Public Policy  
Services Employees International Union

· Pat Flanagan, Principal  
American Capital Strategies

: Thomas Geoghegan, Attorney  
Despres, Schwartz and Geoghegan

: Robert Gibbons, Vice President  
American Institute for Chartered Property  
and Casualty Underwriters

Michael W. Howe, Human Resources  
Officer  
: HealthSpan Health Systems Corporation

· Marvin Kusters, Director of Economic  
Policy Studies  
American Enterprise Institute

“ Ruth Milkman, Professor  
Department of Sociology  
· UCLA

Dinah Nemeroff, Corporate Director  
· Customer Satisfaction & Quality  
· Citibank

Thierry Noyelle, Consultant

: June O'Neill, Professor of  
Economics & Finance  
Director, Center for Study of Business &  
: Baruch College

Pat Recktenwald, Division Vice President  
: Store Operations  
Sears

: Joel Rogers, Professor  
Department of Sociology  
University of Wisconsin-Madison

Kris Rondeau, Assistant Director of  
Organizing for AFSCME  
: HUCTW/AFSCME

Diana Roose, Research Director  
9 to 5, National Association of Working

Margaret Simms, Research Director  
Joint Centre for Political and Economic  
Studies

Lucy Suchman, Principal Scientist and  
Area Manager  
Work Practices and Technology  
Xerox Palo Alto Research Center

Edward Wolff, Professor  
Department of Economics  
New York University

INTERNATIONAL SECURITY AND  
SPACE PROGRAM

➤ **DEFENSE MODELING AND  
SIMULATION PROJECT**

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Professor of Political Science  
Massachusetts Institute of Technology

Donald Blumenthal, Consultant

Jerome Bracken, Consultant

Edward C. Brady, Managing Partner  
Strategic Perspectives, Inc.

David R. Cheriton, Professor of  
Computer Science  
Computer Science Department  
Stanford University

Paul Davis, Manager  
**Corporate Research Defense and Technology**  
Planning  
RAND Corporation

T.N. Dupuy, President  
The Dupuy Institute

John Englund, Past President and CEO :  
Analytic Services, Inc.

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.

Duncan Miller, Senior Staff  
MIT Lincoln Laboratory

· Stuart H. Starr, Director of Plans  
· Mitre Corporation  
·

· Larry Stone, Senior Vice President  
· Metron, Inc.  
·

· Jack Thorpe, Corporate Vice President  
· SAIC Corporation  
·

· Verena S. Vomastik, Senior Analyst  
· Electrospace Systems, Inc.  
·

· Jordon Wiesman, President  
· Virtual World Entertainment  
·

·  
·  
· > FUTURE OF REMOTE SENSING  
· FROM SPACE

Rodney W. Nichols, *Chairman*  
CEO  
The New York Academy of Sciences

· James G. Anderson, Professor  
· Department of Chemistry  
· Harvard University

William Brown, President  
ERIM Corporation

Ronald Brunner, Professor  
Department of Political Science  
University of Colorado

Joanne Gabrynowicz, Associate Professor  
Center for Aerospace Sciences  
University of North Dakota

Alexander F.H. Goetz, Director  
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*<sup>1</sup>  
· Distinguished Service Professor  
· Carnegie-Mellon University

· James F. Leonard, Chairman,<sup>2</sup> 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,<sup>3</sup> Senior Staff Consultant  
· Martin Marietta Energy Systems, Inc.

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

· Elisa D. Harris,<sup>4</sup> Senior Research Analyst  
" The Brookings Institution

· Geoffrey Kemp, Senior Associate  
· Carnegie Endowment for International  
Peace

· Joshua Lederberg,<sup>5</sup> 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,<sup>6</sup> 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<sup>7</sup>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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<sup>1</sup>Resigned March 22, 1993 to become Chief U.S.  
Negotiator for Safe and Secure Dismantle-  
ment of Nuclear Weapons.

<sup>2</sup>Panel member until June 1, 1993; Panel chair after  
June 1, 1993.

<sup>3</sup>Deceased January 16, 1994.

<sup>4</sup>Resigned January 29, 1993 to join National  
Security Council staff.

<sup>5</sup>Ex-officio; Member of Technology Assessment  
Advisory Council.

