

HARVARD UNIVERSITY

ROBERT AND RENÉE BELFER
CENTER FOR SCIENCE AND INTERNATIONAL AFFAIRS

2002-2003

ANNUAL REPORT

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Director's Foreword

The second year of the global war on terrorism has provided tremendous challenges for our nation and has kept BCSIA at the intellectual center of the most significant issues under debate. For the 2002-03 academic year, the headlines of our international press reflected well the internal priorities of our Center. The war in Iraq and search there for Weapons of Mass Destruction (WMD); the challenge from North Korea on reprocessing fuel to create nuclear weapons; and the hot debate over Russian provided technology for an Iranian nuclear facility.

Before elaborating on these issues, I do want to note clearly that BCSIA is about much more than international security in the military sense. In September William Clark delivered to the U.S. House of Representatives Committee on Science his highly acclaimed report on "The State of the Nation's Ecosystems." In April the first Roy Family Award, a recognition program established through the Environment and Natural Resources Program in BCSIA to recognize private-public cooperation for the protection of natural resources was presented to a project in Bolivia. Also this spring four BCSIA faculty members – William Clark, John Holdren, Calestous Juma, and Henry Lee joined to create a new executive education program for senior government officials from developing nations on how to incorporate recent advances in science and technology. In meeting the special challenges of intrastate conflict in Africa, Robert Rotberg, head of the WPF Program on Intrastate Conflict, has hosted presentations by African leaders, as well as published a series of books, op-eds and articles to bring these issues into the public spotlight.

In dealing with the earlier referenced challenges in Iraq, North Korea, and Iran, BCSIA continued its leadership role through a program of engagement with key decision makers and through presenting arguments through the public media. Among the guests who came to BCSIA events this past year for discussion and engagement have been President Musharraf of Pakistan, Senator Dick Lugar, Chairman of the Joint Chiefs of Staff General Dick Myers, Commander of U.S. Northern Command General Ralph Eberhardt, former Secretary of Defense William Cohen, and a host of other scholars, politicians, and opinion makers.

Ashton Carter has remained in the lead for BCSIA through his Preventive Defense Program in dealing with both public appearances and advising our government on the unique challenges of dealing with North Korea's nuclear weapons potential and program. Following our traditional interest in preventing "loose nukes," Matt Bunn, Anthony Weir, and John Holdren joined forces to author "Controlling Nuclear Warheads and Materials: A Report Card and Action Plan." Prior to the military conflict in Iraq, BCSIA international security experts were hard at work assessing the justification for conflict, the cost of engagement, and the likely outcome of the war.

Our stellar International Council continued to make meaningful contributions to our program through their interaction with faculty and researchers and through their active participation on our annual spring gathering. This year President Larry Summers opened our program at the opening dinner and led into a James Schlesinger hosted discussion on

developments in Iraq. On the second day we covered a wide range of contemporary issues including North Korea, U.S. Defense Transformation, the impact of science and technology on the environment, as well as strategies and technologies for combating terrorism. To expand on these meetings, BCSIA has set up a program for conference calls to allow International Board members to share views with distinguished visitors to BCSIA.

In this opening letter I have only been able to touch on some of the highlights of a very productive year for our center here at Harvard. I sincerely hope you will take the time to explore in depth the extraordinary work of our various programs as reported in the following pages.

Graham Allison

Overview ————— ◆ *from the Executive Director*

The 2002-03 academic year again kept BCSIA in the public spotlight and in the heart of intellectual study over the most immediate challenges facing us in international security affairs, environmental and research issues, and science and technology policy.

The war in Iraq provided a unique opportunity for BCSIA to demonstrate its academic prowess by dissecting for the public and for academic peers each aspect of the then pending conflict from the merits of the various arguments on options to the likely cost of such a conflict. Once the war began the media flooded BCSIA with request for expert understanding and explanation of this major international conflict and members of the Center provided more than 100 media interviews in the month-long conflict.

However, despite such major external drains on time and resources, the Center kept its focus on what it does best, advancing policy-relevant knowledge in our primary areas of competence. “International Security” retained its dominant position as the premier American publication for the most crucial issues on the security front. Robert Rotberg of our Program on Intrastate Conflict published State Failure and State Weakness in a Time of Terror. Bill Clark of the Environment and Natural Resources Program made a major contribution with The State of the Nation’s Ecosystems.

Once again BCSIA managed to attract one of the most skilled group of academic fellows to populate any academic institution in America and they collaborated across program lines on such critical issues as our Managing the Atom Project and studies on aspects of terrorism.

Finally, BCSIA continued its faithful service as a good citizen in the Kennedy School and larger Harvard communities. Steve Walt is serving as the Academic Dean of the Kennedy School. Rob Stavins continues to chair a University wide initiative on environmental issues. Numerous faculty and researchers now regularly work across both Center and School lines to share their expertise and build collaborative programs.

The pages that follow reflect the extraordinary accomplishments of these exceptional people of whom we are quite proud. We hope after reading this report you will share our enthusiasm and continue as a member of our larger community.

John Reppert

Caspian Studies Program

MEMBERS

Graham T. Allison, Jr., Director
Brenda Shaffer, Research Director
Anya Schmemmann, Program Manager
John Grennan, Research Assistant
Susan Lynch, Staff Assistant
Grenville Byford, Affiliate
Maury Devine, Fellow

BACKGROUND

The 2002–2003 academic year was the fourth year of the Caspian Studies Program and Azerbaijan Initiative at the Kennedy School. The Program was established in 1999 with a generous gift from the United States–Azerbaijan Chamber of Commerce. The founding sponsors of the Program are ExxonMobil and ChevronTexaco, assisted by gifts from CSO Aker Maritime Offshore LTD, CCC, and ETPM. Continued Support for the Program has come from ExxonMobil, ChevronTexaco, the Amerada Hess Corporation, ConocoPhillips, and Glencore International. Additional research and activity has been made possible by Solar Turbines and the Unocal Corporation.

