Contributors

BRUCE N. AMES is a Professor in the Graduate School of Biochemistry and Molecular Biology at the University of California, Berkeley, and Senior Scientist at the Children's Hospital Oakland Research Institute.

Dr. Ames was director of the National Institute of Environmental Health Sciences Center at U.C. Berkeley for twenty-three years, and he chaired the U.C. Berkeley Department of Biochemistry for six years, 1983–1989. Prior to that he was the Microbial Genetics section chief at the National Institutes of Health in Bethesda, Maryland, a National Science Foundation senior fellow in the laboratories of Frances Crick in Cambridge, England, and F. Jacob in Paris, France, and a biochemist with the National Institutes of Health, where he began his career.

Bruce Ames is the inventor of the Ames Test, which allows scientists to test chemicals to see whether they cause mutations in bacteria and perhaps cancer in humans. His research and testimony led to bans on such synthetic chemicals as Tris, the flame-retardant used in children's pajamas.

He is the author of numerous professional papers as well as

editorials and opinion pieces that have appeared in major newspapers and magazines and the recipient of nearly thirty professional honors and awards. A member of the National Academy of Sciences, Ames earned his Ph.D. in biochemistry and genetics at the California Institute of Technology.

ROGER BATE is the director of the International Policy Network in Washington, D.C., and an adjunct fellow at the Competitive Enterprise Institute (CEI), also in Washington. He was the founder of the Environment Unit at the Institute of Economic Affairs in 1993, and he co-founded the European Science and Environment Forum in 1994. He is a board member of the South African nongovernmental organization Africa, fighting malaria. Bate's Ph.D. is from Cambridge University.

He has advised the South Africa government on water markets and his research interests focus on international environmental regulations. He is particularly interested in the effects of pressures from Western politicians and Green activists to impose first-world environmental policies on developing countries.

Dr. Bate is the editor of *What Risk?* (Butterworth-Heinneman, 1997), a collection of papers that critically assess the way risk is regulated in society, and the author of several scholarly papers about risk and policies in developing countries. In addition, he has published numerous articles about risk and politics in newspapers and magazines, including the *Wall Street Journal*, the *Financial Times*, *Accountancy*, and *LM*. His most recent book is *Life's Adventure: Virtual Risk in a Real World* (Butterworth-Heinemann, 2000).

BERNARD L. COHEN earned his D.Sc. in physics in 1950. He was a group leader in cyclotron research at the Oak Ridge National Laboratory from 1950 through 1958. From 1958 through 1994, he was professor of physics and an adjunct professor in four other departments at the University of Pittsburgh, and he is now pro-

fessor emeritus at the university. He has received several awards from professional physics societies.

In addition to more that 300 papers published in professional journals, Dr. Cohen has written six books: *Heart of the Atom* (Doubleday, 1967), translated into French, German, Italian, and Japanese; *Concepts of Nuclear Physics* (McGraw-Hill, 1971), translated into Arabic and republished by Tata McGraw-Hill (India); *Nuclear Science and Society* (Doubleday, 1974); *Before It's Too Late: A Scientist's Case for Nuclear Power* (Plenum, 1983), translated into Turkish; *Radon* (Consumer Reports Books, 1987, and Avon Books, 1989); and *The Nuclear Energy Option, Alternative for the Nineties* (Plenum, 1990), translated into Japanese and Spanish. Dr. Cohen developed an inexpensive, accurate radon measurement device that has been used by thousands of homeowners.

LOIS SWIRSKY GOLD is director of the Carcinogenic Potency Project and a Senior Scientist, University of California, Berkeley, and Lawrence Berkeley National Laboratory. She has directed the Carcinogenic Potency Project for twenty-four years, and has been a member of the National Institute of Environmental Health Sciences Center at the University of California at Berkeley for fifteen years.

Dr. Gold has served on the Panel of Expert Reviewers for the National Toxicology Program and on the boards of the Harvard Center for Risk Analysis and the Annapolis Center; she was a member of the Harvard Risk Management Group and is at present a member of the Advisory Committee to the Director, National Center for Environmental Health, Centers for Disease Control and Prevention (CDC). She is among the most frequently cited scientists in her field and was awarded the Annapolis Center Prize for risk communication.

