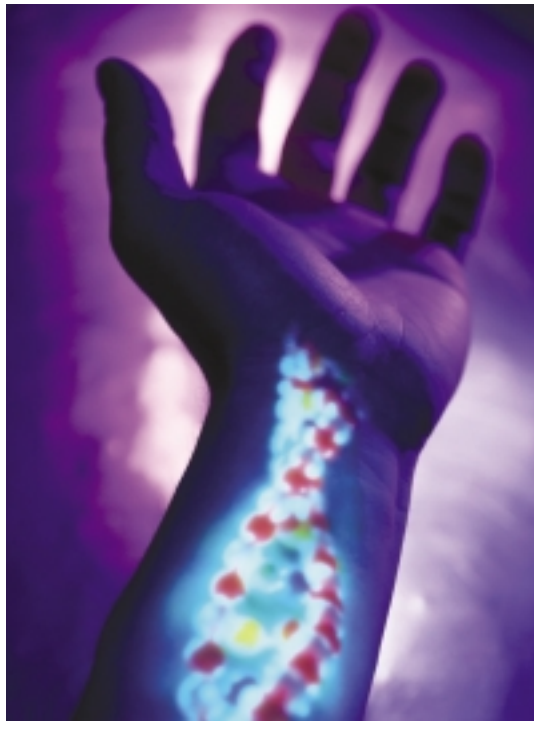
NATIONAL ACADEMY OF SCIENCES
NATIONAL ACADEMY OF ENGINEERING
INSTITUTE OF MEDICINE
NATIONAL RESEARCH COUNCIL

THE NATIONAL ACADEMIES
IN FOCUS

infocusmagazine.org



Minimizing Blast Effects on Buildings | Promise and Limits of Human Cloning Research
Exploring Disparities in Special and Gifted Ed | What Sparks Sudden Climate Change?

Spring 2002

Note from the editor: In *The National Academies In Focus,* we offer our readers broad coverage of the Academies' activities and expanded content, coupled with an updated, visually appealing design. We welcome your comments; e-mail us at <infocusmagazine@nas.edu>.

The National Academies In Focus (formerly *NewsReport*) is a magazine featuring activities of the National Academies, which serve as independent advisers to the federal government on scientific and technical questions of national importance. The National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine are self-perpetuating, honorific societies of distinguished scientists, engineers, and medical professionals. The National Research Council, along with the Institute of Medicine, brings the resources of the entire scientific and technical community to bear on national problems through its volunteer advisory committees. The Research Council is jointly administered by the National Academy of Sciences and National Academy of Engineering.

In Focus (ISSN 1534-8334) is published three times a year by the National Academies, 2101 Constitution Avenue N.W., Washington, D.C. 20418. Subscription (one year): $10; Canada and foreign, $12 (U.S. currency only). Subscription address: *In Focus,* P.O. Box 665, Holmes, PA 19043. Bulk-rate U.S. postage is paid at Washington, D.C. Back issues and back volumes can be ordered in microform from University Microfilms International, 300 North Zeeb Road, Ann Arbor, MI 48106.

Postmaster: Send address changes to
In Focus, P.O. Box 665, Holmes, PA 19043.

Credits:

Cover:	(clockwise from upper left) Shoring structures at Pentagon crash site, photo by Jocelyn Augustino/ Federal Emergency Management Agency; ©PhotoDisc; ©PhotoDisc; ©PhotoDisc;
Page 1:	(col.1, from top) ©PhotoDisc, damage of World Trade Center and adjoining buildings, photo by Andrea Booher/Federal Emergency Management Agency; (col. 2) ©PhotoDisc
Page 2:	(col. 1, from top) ©PhotoDisc; medical clinic in Bagram, Afghanistan, photo by J. Wilson Guthrie/U.S. Army Office of Public Affairs
Page 3:	Photo by Bachrach
Pages 4 & 5:	©Brand X Pictures
Page 6:	©PhotoDisc
Page 7:	Pentagon crash site, photo by Jocelyn Augustino/ Federal Emergency Management Agency
Page 8:	Reconstruction of Pentagon after Sept. 11 attack, photos by Jocelyn Augustino/Federal Emergency Management Agency
Page 9:	©Ford Motor Co. and Wieck Media Services Inc.
Page 10:	©PhotoDisc
Page 11:	Nuclear transplantation in stem cell research, ©James King-Holmes, Science Photo Library
Page 12:	©Digital Vision
Page 13:	©Artville
Page 14:	Flood damage, photos by David Teska (top) and Dave Saville (bottom)/Federal Emergency Management Agency
Page 15:	Space radar image of Missouri River, Glascow, Mo., courtesy NASA
Page 16:	Big Bend Dam on Missouri River, Fort Thompson, S.D., courtesy U.S. Army Corps of Engineers
Page 17:	Photo courtesy M. Carolina Hinestrosa
Page 18:	©Artville
Page 19:	©Pan American Health Organization
Page 20:	Photo courtesy Melissa Marino

THE NATIONAL ACADEMIES **IN FOCUS**
Volume 2 Number 1 infocusmagazine.org

CONTENTS

FEATURES

EDUCATION & RESEARCH

ENGINEERING & TECHNOLOGY

HEALTH, SAFETY, & SOCIAL ISSUES

ENVIRONMENT & RESOURCES

CONTENTS

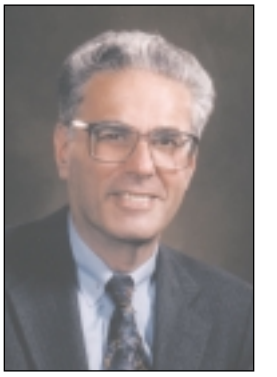
In Focus is prepared by the Office of News and Public Information.

Executive Director: William Skane
In Focus Editor: Valerie Chase
Assistant Editor: Sara Frueh
Staff Writers: Jennifer Burris, Bill Kearney, Vanee Vines,
Design: Francesca Moghari

THE NATIONAL ACADEMIES

Additional information about the institution and its work can be found online at <national-academies.org>.

Institute of Medicine Stands Ready to Face New Challenges in the 21st Century

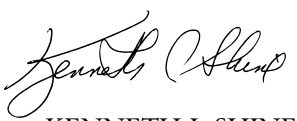


Kenneth I. Shine
IOM president from 1992 to 2002

Over the course of my tenure as president, I have had the opportunity to see the Institute of Medicine and its work grow substantially in reputation and impact. And as we move forward into the 21st century, the Institute will be faced with an additional important challenge — helping the government confront the dangers and aftermath of terrorism. The Institute of Medicine has joined with the National Academy of Sciences and the National Academy of Engineering in undertaking a series of activities related to counterterrorism, including several new projects dealing with vaccine development, public health, and bioterrorism. The Institute has a long history of activities that bear on terrorism, such as identifying new and emerging microbial threats and addressing problems in the public health infrastructure, both of which are essential to combat illness and disease, including threats from terrorism.

Also of importance to us is the continuing collaboration of physicians and scientists of many countries who are dedicated to improving health. While such interaction may not change the attitude of terrorists, it can substantially influence the environment in which they work by bolstering research and public health infrastructures and improving the health and economic status of poor countries. One such effort is the InterAcademy Medical Panel, which recently held the first international meeting of academies of medicine to discuss a health issue of worldwide concern. Thirty-nine countries were represented in a discussion of global strategies to combat infectious diseases and microbial resistance to antibiotics. The keynoter for this meeting was Nobel laureate Joshua Lederberg, who spoke on the international challenge of emerging infections and bioterrorism.

Public health is now recognized as an area of critical national security importance. The IOM stands poised to advise the government on issues such as vaccine safety, military and veterans' health, health care delivery and quality, uninsurance and its consequences, and biomedical research involving stem cells and cloning. Harvey V. Fineberg, former provost of Harvard University and dean of the Harvard School of Public Health, has been selected the next president of the Institute of Medicine. Fineberg combines a rich academic leadership experience with a continuing commitment to and involvement in the health of the public. He is an outstanding choice to lead the Institute in its mission to improve health for Americans and around the world.