Through the Program’s research, outreach, and teaching, it seeks to raise the profile of the region’s opportunities and problems, and utilize Harvard resources to train new leaders who will help shape the future of the region. By establishing a dialogue among policymakers, scholars, and practitioners, the Program hopes to focus the debate in ways that produce effective policy toward and for the region.

The Program’s main objective is promote effective policies from the U.S. policymaking community toward the Caspian region as an area in which the United States has important national interests and where U.S. policy can make major difference. The U.S. policy community includes: the Executive and Legislative branches of government; the analytic community that surrounds these institutions (including think-tanks, universities, and NGOs); and the press. In this noisy environment, the Program’s goal is to identify the Caspian for the policymaking community as a location of importance; to explore and explain the special opportunities and risks in this region; and to identify actions that the U.S. government, other governments, NGOs, universities, and others can take in order to make a difference in the region. Similarly, the Program seeks to increase the understanding of U.S. policy among the Caspian region’s leaders and populations. In addition, the Program seeks to contribute to governance capacity-building in the states of the Caspian region itself.

CASPIAN STUDIES PROGRAM RESEARCH

The Caspian Studies Program's research agenda is focused on three tightly-connected issues which are of importance to the Caspian region: (1) U.S. national interests in the Caspian basin; (2) Specific geopolitical realities and trends in the states bordering the Caspian basin; and (3) U.S. and other states' political, economic, and security strategies toward the Caspian region. The research component of the Program seeks to inform policy and academic debates about these issues through policy briefs, working papers, books, articles, presentations, and reports emerging from the Program's conferences and seminars.

CSP Research Director Brenda Shaffer's research continues to focus on the specific geopolitical realities and trends in the states of the region, as well as their relations with one another and with the United States. Her book on the history of the Azerbaijanis in both Soviet Azerbaijan (and its successor the Republic of Azerbaijan) and Iran was published by MIT Press in October 2002. Dr. Shaffer is the editor of another book that the Program focused on this year—an edited volume entitled *The Limits of Culture: Islam, Foreign Policy, and the Caspian*. This book will be published in early 2004 by the MIT Press and examines the impact of culture on the process of foreign policy in the Caspian region. Dr. Shaffer has also published *Partners in Need: Russian-Iranian Strategic Cooperation and Relations* (Washington D.C.: The Washington Institute for Near East Policy, 2001) and continues to write and lecture on security and proliferation issues that concern Iran. In addition to these books, Shaffer has published several articles and op-eds over the course of the year in a wide variety of journals and papers including the *Wall Street Journal Europe*, the *Christian Science Monitor*, and the *International Herald Tribune*.

CSP Chair Graham Allison also continued his involvement with the program. He delivered a lecture on "Nuclear Proliferation in the Region" at the Kennedy School's Black Sea Security Program. His publications and teaching also incorporate the Caspian region, including his article for the *USACC Investment Guide to Azerbaijan 2003* entitled "Geopolitical Overview of the Caspian Region: Sharing the Caspian Bathtub with the American Elephant" and a Russian and Caspian energy case study in his "Central Issues of American Foreign Policy" course at the Kennedy School. Dr. Allison served as faculty adviser to students from the region studying at the Kennedy School and frequently discusses policy toward the Caspian region with U.S. policy-makers.

CSP Affiliate Grenville Byford's research focuses on Turkey, relations between religion and state, and Turkey's policy in the Caspian region. He published an op-ed this past year in the *International Herald Tribune* entitled "Turkish Politics and an Unwanted War: Give Erdogan Support."

CSP Fellow Maury Devine continued her research on international energy development, particularly on the relationships between business and government. Her research focuses on

lessons from oil and gas development in Norway and their application to the Caspian region, particularly Azerbaijan and Kazakhstan. She is also examining how the lessons learned from the Norwegian oil experience relate to the Caspian countries' fiscal regimes, pace of development, and moves toward privatization.

All the Caspian Studies Program publications, as well as summaries and transcripts of the seminars, are available on the Program's web page, which has also become a key resource for researchers from the region and those doing work on the region.

CASPIAN STUDIES PROGRAM SEMINAR SERIES

One of the main components of the Caspian Studies Program is its Seminar Series, which features leading academics and key policymakers from the United States and from the Caspian region and addresses critical issues in the region. Each of the eight seminars/panel discussions in 2002–2003 was well-attended and attracted a diverse audience of faculty, staff, researchers, graduate students, and community members who engaged in lively discussions. Summaries of each of these seminars are posted on the Program's web page.

The 2002–2003 seminar series encompassed a wide range of security and economic topics. Some of the highlights included Kanat Bozumbayev's presentation on "Lessons from Kazakhstan's Successful Electricity Reform"; ISP Director Steven Miller, ISP Fellow Chen Zak , and CSP Research Director Brenda Shaffer each speaking at a panel discussion on "The Forgotten Threat? Iran and Weapons of Mass Destruction"; and "From Pipe Dream to Pipeline: The Realization of the Baku-Tbilisi-Ceyhan Pipeline," which featured former Ambassador Richard Morningstar.