She is the author of 100 papers on the subjects of analyses of animal cancer tests and implications for human cancer preven-

tion, interspecies extrapolation, risk assessment, and regulatory policy. Her Carcinogenic Potency Database (CPDB), which presents analyses of the results of 6,000 chronic, long-term cancer tests on 1,400 chemicals, was published as a CRC handbook and is available on the Worldwide Web at http://potency.berkeley.edu.

MICHAEL GOUGH, a consultant, earned a B.A. at Grinnell College, and a Ph.D. (biology) at Brown University. After a decade-long academic career at the University of Michigan, Baylor Medical School, and the State University of New York at Stony Brook, and two years at the National Institutes of Health, he joined the congressional Office of Technology Assessment in 1977. At OTA, he began work in health risk assessment and environmental health policy and directed and contributed to OTA reports on subjects ranging from environmental causes of cancer, occupational health and safety, and Love Canal through corn genetics and biotechnology to oil shale mining.

In the early 1980's, Gough directed OTA's congressionally mandated oversight of Executive Branch studies of cancer in veterans of atom bomb tests and of the health of Vietnam veterans. He chaired a Department of Veterans Affairs advisory committee (1987–90) about the possible health effects of herbicides used in Vietnam and the Department of Health and Human Services committee (1990–95) that advises the United States Air Force study of the health of Air Force personnel who sprayed Agent Orange in Vietnam. In September 2000, he accepted reappointment to the DHHS committee. In 1995, he served on the Environmental Protection Agency's Science Advisory Board committee that evaluated EPA's dioxin reassessment.

During his academic career, he was a Fulbright Lecturer in Peru and India, and published two dozen papers in molecular biology, genetics, and microbiology. He is the author of *Dioxin, Agent Orange* (Plenum, 1986), coeditor, with T. S. Glickman, of

Readings in Risk (Johns Hopkins University Press, 1990), and coauthor, with Steven J. Milloy, of *Silencing Science* (Cato, 1999). He is the author of more than forty papers about environmental and occupational health as well as numerous newspaper op-eds. He has testified about three dozen times before Congress. He is a fellow of the Society for Risk Analysis and was president of the International Society for Regulatory Toxicology and Pharmacology (2001–2002).

DR. WILLIAM HAPPER is a Professor in the Department of Physics at Princeton University. On August 5, 1991, with the consent of the Senate, he was appointed Director of Energy Research in the Department of Energy by President George H. W. Bush. He oversaw a basic research budget of some $3 billion, which included much of the federal funding for high energy and nuclear physics, materials science, magnetic confinement fusion, environmental science, biology, the human genome project, and other areas. He remained at the DOE until May 31, 1993, to help during the transition to the Clinton administration. He was reappointed Professor of Physics at Princeton University on June 1, 1993, and named Eugene Higgens Professor of Physics and Chair of the University Research Board in 1995. With an interest in applied as well as basic science, he has served as a consultant to numerous firms, charitable foundations, and government agencies. From 1987 to 1990 he served as chairman of the Steering Committee of JASON, a group of scientists and engineers who advise agencies of the federal government on matters of defense, intelligence, energy policy, and other technical problems. A Fellow of the American Physical Society and the American Association for the Advancement of Science, and a member of the American Academy of Arts and Sciences, the National Academy of Sciences, and the American Philosophical Society, he has published over 160 scientific

papers. He is also a member of the Board of Directors of the George C. Marshall Institute.

