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Summer/Fall 2002

THE NATIONAL ACADEMIES

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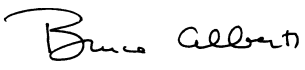
THE NATIONAL ACADEMIES

Science and Technology Are Essentials That No Nation Can Afford to Ignore

The scientific community can and must contribute — through vigorous scientist-to-scientist and institution-to-institution interactions — to creating a healthier and more sustainable world. Scientists can provide a voice for rationality and moderation in political affairs. They also can easily build strong bridges of understanding between cultures through collaborations in science, technology, health, agriculture, education, human rights, and sustainable economic development.

For precisely these reasons, the National Academies have worked for many years to help scientists from different countries collaborate. Experience has demonstrated that when we carry out joint studies with other academies from developing countries, we not only provide valuable information for decision-makers, we also play a significant role in building their future capacity for policy work. For example, our joint project on the Mexico City water supply stimulated that country's establishment of its own national research council, modeled after the National Research Council that is part of the U.S. National Academies. A second Academies study, *Water for the Future: The West Bank and Gaza Strip, Israel, and Jordan,* successfully generated new scientific and technological connections between countries historically marked by conflict; it also produced a more cooperative and holistic way to deal with limited water resources in the area. And another joint study, *Cooperation in the Energy Futures of China and the United States,* stimulated an institutional cooperation between the Chinese Academies of Sciences and Engineering that will benefit their future policy work in China.

Some mistakenly believe that science is a luxury that developing nations cannot afford. Just the opposite is true. No nation can afford to be without its own cadre of scientists and engineers, with the expertise appropriate for its particular needs. For example, even the poorest nations will benefit from the contributions that such individuals can make to health, environment, agriculture, and economic development. Consider the tragic situation today in Zambia, where the government is preventing famine-starved people from eating donations of U.S. corn that was genetically engineered to produce Bt toxin, a natural insecticide. Examples such as these should make it obvious that science advice must be generated internally, if it is to be effective for wise decision-making. And only local scientists can harness the world's huge and growing store of scientific and technical knowledge to meet local opportunities and challenges, while generating new knowledge based on wisdom from their own societies.



BRUCE ALBERTS
President, National Academy of Sciences

Surveying the Landscape of Opportunity

When it comes to real estate sales, it's been said that what matters most in negotiating the best deal is "location, location, location." Likewise, where people live can significantly shape the quality and breadth of resources available to them — from educational, employment, and public safety offerings to the availability of hospitals and parks.

Many factors contribute to social and economic disparities between neighborhoods. As a result, the location of one's residence can either put up barriers to resources or open doors to them. Neighborhoods also can influence the well-being of individuals and families. For example, inner-city communities that are marked by deep poverty often have characteristics that can degrade the quality of life for residents of these areas. Rates of crime, illness, and chronic disease tend to be high. Student achievement is generally low, and strong community groups that supervise children's behavior are scarce. Inadequate public transportation makes it difficult for poor inner-city residents to take advantage of jobs in the suburbs, where much of today's

employment growth occurs. Further, the physical environment suffers as abandoned buildings become havens for illicit activities. Clearly, location matters.

The social dynamics of metropolitan neighborhoods is an important research area that should be further studied to help policy-makers better understand fundamental problems, and work to build stronger neighborhoods, says a new National Research Council report that presents the findings of a workshop on the topic. Experts at the meeting explored how place and neighborhood relate to opportunity on several key fronts: employment and the transition from welfare to work; public health; and child development. They also considered research that could inform public policy. The Research Council held the workshop to broaden discussion of findings from its 1999 report, *Governance and Opportunity in Metropolitan America,* which examined how the sheer number and variety of local governments, each going its own way, often make socioeconomic inequalities between city dwellers and suburbanites worse.

On the whole, workshop participants agreed that sophisticated studies on the "importance of place" certainly could contribute to successful policies and help address issues that concern troubled neighborhoods. They also may reveal ways to connect inner-city residents with suburban jobs.

The road to gaining this knowledge may be long and winding, however. Researchers have taken steps to factor into their studies more of the details that affect people's lives, and these improvements in methodology have been heartening. Still, such work

should go further, the report says. Studies need to systematically blend in larger issues related to metropolitan governance and demographic trends. Broad policies — zoning and taxation, for instance — also shape neighborhoods. The same can be said for a community's overall context, which includes its racial composition and employment prospects.

Researchers also should look into new and creative ways to use statistical models to figure out how certain neighborhoods have evolved and how they produce effects on people, the report says. Trying to examine the big picture may be akin to looking through a kaleidoscope. But society could only benefit from knowing more about the basic local conditions that represent a minimum standard for residents to prosper.
— *Vanee Vines*

Equality of Opportunity and the Importance of Place: Summary of a Workshop. Steering Committee on Metropolitan Area Research and Data Priorities, Division of Behavioral and Social Sciences and Education (2002, 84 pp.; ISBN 0-309-08467-9; available from the National Academies Press, tel. 1-800-624-6242; $18.00 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10413.html>).

The steering committee was chaired by **William Morrill,** consultant, Caliber Associates, Fairfax, Va. The workshop and its summary were sponsored by the U.S. Department of Health and Human Services.

From Grad School to Grade School

Attracting Ph.D.s to K-12 Education

Many newly minted Ph.D.s in science and mathematics begin their job search outside the traditional academic realm, seeking opportunities that would allow them to use their training in novel and rewarding ways. An ideal destination may be closer than they think. Given their passion for their work, knack for learning through discovery, and ease with information technology, talented postdoctoral scholars are needed and would be truly appreciated in the world of K-12 education.

They could help improve teaching and learning at a time when U.S. student achievement in science and math often trails that of peers in many other industrialized countries, says a new report from the National Research Council. Meanwhile, teaching and other positions in K-12 education could offer postdocs a challenging career path.

To experiment with such a match, the report calls for the creation of a national fellowship program to attract Ph.D.s, a pilot project to test the program in interested schools and learning centers, and a comprehensive plan to evaluate its impact.

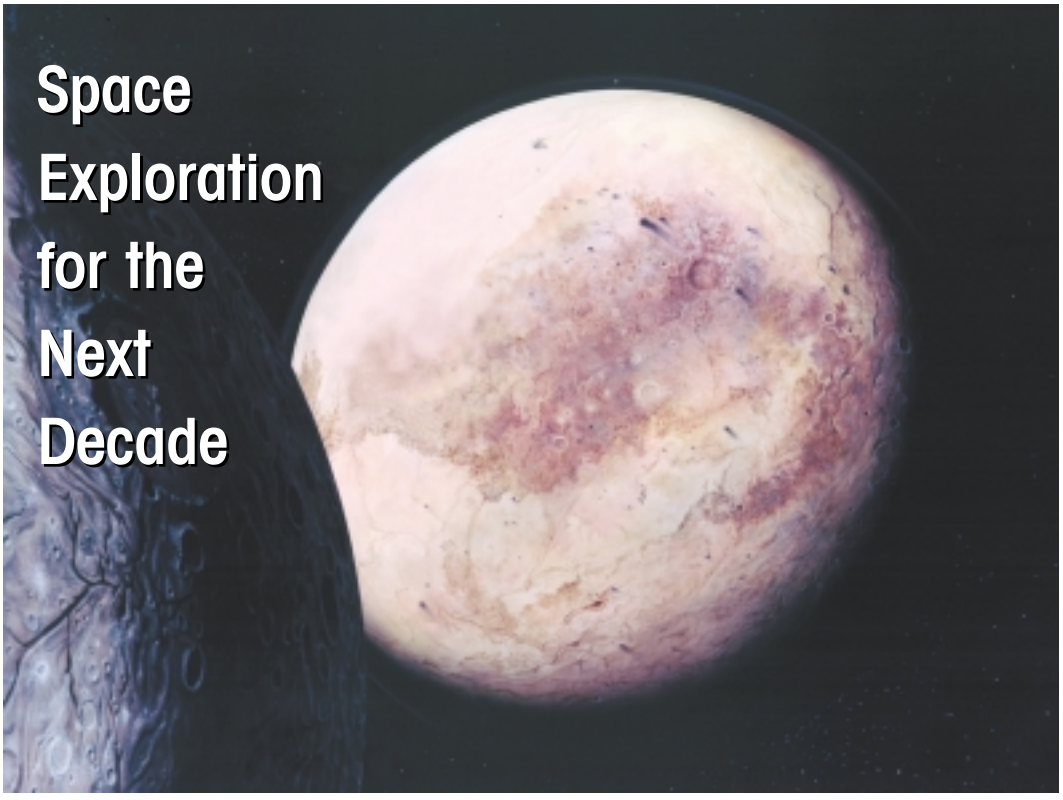
A critical step in rolling out the proposed program would be the selection of the Ph.D.s themselves. Ideal candidates would have doctorates in physical, biological, or mathematical sciences, or in engineering. Plus, they would have a strong commitment to K-12 education and an affinity for teaching, said the committee that wrote the report.