In addition to the formal seminar series, the Program sponsored two addresses during the 2002–2003 academic year. In October 2002, it co-sponsored an address at the School for Advanced International Studies (SAIS) in Washington D.C. with the SAIS Central Asia–Caucasus Institute and the United States–Azerbaijan Chamber of Commerce by Ilham Aliyev, First Vice-President of the State Oil Company of Azerbaijan (SOCAR) and member of the *Milli Majlis* (Parliament), who was recently elected President of the Republic of Azerbaijan. He spoke on the role that the Azerbaijani energy industry has played and will continue to play in advancing the country's overall economic development and also on the continuing Nagorno-Karabagh conflict between Armenia and Azerbaijan and its impact on regional stability. In March 2003, Steven Miller addressed fellows from the Caspian region and staff and associates of the Program on "Current Trends in U.S. Foreign Policy: Implications for the Caspian."

The Program hosted a number of activities for students from the Caspian region states who are attending the Kennedy School of Government. These events and meetings provided networking opportunities and encouraged the Fellows to build contacts that, upon return to government service in their home states, they could use as a future conduit of working relationships to counterparts in the United States. In addition, the Program hosted a dinner in celebration of the graduation of the students from the Caspian region. Ambassador Kanat Saudabayev of Kazakhstan attended both the dinner and the KSG diploma ceremony.

OUTREACH: ENGAGING GOVERNMENTS AND THE POLICY COMMUNITY

The Caspian region, with its rich oil and gas reserves and its sensitive geostrategic location, is an important but little understood area of the world. The key objective of the outreach component of the Caspian Studies Program is to engage members of the policymaking community, including the U.S. Congress, on energy and security issues. The Program ultimately seeks to establish international dialogue among policymakers, scholars, and practitioners. The program also seeks to provide an informal setting for policymakers from the United States and the Caspian region, representatives of corporations that are active there, and academics to meet in and exchange policy views on the region.

During the 2002–2003 academic year, the Program continued to pursue these objectives through a variety of activities including: media appearances by Program staff, participation in outside conferences, a vibrant Caspian Seminar Series, and individual meetings and briefings with U.S. and regional policymakers.

Research Director Brenda Shaffer held several briefings and policy meetings for U.S. Government officials and policymakers in Washington, D.C. over the course of the year. The most significant of these was her briefing of Senator Conrad Burns on energy security issues and Caspian energy developments in September 2002. She also gave several briefings at the Departments of Defense, Energy, and State.

Dr. Shaffer also made presentations to and met with foreign government officials and policymakers at Harvard and in Washington D.C. She addressed a visiting delegation of the Russian Duma at KSG, met with First Vice-President of SOCAR Ilham Aliyev and Deputy Prime Minister Karim Massimov of Kazakhstan when they visited Washington D.C., and discussed U.S. foreign policy in the Caspian region with Du Dewen, Deputy Director of the Department of East European and Central Asian Affairs in the Chinese Foreign Ministry.

In London, Dr. Shaffer met with Emil Majidov, Consul in the Embassy of the Republic of Azerbaijan, spoke at *Karabagh Conflict: Public Discussion* which was held at the House of Lords, and made presentations at the London School of Economics (*Azerbaijan Movement: New Challenges in Iranian Politics* and *Baku-Tbilisi-Ceyhan: Eurasian Energy Corridor*) and at Chatham House, the Royal Institute of International Affairs (*Azerbaijan's Foreign Policy Priorities and Responses to Regional Challenges*). At the Italian Ministry of Foreign Affairs in Rome, she spoke at the “Energy and Water Security in Central Asia: Sustainability Concerns and Geopolitical Issues” seminar and roundtable discussion on *Geopolitical Scenario in Central Asia*.

Research Director Brenda Shaffer also presented the Program’s research findings at other conferences in the United States and abroad. Dr. Shaffer represented the Caspian Studies Program at several conferences including “Security and Insecurity in Central Asia and the Caucasus: A Regional Challenge with Global Implications,” a conference at the Yale Center for the Study of Globalization. Dr. Shaffer presented a paper before the European Union Institute for Security Studies Task Force on the Caucasus, a body to which she was appointed this year. She lectured at the National Bureau of Asian Research’s “Caspian Sea Basin Security” conference as well.

Shaffer also was a participant in the two colloquia of the Stiftung Wissenschaft und Politik (SWP)/Nixon Center Working Group, “Iran and Its Neighbors: Diverging Views on a Strategic Region” where she presented on “Iran in Central Asia and the Caucasus.” The Program frequently presented its research findings to the media. Brenda Shaffer discussed the Nagorno-Karabagh conflict, Iran’s regime stability and ethnic politics, the Iranian nuclear program, regional implications of the war in Iraq, and security issues in the South Caucasus and Central Asia in various media outlets including: the *British Broadcasting Corporation* (in English, Russian, and Azerbaijani); *National Public Radio* (WBUR’s “The Connection”); *Voice of America*; *Israel Broadcasting Authority* (in English and Arabic); *Radio Free Europe/Radio Liberty*; *Public Broadcasting Service* (“McLaughlin’s One on One”); and *CNN International’s* Q&A. In Azerbaijan, Dr. Shaffer was featured in the following media outlets: *Lider Television*, *525-ci Qazet*, and *RFE/RL’s* Azerbaijani service.

Shaffer wrote a number of op-eds that appeared in the *Wall Street Journal Europe*, the *Christian Science Monitor*, and the *International Herald Tribune*. She was also quoted extensively in news stories and features for the *Moscow Times*, *RFE/RL*, and the *Associated Press*, commenting on Iran’s nuclear program and treatment of ethnic minorities and Caspian energy resources.

AZERBAIJAN INITIATIVE

The Azerbaijan Initiative of the Caspian Studies Program includes briefings, seminars, and events on critical issues related to Azerbaijan and provides funds for emerging leaders from Azerbaijan to attend programs at the Kennedy School. During the initial three years of the Caspian Studies Program, there are scholarships for full-time graduate students to attend the Mid-Career Program and receive their Masters in Public Administration degrees and for individuals with extensive government experience in Azerbaijan to attend Executive Education Programs as USACC Fellows.