KENNETH I. SHINE
President, Institute of Medicine

Time to Improve Tech Literacy

A New Approach to Technology Education

Although many education reformers and business leaders have promoted the idea that all Americans should be better prepared to navigate the sea of high technology, the issue of technological literacy remains stuck on a sandbar.

Most Americans know little about technology, yet from day to day they must make critical decisions regarding it, such as whether to buy genetically engineered foods or conduct banking transactions over the Internet. The situation creates a paradox, given the dominant role that technology plays in modern society. Moreover, the use of computers as a learning tool in the classroom often is confused with the broader concept of being technologically literate.

On the whole, technology is the modification of nature to meet human needs. However, most people still think of it only

in terms of tangible products, like computers and microwave ovens. But technology also comprises the knowledge and processes necessary to create and operate such products, and the infrastructure necessary to design, make, and repair them.

What is "technological literacy," then? It involves knowing something about the nature and history of technology, as well as having the capabilities and critical-thinking skills to consider its development and use. A new report from the National Academy of Engineering and National Research Council calls for a broad-based effort to place the issue of comprehensive technological literacy front and center on the nation's "home page," with the goal of increasing awareness and skills in this area among all segments of the population.

Boosting technological literacy would have numerous benefits, including helping to ensure that decisions made by citizens, business and government leaders, and others are well-reasoned, said the committee that wrote the report. Plus, a more technologically savvy population would be better prepared to enter today's high-tech workplace and would help bridge the "digital divide" — the gap between parts of the country and people who are plugged into technological innovations and services, and those who for various reasons are not.

Learning about technology should begin in kindergarten, and its connection with all subjects should be emphasized throughout a student's education, the report says. Technology content should be infused into curricula, teaching materials, and student assessments. And all educators should be better prepared to teach about the subject.

At the federal level, the National Science Foundation and U.S. Department of Education should encourage publishers to include technology content in new textbooks about science, social studies, and other topics. Likewise, agencies with a technological focus, such as NASA and the National Institutes of Health, should support the development of curricula for teachers of all subjects and grades, the committee said.

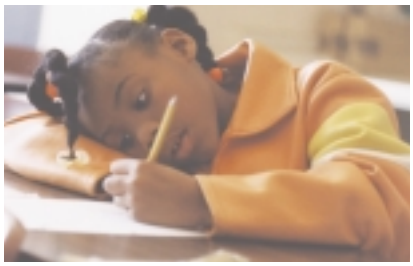
Action should not be limited to the classroom, however. The report urges government agencies and private foundations to support executive education programs designed to boost the technological literacy of leaders in the public and private sectors. And U.S. engineering societies should open their wallets to underwrite the costs of new government- and media-fellowship programs that would create a cadre of policy experts and journalists with a background in engineering. Participating fellows could play a role in public outreach efforts. Through creative exhibits and programs, museums as well as science and technology centers also can help the general public be better prepared to participate in discussions about technological issues. — *Vanee Vines*

Technically Speaking: Why All Americans Need to Know More About Technology. Committee on Technological Literacy, National Academy of Engineering and National Research Council (2002, 170 pp.; ISBN 0-309-08262-5; available from National Academy Press, tel. 1-800-624-6242; $19.95 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10250.html>).

The committee was chaired by **A. Thomas Young,** executive vice president, Lockheed Martin Corp. (retired), North Potomac, Md. The study was sponsored by the National Science Foundation and Battelle Memorial Institute.

Racial, Ethnic Disparities in Special and Gifted Education

At one time or another, parents may question whether local schools are up to the job of teaching their kids. But the concern can run deeper among minorities, whose children often attend schools that lack challenging curricula and well-trained teachers.



High-Quality Instruction and Early Intervention Are Key to Meeting Children's Needs

When school administrators tell some minority parents that their children may need special education, the alarm bells ring even louder. That's because since a federal law began requiring all schools to meet the learning needs of disabled students, disproportionately large numbers of children in some racial and ethnic groups have been identified with disability labels and placed in special ed programs. The labels are intended to identify those who need extra educational support, but identification also may bring lowered expectations from teachers and others.

Some minority children are indeed at greater risk of school failure and more likely to be considered for special services under the 1975 Individuals with Disabilities Education Act because their families lack economic or social resources. But the nature of classroom instruction and a school's environment also play a prominent role in influencing learning and behavior.

To make sure that minority students who are poorly prepared for school are not assigned to special education for that reason, educators should be required to first provide them with high-quality instruction and social support in a regular setting before determining whether special services are needed, says a new report from the National Research Council. States also should beef up training requirements for prospective and current teachers so they can better meet the needs of atypical learners.

The committee that wrote the report emphasized that its recommended approach should not delay services to schoolchildren whose needs are pronounced, or to students who arrive at school with a disability label.

To root out many students' school troubles, government officials should improve and expand early childhood services, the report adds. Because reading difficulties and behavior problems are two of the most common reasons that students are singled out for special education, states also should implement universal screening and intervention strategies in those areas.

At the same time, the report calls for rigorous research on identifying students who have special gifts and talents. Historically, disproportionately low numbers of African-Americans, Hispanics, and American Indians have been placed in K-12 gifted classes — the opposite of trends in special education.
— *Vanee Vines*

Minority Students in Special and Gifted Education. Committee on Representation of Minority Children in Special Education and Gifted Programs, Division of Behavioral and Social Sciences and Education (2002, approx. 350 pp.; ISBN 0-309-07439-8; available from National Academy Press, tel. 1-800-624-6242; $49.95 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10128.html>).

The committee was chaired by **Christopher T. Cross,** senior fellow, Center on Education Policy, Washington, D.C. The study was sponsored by the U.S. Department of Education.

A Blueprint for Saving Lives

Better Building Methods Can Make Terrorist Attacks Less Lethal

One campaign in the United States' war on terrorism may unfold not in halls of state or distant caves, but on the nation's drafting tables and construction sites.

A building's ability to withstand a blast can make a crucial difference in the number of lives saved in a terrorist attack. The fact that more people weren't killed in last fall's attack on the Pentagon, for example, has been widely credited to a recent renovation of the building segment where the airplane struck. Structurally reinforced walls resisted collapse long enough for many people to escape, and blast-resistant windows didn't shatter and cause additional injuries.

Research and testing on such building attributes and the effects of bomb blasts has been carried out by a defense department agency called the Defense Threat Reduction Agency (DTRA) since the mid-1990s. So far, the agency has applied its research largely to protecting buildings used for military purposes. But after September 11 no one would argue that these are the only structures vulnerable to attack. In a recent review of DTRA's blast-effects research program, a National Research Council committee urged the agency to step up efforts to share its research findings and building

innovations with the civilian design and building community.

The agency should reach out to civilian builders through both existing and new channels, the committee said. By developing and distributing assessment tools and design guides, DTRA can help architects and engineers evaluate a planned or existing building's risks and include features that could minimize damage. And the added costs of incorporating such features could be kept down by folding blast-resistant features into a strategy that protects against a variety of hazards, the committee suggested. Installing shatterproof windows or hardening masonry walls, for instance, can guard against earthquakes and extreme winds as well as human malevolence.

The collection of data — not just its distribution — should also be intensified, the committee said. Bombings can be considered

a double tragedy because medical and blast-effects information that could save lives in the future often go unrecorded in the chaos that follows an attack. The federal government should set up rapid-response teams to gather this data. Such information could help medical personnel, search-and-rescue teams, and builders prevent and respond to future attacks.

Could these "technology transfer" efforts pose security risks if information falls into the wrong hands? It's possible, the committee acknowledged; but the most sensitive data — such as the design specifications for particular buildings — could be kept confidential. The risk posed by keeping information out of the right hands, the report concludes, would be far greater.
— *Sara Frueh*

Protecting People and Buildings From Terrorism: Technology Transfer for Blast-Effects Mitigation. Committee for Oversight and Assessment of Blast-Effects and Related Research, Board on Infrastructure and the Constructed Environment, Division on Engineering and Physical Sciences (2001, 100 pp.; ISBN 0-309-08286-2; available from National Academy Press, tel. 1-800-624-6242; $28.00 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10230.html>).