Once selected, however, postdocs would not be expected to simply "wing it" in the classroom. Through course work as well as extensive hands-on training in K-12 settings, the program would prepare them to obtain a teacher's license. And they would be encouraged to use their connections in the scientific and engineering communities to help strengthen links among schools, colleges, universities, and science-based institutions. Ultimately, these scholars could become not only seasoned, highly skilled teachers, but also leaders in efforts to boost the quality of teaching and learning in the nation's schools, the report says.

The program's cost would depend on the number of fellows selected each year and the overall duration of the pilot project. But each individual fellowship should last two years, and postdocs could expect a stipend of about $35,000 per year, the report says. A national program, possibly supported with funds from both the federal government and private sources, would compensate scholars in their first year. Schools where they would work during their fellowship would be expected to pay stipends and benefits in the second year. — *Vanee Vines*

Attracting Ph.D.s to K-12 Education: A Demonstration Program for Science, Mathematics, and Technology. Committee on Attracting Science and Mathematics Ph.D.s to K-12 Education: From Analysis to Implementation, Division of Behavioral and Social Sciences and Education and Division on Policy and Global Affairs (2002, 108 pp.; ISBN 0-309-08427-X; available from the National Academies Press, tel. 1-800-624-6242; $26.00 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10433.html>).

The committee was chaired by **M. Patricia Morse,** acting professor of zoology, University of Washington, Seattle. The study was sponsored by the National Research Council with additional support from the William and Flora Hewlett Foundation, Burroughs Wellcome Fund, Camille and Henry Dreyfus Foundation, and Carnegie Corp. of New York.



Space Exploration for the Next Decade

Missions to **Pluto-Kuiper Belt** and **Europa** Should Top NASA's Agenda

One might expect a place that is dark, frigid, and dauntingly remote to have a tough time attracting visitors. And so far that's been Pluto's fate: It is the only planet in the solar system that has never been visited by a robotic probe. Now a new National Research Council report says Pluto and its neighborhood are too scientifically compelling for NASA to wait any longer to send a mission there.

It's not just the lure of being the last unexplored planet in the solar system that makes Pluto so intriguing to scientists. Perhaps most interesting about the distant planet is that it's the largest known member of the Kuiper Belt, a field of icy, rocky objects that are thought to have changed little since they first condensed some 4.6 billion years ago.

"Data collected on the Kuiper Belt over the last decade suggest that it's made up of innumerable objects, and that they have a bizarre variety of properties," said Michael Belton, president, Belton Space Exploration Initiatives, Tucson, Ariz., and chair of the committee that wrote the report. "A mission would let us study some of those

properties more closely." This examination may help scientists understand how the solar system began, because the giant planets are believed to have been created from objects like those in the Kuiper Belt. A mission might also provide clues to the origin of life on Earth, the report says, which may have started with organic material delivered by a comet from the region billions of years ago.

A mission to Pluto and the Kuiper Belt has been on and off NASA's agenda for several years. The Bush administration eliminated funding for the mission in NASA's 2003 budget, citing the high cost involved. But the report says that a trip to the Kuiper Belt could gather enough data — possibly paradigm-shifting information — to justify its price tag, which is midsize by space-exploration standards.

Another reason not to delay the mission is that the time window for studying Pluto is closing. The planet is beginning the leg of its 248-year solar orbit that is farthest from the sun; more of the surface will be shadowed and the atmosphere will freeze, making study impossible. A thaw — and another chance to survey the brightest object in the murky Kuiper Belt — won't happen again for more than a century.

The report makes several recommendations for NASA's space exploration agenda over the next decade, prioritizing missions within different size classes — including large missions, which NASA has shied away from in recent years. But giving up larger missions would be a mistake, the committee believes. "For the scientific health of the space program you need a major mission from time to time," said Belton. "They're costly, but they can help us achieve a breadth of knowledge that smaller missions can't."

The next large mission should be sent to Jupiter's moon Europa, the report says. The satellite is thought to have an ocean under its icy crust — which makes it, with Mars, the best place beyond Earth to search for life. The mission would confirm the presence of the ocean, study its qualities, and try to determine whether it does in fact harbor living organisms.

Important research can be done from the ground as well, the report notes, urging NASA to partner with the National Science Foundation to build a large-aperture survey telescope, which could survey the faintest objects in the entire northern sky every week. In addition to aiding the study of distant Kuiper Belt objects, the telescope would offer a very concrete benefit: the ability to better detect and assess the risk posed by small asteroids and comets that most frequently collide with Earth.

— *Sara Frueh*

New Frontiers in the Solar System: An Integrated Exploration Strategy. Solar System Exploration Survey Steering Committee, Space Studies Board, Division on Engineering and Physical Sciences (2002, approx. 457 pp.; ISBN 0-309-08495-4; available from National Academies Press, tel. 1-800-624-6242; $44.95 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10432.html>).

The panel was chaired by **Michael S. Belton,** president, Belton Space Exploration Initiatives. The study was funded by NASA.

A BIG Future for SMALL SCIENCE

Ensuring the Promise of Nanotechnology

Think big, but envision small. Almost invisible, in fact — no larger than 1/100,000 the width of a human hair. Now imagine working on that scale.

Nanotechnology is a science that does just that, manipulating matter at the atomic, molecular, and macromolecular levels. Operating at these most basic levels, scientists are able to create materials, devices, and systems with fundamentally new properties and functions. Industry and academia aim to use the science to design a new generation of products that are faster, cheaper, lighter, and stronger.

Science and engineering at the nanoscale will have a dramatic impact on fields such as computing, telecommunications, and medicine. One example is the application of nanosized semiconductor crystals known as "quantum dots," which fluoresce when irradiated. Quantum dots can be attached to genetic base pairs and used as markers for DNA diagnostics. Attaching dots of different sizes to different molecules allows researchers to track biological processes by monitoring the molecules' fluorescence. Because of their semiconducting properties, they also might serve as components of potentially faster, more efficient computers that can store trillions of bits of information on a device no larger than a pinhead.