In 2002, three fellowships were awarded to provide emerging leaders from Azerbaijan the opportunity to sharpen their skills, knowledge, and expertise through participation in Kennedy School Executive Programs. The 2002–2003 Azerbaijan Initiative fellows were Fakhraddin Gurbanov, ambassador-at-large for the Republic of Azerbaijan, who attended the Kennedy School’s Senior Managers in Government Program in August 2002, and Farid Shafiyev, second secretary of the Division of Security Affairs in Azerbaijan’s Ministry of Foreign Affairs, who graduated from the Kennedy School at the end of the 2002–2003 year with a Master’s Degree in Public Administration and who was also a Mason Mid-Career Fellow during that period.

The 2003–2004 USACC scholarship recipient is Shahmar Mosumov, who was Department Director at the National Bank of Azerbaijan. He is a Mason Mid-Career Fellow and is pursuing a Master’s Degree in Public Administration.

INTEGRATING THE CASPIAN REGION INTO THE KENNEDY SCHOOL AND HARVARD’S TEACHING AND PROGRAMMING

In addition to the research, engagement, and fellowship components, the Caspian Studies Program has facilitated the direction of additional existing Harvard University resources toward

activities focused on the Caspian region. By integrating these new activities into already existing programs, we have strengthened and enhanced their impact and heightened awareness of the Caspian region at Harvard.

By working with the Kennedy School's international programs office to publicize the educational opportunities available to students from other countries in the region, Caspian Studies Program staff helped to recruit students from the Caspian region to study in degree programs at the Kennedy School. The Caspian Studies Program maintained close contact with these students throughout the year; the students participated in and helped inform the Program's research, outreach, publications, and events. Nurlan Kapparov (MC/MPA from Kazakhstan) helped organize and moderated the "Lessons from Kazakhstan's Successful Electricity Reform" seminar, Janar Aitjanova (MC/MPA from Kazakhstan) was instrumental in planning the seminar on "Eastern Europe and the Commonwealth of Independent States: UNDP's Perspective of Development and Integration Challenges," and Farid Shafiyev (MC/MPA from Azerbaijan) gave a lecture with an accompanying audio-visual presentation on his country's history and culture for Harvard Neighbors, a University community group.

Similarly, Caspian Studies Program staff collaborated with the Black Sea Security Program staff in May 2003. The Black Sea Program brought delegates from nine countries (Armenia, Azerbaijan, Bulgaria, Georgia, Greece, Romania, Moldova, Turkey, and Ukraine) to Harvard's Kennedy School of Government in order to discuss emerging security trends in the Black Sea region. CSP Chair Graham Allison lectured on nuclear proliferation in the region. CSP Research Director Brenda Shaffer led a session on Iran. Dr. Shaffer also moderated a panel discussion of officials from the three countries of the South Caucasus— Armenia, Azerbaijan, and Georgia—that was entitled "U.S. Security and Military Cooperation with the Countries of the South Caucasus."

The Caspian Studies Program also facilitated the inclusion of the Caspian region in the curricula of courses at the Kennedy School and at Harvard more broadly. Professor Allison's Central Issues in American Foreign Policy includes a case on U.S. policy on promoting Russian and Caspian oil exports and on U.S. energy policy more generally. Dr. Allison and John Grennan co-authored the case entitled "U.S. Policy on Russian and Caspian Oil Exports: Addressing America's Oil Addiction" for the course. CSP worked with Professor Brian Mandell to integrate ongoing conflicts from the greater Caspian region into both his research and teaching on negotiations and conflict resolution.

CSP Research Director Brenda Shaffer participated in three KSG events that addressed issues surrounding the war in Iraq: "Conversation on Iraq" in Washington D.C., the Dean's Conference on "Global Risks and Realities: How Should America Lead?", and a Forum panel discussion on America's role in the world in the aftermath of that war. In each of these panels, she provided information about and perspectives from the greater Caspian region.

MEMBERS' ACTIVITIES

Graham Allison, Faculty Chair of the Caspian Studies Program, has continued to play an active role in the 2002–2003 academic year. He delivered a lecture on “Nuclear Proliferation in the Region” at the Kennedy School’s Black Sea Security Program. His publications and teaching also incorporate the Caspian region, including his article for the *USACC Investment Guide to Azerbaijan 2003* entitled “Geopolitical Overview of the Caspian Region: Sharing the Caspian Bathtub with the American Elephant” and a Russian and Caspian energy case study in his “Central Issues of American Foreign Policy” course at the Kennedy School. In June 2003, he was honored by the Republic of Kazakhstan with the Order of Dostik for his efforts to remove nuclear weapons from Kazakhstan during his tenure as Assistant Secretary of Defense in the Clinton Administration and for his support of Kazakhstani students at the Kennedy School.

Brenda Shaffer serves as research director of the Caspian Studies Program and is an International Security Program post-doctoral fellow. Dr. Shaffer is also a recipient of the “Young Truman Scholar” Award in the field of Middle Eastern Studies of the Harry S. Truman Research Institute for the Advancement of Peace at the Hebrew University of Jerusalem. Dr. Shaffer’s research concentrates on the Caucasus, Central Asia, Iran, Russian-Iranian relations, theoretical issues of collective identity, and the link between culture and foreign policy. She published a number of works this year, including a book entitled *Borders and Brethren: Iran and the Challenge of Azerbaijani Identity* as part of the BCSIA’s Studies in International Security at MIT Press; a number of op-eds, which appeared in the *Wall Street Journal Europe*, the *Christian Science Monitor*, and the *International Herald Tribune*; journal articles in *Current History* and *Géopolitique*; and a chapter on Azerbaijanis in Iran in an edited volume in Turkish. Dr. Shaffer is currently working on an edited volume entitled *The Limits of Culture: Islam, Foreign Policy, and the Caspian*, which will also be published as part of the BCSIA Studies in International Security Series.