<sup>6</sup>Resigned August 13, 1993 to become Counselor  
for Nonproliferation in the U.S. Department  
of Energy

T E L E C O M M U N I C A T I O N   A N D  
C O M P U T I N G   T E C H N O L O G I E S  
P R O G R A M

➤ **ASSESSMENT OF INFORMATION**  
T E C H N O L O G Y   F O R   C O N T R O L   O F  
M O N E Y   L A U N D E R I N G

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**

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· 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  
Wisconsin 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  
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CERT Coordination Center  
Software Engineering Institute  
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Computer Science  
Director of Campus Networking  
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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, Missoula, MT

\_\_\_\_\_  
\*Deceased.

Laurel L Thomas, Director of Telecommunications Bloomsburg Telecommunications Consortium for Columbia, PA County and Region	: EDUCATION AND HUMAN RESOURCES PROGRAM : ► HUMAN GENOME PROJECT AND PATENTING DNA SEQUENCES
Marilyn B. Ward, Division Commander Communications Division and ComCenter Orlando Police Department	: : LeRoy Walters, <i>Chair</i> : Director, Center for Bioethics : Kennedy Institute of Ethics : Georgetown University
<b>Information Technology and the Health Care System Workshop on Consumer Issues</b>	: Charles Auffrey, Project Director Genethon, Evry, France
<b>Information Technology and the Health Care System Federal Agency Work- shop</b>	: David Botstein, Professor and Chairman : Department of Genetics : Stanford University Medical Center
<b>Information Security and Privacy in Network Environments Federal Agency Workshop</b>	Robert M. Cook-Deegan, Senior Program Officer : National Academy of Sciences
<b>Information Security and Privacy in Network Environments: Federal Context Workshop</b>	: Rebecca S. Eisenberg, Professor of Law : University of Michigan Law School : : James F. Haley, Jr., Partner : Fish & Neave :
<b>Information Security Privacy in Network Environments Workshop on Commercial, Industry, and Research Perspectives</b>	: Marilyn Hartig, Vice President : External Alliance and Technology : Bristol Myers Squibb :
<b>Workshop on Information Technologies for Analyzing Wire Transfers</b>	: Max D. Hensley, VP, Intellectual Property : Gilead Sciences, Inc. :
<b>Workshop on Privacy and Confidentiality in Payment Systems</b>	: Thomas D. Kiley, Consultant
<b>Workshop on Wire Transfer in Money Laundering</b>	William A. Linton, III, Director : Center for Education and Lifelong Learning KQED
<b>Workshop on the Social Security Administration's Automation Program</b>	: 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
<b>Workshop on Wireless Technologies and the National Information Infrastruc- ture</b>	

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

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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 Se-  
quences**

**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

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

► PREPARING FOR AN  
UNCERTAIN CLIMATE

Helen M. Ingram, Chairman  
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University of Arizona

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Vera Alexander, Dean  
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Michael J. Bean, Senior Attorney  
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Margaret Adela Davidson, Executive  
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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  
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Barbara Miller, Senior Civil Engineer  
Tennessee Valley Authority

Steve Peck, Director  
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Electric Power Research Institute

Herman Shugart Chairman  
Department of Environmental Sciences  
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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

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Virginia Lazenby O'Hara Professor of  
Biochemistry  
Department of Biochemistry  
University of Texas Southwestern Medical  
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Dean for Graduate Studies  
Institute of Environmental Health  
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The Johns Hopkins University School of  
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Gilbert Omenn, Dean  
School of Public Health and Community  
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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  
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. Malcom MacKinnon III, President  
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**Workshop on Technologies to Benefit  
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**Workshop on Risks to Students in School**

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# 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.

E S T A B L I S H M E N T O F T H E O F F I C E O F T E C H N O L O G Y A S S E S S M E N T

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 Technology Assessment 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 Office 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. identify 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. identify 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 consultation with 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 may be 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 title 5, United States Code.

T E C H N O L O G Y A S S E S S M E N T B O A R D

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 chairmanship 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 during 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 may be 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 may be 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 title 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 may be 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 section 5315 of title 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 may 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 3705 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 authorized 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 may 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 thereof 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)(1) 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)(1) 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 title 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)(1) 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 out 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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