JOSEPH P. MARTINO is a private consultant in the field of technology management. He is a Fellow or Associate Fellow of several professional organizations, including the Institute of Electrical and Electronics Engineers, the American Institute of Aeronautics & Astronautics, and the American Association for the Advancement of Science. Dr. Martino served for twenty-two years in the U.S. Air Force, retiring as a full colonel. He holds degrees in physics (A.B., Miami University), electrical engineering (M.S., Purdue University), and mathematics (Ph.D., Ohio State University). While on active duty, he was a member of the Plans Staff of both the Air Force Avionics Laboratory and the Air Force Office of Scientific Research and was also Chief of the Environmental Analysis Division of the Air Force Office of Research and Analysis. After leaving the Air Force, Dr. Martino became a Senior Research Scientist at the University of Dayton Research Institute (1975–93), where he conducted research for the Army Missile Command, Martin Marietta, AT&T, IT&T, the Hobart Corporation, and other sponsors. He also created and taught graduate-level courses in technological forecasting and technology assessment in the School of Engineering—courses that covered technological forecasting (its application to R&D planning, business, and government) and methods of anticipating the social, economic, and environmental consequences of new technology. He is the author of *Technological Forecasting for Decision Making* (Elsevier Science, 2d ed., 1983) and *Science Funding: Politics and Porkbarrel* (Transaction Pub, 1992).

PATRICK J. MICHAELS is the Virginia State Climatologist, Professor of Environmental Sciences at the University of Virginia, and the CEO of an environmental consulting firm. He holds A.B. and S.M. degrees in biological sciences and plant ecology from the Univer-

sity of Chicago and a Ph.D. in ecological climatology from the University of Wisconsin at Madison. He is a past president of the American Association of State Climatologists and was program chair for the Committee on Applied Climatology of the American Meteorological Society. He is a visiting scientist with the George C. Marshall Institute in Washington, D.C., and a senior fellow of the Cato Institute, also in Washington.

Michaels is a contributing author and reviewer of the United Nations Intergovernmental Panel on Climate Change, and his research papers have been published in the major scientific journals, including *Climate Research, Climatic Change, Geophysical Research Letters, Journal of Climate, Nature*, and *Science*. His writings for the general public have appeared in the *Washington Post*, *Washington Times*, *Los Angeles Times*, *USA Today*, *Houston Chronicle*, and *Journal of Commerce*. He has appeared on ABC, NPR's "All Things Considered," PBS, Fox News Channel, CNN, MSNBC, CNBC, BBC, and Voice of America. According to *Nature* magazine, Michaels may be the most popular lecturer in the nation on the subject of global warming.

HENRY I. MILLER, M.S., M.D., is a research fellow at the Hoover Institution. His research focuses on public policy toward science and technology, especially pharmaceutical development and the new biotechnology. His work often emphasizes models for regulatory reform. Miller joined the Food and Drug Administration in 1979, where he was the medical reviewer for the first genetically engineered drugs evaluated by the FDA and was instrumental in the rapid licensing of human insulin and human growth hormone. From 1989 to 1994 he was the founding director of the FDA's Office of Biotechnology, and he represented the FDA and the U.S. government on various expert and policy panels. After leaving government service, Miller became the Robert Wesson Fellow in Scientific Philosophy and Public Policy at the Hoover

Institution (1994–96). His monographs about risk assessment and management and regulatory policy and reform include *Policy Controversy in Biotechnology: An Insider's View* (R. G. Landes, 1997), *Biotechnology Regulation: The Unacceptable Costs of Excessive Regulation* (London: Social Affairs Unit, 1997), and *To America's Health: A Proposal to Reform the Food and Drug Administration* (Hoover Institution Press, 2000). In addition, he has published academic papers in prominent medical, scientific, and public affairs journals—*The Lancet*, *Journal of the American Medical Association*, *Science*, *Nature*, and *Nature Biotechnology*—and articles for the general public in magazines and newspapers worldwide, including, the *Weekly Standard*, *National Review*, *Wall Street Journal*, *New York Times*, and *Financial Times* (London). He is a regular commentator on the nationally syndicated John Batchelor–Paul Alexander Program on ABC radio.

ROBERT NILSSON joined the Swedish Environmental Protection Agency in 1974. While the head of the toxicological unit of the Products Control Division, he was instrumental in pushing through regulations on reductions of lead in gasoline, as well as the first general restrictions in the world on the use of cadmium. In 1986, the newly created National Chemicals Inspectorate (KEMI) took over most of the responsibility for chemicals control, and Nilsson was senior toxicologist at KEMI until July 2002. Dr. Nilsson's Ph.D. was earned in biochemistry and radiation biology.