The committee was chaired by **Mete A. Sozen,** Kettlehut Distinguished Professor of Civil Engineering, Purdue University, West Lafayette, Ind. The study was funded by the Defense Threat Reduction Agency.

ROLLOVER AND RATINGS

How Useful and Accurate Is the Current Five-Star System?

Purchasing a new car, pickup truck, or the increasingly popular sport utility vehicle involves a multitude of considerations, from the ticket price and passenger capacity of the vehicle to its gas mileage and safety on the road. But one factor that may pass under a consumer's radar when comparison shopping is a vehicle's risk for rolling over.

Each year more than 10,000 people are killed and another 27,000 are seriously injured in rollover crashes. These accidents account for nearly one-third of the nation's annual deaths in cars and light trucks, which include SUVs, minivans, and pickup trucks.

Responding to a surge in public concern, the federal government undertook the development of a rating system to determine a vehicle's risk of rollover. Last year, the National Highway Traffic Safety Administration created and implemented a five-star rating system as part of its New Car Assessment Program that would provide consumers with the rollover information they need to make sound purchasing decisions. For example, the lowest-rated vehicles, which receive a one-star rating, are considered at least four times more likely to roll over than the five-star-rated vehicles, if involved in a single-vehicle crash. The star ratings are based on a top-heaviness measurement known as the static stability factor, calculated mathematically using a vehicle's track width and center-of-gravity height.

But automobile manufacturers and some consumer groups questioned NHTSA's decision to use top-heaviness as the sole measurement to rate rollover risk, without also taking into account other performance factors such as how vehicles handle when they are in motion.

According to a new Research Council report, the static stability factor is a useful indicator of a vehicle's propensity to roll over, but the consumer information NHTSA developed is likely to be of limited practical use to the public. Two vehicles given the same star rating may have significantly different rollover tendencies. The report suggests a rating system with more categories or a numerical score that would better communicate rollover risk and make the system more effective in helping buyers make informed choices.

Also, dynamic tests based on actual driving performance to evaluate how the vehicle handles leading up to the crash should be included in the assessment of rollover risk. Some vehicles are equipped with electronic stability control systems that may help a driver avoid situations that could result in a rollover. In its report, the committee suggested that the NHTSA develop a system that uses the static stability factor and information from road tests to provide a more complete picture of rollover behavior. NHTSA is currently developing dynamic tests for rollover in response to legislation. — *Jennifer Burris*

An Assessment of the National Highway Traffic Safety Administration's Rating System for Rollover Resistance (TRB Special Report 265). Committee for the Study of a Motor Vehicle Rollover Rating System, Transportation Research Board (2002, approx. 120 pp.; available online from National Academy Press at <books.nap.edu/catalog/10308.html>).

The committee's chair is **David N. Wormley,** dean of the College of Engineering, Pennsylvania State University, University Park. The study was funded by the U.S. Department of Transportation.

Pursuing Promising Areas — and Setting Boundaries — in **Human Cloning** Research

Little wonder that controversy has surrounded the topic of human reproductive cloning. Such a prospect brings into stark relief questions about who we are, what we might become, and how we should use new scientific advances. It also raises ethical considerations about certain types of related research.

Elected officials, with input from all segments of society, will have to make the fundamental ethical and public policy choices concerning cloning. The scientific community's role is to provide a clear understanding of what science actually says about the safety and feasibility of technologies that might be used to clone humans, as well as the possible implications that a ban on human reproductive cloning might have on stem cell research. For this purpose, the National Academies convened a panel to probe the scientific and medical aspects of human reproductive cloning — with the hope that its report would provide useful input to decision-makers and the public.

After conducting a review of the relevant literature, the panel recommended that U.S.

policy-makers ban cloning aimed at creating a child because it would be dangerous for the woman, fetus, and newborn — and would most likely fail.

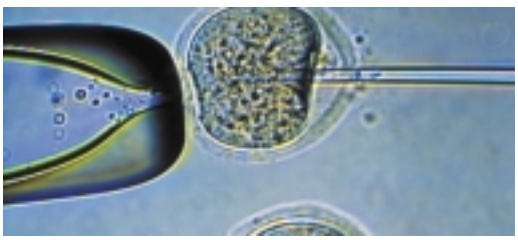
The need for a ban should be re-examined within five years, but it should be reconsidered only if a new scientific review indicates that the procedures are likely to be safe and successful, and if a broad national dialogue on societal, religious, and ethical issues suggests that reconsideration is warranted, the report says.

To date, sheep and five other mammalian species — cattle, pigs, goats, mice, and cats — have been cloned. The results of many of these experiments clearly illustrate the problems involved. Few cloning attempts are successful. Many clones die *in utero* — even at late stages — or soon after birth, and those that survive frequently have severe birth defects. Plus, female animals carrying cloned fetuses face serious risks, including the possibility of death. Human reproductive cloning is likely to have similar results, the panel concluded.

Human reproductive cloning is an assisted reproductive technology, which if successful would produce a newborn genetically identical to another person. The method used to initiate the procedure involves removing the nucleus of an egg cell and replacing it with the nucleus of a cell from an adult. The reconstructed egg is then stimulated to begin dividing, leading to the formation of a pre-implantation embryo — or "blastocyst" — made up of roughly 150 cells. If placed in a uterus, the blastocyst can implant and become a fetus, which may develop further and result in a newborn.

There is a related but different procedure, referred to as nuclear transplantation to produce stem cells. Unlike reproductive cloning, the aim of this procedure is to create embryonic stem cells only for clinical and research purposes and does not involve placing a blastocyst in a uterus.

The scientific and medical considerations that justify a ban on human reproductive cloning at this time do not apply



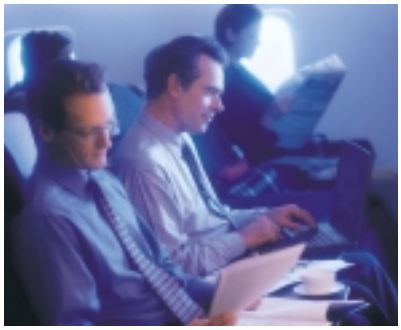
to stem cell research, the panel said. Stem cells are unspecialized cells that can renew themselves indefinitely and, under the right conditions, develop into more mature cells with specialized functions. They could be powerful tools for medical research and improved therapies for treating disease. Still, a wide-ranging national dialogue on the societal, religious, and ethical issues concerning this area of study also is needed. The panel hopes its work will inform these broader considerations by all segments of society. — *Vanee Vines*

Scientific and Medical Aspects of Human Reproductive Cloning. Panel on Scientific and Medical Aspects of Human Cloning; Committee on Science, Engineering, and Public Policy, Division on Policy and Global Affairs; Board on Life Sciences, Division on Earth and Life Studies (2002, 296 pp.; ISBN 0-309-07637-4; available from National Academy Press, tel. 1-800-624-6242; $35.00 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10285.html>).

The panel was chaired by **Irving L. Weissman,** Karel and Avice Beekhuis Professor of Cancer Biology, and professor of pathology and developmental biology, Stanford University, Stanford, Calif. The study was sponsored by the National Academies.

Can Air Travelers Breathe Easy?

A NEW LOOK AT AIR QUALITY ON PLANES



While poor air quality probably isn't the hazard foremost in Americans' minds as they board planes these days, it's been a concern for years. Many frequent fliers suspect that at one time or another they've caught a cold on a recent flight. Passengers have lodged complaints about dry eyes, dizziness, and a slew of other symptoms. And flight attendants have repeatedly questioned the safety of the air they spend their careers breathing.