For nanotechnology to fulfill its promise, however, the government-funded National Nanotechnology Initiative — which has received almost $1 billion in funding since 2001 — needs to increase its support of long-term research and promote more interdisciplinary efforts, says a new report from the National Research Council.

One of the initiative's current long-range goals is to move the science out of the laboratory and into society. For this to happen, a continued investment in the development of tools that allow scientists to view, model, and manipulate nanoscale objects is necessary.

A new breed of scientist also must emerge, one who is well-grounded in a specific discipline but able to work across multiple fields, the report says. This is essential because nanoscale science and technology combines many disciplines, such as biology, physics, chemistry, and engineering. Nanotechnology centers in the United States currently encourage collaboration, but creation of a more widespread interdisciplinary culture — both nationally and internationally — is crucial to stimulating growth in the field.

Federal leaders of the initiative need to develop an overarching strategic plan, and outline goals and objectives, especially long-term ones. To provide further guidance to federal agencies on important R&D opportunities, an independent advisory board composed of leaders from industry and academia should be established, the report recommends. — *Jennifer Burris*

Small Wonders, Endless Frontiers: A Review of the National Nanotechnology Initiative. Committee for the Review of the National Nanotechnology Initiative, Division on Engineering and Physical Sciences (2002, 68 pp.; ISBN 0-309-08454-7; available from the National Academies Press, tel. 1-800-624-6242; $18.00 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10395.html>).

The committee was chaired by **Samuel Stupp,** professor, Northwestern University, Evanston, Ill. The study was sponsored by the National Science Foundation.

Pushing the Limits

Are Trucks Too Big and Heavy?

While driving down a local highway, have you ever found yourself doing a double take when a tractor-trailer zooms past? The trucks seem larger than the ones on the interstate. It's no illusion. They might very well be.

Given current federal size limits, larger trucks sometimes have to avoid interstate highways and use secondary roads where accidents are more likely to happen and maintenance costs are higher.

The federal government first placed limits on truck size and weight in 1956, as part of the legislation that created the federal highway program. Since then, the regulations have only been significantly revised twice. In 1991, Congress passed a law as a safety measure that prohibits states from expanding the use of heavier double and triple trailers.

But a new report from the Transportation Research Board recommends that the government should authorize states to allow trucks exceeding present federal limits to operate on interstate highways, provided that impacts on safety and road-maintenance costs are monitored.

The standard tractor-trailer has five axles, and the current federal limit is 80,000 pounds. States should be allowed to issue permits for the operation of six-axle tractor-trailers weighing up to 90,000 pounds, the report says. Increasing the length of the truck reduces shipping costs moderately, and lowering the weight-per-axle ratio cuts down on pavement wear and tear. But an overall increase in the total weight of trucks also results in higher costs for bridge construction and highway maintenance.

The committee that wrote the report recommends Congress should charter a new organization to oversee implementation of federal truck-size regulations and evaluate their results, carry out pilot studies and research to determine the impact of trucks on highways, and recommend new rules based on its findings.

The proposed pilot studies and permit program could provide incentives for industry and states to develop safety innovations. Promising technologies, such as electronic braking systems, could improve truck safety but more research and monitoring is needed, the report says.

While trucking firms and shipping groups advocate liberalization of limits, highway-safety advocacy groups, some small trucking firms, and a number of states oppose increases in truck size. And the railroad industry fears the change would divert freight from the rail to highways. Objective data collection and analysis, together with public input, should break the gridlock over size and weight policies. — *Jennifer Burris*

Regulation of Weights, Lengths, and Widths of Commercial Motor Vehicles: TRB Special Report 267. Committee for the Study of the Regulation of Weights, Lengths, and Widths of Commercial Motor Vehicles, Transportation Research Board (2002, 270 pp.; ISBN 0-309-07701-X; available from the board, tel. 202-334-3214; $24.00 for single copies; also on the Internet at <books.nap.edu/catalog/10382.html>).

The committee was chaired by **James W. Poirot,** chairman emeritus, CH2M Hill Ltd., Mukilteo, Wash. The study was funded by the U.S. Department of Transportation.

A Child-Safe INTERNET

Multifaceted Approach Needed to Protect Kids Online

Many children today have never known a world without personal computers and the Internet. In fact, nearly 60 percent of school-age children have access to the Internet at home and at school, according to a 2000 survey by the Census Bureau.

While many parents may lack the technological sophistication of their children, they can't ignore the added responsibility posed by Internet access. Because the Web doesn't distinguish between adults and children, it is difficult to protect children from inappropriate materials on this global, interactive, and anonymous medium.

Although the percentage of adult-oriented, sexually explicit material on the Web is quite small, making up less than 2 percent of all online content, it generates about $1 billion a year in revenue from paying customers. Its high profile and easy accessibility pose a real challenge for parents, policy-makers, and educators.

Many workplaces, schools, and libraries use filters and monitoring to block access and inadvertent exposure to pornography, and laws and regulation work to reduce the extent of its availability. But there is no single approach — technical, legal, economic, or educational — sufficient to protect children from pornography, says a new report from the National Research Council.

Controlling where children go, what they see, to whom they talk, and what they do when online requires a balanced mix of interventions. An essential element of protecting kids from such material on the Internet is the promotion of social and education strategies that teach children to make wise choices online, the report says.

Parents can start by gaining a basic understanding of what is on the Internet and initiating sometimes-uncomfortable conversations with their children. Home computers could be put in places that make solitary viewing impossible. Parents also can provide explicit instruction and guidance to their children about what they consider unacceptable activities.

Children should also be educated in Internet safety, much as they are educated about physical safety. This might include teaching them how sexual predators and hate group recruiters typically approach young people on the Internet, how to recognize jargon that signals inappropriate material, and when it is okay to provide personal information online.

Many children learn as much from peers and older siblings as they do from parents, teachers, and other adults. Peer mentoring, which has been shown to help some young people avoid crime and stay in school, could potentially help promote safe use of the Internet.

In addition to such hands-on human interventions, technology and public policy have important roles to play as well. Technology-based tools provide parents and other responsible adults with added options to protect children and can be highly effective. But these technologies are inherently imperfect because they may also block informative and educational content and will always allow some inappropriate things to leak through. Regardless of whether technology is used, a child must learn how to deal with the material they encounter.

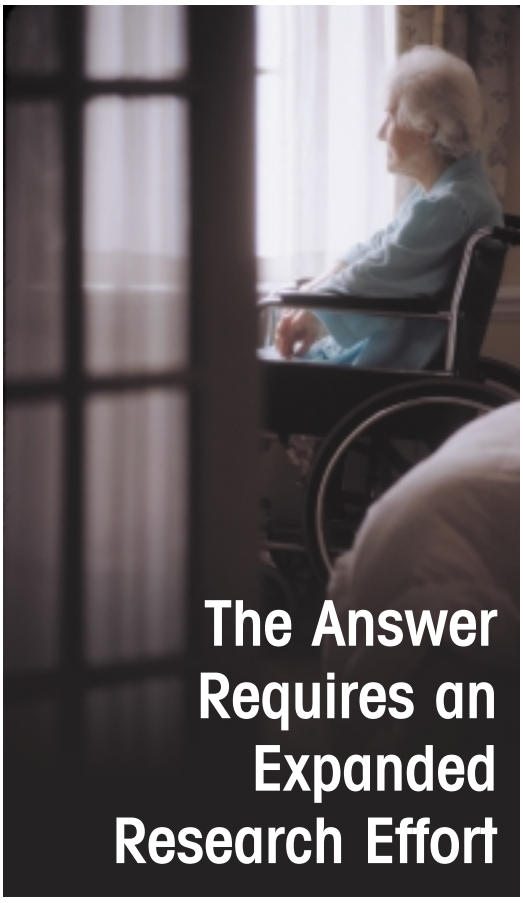
Public policy can help make sexually explicit material less available to children. For example, providing incentives could lead the adult online entertainment industry to take actions to restrict children's access to content and, to some extent, reduce the number of providers of such material. Aggressive enforcement of existing anti-obscenity and child pornography laws can also make a difference. Public policy can also be used to promote media literacy and Internet safety education; to support development of quality, online educational material for children; and to encourage self-regulatory efforts by private parties.