In her policy outreach efforts, Dr. Shaffer gave a number of briefings and lectures at government fora, including a briefing of Senator Conrad Burns on energy security issues and Caspian energy developments; briefings at the Departments of Defense, State, and Energy; lectures at conferences at the Italian Foreign Ministry and the European Union Institute for Security Studies Task Force on the Caucasus, to which she was recently appointed a member. She spoke frequently on the Nagorno-Karabagh conflict, security issues in the Caucasus, and Iran at a variety of international conferences and seminars—including two colloquia of the SWP/Nixon Center Working Group on “Iran and Its Neighbors”, a National Bureau of Asian Research conference, a panel discussion at the House of Lords in London, and two events at the London School of Economics. Dr. Shaffer frequently met with and briefed senior officials from the Caspian region as well.

Dr. Shaffer participated in three KSG events that addressed issues surrounding the war in Iraq: “Conversation on Iraq” in Washington D.C., the Dean’s Conference on “Global Risks and Realities: How Should America Lead?”, and a Forum panel discussion on America’s role in the world in the aftermath of that war.

Anya Schmemmann was the program manager for the Caspian Studies Program. She graduated from Harvard College with Honors in 1993 with a B.A. in Government and received her M.A. in Russian, East European and Central Asian Studies from Harvard University in 1995. Previously, she was the Communications Officer for the Belfer Center for Science and International Affairs and a Project Manager for the EastWest Institute's European Security Program. She supervised CSP daily operations, organized events, and oversaw the writing and editorial process for both print and electronic publications. She also wrote a *BCSIA Media Feature* that detailed Director Graham Allison's receiving the Order of Dostik from Ambassador Kanat Saudabayev of Kazakhstan following the KSG diploma ceremony in June 2003.

John Grennan was a research assistant at the Caspian Studies Program. He graduated from Georgetown University in 1997 and received his M.A. in History from Duke University in 2000. He has previously worked as a researcher at the Survivors of the Shoah Visual History Foundation, an editor at the Washington Institute for Near East Policy, and as a history and writing instructor at Duke University. He conducted research on Caspian and Russian energy developments, relations among Caspian basin states, and U.S.-Iranian relations. He is co-author with Graham Allison of "Addressing America's Oil Addiction: U.S. Policy on Russian and Caspian Oil Exports."

This year, he developed and maintained the Program's new website, copyedited the Caspian Studies Program's newsletter, prepared all the event summaries that were posted on the website, and wrote two *KSG News Stories* about Program events. He also conceived of and was instrumental in organizing the panel discussion on "The Forgotten Threat? Iran and Weapons of Mass Destruction."

Susan Lynch is the staff assistant for the Caspian Studies Program, providing administrative support, assisting in daily operations, and planning event logistics. She also assists in the production and distribution of program publications, which involves maintaining the contacts database and other outreach operations. She joined the Caspian Studies Program in 2002 after working for the BCSIA Studies in International Security as a freelance proofreader. She graduated from the Pennsylvania State University in 1984 with a B.S. in Microbiology.

Grenville Byford is a research affiliate of the Caspian Studies Program. He holds a B.A. in Chemistry from Oxford University and an M.B.A. from the Harvard Business School. His research focuses on Turkey, relations between religion and state, and Turkey's policy in the Caspian region. During 2002–2003, he worked with KSG students from the Caspian region to expand their educational experience at Harvard. He has published op-eds relating to Turkey, most recently in the *International Herald Tribune*.

Maury Devine is the former president and managing director of Mobil (now ExxonMobil) in Norway and was a fellow at the Caspian Studies Program. Her research focuses on lessons from

oil and gas development in Norway and their application to the Caspian region, particularly Azerbaijan and Kazakhstan. She is also examining how the lessons learned from the Norwegian oil experience relate to the Caspian countries' fiscal regimes, pace of development, and moves toward privatization. She is examining the State Oil Fund of Azerbaijan, the Norwegian State Oil Fund, and other examples of oil funds around the world, comparing their structures and successes.

PUBLICATIONS

To review publications of the Caspian Studies Program and its members, see page 150.

EVENTS

To review events of the Caspian Studies Program and its members, see page 131.

Environment and Natural Resources Program

MEMBERS

FACULTY

William Clark, Harvey Brooks Professor of International Science, Public Policy and Human Development;
Director, Sustainable Development Program, Center for International Development
Cary Coglianese, Associate Professor of Public Policy; Chair, Regulatory Policy Program
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Henry Lee, Jaidah Family Director of the Environment and Natural Resources Program; Lecturer in Public Policy;
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Calestous Juma, Professor of the Practice of International Development and Director of the Science,
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Edward Parson, Associate Professor of Public Policy
Robert Stavins, Albert Pratt Professor of Business and Government

SENIOR FELLOWS AND RESEARCH STAFF

Ian Bowles, Senior Research Fellow, ENRP and STPP
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Nancy Dickson, Executive Director, Research and Assessment Systems for Sustainability Project
Charles H. W. Foster, Senior Research Fellow, ENRP
Robert Frosch, Senior Research Fellow, ENRP
Mary Graham, Senior Research Fellow, ENRP and STPP
J. Michael Hall, Senior Research Fellow, Research and Assessment Systems for Sustainability and Initiative
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Cheryl Holdren, Senior Research Fellow, Kennedy School of Government
Robert Kates, Visiting Scholar, ENRP
Philip Sharp, Senior Research Fellow, ENRP