The National Research Council recently examined the issue to see if such worries are warranted. What it found was a shortage of data, making it difficult to establish a relationship between poor air quality on planes and health complaints — a deficit the Federal Aviation Administration should remedy. But there is evidence that some people, particularly those with pre-existing medical conditions, face an increased risk of health problems when they fly.

High levels of ozone — a chemical that occurs naturally in the atmosphere — have been known to worsen respiratory problems such as asthma. Studies indicate that ozone levels on some flights may exceed FAA and Environmental Protection Agency standards, the committee said, calling on the FAA to ensure that its current regulation for ozone is met for all flights. Aircraft should be either equipped to prevent the chemical from entering the cabin, or prohibited from flying at altitudes where high ozone concentrations are likely to occur.

Low air pressure may pose risks as well. At cruising altitudes, air pressure in the atmosphere is inadequate to support human life, so the cabin is "pressurized" to a safe level. But cabin pressure may still be too low to provide sufficient oxygen for infants and certain adults, the committee said. FAA needs to examine whether its current standard can protect everyone onboard, the report says.

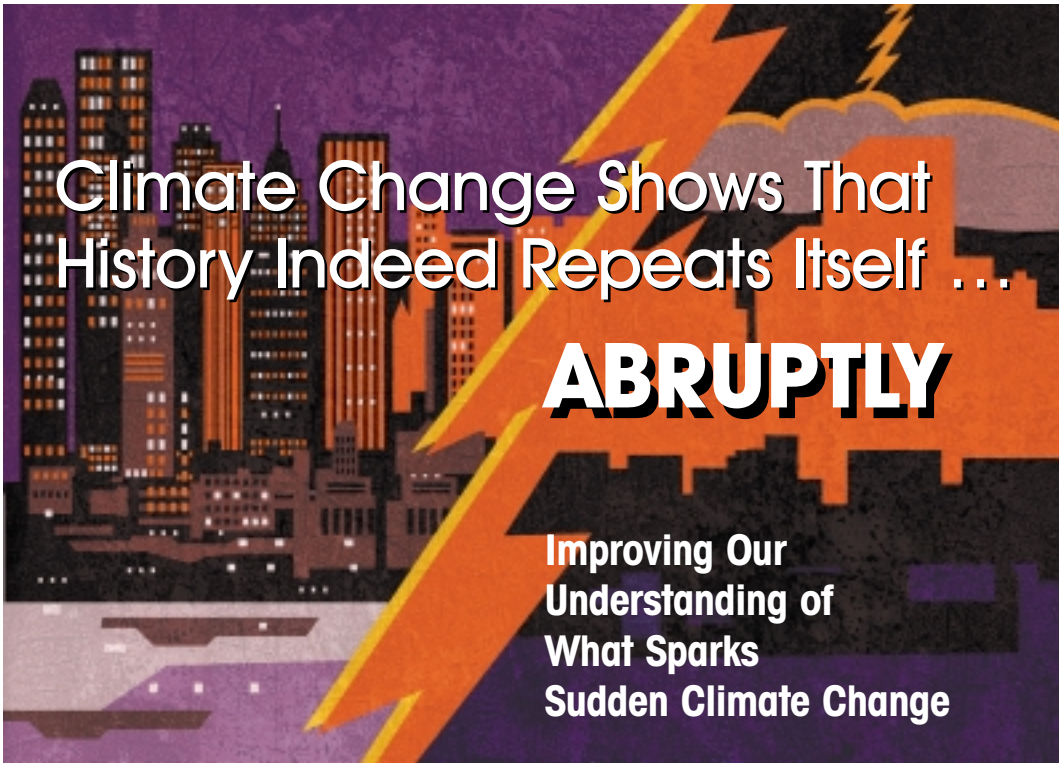
And what about those cold and flu cases that develop suspiciously soon after air travel? The airplane ventilation system doesn't appear to aid transmission of infectious diseases, the committee found; a large number of people sharing a relatively small space for an extended time does.

It is still unknown, however, whether the current standard for cabin ventilation — which requires only half the fresh air required for buildings — is adequate for passengers' comfort and well-being. In general, the report calls on FAA to conduct a rigorous scientific investigation to demonstrate that all of its air-quality standards are adequate to protect public health — and to revise any standards that aren't. It also should establish a surveillance program to keep a more watchful eye on cabin conditions and health complaints in the future.

— *Sara Frueh*

The Airliner Cabin Environment and the Health of Passengers and Crew. Board on Environmental Studies and Toxicology, Division on Earth and Life Studies (2002, 344 pp.; ISBN 0-309-08289-7; available from National Academy Press, tel. 1-800-624-6242; $37.00 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10238.html>).

The committee was chaired by **Morton Lippman,** professor, Nelson Institute of Environmental Medicine, New York University School of Medicine, Tuxedo. The study was funded by the Federal Aviation Administration.



Normal variability in the climate can cause odd weather patterns, such as the unusually warm temperatures felt across much of the northern United States this past winter. But what if, over the course of a few short years, typically frigid Boston suddenly seemed more like milder Atlanta in the winter months? That may not sound too bad to some folks in Boston, but they might feel differently, considering the possible repercussions.

Abrupt climate change is the subject of a recent National Research Council report that says the likelihood of sudden climate shifts needs to be studied more closely, especially given the current global warming trend. Scientists don't know enough to predict when abrupt changes will occur, but they know from the Earth's history that periods of gradual change, like now, were punctuated by episodes of severe floods and droughts and sudden changes in average temperatures — 18 degrees Fahrenheit in 10 years in some places.

The committee that wrote the report was chaired by Pennsylvania State University's Richard B. Alley, who has made several trips to Greenland and Antarctica, where he and his colleagues have drilled almost two miles deep into the ice to discover what the climate was like thousands of years ago. Past atmospheric conditions are

frozen in time, so to speak, in tiny gas bubbles trapped within each layer of ice.

The records in the ice cores show repeated instances of large and abrupt climate changes in the last 100,000 years. The most notable occurred when gradual warming at the end of the last ice age triggered an abrupt cooling period, which finished with an especially sudden warming about 12,000 years ago. Since then, less dramatic — though still abrupt — climate changes have occurred, including last century's rapid warming of the North Atlantic from 1920 to 1930 and the Dust Bowl drought of the 1930s.

When the climate is being forced to change — as is the case now with greenhouse gases that are warming the planet — it increases the number of mechanisms that can spark an abrupt change, the report says. To better understand these mechanisms, especially those that occur during warming trends, researchers need to improve computer models that simulate abrupt climate change. The ultimate goal should be to accurately forecast such events.

In the meantime, surprises are inevitable.

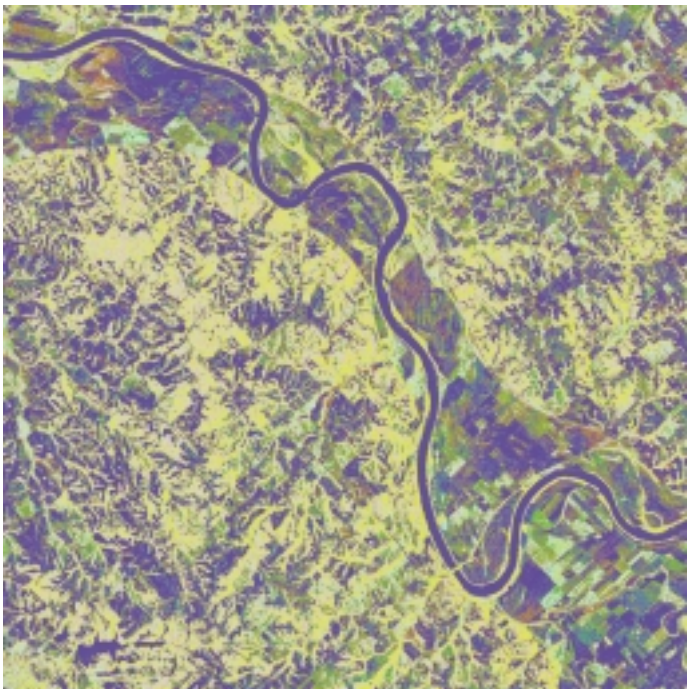
"There's no need to panic," says Alley, "since humans should be able to adapt to these climate changes, although poorer countries will have a harder time doing so."