The committee that wrote the report found that studies examining the impact on children from viewing sexually explicit material are limited and this area needs to be further researched. In addition, more technology-based tools should be developed. Current technologies are not well-matched to the growing diversity of channels through which children may be exposed to inappropriate content or experiences.

— *Jennifer Burris*

Youth, Pornography, and the Internet. Committee to Study Tools and Strategies for Protecting Kids From Pornography and Their Applicability to Other Inappropriate Internet Content, Computer Science and Telecommunications Board, Division on Engineering and Physical Sciences (2002, 480 pp.; ISBN 0-309-08274-9; available from the National Academies Press, tel. 1-800-624-6242; $47.95 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10261.html>).

The committee was chaired by **Dick Thornburgh,** former U.S. attorney general and counsel, Kirkpatrick & Lockhart LLP, Washington, D.C. The study was sponsored by the U.S. departments of Justice and Education, W.K. Kellogg Foundation, Microsoft Corp., IBM Corp., and the National Research Council.



How Many of the Elderly Are Abused or Neglected?

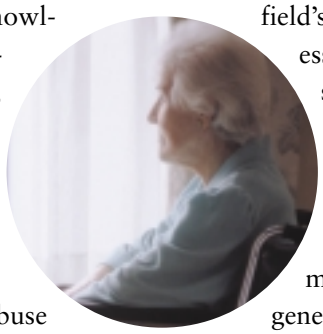
The Answer Requires an Expanded Research Effort

Their golden years are hardly peaceful for the estimated 1 million to 2 million elderly people who are victims of abuse and neglect. Even though the problem of "granny battering" hit the news in 1978 as a result of congressional hearings, there is an abysmal absence of research into the neglect and abuse of elderly Americans, says a new report from the National Research Council.

Fewer than 50 peer-reviewed studies of elder mistreatment exist in the scientific literature. Current research is spotty, and most of the reports have methodological weaknesses, said the committee that wrote the report. This mistreatment, as the committee defined it, includes physical and emotional abuse, neglect, and financial abuse of vulnerable elderly people by individuals they trust or rely on for care. Who commits it and why, the circumstances under which it occurs, and what preventive measures are effective — even what constitutes "elderly" — are questions still to be answered. "The current knowledge base about even the most elementary facts concerning elder mistreatment is incomplete, contradictory, misleading, and

noncumulative," the report says. Meanwhile, between 3 percent and 5 percent of elderly people are thought to be abused. As the nation's over-65 population figures climb in the 21st century, so too will the number of victims.

"I was genuinely surprised at how little we know — the gaps in our knowledge are enormous," said committee chair Richard J. Bonnie, director of the Institute of Law, Psychiatry, and Public Policy at the University of Virginia, Charlottesville. "In terms of the development of knowledge, the field of elder abuse is about where the child-abuse field was in the early 1970s. We are really at the beginning."



Even good base line data on the magnitude and social costs of the problem are lacking. Current estimates of how many Americans over the age of 65 have suffered some type of mistreatment at the hands of a caretaker are little more than educated guesses. There has never been a national survey to determine the size of the problem. Still more poorly understood are the situations that lead to mistreatment and the underlying causes of the abuse. Designing effective public policies to prevent and counteract elder mistreatment requires this basic information.

But more of the same type of research won't do the trick, the report says. Current reports of research findings lack standardization and control groups and are based on reported cases, rather than studies of a population as a whole; therefore the findings cannot be extrapolated to the larger population. Even before collecting the much-needed data on the extent of the problem, researchers in the field need to develop uniform definitions and modes of measurement. Such systematizing of the field's research methodologies is essential before launching a full-scale national study of the extent and types of elder mistreatment in the United States.

Discovering the scope and significance of elder mistreatment requires attracting a new generation of interdisciplinary scientists to the field. Establishing the necessary infrastructure demands a long-term funding commitment by federal, state, and private agencies.

"As a society, we have a strong moral obligation to protect people who, as they are aging, lose the capacity to protect themselves," Bonnie said. "A meaningful investment in building the foundation for this field is truly needed."

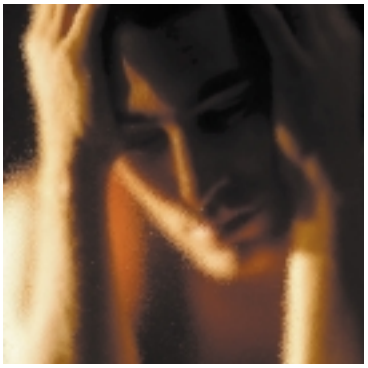
— *Mari N. Jensen*

Elder Mistreatment: Abuse, Neglect, and Exploitation in an Aging America. Panel to Review Risk and Prevalence of Elder Abuse and Neglect, Committee on National Statistics and Committee on Law and Justice, Division of Behavioral and Social Sciences and Education (2002, 568 pp.; ISBN 0-309-08434-2; available from the National Academies Press, tel. 1-800-624-6242; $57.95 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10406.html>).

The committee was chaired **Richard J. Bonnie,** John S. Battle Professor of Law and director, Institute of Law, Psychiatry, and Public Policy, University of Virginia, Charlottesville. The study was funded by the National Institute on Aging.

SUICIDAL Tendencies

Curbing the Nation's Suicide Rate



In popular culture, suicide is sometimes romanticized as the tragic result of a broken heart or troubled spirit. It is even portrayed as gutsy, as in the movie "Thelma and Louise" when the lead characters decide to drive off a cliff rather than face the police.

However, suicide is anything but fictional melodrama. Every year about 30,000 Americans kill themselves — more than the average number of homicides. Overall, suicide is the 11th-leading cause of death for Americans, and the third-leading cause of death for those between the ages of 15 and 24, government statistics show. Emergency rooms annually treat 650,000 people after they attempt to take their own lives. But despite its prevalence and impacts, efforts to reduce suicide have lacked the serious national attention afforded other major public health issues.

Research efforts and prevention programs have offered some insights into factors that increase or decrease the risk of suicide, but a dearth of information hampers the nation's ability to fully understand the problem and craft solutions. To that end, a new report from the Institute of Medicine puts forth a blueprint for research designed to fill in the data gaps. Many questions about suicide remain unanswered because the appropriate infrastructure to adequately address them is lacking. The report calls for the creation of a national network of laboratories geared to perform large-sample studies through a multidisciplinary approach. A consortium of labs would allow exploration of differences in risk and protective factors across regions, economic classes, and other variables, and would serve as a central repository of suicide data. Similar approaches already have been taken with cancer and Alzheimer's disease research, both of which have benefited from dedicated research centers.

What existing data do show is that the majority of suicidal people visit a doctor in the months or weeks before their deaths. Physicians and nurses often are these individuals' first and only medical contact. Primary care providers could serve as a front-line intervention force to steer at-risk patients into treatment. Reluctance among primary care providers to discuss suicide risk factors with patients could be eased through training that incorporates study of suicidal behavior.