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Katherine Emans, Pre-Doctoral Fellow
Darby Jack, PhD. Candidate
Colin Polsky, Research Fellow

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Lori Snyder, Ph.D. Candidate
Vanessa Timmer, Pre-Doctoral Fellow
Alexander Wagner, Ph.D. Candidate, Crump Fellow 2002-2003
Rui Wang, Pre-Doctoral Fellow
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Jo-Ann Mahoney, Coordinator, Events and Publications, ENRP
Zannah Marsh, Assistant to the Director, ENRP
Jennifer Shultis, Assistant to Professor Stavins

BACKGROUND

In today's world, decision makers are increasingly aware that one cannot look at environmental policy without including economic and energy policy and that security means not just protection from military aggression, but also maintenance of adequate supplies of food, water and health. Such problems cannot be effectively addressed solely from one discipline or from the perspective of one issue or one country. The world of the future will demand the integration of multiple needs and values across both disciplinary and geographical boundaries. These beliefs continue to govern the direction and structure of the BCSIA's Environment and Natural Resources Program (ENRP).

As a result, the Program has nurtured linkages to other programs within the BCSIA and with programs at the Kennedy School. The ENRP's ongoing work on energy and climate change policy is closely tied to that of the Science and Technology Policy Program (STPP) headed by John Holdren. In fact, Henry Lee, ENRP Director, is co-principal investigator in all of the STPP's energy projects. In addition, Bill Clark, faculty chair of the ENRP, is also the chair of the Center for International Development's (CID) projects on sustainable development and the environment. The ENRP also has joint projects with the Center for Business and Government, the Taubman Center for State and Local Government, and the China and Middle East Programs.

To implement this interdisciplinary agenda, the ENRP brings together scholars from the physical sciences with those from the social sciences, such as economics and management and law, and from the United States as well as from countries in both the developed and developing world. Professors John Holdren and Bill Clark have impeccable credentials in the sciences. Professor Robert Stavins is one of the nation's foremost environmental economists. William Hogan continues to be at the intellectual center of electricity restructuring. Calestous Juma, formerly head of the United Nation's Biodiversity program, has initiated new projects with developing countries on technology and environmental policy. This faculty covers a spectrum of disciplines and perspectives united by their mutual interest in public policy. They were supported by a number of lecturers, junior faculty and senior fellows including: Henry Lee, Cary Coglianese,

Charles H.W. Foster, Robert Frosch, Ian Bowles, Robert Correll, Michael Hall, Mary Graham, Edward Parson and Archon Fung.

The World Summit on Sustainable Development (WSSD) in Johannesburg in late August of 2002 identified the goals, strategies and initiatives that will shape the global efforts to move closer to a sustainable economy and environment. The work at the ENRP strives to contribute to the implementation of these Millennium WSSD's goals and the UN agenda. Singularly each of the ENRP's research initiatives focuses on issues at the cutting edge of the international policy debate. John Holdren's work on energy policy, Robert Stavins' on climate change and water pricing, Bill Hogan's on power, Henry Lee and Tony Gomez-Ibanez's program on public infrastructure, Calestous Juma's research on biodiversity, Archon Fung's work on risk, and Bill Clark's multiple projects on sustainability—all are making important contributions. But their real strength lies in their interaction and complementarity. Countries do not make decisions on climate change independent of the need to assure their people of adequate supplies of food and energy, nor do they look at biodiversity independent of their need to find jobs and an improved quality of life for their citizens. The challenge facing the ENRP is to knit these research efforts into a larger whole.

RESEARCH

The ENRP's research strives to answer several of the key questions confronting the global community. These questions, which were outlined in last year's Annual Report, include the following:

- How can we do a better job of bridging the gap across natural, social and engineering sciences, the environment and development communities, multiple sectors of human activity, geographic and temporal scales and more generally the worlds of knowledge and action?
- How can societies strengthen their infrastructure and capacity for conducting and applying science and technology to enhance the sustainability of our environment?
- How can policy makers move from assessing environmental threats on an individual basis to looking at where multiple threats stress the environment?
- How can societies respond effectively and efficiently to the threat of global environmental threats, such as climate change, loss of biodiversity and environmentally unsustainable economic policies?
- What would constitute a sustainable energy agenda and how can countries design, develop and implement such policies?

The largest research effort, Science and Technology for Sustainability, under Bill Clark's direction, has sought to promote the social goals of accelerated human development while

protecting the earth's life support systems. Groups as diverse as the World Bank, the UN Development Programme, the International Council of Science (ICSU) and the US National Academy of Sciences have emphasized the significantly increased role that science and technology must play in supporting decision making if those challenges are to be met. And the Bush Administration has recently highlighted the emerging area of "sustainability science" as meriting high priority in our country's efforts to increase the relevance, timeliness and overall social utility of its science and technology endeavor.

After two decades of remarkable progress in the earth system sciences, science and technology is well positioned to meet these challenges. Fulfilling that promise, however, will require that past accomplishments be drawn together in three important ways: *integration* across the human and natural dimensions of the earth system; incorporating a *decision support* orientation in the selection of problems to be studied, priorities to be pursued, and applications institutions to be developed; and *building capacity* in the research, program management and decision communities to perform these tasks.

In 2002-2003, the ENRP supported a number of new initiatives, including a study for the Rockefeller Foundation on the efficacy of "debt for carbon" swaps in developing countries, an initiative with the Taubman Center led by Archon Fung and Mary Graham on the strengths and weaknesses of disclosure programs in reducing risks, an executive session on oil and security in the post-Iraq war era, and a major study assessing and comparing 13 proposals to design and structure an international regime to reduce greenhouse gas emissions.