But that is no reason for complacency either, the report says. Strategies should be pursued to reduce human and ecological vulnerabilities, including slowing down the pace of global warming. "Slowing down a little may help us a lot," says Alley. "An abrupt change is harder to deal with than a gradual one." — *Bill Kearney*

Abrupt Climate Change: Inevitable Surprises. Committee on Abrupt Climate Change: Implications for Science and Public Policy; Polar Research Board, Ocean Studies Board, and Board on Atmospheric Sciences and Climate; Division on Earth and Life Studies (2001, 244 pp.; ISBN 0-309-07434-7; available from National Academy Press, tel. 1-800-624-6242; $39.95 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10136.html>).

The study was chaired by **Richard B. Alley,** Evan Pugh Professor of Geosciences, and Associate of the Environment Institute, College of Earth and Mineral Sciences, Pennsylvania State University, University Park. The study was funded by the U.S. Global Change Research Program and the National Bureau of Economic Research Program on Environmental Economics, Yale University.

Bringing Back the **Big Muddy**



ECOLOGICAL RECOVERY CALLS FOR A NEW STRATEGY

The Missouri River is still America's longest river, but it used to be even longer. The "Big Muddy" that once meandered in nearly circular loops in places has been dammed, straightened, and channelized to the point that it is now about 200 miles shorter than it was when Lewis and Clark explored it at the beginning of the 19th century.

But the taming of the Missouri has cost it more than just miles, says a new report from the National Research Council. The ecosystem of the river and its floodplain have been severely degraded by human activities and will continue to deteriorate unless its natural water flow is significantly restored.

"The science tells us that the river basin is in a serious state of decline," said the U.S. Geological Survey's Steven Gloss, who chaired the committee that wrote the report. "Now we need to use that science to guide restoration efforts."

Lewis and Clark were the first to document the vast biological richness of the Missouri, returning from their epic expedition with descriptions of several new species, some of which are now in serious trouble. Two species of birds and one of

fish are listed as endangered by the federal government. Fifty-one more species of fish are considered rare, uncommon, or decreasing in numbers, and habitat and vegetation along the river continue to decline. The sediment flow that gave the

river its nickname and is crucial to any river's ecological well-being has been reduced by more than 100 million tons a year in some places.

Restoring natural water flow has jump-started ecological recovery in some smaller rivers across the country, and should be tried here using a scientific approach known as adaptive management, the report says. The approach allows decisions to be based on the latest scientific evidence as well as changing social and economic situations. This is especially important in the case of the Missouri, since river managers have been hamstrung by conflicts among environmental and tourist-industry groups, who want greater natural water flow for ecological and recreational reasons, and farmers, who worry that more water will cause damaging floods.

The U.S. Army Corps of Engineers is at the center of this controversy because it operates the six large dams that are the centerpiece of the Missouri River water storage system. For the past 14 years, the Corps has been trying to rewrite the manual that guides its water-release schedule, but has been unable to finish given the competing demands of stakeholders. The report calls for a halt to further revision of this manual until the changes reflect an adaptive management strategy, which should be implemented by a group of directors representing all stakeholder groups.

For all of this to work, Congress will need to intervene. It should pass a Missouri River Protection and Recovery Act to keep river managers focused on improving the ecosystem, the report says.

Congress also should authorize the Corps to set different water-release schedules for different parts of the river. The Corps has always released water to maintain a proper channel for barges carrying crops to port. But barge traffic has been dropping steadily since 1977, so there may be parts of the river — especially upstream — where the navigation benefits are small. — *Bill Kearney*

The Missouri River Ecosystem: Exploring the Prospects for Recovery. Committee on Missouri River Ecosystem Science, Water Science and Technology Board, Division on Earth and Life Studies (2002, approx. 250 pp.; ISBN 0-309-08314-1; available from National Academy Press, tel. 1-800-624-6242; $37.00 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10277.html>).

The committee was chaired by **Steven Gloss,** program manager, Biological Resources, Grand Canyon Monitoring and Research Center, U.S. Geological Survey, Flagstaff, Ariz. The study was funded by the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency.

BY MARIA CAROLINA HINESTROSA

It's Time to Improve Methods for ***Breast-Cancer Detection***

It has been more than seven years since I was first diagnosed with breast cancer at age 35. Since then, my life has changed in more ways than I could have imagined. I became an activist, founding a nonprofit advocacy organization for Latin American women with breast cancer. And I learned that I am by no means alone. Each year, more than 180,000 new cases of invasive breast cancer are diagnosed and more than 40,000 women die from it. Breast cancer is still a leading cause of cancer death in this country, and it's *the* leading cause of death for women ages 35 to 50.

I also learned a lot about what is needed to fight this disease. One of the most obvious areas for improvement is in breast-cancer detection. Since the 1970s, X-ray film mammography has been the main tool for breast-cancer screening. However, mammography has many limitations, so new technologies and tools to detect breast cancer are urgently needed. I served on a National Academies committee that examined several new and promising imaging and molecular biological technologies that may someday improve our ability to detect breast cancers at a curable stage. We found that more evaluation and development of these tools are required and warranted.

The federal government needs to develop a more systematic approach to evaluating these technologies. Clinical trials — designed with support and input from relevant federal agencies and breast-cancer advocates — are needed to assess screening tools. The National Cancer Institute should create a permanent infrastructure for testing new detection technologies and reassessing the effectiveness of established screening tools. It's also essential that women be able to participate in these studies. Private insurers should cover the costs of screening tests for women who participate in clinical trials but are not eligible for Medicare or Medicaid.

But before any real breakthroughs are possible, researchers need a better understanding of the basic biology of breast cancer. And even the best technologies will be of limited help unless women have greater access to them. The breast- and cervical-cancer screening program offered by the Centers for Disease Control and Prevention — which provides free screening mammography to uninsured, low-income women — reaches only 15 percent of eligible women. Congress should expand this program to reach at least 70 percent, and state legislatures should provide Medicaid funds for timely treatment of women diagnosed through this screening program.

There may never be a single technology that can detect all breast cancers. But taking these important steps will most certainly improve understanding of the disease — and save women's lives.

Maria Carolina Hinestrosa, co-founder and executive director of Nueva Vida, Support Network for Latinas with Cancer, Silver Spring, Md., served on the committee that produced the report *Mammography and Beyond: Developing Technologies for the Early Detection of Breast Cancer.*

This article was adapted from a piece distributed by the National Academies Op-Ed Service. Visit the Service's Web site at <national-academies.org/op-ed> for a comprehensive collection of authoritative commentary on issues involving science, technology, and medicine.

What to Do With Russia's Nuclear Waste?

Keeping nuclear material in the former Soviet Union out of the hands of terrorists has taken on renewed importance since Sept. 11. But even before that fateful day's terrorist attacks, the National Research Council had teamed up with the Russian Academy of Sciences to look for ways to secure that country's nuclear waste. A committee of five Americans and five Russians has been formed to

identify storage and disposal options that not only will prevent nuclear proliferation, but also protect the environment and human health.

As a first step, the committee will take an inventory of how much nuclear waste there is in Russia, since past counts have been inconsistent. Large amounts of spent nuclear fuel and high-level radioactive waste are scattered at dozens of sites across Russia. Some of it, especially highly enriched uranium from decommissioned nuclear submarines, could be used by terrorists to build weapons of mass destruction.

The United States is in the process of immobilizing its liquid waste in glass logs that will be stored at government nuclear facilities until a permanent geological repository, such as the one proposed for Yucca Mountain, Nev., is available to accept them and the nation's spent nuclear fuel. Russia too hopes to dispose of its waste in geological repositories; however, its plans for safe and secure interim storage are not as far along as those of the United States. The committee will consider how American storage and disposal options may be applied in Russia.