Few treatment and prevention programs have had the capacity to conduct long-term evaluations of their efficacy. However, the report highlights examples of prevention programs that seem to be effective. The U.S. Air Force's program, for example, appears to have reduced suicide rates in its community by increasing access to treatment and support and reshaping attitudes about suicide. More work needs to be done to determine whether programs like this can be expanded to other populations.

— *Christine Stencel*

Reducing Suicide: A National Imperative. Committee on Pathophysiology and Prevention of Adolescent and Adult Suicide, Board on Neuroscience and Behavioral Health, Institute of Medicine (2002, 516 pp.; ISBN 0-309-08321-4; available from the National Academies Press, tel. 1-800-624-6242; $59.95 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10398.html>).

The committee was co-chaired by **William E. Bunney Jr.,** Della Martin Chair of Psychiatry, department of psychiatry and human behavior, University of California, Irvine; and **Arthur M. Kleinman,** Maude and Lillian Presley Professor of Medical Anthropology, Harvard University School of Medicine. The study was sponsored by the U.S. Department of Health and Human Services and the U.S. Department of Veterans Affairs.

The Myriad Sources of

Oil in the Sea

Even though disasters like the recent spill off the coast of Spain sometimes still occur, double-hull tankers and tougher international standards have led to a significant drop in the amount of oil spilled by ships since 1989, when the *Exxon Valdez* ran aground off the coast of Alaska. That's the good news. The bad news is that 29 million gallons of oil, more than twice the amount that leaked from the *Valdez,* still winds up in North American ocean waters each year as a result of human activity, according to a new report from the National Research Council. But instead of coming from tankers, the vast majority of this oil arrives in the sea via such sources as land-based runoff, polluted rivers, jet skis, and even airplanes that jettison fuel over the water. Typically, only about 10 percent comes from tanker and pipeline spills, or is released during the oil-drilling process.

"The oil you see glistening on the road when it starts to rain runs off the pavement and eventually finds its way to the sea," explained Nancy N. Rabalais, a professor at the Louisiana Universities Marine Consortium and member of the committee that wrote the report. Oil

runoff from cars and trucks is a particular problem in coastal regions where more roads and parking lots are being built to accommodate dramatic population growth. Oil that is in wastewater or that has been improperly disposed of also finds its way to the ocean. Two-stroke engines manufactured before 1998 discharge significant amounts of unburned fuel and can still be found on many recreational boats and jet skis. And bigger ships may release oil from their engines while in port or at sea.

Scientists studying the aftermath of the *Valdez* spill discovered that the environmental devastation caused by an oil spill of that magnitude lasts much longer than previously thought. Researchers have also learned, however, that the impact of an oil spill is not always proportional to its size, since even a small spill in an ecologically sensitive area can have long-term effects. And there is growing evidence that toxic compounds found in oil can adversely affect marine species even at very low concentrations.

But while scientists have gained new insight into the damage caused by an acute oil spill, less is known about how the ocean ecosystem is affected by chronic releases from land-based sources or boat engines. To learn more, a major research effort should be launched by the federal government, the report says. Such research could be aided by a closer look at how marine life is affected when oil seeps naturally into the ocean. About 180 million gallons of oil seeps into the ocean from the seafloor each year, the committee estimated.

The report says federal and state agencies should collaborate on a new system for documenting sources of runoff to better monitor how much oil is seeping into the sea. And the U.S. Environmental Protection Agency should continue efforts to phase out older two-stroke engines. Rabalais said consumers can do their part by following municipal guidelines for discarding oil and by maintaining their car engines.

The fact that most of the oil entering the ocean comes from land or small watercraft does not mean, however, that governments can ignore tanker safety since the potential is still there for a large spill, especially in regions of the world with lax safety controls, the report notes.

— *Bill Kearney*

Oil in the Sea III: Inputs, Fates, and Effects. Committee on Oil in the Sea: Inputs, Fates, and Effects, Ocean Studies Board, Division on Earth and Life Studies, and Marine Board, Transportation Research Board (2002, approx. 446 pp.; ISBN 0-309-08438-5; available from the National Academies Press, tel. 1-800-624-6242; $54.95 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10388.html>).

The committee was chaired by **James M. Coleman,** Boyd Professor, Coastal Studies Institute, Louisiana State University, Baton Rouge. The study was funded by the U.S. Minerals Management Service, U.S. Geological Survey, U.S. Department of Energy, U.S. Environmental Protection Agency, National Oceanic and Atmospheric Administration, U.S. Coast Guard, U.S. Navy, American Petroleum Institute, and the National Ocean Industries Association.

Murky Waters

Will Everglades Restoration Clarify Nearby Bay?

The 850 square miles of water that make up Florida Bay is rarely much more than about a meter deep, a fact that would lead you to believe it should be no trouble seeing the sandy bottom regardless of where you stand. This was true 30 or 40 years ago. But in the 1980s, it started getting cloudy from increasing algae growth and suspended sediment. At the same time, dense meadows of turtle grass common to the bay began to die off.

The prevailing assumption in Florida was that high salinity — partly caused by lower freshwater inflows from the nearby Everglades — was to blame for the loss of grass and muddying of the water. So when a joint federal-state task force said that it wanted to elevate water levels in the Everglades as part of a multibillion-dollar restoration effort, many people figured the water clarity in the bay, which receives much of its fresh water from the Everglades, would improve.

But a new report from a Research Council committee advising the task force on scientific matters questions whether more fresh water is really the answer to a problem that may not have been caused by too much salt to begin with. It calls the evidence linking high salinity to the loss of turtle grass "debatable," and says that some scientists suspect the bay's environmental woes are in fact due to nutrient pollution, which fresh water from the Everglades may bring more of. And even if the Everglades restoration plan is fully implemented, it is unclear how much fresh water will actually flow into the bay, with some models predicting little change from current levels by the year 2050.

Ironically, efforts to return the bay to its grassy, pristine self may not be what nature intended. Historical accounts from the 19th century describe a murky body of water, not a clear one.

A more reliable characterization of the bay's historical condition and a focused technical review of how the Everglades restoration plan will affect the bay are needed, the committee said.

— *Bill Kearney*

Florida Bay Research Programs and Their Relation to the Comprehensive Everglades Restoration Plan. Committee on Restoration of the Greater Everglades Ecosystem, Water Science and Technology Board and Board on Environmental Studies and Toxicology, Division on Earth and Life Studies (2002, 54 pp.; ISBN 0-309-08491-1; available from National Academies Press, tel. 1-800-624-6242; $18.00 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10479.html>).

The committee was chaired by **Jean M. Bahr,** University of Wisconsin, Madison. The study was funded by the U.S. Department of the Interior.

Science's Call to Duty

The National Academies Examine Threats to Homeland Security

Whether by designing sophisticated weapons, building better ships and planes, or advancing battlefield medicine, scientists, engineers, and doctors have always answered their country's call to service during wartime, and the current war against terrorism is no different. A week after the Sept. 11 attacks, the presidents of the National Academies wrote to President Bush, saying that the Academies "stand ready to provide advice and counsel in any way that the nation desires." The Bush administration took them up on the offer almost immediately and asked for real-time advice on how to protect the mail during the anthrax attacks.

Meanwhile, the Academies also got to work fulfilling another promise made in the letter: to convene groups of experts to identify — and look for ways to counter — the most dangerous threats facing the United States. They drafted more than 100 scientists, engineers, physicians, and national-security specialists to take part in the task, which led to a 440-page report — *Making the Nation Safer: The Role of Science and Technology in Countering Terrorism*.