He has worked for OECD in various capacities, for the International Program on Chemical Safety (IPCS) and for WHO, and has advised the Ministries of Environment of the governments of Iran and India. From 1992 through July 2002, with support from U.S. industry and the Commission of the European Union, he conducted research on international environmental activities in his capacity as adjunct professor of molecular toxicology and risk assessment at Stockholm University, and since July 2002 he has

continued that research as visiting professor there. His position as member of the executive board for the International Society of Regulatory Toxicology and Pharmacology in the U.S. (1994–99), as well as his role as technical adviser in products liability litigation, sometimes directed against industry interests, underline his continued interest in the "politics of chemical risk."

In July 2002, Dr. Nilsson accepted an appointment as professor in toxicology at the Nofer Institute of Occupational Medicine & WHO Collaborating Centre in Lodz, Poland. As part of his responsibility, he advises the new Polish government about creating and supervising a modern regulatory system for chemicals control.

STEPHEN SAFE is a Distinguished Professor of Veterinary Physiology & Pharmacology at Texas A&M University, where he is the director of the Center for Environmental and Rural Health. Dr. Safe's laboratory research is focused on environmental chemistry, toxicology, biochemistry, and mechanisms of action of polychlorinated biphenyls (PCBs), dibenzo-p-dioxins (PCDDs), dibenzofurans (PCDFs) and related compounds. He received a Phil. D. from Oxford University, and a M.Sc. from Queen's University. Dr. Safe is a Senior Scientist, Institute of Occupational and Environmental Medicine, Texas A&M University, and Adjunct Professor, University of Guelph. He served on the National Academy of Sciences Committee on Hormonally Active Agents in the Environment. A member of chemical, biochemical, and microbiology professional societies, he has received awards for his research and has been an honored lecturer at universities in the United States, Canada, and the United Kingdom. In addition to his research papers, published in premier scientific journals, he has published opinion pieces about risks from environmental chemicals in major newspapers.

S. FRED SINGER's research focuses on global climate change, depletion of stratospheric ozone, acid rain, air pollution, the U.S.

space program, energy resources, and U.S. energy policy. His Ph.D. in physics is from Princeton University.

A pioneer in rocket and satellite technology, Singer devised the basic instrument for measuring stratospheric ozone, was the principal investigator on a satellite experiment retrieved by the space shuttle in 1990, and was the first scientist to predict that population growth would increase atmospheric methane—an important greenhouse gas.

Now president of the Science and Environmental Policy Project, a nonprofit policy research group he founded in 1990, Singer is also Distinguished Research Professor at George Mason University and professor emeritus of environmental science at the University of Virginia. He was the founding Dean of the School of Environmental and Planetary Sciences, University of Miami (1964–67), and director of the Center for Atmospheric and Space Physics, University of Maryland (1953–62). Among his several positions in the U.S. government, he was the first director of the National Weather Satellite Service (1962–64) and Deputy Assistant Administrator for Policy, U.S. Environmental Protection Agency (1970–71).

Singer has received numerous awards for his research, including a Special Commendation from the White House for achievements in artificial earth satellites, a U.S. Department of Commerce Gold Medal Award, and the first Science Medal from the British Interplanetary Society. He has served on state and federal advisory panels, including five years as vice chairman of the National Advisory Committee on Oceans and Atmospheres. He frequently testifies before Congress.

He is the author or editor of more than a dozen books and monographs, including *Is There an Optimum Level of Population?* (McGraw-Hill, 1971), *Free Market Energy* (Universe Books, 1984), *Global Climate Change* (Paragon House, 1989), *Hot Talk, Cold Science: Global Warming's Unfinished Debate* (Independent Insti-

tute, 1997), and also has published more than 400 technical papers in scientific, economic, and public policy journals. His editorial essays and articles have appeared in numerous publications, including the *Wall Street Journal*, *New York Times*, *New Republic*, *Newsweek*, *Journal of Commerce*, *Washington Times*, and *Washington Post*.