The committee met this spring in Russia. While there, some members visited the infamous Mayak site in the Ural Mountains, where radioactive waste deposited in a lake has caused severe environmental contamination. A final report, in both English and Russian, is expected to be released this summer.

Meanwhile, the presidents of the U.S. National Academies and Russian Academy of Sciences issued a joint statement in February calling for greater collaboration between their two countries in preventing nuclear proliferation. They agreed to recommend to their respective governments immediate steps that should be taken to increase cooperation in this area.

— Bill Kearney

(See listing on page 22.)

A Global Campaign to Improve Human Health

HIV and AIDS, tuberculosis, and malaria claimed the lives of nearly 6 million people last year. In developing nations, diminished health from these and other infectious diseases is one of the key reasons why the poor remain impoverished, according to the World Health Organization. But with the explosion in medical knowledge and advances in health care technology in recent decades, it is possible to prevent many deaths and reduce suffering. Political will and social support often are the linchpins.

At its first meeting, the InterAcademy Medical Panel gathered in March in Paris to discuss global strategies to combat infectious diseases as well as microbial resistance to antibiotics — a phenomenon that presents a formidable challenge to the health care and research communities. The panel, established two years ago in conjunction with the World Conference of Scientific Academies held in Tokyo, is a voluntary association of the world's medical academies and medical divisions of science academies. Its role in fighting communicable disease was a key theme at the meeting, which marked the first time that representatives from such academies gathered in one place to focus on a health issue of global importance. Joshua Lederberg, an American geneticist and microbiologist who received the 1958 Nobel Prize for his work in bacterial genetics, offered the keynote address on the international challenge of emerging infections. Other discussions centered on terrorist attacks that involve biological or chemical assaults — a problem for which many countries have had to increase levels of national preparedness.

Using scientific know-how to improve health conditions worldwide, particularly in poor nations, is one of the panel's primary goals. It also aims to boost understanding of health issues and provide independent scientific advice on health policy to national governments and global organizations. Academies from nearly 40 countries on six continents are involved in the effort. Additional information is available on the U.S. National Academies' Web site at <national-academies.org/iamp>.

— *Vanee Vines*

(See listing on page 22.)

BY MELISSA MARINO

A Misfit Scientist

Goes to Washington

Melissa Marino is a doctoral candidate in biomedical science, specializing in neuroscience, at the University of South Carolina School of Medicine. She earned her bachelor's degree in medical technology and previously worked as a clinical microbiology technologist at the Palmetto Baptist Medical Center in Columbia, S.C.

Like most students starting science doctoral programs, I began mine expecting to follow the usual path to a career in scientific research — earn my Ph.D., do a postdoc fellowship or two, maybe move on to a temporary research position, and, if I'm extremely lucky, a tenure-track position. That's what scientists do, right? After some self-assessment and a few years at the research bench, though, I started to realize that a slowly progressing, narrowly focused academic research position might not be in the cards for me. My scientific interests are broad and ever-changing — not characteristics normally associated with success in an intensive research career.

I found myself spending hours scouring science job ads, reading books and articles about alternative careers, and searching the Web exhaustively for something a little different from research. For this I received some rather negative reactions, not only from some of the faculty, but also, somewhat surprisingly, from some of my fellow graduate students. It made me think that I was crazy to be contemplating anything other than a research career. Should I just go with the academic flow, continuing down the path that so many have taken before me?

What I truly preferred was reading and writing about science rather than actually doing science. I daydreamed about a career that didn't involve microscopes, animal colonies, or behavioral testing. So with support from the few open-minded faculty members and close friends, I decided to pursue my interests. For me, this meant (yikes!) an internship.

At my age and this stage in my graduate career — beginning my fourth year in a Ph.D. program — temporarily leaving my home and husband and putting my research on hold for several months just seemed like the last thing I should do. But since these opportunities don't come along every day, I decided to take the chance. So, it was off to the National Academies in Washington, D.C., to carry out the kind of research that many graduate students neglect — researching my career options as a scientist.

The National Academies seemed like a good place to begin my foray into the mysterious world of nonacademic careers. The Academies offer a formal science-policy internship program for graduate students and postdoctoral-level scientists — the Christine Mirzayan Internship Program. Interns are assigned to work throughout the institution, depending on their interests. The Academies have boards that cover every subject imaginable, from physical sciences and technology to social sciences and medicine. It was not hard to find something related to my research, but, for me, this experience was about trying something entirely new — an opportunity that I would never have in my normal graduate school experience. Because my love of science and writing seemed appropriate to the business of science communications, I spent my summer in the Academies' Office of News and Public Information.

There are many young scientists, just like me, searching for something rewarding to do outside the traditional academic realm.

Well, I wanted to write, and write I did — among many other things. I put together a comprehensive article on radioactive waste and selected and wrote several news briefs for the Academies' Web site. The majority of my time was spent writing news items on articles in the *Proceedings of the National Academy of Sciences* and tracking articles in the journal that would be of particular interest to the press. I read and wrote about mathematics, ecology, medicine, biochemistry, psychology, science policy, and more — a range of topics that I would never have had time to explore during a regular semester in graduate school. The work I did got me started in science writing, and, as a result, I'm now a freelance science writer. Helping to communicate the latest scientific research to the media to facilitate public understanding of science has been more rewarding to me than any amount of time I could spend at the research bench.

Having said that, one of the most valuable things I learned that summer was that I am not alone. There are many young scientists, just like me, searching for something rewarding to do outside the traditional academic realm — a way to use their science background in innovative ways to affect the world around them. And they are not "flunkies" or "slackers" who can't cut it in the research arena — they are at the top of their classes in the finest academic institutions in the country and the world. The experience validated my belief that a scientist can do great things outside the laboratory, and it encouraged me to continue to pursue these interests, knowing that there is a place for scientists like me. Maybe I'm not such a misfit after all!

Find out more about the Christine Mirzayan Internship Program at <national-academies.org/internship>. This article was adapted from one that appeared last November on *Science's* Next Wave at <nextwave.sciencemag.org>, a career development resource for scientists published by the American Association for the Advancement of Science (©AAAS).

Projects

The following projects have been undertaken by units of the National Academies. The latest information about all current committee activities — including project descriptions, committee rosters, and meeting information — is now available in "Current Projects" on the National Academies' Web site.

Communicating Occupational Safety and Health Information to Spanish-Speaking Workers. Board on Earth Sciences and Resources, Division on Earth and Life Studies. Project director: Tammy Dickinson. Chair: Susan C. Scrimshaw, dean, School of Public Health, University of Illinois, Chicago. Sponsor: National Institute for Occupational Safety and Health.

End Points for Spent Nuclear Fuel and High-Level Radioactive Waste in Russia. Board on Radioactive Waste Management, Division on Earth and Life Studies; and Office for Central Europe and Eurasia, Division on Policy and Global Affairs. Project director: Micah Lowenthal. Co-chairs: John F. Ahearne, director, Ethics Program, Sigma Xi Center, Sigma Xi, The Scientific Research Society, Research Triangle Park, N.C.; and Nikolay P. Laverov, vice president, Russian Academy of Sciences, Moscow. Sponsors: U.S. Department of Energy with additional support from the Russian Ministry of Atomic Energy and Russian Academy of Sciences. (See p. 18 in this issue of *In Focus*.)