The report lists several steps that can be taken right away to counter terrorism using existing technologies. These include initiatives to secure nuclear material in the former Soviet bloc, boost vaccine supplies, improve ventilation systems in public buildings, and supply emergency personnel with the latest communication tools.

For the future, research is urgently needed to reduce vulnerabilities further, the report says. The nation has to create drugs for pathogens that are not currently treatable and develop sensors that can rapidly detect radiological, biological, or chemical materials. The blast- and fire-resistance of buildings should be improved as well. And power grids must be mapped in a manner that allows them to bypass damaged areas if they come under attack.

These and other research opportunities may go unrealized, however, unless the federal government formulates a strategy for pursuing them, the report says. This will be difficult given that the agencies that traditionally fund research are not necessarily the same agencies responsible for homeland security. To narrow this gap, the new Department of Homeland Security that was proposed by President Bush should have an undersecretary for science and technology. Homeland security officials should also be supported by an independent, nonprofit institute that could employ experts to analyze vulnerabilities in the nation's infrastructure.

Although this report is the centerpiece of the Academies' counterterrorism activities, they have undertaken other studies and held workshops to seek ways to make the nation safer. For example, the Natural Disasters Roundtable met to discuss what emergency workers who deal with disasters could teach the country about responding to terrorist attacks. The Academies also established a Web site — <www.nap.edu/firstresponders> — to provide firefighters, EMTs, and other rescue personnel with links to credible information resources on chemical and biological terrorism. The Transportation Research Board and the National Materials Advisory Board have been advising the new Transportation Security Administration on explosives-detection technologies. How the Internet performed on Sept. 11 was the focus of another study. And a report on deterring terrorism says threats against terrorists work but that other efforts, such as trying to turn foreign populations against terrorist organizations, are needed as well.

Last fall the Academies released *Countering Agricultural Bioterrorism,* a study that began before Sept. 11 but took on obviously greater importance after that day. It says that the country remains vulnerable to a bioterrorism attack on its crops and livestock and needs a more comprehensive plan to defend against it.

The Academies hosted a workshop to address the thorny issue of restrictions being placed on the publication of research findings in the name of national security. In a recent statement, the presidents of the National Academies said scientists should work closely with federal agencies to identify research that may be related to new security threats and to develop principles for researchers in those fields, but that the government should not vaguely categorize information as "sensitive but unclassified."
— Bill Kearney

A collection of the Academies reports in this area is accessible at <www.nap.edu/terror>. Information on projects under way is available at <national-academies.org>.

Making the Nation Safer. Committee on Science and Technology for Countering Terrorism, National Research Council (2002, 440 pp.; ISBN 0-309-08481-4; available from National Academies Press, tel. 1-800-624-6242; $43.95 plus $4.50 shipping for single copies; also on the Internet at <books.nap.edu/catalog/10415.html>).

The committee was co-chaired by **Lewis M. Branscomb,** emeritus professor of public policy and corporate management; and emeritus director of the science, technology, and public policy program, Center for Science and International Affairs, John F. Kennedy School of Government, Harvard University, Cambridge, Mass.; and **Richard D. Klausner,** executive director of global health, Bill & Melinda Gates Foundation, Seattle. The study was funded by the National Academies.

Mitchell Gift to Endow Academies' Efforts in Sustainability Science

The National Academies are pleased to announce a $10 million gift from Houston-based philanthropist George Mitchell and the George and Cynthia Mitchell Foundation. The gift — and an additional $10 million in future matching funds — will underwrite the National Academies' newly created **George and Cynthia Mitchell Endowment for Sustainability Science.** A key step in developing the capacity of the National Academies to undertake important new efforts on sustainable growth, the endowment will fund research, studies, and other activities in the emerging field of sustainability science and technology.

George Mitchell has made his mark as a renaissance American businessman and entrepreneur. As a young petroleum geologist and engineer in Texas after World War II, he realized that in the rush to find oil and drill profitable wells, big petroleum companies were often ignoring — even burning off as waste — another important energy source: natural gas. He set his sights on exploiting that underutilized resource and built his own industry powerhouse around it — the Mitchell Energy & Development Corp.

An early admirer of the work of design and ecology visionary Buckminster Fuller, the young CEO Mitchell also realized that there were finite energy resources and raw materials for a world whose population was increasing rapidly. In the 1970s he helped sponsor the work of Dennis Meadows, whose Club of Rome study *The Limits to Growth* was a global wake-up call on the pressing need for sustainable energy technologies and food sources worldwide.

"[In the late 1960s,] I first became involved at the Aspen Institute with Buckminster Fuller, a tremendous mind," said Mitchell. "I was intrigued with him and his concept that the Earth could handle only so many people . . . because I realized that his concept was right. Later, with Dennis Meadows and his study *The Limits to Growth*, we came up with a new concept. We talked about 'alternatives to growth.' Then we finally hit on 'sustainable societies.' What we were really trying to determine was, how could you establish sustainable societies when you have a rapid population growth?"

Mitchell has been equally concerned about unplanned urban sprawl in this country, much of it — he believes — fueled by "white flight" to suburbs in the 1960s and 1970s that threatened the very existence of central city cores. After visits to inner-city communities like Watts and Bedford-Stuyvesant, Mitchell turned his talents and resources to developing a

master-planned city for residents of all incomes. His new town, "The Woodlands," is located just north of downtown Houston. Today it is home to more than 70,000 residents. Its design, which will accommodate a total population of 150,000 and provide jobs for 75,000, has won awards for urban design, energy use, and ecology.

In Houston, Mitchell and his wife Cynthia are major philanthropic supporters of the arts, education, and medical research. In 1982, he founded the Houston Advanced Research Center, an institution dedicated to environmental issues and sustainable growth, with special emphasis on critical regional issues such as clean air and water.

The National Academies have enjoyed a close and productive association with George and Cynthia Mitchell. Together with Mitchell Energy & Development Corp., the Mitchells underwrote the National Academies' landmark *Our Common Journey: A Transition Toward Sustainability,* the 1999 report that redefined the role science and technology can play in sustainable development. *Our Common Journey* helped establish the National Academies' long-term commitment to research for global economic development that maximizes the efficient and wise use of the Earth's resources.

"George Mitchell has long been a vocal advocate for research and planning for a more sustainable world," said National Academy of Sciences President Bruce Alberts. "He is a corporate leader who clearly understands that we now have a window of opportunity in which to address the challenges that the Earth's rapidly growing population poses for our finite resources. We thank him for his wisdom and dedication to these issues and for his expression of confidence in the National Academies."

One of George Mitchell's major contributions to sustainable development has been his strong conviction that, to be successful, it must enlist the active participation of corporations and business leaders. New products, services, and processes that achieve growth with minimal negative impact on communities, resources, and health, he believes, will be key ingredients in sustainable development.

"What does sustainable growth come down to?" asks Mitchell. "Well, if you can't make the world work with 6 billion people, what are you going to do with 9 and a half billion? How do we finally get enough collective organization and efforts in the next 10 to 40 years to really see how we resolve these issues?" Mitchell said he is counting on the National Academies, and science academies worldwide, to take the initiative.



Getting the 'Big Dig' Back on Track

For over a decade Boston's skyline has been punctuated not just by office towers but also by cranes, its streets have rumbled with dump trucks along with the usual urban din, and its commuters have had to navigate an ever-changing map of detours. These are only surface signs of an upheaval that's going on mainly underground — a public works project that is the largest, most complex, and most expensive ever undertaken in the United States.