In 2002-2003, several ENRP faculty received well-deserved recognition. Bill Clark was inducted into the National Academy of Sciences. The Heinz Center report on the *State of the Nation's Ecosystems*, which Clark designed, was released in the Fall. John Holdren continued his active role with the National Academy of Sciences, participating as a leader in five of their major studies. After three years, Robert Stavins resigned as Chair of EPA's Environmental Economics Advisory Committee, having contributed to the restructuring and rebuilding of the agency's analytic capability. He remains an active member of the EPA's Clean Air Act Advisory Committee. Calestous Juma attended the World Summit on Sustainable Development in Johannesburg and serves as a major advisor to the United Nations. Calestous has been intimately involved in several of Kofi Anan's activities on biodiversity and environmental sustainability.

OUTREACH

This was a banner year for environment and natural resource events at the Kennedy School. On October 1, the ENRP hosted the John Sawhill memorial lecture, honoring the late President of the Nature Conservancy, who had served on the Environment and Natural Resources Steering Committee since its inception and was a long-standing friend to the school and its work in the areas of energy and environmental policy. Edward O. Wilson gave the main presentation on "The Future of Life," the Global Conservation Challenge to a capacity crowd in the ARCO Forum. ENRP Senior Fellow Ian Bowles and Massachusetts Audubon president Laura Johnson responded to Wilson's presentation.

ENRP awarded the first Roy Family Award to The Noel Kempff Mercado Climate Action Project at a ceremony held on April 3, 2003. The Program recognized the five project partners who acquired logging rights on 2 million acres of forestland adjacent to one of the most biologically diverse areas in the world – Bolivia’s Noel Kempff Mercado National Park – effectively doubling the size of the park. The ceremony was coupled with a panel discussion on “Pushing the Frontiers of Environmental Conservation: Public-Private Partnerships for Sustainable Development.” Dr. E. Linn Draper, Chairman, CEO, and President of American Electric Power gave the opening address, with responses from the Bolivian Ambassador to the US, and representatives from The Nature Conservancy, PacifiCorp, BP, and the Fundacion Amigos de la Naturaleza, Bolivia.

Twenty years ago, a group of BCSIA faculty and senior researchers at Harvard University’s Belfer Center for Science and International Affairs (BCSIA) published a book entitled *Energy and Security*, examining the magnitude and scope of the costs inherent in America’s growing dependence on imported oil, and provided a framework for designing future energy policies. As our nation’s involvement in the Middle East enters a new chapter, the BCSIA and the ENRP believed it would be constructive to reflect on the evolution of the oil security issue over the past two decades and to discuss the United States’ changing relations with this region. To this end, the Center convened a one-day Executive Session on Oil and Security in Cambridge on May 14, 2003.

The session was attended by a select group of senior officials from government, the private sector, and research institutions, including an impressive cross-section of the energy leaders from the past five administrations. The discussion focused on issues such as the role of Saudi Arabia as the swing oil producer, the emergence of China as a major buyer in the petroleum marketplace, the security implications of greater gas trade, and the Strategic Petroleum Reserve.

ENRP hosted a myriad of speakers throughout the year including: Jan Pronk, the UN-Secretary General’s Special Envoy to the Johannesburg Summit and former Minister of Environment for the Netherlands; Carol Browner, the longest sitting EPA Administrator (1993-2001); and Frank Blake, former Deputy Secretary for the U.S. Department of Energy under the recent Bush Administration. The Program held a regular seminar series: the Science and Technology for Sustainable Development Seminar, which brought international and national academics to BCSIA, and co-sponsored with STPP a seminar on Energy Technology and Policy.

TRAINING

The school held the fifth annual executive training session on Environmental Economics for the Non-Economists in May. The ten-day session, chaired by Prof. Robert Stavins, was attended by thirty participants. At the request of the U.S. EPA, Stavins designed and taught an abridged, accelerated version of the course in the DC area for senior government officials. The Infrastructure in a Market Economy Program (IME), led by Henry Lee and Tony Gomez-Ibanez, continued to prosper. In addition to its successful summer session, the IME Program has developed a network of Latin American Universities to train officials throughout that region and has designed a special infrastructure training program for China, focusing in part on urban issues.

FELLOWS

Ian Bowles completed his two-year residency as an ENRP Senior Research Fellow, after having served as Senior Director of Environmental Affairs at the National Security Council and as Associate Director for the Global Environment at the White House Council on Environmental Quality under the Clinton administration. While at ENRP, Bowles participated in several ARCO Forums and seminars, and published multiple articles on greenhouse treaty-making and the U.S. international conservation mandate, as well as crafting a book proposal with Joseph Aldy on market-based solutions to climate change. ENRP Senior Research Fellow Mary Graham co-directed the Transparency Policy Project in conjunction with the Taubman Center for State and Local Government. In 2002, she was appointed to the Kennedy School Environmental Council.

The Sustainability Initiative housed several pre-and-post doctoral fellows, including Jonathan Borck, Colin Polsky, and Vanessa Timmer. Senior Research Fellow Robert Correll, who concurrently served as Senior Fellow of the American Meteorological Society, attended the World Summit on Sustainable Development in Johannesburg.