InterAcademy Medical Panel. ***North America:*** National Academy of Medicine of Mexico; Institute of Medicine, U.S. National Academies. ***Latin America and the Caribbean:*** Academia Nacional de Medicina de Buenos Aires, Argentina; National Academy of Sciences of Bolivia and Academia Boliviana de Medicina; National Academy of Medicine of Columbia; Academy of Sciences of Cuba; Caribbean Academy of Sciences, Trinidad. ***East Asia, South Asia, and the Pacific:*** Australian Academy of Science; Chinese Academy of Engineering; Indian National Science Academy; Science Council of Japan; National Academy of Sciences, Republic of Korea; Academy of Sciences Malaysia; Mongolian Academy of Sciences. ***Europe and Central Asia:*** Croatian Academy of Sciences and Arts and Croatian Academy of Medical Sciences; Academy of Sciences of the Czech Republic; French National Academy of Medicine and French Academy of Sciences; Academy of Athens, Greece; Accademia Nazionale dei Lincei, Italy; Latvian Academy of Science; Lithuanian Academy of Sciences; Royal Netherlands Academy of Arts and Sciences; Norwegian Academy of Science and Letters; Russian Academy of Medical Sciences; Slovak Postgraduate Academy of Medicine and Slovak Academy of Science Institute of Virology; Slovenian Academy of Sciences and Arts; Royal Swedish Academy of Sciences; Swiss Academy of Medical Sciences; Turkish Academy of Sciences; Academy of Medical Sciences, United Kingdom. ***Africa and the Middle East:*** Academy of Scientific Research and Technology, Egypt; Israel Academy of Sciences and Humanities; African Academy of Sciences, Kenya; University of Malawi; Senegalese Academy of Sciences; Academy of Science of South Africa. (See p. 19 in this issue of *In Focus*.)

Toward Improved International Labor Standards: Data, Monitoring, and Compliance. Center for Education, Division of Behavioral and Social Sciences and Education. Project director: Nevzer Stacey. Chair: Theodore H. Moran, Marcus Wallenberg Chair, Walsh School of Foreign Service, Georgetown University, Washington, D.C. Sponsor: Bureau of International Labor Affairs, U.S. Department of Labor.

Publications

For documents shown as available from National Academy Press (NAP), write to 2101 Constitution Avenue N.W., Washington, D.C. 20418; telephone (202) 334-3313 or 1-800-624-6242; or order on the Internet at <www.nap.edu>. Documents from a specific unit of the National Academies are available from the source as noted. Prices and availability of all documents are subject to change. Charges listed are for single copies; discounts are available for bulk orders.

The Age of Expert Testimony: Science in the Courtroom — Report of a Workshop
Science, Technology, and Law Panel, Division on Policy and Global Affairs (2002, 68 pp.; ISBN 0-309-08310-9; available from NAP, $12.00 plus $4.50 shipping).

The Anthrax Vaccine: Is it Safe? Does it Work?
Medical Follow-up Agency, Institute of Medicine (2002, 288 pp.; ISBN 0-309-08309-5; available from NAP, $37.00 plus $4.50 shipping).

Astronomy and Astrophysics in the New Millennium — Panel Reports
Board on Physics and Astronomy and Space Studies Board, Division on Engineering and Physical Sciences (2002, 400 pp.; ISBN 0-309-07037-6; available from NAP, $49.00 plus $4.50 shipping).

At What Price? Conceptualizing and Measuring Cost-of-Living and Price Indexes
Committee on National Statistics, Division of Behavioral and Social Sciences and Education (2002, 352 pp.; ISBN 0-309-07442-8; available from NAP, $49.95 plus $4.50 shipping).

Biological Threats and Terrorism: Assessing the Science and Response Capabilities — Workshop Summary
Board on Global Health, Institute of Medicine (2002, 315 pp.; ISBN 0-309-08253-6; available from NAP, $42.00 plus $4.50 shipping).

Broadband: Bringing Home the Bits
Computer Science and Telecommunications Board, Division on Engineering and Physical Sciences (2001, 336 pp.; ISBN 0-309-08273-0; available from NAP, $34.95 plus $4.50 shipping).

Caffeine for the Sustainment of Mental Task Performance: Formulations for Military Operations
Committee on Military Nutrition Research, Food and Nutrition Board, Institute of Medicine (2001, 157 pp.; ISBN 0-309-08258-7; available from NAP, $39.00 plus $4.50 shipping).

Capitalizing on New Needs and New Opportunities: Government-Industry Partnerships in Biotechnology and Information Technologies
Board on Science, Technology, and Economic Policy, Division on Policy and Global Affairs (2001, 360 pp.; ISBN 0-309-08257-9; available from NAP, $68.75 plus $4.50 shipping).

Choosing the Right Formula — Initial Report
Committee on National Statistics, Division of Behavioral and Social Sciences and Education (2001, 102 pp.; ISBN 0-309-07580-7; available from NAP, $25.00 plus $4.50 shipping).

Commercial Supersonic Technology: The Way Ahead
Aeronautics and Space Engineering Board, Division on Engineering and Physical Sciences (2001, 52 pp.; ISBN 0-309-08277-3; $18.00 plus $4.50 shipping).

Community and Quality of Life: Data Needs for Informed Decision Making
Board on Earth Sciences and Resources, Division on Earth and Life Studies (2002, 200 pp.; ISBN 0-309-08260-9; available from NAP, $39.95 plus $4.50 shipping).

Community Programs to Promote Youth Development
Board on Children, Youth, and Families, National Research Council and Institute of Medicine (2002, 432 pp.; ISBN 0-309-07275-1; available from NAP, $49.95 plus $4.50 shipping).

Cybersecurity Today and Tomorrow: Pay Now or Pay Later
Computer Science and Telecommunications Board, Division on Engineering and Physical Sciences (2002, 50 pp.; ISBN 0-309-08312-5; available from NAP, $12.00 plus 4.50 shipping).

Disability Determination for Mental Retardation
Board on Behavioral, Cognitive, and Sensory Sciences, Division of Behavioral and Social Sciences and Education (2002, approx. 240 pp.; ISBN 0-309-08323-0; available from NAP, $37.00 plus $4.50 shipping).

The Disposition Dilemma: Controlling the Release of Solid Materials from Nuclear Regulatory Commission-Licensed Facilities
Board on Energy and Environmental Systems, Division on Engineering and Physical Sciences (2002, approx. 220 pp.; ISBN 0-309-08417-2; available from NAP, $45.00 plus $4.50 shipping).

The Drama of the Commons
Committee on the Human Dimensions of Global Change, Division of Behavioral and Social Sciences and Education (2002, 521 pp.; ISBN 0-309-08250-1; available from NAP, $25.00 plus $4.50 shipping).

Effects of Trawling and Dredging on Seafloor Habitat
Ocean Studies Board, Division on Earth and Life Studies (2002, approx. 183 pp.; ISBN 0-309-08340-0, available from NAP, $39.00 plus $4.50 shipping).

Environmental Effects of Transgenic Plants: The Scope and Adequacy of Regulation
Board on Agriculture and Natural Resources, Division on Earth and Life Studies (2002, 320 pp.; ISBN 0-309-08263-3; available from NAP, $49.95 plus $4.50 shipping).

Equipping Tomorrow's Military Force: Integration of Commercial and Military Manufacturing in 2010 and Beyond
Board on Manufacturing and Engineering Design, Division on Engineering and Physical Sciences (2002, 86 pp.; ISBN 0-309-08316-8; available from NAP, $18.00 plus $4.50 shipping).

Food Chemicals Codex: Third Supplement to the Fourth Edition
Food and Nutrition Board, Institute of Medicine (2001, 140 pp.; ISBN 0-309-07430-4; available from NAP, $39.95 plus $4.50 shipping).

From Scarcity to Visibility: Gender Differences in the Careers of Doctoral Scientists and Engineers
Committee on Women in Science and Engineering, Office of Scientific and Engineering Personnel, Division on Policy and Global Affairs (2001, 311 pp.; ISBN 0-309-05580-6; available from NAP, $45.00 plus $4.50 shipping).

Future R&D Environments: A Report for the National Institute of Standards and Technology
Division on Engineering and Physical Sciences (2002, 218 pp.; ISBN 0-309-08336-2; available from NAP, $47.00 plus $4.50 shipping).