Known as the "Big Dig," the megaproject is creating an eight- to 10-lane underground expressway through the middle of Boston. It will replace the city's overburdened and deteriorating Central Artery, an elevated highway built in the 1950s that was meant to carry 75,000 vehicles each day but now shoulders a daily load of almost 200,000. The project, which is more than 80 percent complete, also includes a new tunnel to Logan airport that passes under Boston Harbor and was finished in 1995, as well as a two-bridge crossing of the Charles River. The larger of the two, the Leonard P. Zakim Bunker Hill Bridge, is the widest cable-stayed bridge in the world.

The Big Dig hopes to give relief to those who currently endure lengthy traffic jams on the Artery, which has an accident rate four times the average for urban interstates. The project also will transform the urban landscape, reconnecting downtown Boston with its waterfront and opening up about 200 acres of space throughout the city.

Delays and cost overruns have plagued the project, however, taxing not only motorists' patience but also pocketbooks across the United States. When ground was broken in 1991, the project was slated for completion in 1998 and estimated to cost about $6 billion; it is now expected to be completed in 2005 at a cost of $14.6 billion.

In an effort to keep the remainder of the project on schedule and within budget, the Massachusetts Turnpike Authority has asked the National Research Council to evaluate current management practices and structure. The panel will assess whether the management is using industry "best practices," and will also give suggestions for finishing the project in a timely and cost-effective way. The review is scheduled for release in early 2003. — *Sara Frueh*

(See listing on page 26.)

A Stop to Underage Drinking

When NBC announced about a year ago that it would start airing television ads for hard alcohol for the first time in 50 years, it drew protests from advocacy groups and legislators, leading the network to reverse its decision a few months later. Chief among the objections was that the ads would glamorize alcohol use to a very susceptible audience — teen-agers and young adults.

Research has shown that youths who use alcohol, particularly those who drink a lot, take on added risks compared with their nondrinking peers. Kids who drink are more likely to get poor grades than their classmates who abstain. They are more likely to have sex at a younger age and to have multiple partners; they're also less likely to use condoms, raising their risk of contracting sexually transmitted diseases. Drinking among college students has been linked to higher rates of accidental injuries and fatalities, physical assaults, date rape, and vandalism.

All 50 states and the District of Columbia have laws setting the minimum drinking age at 21, but kids who are underage report having access to alcohol anyway. And a considerable number of them are binge drinking: In 2000, almost one in five youths aged 12 to 20 had five or more drinks on the same occasion at least once in the past 30 days.

Communities and states have experimented with a range of approaches to preventing underage drinking such as programs aimed at swaying youth attitudes and choices, higher taxes on alcohol, and aggressive ID checks at bars and liquor stores. Advocates have urged the federal government to take a stronger lead, prompting Congress to ask the National Academies to recommend a prevention strategy.

The study committee, whose work got under way last summer, is examining the wide variety of existing efforts to assess what works and what doesn't. Based on

what it finds to be successful, the committee will develop a strategy for reducing underage drinking. Its report is slated for release in May 2003. — *Sara Frueh*
(See listing on page 26.)

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.

Developing a Strategy to Reduce and Prevent Underage Drinking.
Board on Children, Youth, and Families, National Research Council and Institute of Medicine. Project director: Mary Ellen O'Connell. Chair: Richard Bonnie, John S. Battle Professor of Law, School of Law; professor of psychiatric medicine; and director, Institute of Law, Psychiatry and Public Policy, University of Virginia, Charlottesville. Sponsor: U.S. Department of Health and Human Services. (See page 25 in this issue of *In Focus*.)

Evaluation of the Addition of Ingredients New to Infant Formula.
Food and Nutrition Board, Institute of Medicine. Project director: Paula Trumbo. Chair: Richard J. Deckelbaum, Robert R. Williams Professor of Nutrition and Pediatrics and director, Institute of Human Nutrition, College of Physicians and Surgeons, Columbia University, New York City. Sponsor: U.S. Food and Drug Administration.

Implications of Dioxin in the Food Supply.
Food and Nutrition Board, Institute of Medicine; and Board on Agriculture and Natural Resources and Board on Environmental Studies and Toxicology, Division on Earth and Life Studies. Project director: Ann Yaktine. Chair: Robert S. Lawrence, associate dean for professional education programs, Edyth Schoenrich Professor of Preventive Medicine, and professor of health policy, Bloomberg School of Public Health, Johns Hopkins University, Baltimore. Sponsors: U.S. Food and Drug Administration and U.S. Department of Agriculture.

Non-Native Oysters in the Chesapeake Bay.
Ocean Studies Board, Division on Earth and Life Studies. Project director: Susan Roberts. Co-chairs: James Anderson, professor, department of environmental and natural resource economics, University of Rhode Island, Kingston; and Dennis Hedgecock, professor, Bodega Marine Laboratory, University of California, Davis. Sponsors: U.S. Environmental Protection Agency, National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, Maryland Department of Natural Resources, Virginia Sea Grant, Maryland Sea Grant, Connecticut Sea Grant, National Fish and Wildlife Foundation, and Virginia Department of Environmental Quality.

Performance Standards for Adult Literacy.
Board on Testing and Assessment, Division of Behavioral and Social Sciences and Education. Project director: Judith Koenig. Chair to be selected. Sponsor: U.S. Department of Education.

Review of Project Management Practices Employed on the Boston Central Artery ("Big Dig") Project.
Board on Infrastructure and the Constructed Environment, Division on Engineering and Physical Sciences. Project director: Richard Little. Chair: John T. Christian, consulting engineer, Waban, Mass. Sponsor: Massachusetts Turnpike Authority. (See page 24 in this issue of *In Focus*.)

Vaccines Against Drugs of Addiction.
Board on Behavioral, Cognitive, and Sensory Sciences, Division of Behavioral and Social Sciences and Education; and Board on Neuroscience and Behavioral Health and Board on Health Promotion and Disease Prevention, Institute of Medicine. Project director: Tracy Myers. Chair: Henrick Harwood, vice president, The Lewin Group, Falls Church, Va. Sponsor: National Institute on Drug Abuse.

Publications

For documents shown as available from the National Academies Press (NAP), write to 500 Fifth St., N.W., Lockbox 285, Washington, D.C. 20055; tel. (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.

Access to Research Data in the 21st Century: An Ongoing Dialogue Among Interested Parties — Report of a Workshop
Science, Technology, and Law Panel, Division on Policy and Global Affairs (2002, 52 pp.; ISBN 0-309-08329-X; available from NAP, $18.00 plus $4.50 shipping).

Animal Biotechnology: Science-Based Concerns
Board on Agriculture and Natural Resources and Board on Life Sciences, Division on Earth and Life Studies (2002, 201 pp.; ISBN 0-309-08439-3; available from NAP, $34.95 plus $4.50 shipping).

Biosolids Applied to Land: Advancing Standards and Practices
Board on Environmental Studies and Toxicology, Division on Earth and Life Studies (2002, 368 pp.; ISBN 0-309-08486-5; available from NAP, $44.00 plus $4.50 shipping).

Cancer and the Environment: Gene-Environment Interaction — Workshop Summary
Roundtable on Environment Health Sciences, Research, and Medicine, Board on Health Sciences Policy, Institute of Medicine (2002, 140 pp.;

ISBN 0-309-08475-X; available from NAP, $27.00 plus $4.50 shipping).

Care Without Coverage: Too Little, Too Late
Board on Health Care Services, Institute of Medicine (2002, 193 pp.; ISBN 0-309-08343-5; available from NAP, $27.00 plus $4.50 shipping).