Genetic Status of Atlantic Salmon in Maine — Interim Report
Board on Environmental Studies and Toxicology and Ocean Studies Board, Division on Earth and Life Studies (2002, 76 pp.; ISBN 0-309-08311-7; available from NAP, $18.00 plus $4.50 shipping).

Global Networks and Local Values: A Comparative Look at Germany and the United States
Computer Science and Telecommunications Board, Division on Engineering and Physical Sciences (2001, 260 pp.; ISBN 0-309-07310-3; available from NAP, $30.00 plus $4.50 shipping).

Immunization Safety Review: Multiple Immunizations and Immune Dysfunction
Board on Health Promotion and Disease Prevention, Institute of Medicine (2002, approx. 119 pp.; ISBN 0-309-08328-1; available from NAP, $18.00 plus $4.50 shipping).

Improving Mathematics Education: Resources for Decision Making
Mathematical Sciences Education Board, Center for Education, Division of Behavioral and Social Sciences and Education (2001, 49 pp.; ISBN 0-309-08300-1; available from NAP, $18.00 plus $4.50 shipping).

Interim Report #6 on Spacecraft Water Exposure Guidelines
Committee on Toxicology, Board on Environmental Studies and Toxicology, Division on Earth and Life Studies (2002, 28 pp.; available only online at <www.nap.edu>).

Learning and Understanding: Improving Advanced Study of Mathematics and Science in U.S. High Schools
Center for Education, Division of Behavioral and Social Sciences and Education (2002, approx. 300 pp.; ISBN 0-309-07440-1; available from NAP, $34.95 plus $4.50 shipping).

Letter Report from the Committee on Youth Population and Military Recruitment
Division of Behavioral and Social Sciences and Education (2002, 10 pp.; available only online at <www.nap.edu>).

Measuring and Sustaining the New Economy — Report of a Workshop
Board on Science, Technology, and Economic Policy, Division on Policy and Global Affairs (2002, 268 pp.; ISBN 0-309-08298-6; available from NAP, $53.25 plus $4.50 shipping).

Measuring Housing Discrimination in a National Study — Report of a Workshop
Committee on National Statistics, Division of Behavioral and Social Sciences and Education (2002, 77 pp.; ISBN 0-309-08325-7; available from NAP, $18.00 plus $4.50 shipping).

The Mission of Microgravity and Physical Sciences Research at NASA
Space Studies Board, Division on Engineering and Physical Sciences (2001, 21 pp.; copies available free from the board, tel. 202-334-3477 or e-mail <ssb@nas.edu>).

Opportunities to Improve the U.S. Geological Survey National Water Quality Assessment Program
Water Science and Technology Board, Division on Earth and Life Studies (2002, 252 pp.; ISBN 0-309-08305-2; available from NAP, $34.00 plus $4.50 shipping).

Predicting Invasions of Nonindigenous Plants and Plant Pests
Board on Agriculture and Natural Resources, Division on Earth and Life Studies (2002, approx. 198 pp.; ISBN 0-309-08264-1; available from NAP, $39.95 plus $4.50 shipping).

Principles and Operational Strategies for Staged Repository Systems — Progress Report
Board on Radioactive Waste Management, Division on Earth and Life Studies (2002, 22 pp., available only online at <www.nap.edu >).

Progress in Improving Project Management at the Department of Energy — 2001 Assessment
Board on Infrastructure and the Constructed Environment, Division on Engineering and Physical Sciences (2001, 140 pp., ISBN 0-309-08280-3; available from NAP, $31.50 plus $4.50 shipping).

Review of a Research Protocol Prepared by the University of Utah — Letter Report
Board on Radiation Effects Research, Division on Earth and Life Studies (2002, 20 pp.; available only online at <www.nap.edu>).

A Review of the Florida Keys Carrying Capacity Study
Ocean Studies Board and Water Science and Technology Board, Division on Earth and Life Studies (2002, approx. 169 pp., ISBN 0-309-08346-X; available from NAP, $27.00 plus $4.50 shipping).

The Right Thing to Do, The Smart Thing to Do: Enhancing Diversity in the Health Professions — Summary of the Symposium on Diversity in Health Professions in Honor of Herbert W. Nickens, M.D.
Institute of Medicine (2001, 376 pp.; ISBN 0-309-07614-5; available from NAP, $44.00 plus $4.50 shipping).

Scientific Evaluation of Biological Opinions on Endangered and Threatened Fishes in the Klamath River Basin — Interim Report
Board on Environmental Studies and Toxicology, Division on Earth and Life Studies (2002, approx. 38 pp.; ISBN 0-309-08324-9; available from NAP, $12.00 plus $4.50 shipping).

Setting the Course: A Strategic Vision for Immunization Finance, Part 1: Summary of the Chicago Workshop
Division of Health Care Services, Institute of Medicine (2002, 60 pp.; ISBN 0-309-08307-9; available from NAP, $18.00 plus $4.50 shipping).

Signs of Life: A Report Based on the April 2000 Workshop on Life Detection Techniques
Committee on the Origins and Evolution of Life, Space Studies Board, Division on Engineering and Physical Sciences; and Board on Life Sciences, Division on Earth and Life Studies (2002, approx. 74 pp.; ISBN 0-309-08306-0; copies available free from the Space Studies Board, tel. 202-334-3477 or e-mail <ssb@nas.edu>).

Spills of Emulsified Fuels: Risks and Responses
Ocean Studies Board, Division on Earth and Life Studies, and Marine Board, Transportation Research Board (2002, 118 pp.; ISBN 0-309-08301-X; available from NAP, $27.75 plus $4.50 shipping).

Technology and Assessment: Thinking Ahead — Proceedings from a Workshop
Board on Testing and Assessment, Center for Education, Division of Behavioral and Social Sciences and Education (2002, 104 pp.; ISBN 0-309-08320-6; available from NAP, $27.00 plus $4.50 shipping).

Technology and Economic Analysis in the Prepublication Version of the Report *Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards* — Letter Report
Division on Engineering and Physical Sciences (2002, 43 pp.; available only online at <www.nap.edu>).

Transfer of Pollution Prevention Technologies
Board on Manufacturing and Engineering Design, Division on Engineering and Physical Sciences (2002, approx. 64 pp.; ISBN 0-309-08402-4; available from NAP, $18.00 plus $4.50 shipping).

Transforming Remote Sensing Data into Information and Applications
Space Studies Board, Division on Engineering and Physical Sciences; and Ocean Studies Board, Division on Earth and Life Studies (2001, 90 pp.; ISBN 0-309-09271-4; copies available free from the board, tel. 202-334-3477 or e-mail <ssb@nas.edu>).

Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care
Board on Health Sciences Policy, Institute of Medicine (2002, approx. 598 pp.; ISBN 0-309-08265-X; available from NAP, $44.95 plus $4.50 shipping).

Update on NRC Recommendations for a Modified Baseline Process at Pueblo Chemical Depot — Letter Report
Board on Army Science and Technology, Division on Engineering and Physical Sciences (2002, 7 pp.; available only online at <www.nap.edu>).

Update on the Engineering Design Studies Evaluated in the NRC Report *Analysis of Engineering Design Studies for Demilitarization of Assembled Chemical Weapons at Pueblo Chemical Depot* — Letter Report
Board on Army Science and Technology, Division on Engineering and Physical Sciences (2002, 9 pp.; available only online at <www.nap.edu>).

Veterans and Agent Orange: Herbicide/Dioxin Exposure and Acute Myelogenous Leukemia in the Children of Vietnam Veterans
Board on Health Promotion and Disease Prevention, Institute of Medicine (2002, 42 pp.; ISBN 0-309-08338-9; available from NAP, $12.00 plus $4.50 shipping).

Visual Impairments: Determining Eligibility for Social Security Benefits
Board on Behavioral, Cognitive, and Sensory Sciences, Division of Behavioral and Social Sciences and Education (2002, approx. 212 pp.; ISBN 0-309-08348-6; available from NAP, $35.00 plus $4.50 shipping).

INFOCUS
P.O. Box 665
Holmes, PA 19043