Closure and Johnston Atoll Chemical Agent Disposal System
Board on Army Science and Technology, Division on Engineering and Physical Sciences (2002, 66 pp.; ISBN 0-309-08405-9; available from NAP, $18.00 plus $4.50 shipping).

Considerations for Viral Disease Eradication: Lessons Learned and Future Strategies — Workshop Summary
Forum on Emerging Infections, Board on Global Health, Institute of Medicine (2002, 213 pp.; ISBN 0-309-08414-8; available from NAP, $38.00 plus $4.50 shipping).

Deadly Lessons: Understanding Lethal School Violence
Committee on Law and Justice, Division of Behavioral and Social Sciences and Education, and Board on Children, Youth, and Families, National Research Council and Institute of Medicine (2002, 400 pp.; ISBN 0-309-08412-1; available from NAP, $39.95 plus $4.50 shipping).

Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids
Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board, Institute of Medicine (2002, approx. 936 pp.; ISBN 0-309-08525-X; available from NAP, $64.95 plus $4.50 shipping).

Discouraging Terrorism: Some Implications of 9/11
Center for Social and Economic Studies, Division of Behavioral and Social Sciences and Education (2002, 46 pp.; ISBN 0-309-08530-6; available from NAP, $18.00 plus $4.50 shipping).

Diversity in Engineering: Managing the Workforce of the Future
National Academy of Engineering (2002, 157 pp.; ISBN 0-309-08429-6; available from NAP, $36.50 plus $4.50 shipping).

Down to Earth: Geographic Information for Sustainable Development in Africa
Committee on Geography and Mapping Science Committee, Board on Earth Sciences and Resources, Division on Earth and Life Studies (2002, 172 pp.; ISBN 0-309-08478-4; available from NAP, $39.00 plus $4.50 shipping).

The Dynamics of Disability: Measuring and Monitoring Disability for Social Security Programs
Board on Health Care Services, Institute of Medicine; and Committee on National Statistics, Division of Behavioral and Social Sciences and Education (2002, 372 pp.; ISBN 0-309-08419-9; available from NAP, $49.95 plus $4.50 shipping).

The Emergence of Zoonotic Diseases: Understanding the Impact on Animal and Human Health — Workshop Summary
Forum on Emerging Infections, Board on Global Health, Institute of Medicine (2002, 157 pp.; ISBN 0-309-08327-3; available from NAP, $30.00 plus $4.50 shipping).

Emerging Animal Diseases: Global Markets, Global Safety — A Workshop Summary
Board on Agriculture and Natural Resources, Division on Earth and Life Studies (2002, 41 pp.; ISBN 0-309-08468-7; available from NAP, $18.00 plus $4.50 shipping).

Emerging Issues in Hispanic Health — Summary of a Workshop
Committee on Population, Center for Social and Economic Studies, Division of Behavioral and Social Sciences and Education (2002, 56 pp.; ISBN 0-309-08524-1; available from NAP, $18.00 plus $4.50 shipping).

Evolution of Evidence for Selected Nutrient and Disease Relationships
Food and Nutrition Board, Institute of Medicine (2002, 87 pp.; ISBN 0-309-08308-7; available from NAP, $23.00 plus $4.50 shipping).

For Greener Skies: Reducing Environmental Impacts of Aviation
Aeronautics and Space Engineering Board, Division on Engineering and Physical Sciences (2002, 56 pp.; ISBN 0-309-08337-0; available from NAP, $18.00 plus $4.50 shipping).

High-Impact Terrorism: Proceedings of a Russian-American Workshop
Office for Central Europe and Eurasia Development, Security, and Cooperation, Division on Policy and Global Affairs, in cooperation with the Russian Academy of Sciences (2002, 279 pp.; ISBN 0-309-08270-6; available from NAP, $47.00 plus $4.50 shipping).

Human Interactions with the Carbon Cycle — Summary of a Workshop
Committee on the Human Dimensions of Global Change, Division of Behavioral and Social Sciences and Education (2002, 41 pp.; ISBN 0-309-08420-2; available from NAP, $12.00 plus $4.50 shipping).

Integrity in Scientific Research: Creating an Environment that Promotes Responsible Conduct
Board on Health Sciences Policy, Institute of Medicine; and Board on Life Sciences, Division on Earth and Life Studies (2002, 216 pp.; ISBN 0-309-08479-2; available from NAP, $24.95 plus $4.50 shipping).

IDs — Not That Easy: Questions About Nationwide Identity Systems
Computer Science and Telecommunications Board, Division on Engineering and Physical Sciences (2002, 74 pp.; ISBN 0-309-08430-X; available from NAP, $18.00 plus $4.50 shipping).

Immunization Safety Review: Hepatitis B Vaccine and Demyelinating Neurological Disorders
Board on Health Promotion and Disease Prevention, Institute of Medicine (2002, 120 pp.; ISBN 0-309-08469-5; available from NAP, $28.00 plus $4.50 shipping).

Information Technology Research, Innovation, and E-Government
Computer Science and Telecommunications Board, Division on Engineering and Physical Sciences (2002, 147 pp.; ISBN 0-309-08401-6; available from NAP, $26.00 plus $4.50 shipping).

Is Soccer Bad for Children's Heads? Summary of the IOM Workshop on Neuropsychological Consequences of Head Impact in Youth Soccer
Board on Neuroscience and Behavioral Health, Institute of Medicine (2002, 26 pp.; ISBN 0-309-08344-3; available from NAP, $12.00 plus $4.50 shipping).

Life in the Universe: An Examination of United States and International Programs in Astrobiology
Space Studies Board, Division on Engineering and Physical Sciences, and Board on Life Sciences, Division on Earth and Life Studies (2002, approx. 94 pp.; ISBN 0-309-08496-2; copies available free from the Space Studies Board, tel. 202-334-3477 or e-mail <ssb@nas.edu>).

Marine Biotechnology in the Twenty-First Century: Problems, Promise, and Products
Ocean Studies Board and Board on Life Sciences, Division on Earth and Life Studies (2002, 132 pp.; ISBN 0-309-08342-7; available from NAP, $33.00 plus $4.50 shipping).

Methodological Advances in Cross-National Surveys of Educational Achievement
Board on International Comparative Studies in Education and Board on Testing and Assessment, Center for Education, Division of Behavioral and Social Sciences and Education (2002, 350 pp.; ISBN 0-309-08333-8; available from NAP, $55.00 plus $4.50 shipping).

Modeling and Simulation in Manufacturing and Defense Systems Acquisition: Pathways to Success
Board on Manufacturing and Engineering Design, Division on Engineering and Physical Sciences (2002, 198 pp.; ISBN 0-309-08482-2; available from NAP, $41.25 plus $4.50 shipping).

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The Common Thread

A Story of Science, Politics, Ethics, and the Human Genome

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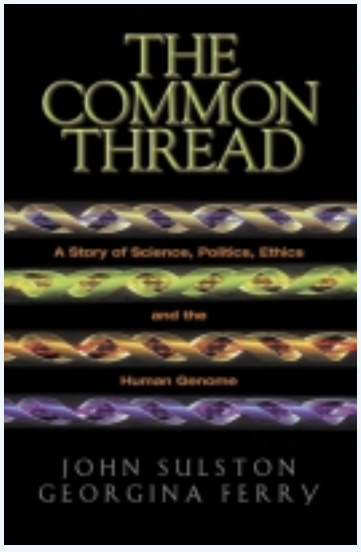

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