RESEARCH AGENDA AND POLICY OUTREACH

Research in 2002-2003 focused on the following main issue areas:

- I. Science and Technology in a Transition Toward Sustainability**, an international collaborative effort, seeking to promote the social goals of accelerated human development while protecting the earth's life support systems
- II. Climate Change Research**, a multifaceted effort to analyze means to reduce greenhouse gas emissions, nationally and globally, through market incentives and international research and development implementation.
- III. Market-Based Environmental Policy**, which examines innovative, market-based instruments for implementing cost-effective means to meet environmental standards.
- IV. Benefits of Environmental Protection**, which developed and applied a new econometric method for estimating the benefits of environmental amenities.
- V. Oil and Security**, examining the evolving issue of oil resources and security in light of recent developments in the Middle East.
- VI. Energy Technology Innovation**, a joint effort with STPP, to design and assess policies and programs focusing on new energy technologies for a world constrained by the threat of climate change.

- VII. Transparency Policy Project**, a joint effort with the Taubman Center, analyzing regulatory policies, including environmental regulation, based on information disclosure to the public.
- VIII. Forest Conservation**, examining the feasibility of debt-for-nature swaps and conservation mechanisms to stabilize the world's reserves of sequestered carbon.
- IX. Executive Training Initiatives**, two training programs designed in concert with several other KSG centers to introduce economics to the non-economist and to teach government officials and business leaders from developing countries how to legislate, finance, and manage infrastructure effectively.

A description of specific initiatives for 2002-2003 within each research area follows.

I. SCIENCE AND TECHNOLOGY IN A TRANSITION TOWARD SUSTAINABILITY

Over the past academic year, the Center engaged in a growing program of research to enhance the contribution of science and technology in support of a more sustainable environment. The transition towards sustainability – enhancing human well-being while conserving the earth's life support systems and reducing hunger and poverty – is one of the most challenging programs initiated by the international community. This is mainly because implementing Agenda 21, the work program set out by the United Nations Conference on Environment and Development in 1992, involves fundamental requirements. First, it entails significant institutional reform at the national level to achieve the integration of environment and development. The vision of sustainable development as articulated in major policy statements since the publication of *Our Common Future* in 1987 has recognized the critical role played by science and technology. Managing the transition towards sustainability will entail significant efforts to redirect science and technology. But the role of science and technology has remained marginal to sustainability goals. This is partly because the science and technology policy community has often been concerned with growth strategies while the environmental community has been focusing on narrower conservation goals. Indeed, the activities of these two communities have often been seen as contradictory. Making the transition towards sustainability will entail bringing these communities together. Doing this will involve the clarification of theoretical aspects of the relationship between technological innovation, economic growth, and environmental management as well as the associated institutional adjustments.

This Center's emerging effort to address these challenges grows from independent activities that have been underway in its Science, Technology and Public Policy Program and its Environment and Natural Resources Program, and from collaborations with Harvard's Center for International Development and the University Center on the Environment. This work has focused on the basic sciences of sustainability, energy technology innovations, biotechnology, and biodiversity. For this report, we describe one of the component activities based at the Environment and Natural Resources Program. Other components are described in the section on the Science, Technology and Public Policy Program.

Research and Assessment Systems for Sustainability

This project seeks to foster the design and evaluation of strategies with which the next generation of national and international global environmental change programs might more effectively integrate and support its research, assessment and decision-support activities. The project's pursuit of practical solutions to the pressing challenges of sustainability has driven us to tackle an array of fundamental questions. Research in the project addressed:

Long-term trends and a sustainability transition

We emphasize the multi-trend nature of ten classes of trends, which makes them complex, contradictory, and often poorly understood. Each class includes trends that make a sustainability transition more feasible as well as trends that make it more difficult. Taken in their entirety, they serve as a checklist for the consideration of global trends that impact place-based sustainability studies.

Characterizing a sustainability transition: Goals, targets, trends, and driving forces

We identify a small set of goals, quantitative targets, and associated indicators that further characterize a sustainability transition by drawing on the consensus embodied in internationally negotiated agreements and plans of action. To illustrate opportunities for accelerating progress, we then examine current scholarship on the processes that influence attainment of four such goals: reducing hunger, promoting literacy, stabilizing greenhouse-gas concentrations, and maintaining fresh-water availability. This analysis reveals "levers of change," forces that both control the rate of positive change and are subject to policy intervention.

A framework for vulnerability analysis in sustainability science

We develop a vulnerability framework for the assessment of coupled human-environment systems. Vulnerability is registered not by exposure to hazards alone but also resides in the sensitivity and resilience of the system experiencing such hazards. This recognition requires revisions and enlargements in the basic design of vulnerability assessments, including the capacity to treat coupled human-environment systems and those linkages within and without the systems that affect their vulnerability.

Illustrating the coupled human-environment system for vulnerability analysis

The usefulness of our vulnerability framework is illustrated through three case studies: the tropical southern Yucatán, the arid Yaqui Valley of northwest Mexico, and the pan-Arctic. The role of external forces in reshaping the systems in question and their vulnerability to environmental hazards is shown, as well as the different capacities of stakeholders to respond to the changes and hazards. The framework proves useful in directing attention to the interacting parts of the coupled human-environment system and helps identify gaps in information and understanding relevant to reducing vulnerability in the systems as a whole.

Knowledge systems for sustainable development

This research suggests that efforts to mobilize science and technology for sustainability are more likely to be effective when they manage boundaries between knowledge and action in ways that simultaneously enhance the salience, credibility, and legitimacy of the information they produce. Effective systems apply a variety of institutional mechanisms that facilitate communication, translation and mediation across boundaries.

The project is a collaborative endeavor involving scholars from Harvard, Stanford, and Clark Universities, the Stockholm Environment Institute, the Potsdam Institute for Climate Impact Research, and the International Human Dimensions Programme on Global Environmental Change. It is supported by a core grant from the National Science Foundation with contributions from the National Oceanic and Atmospheric Administration's Office of Global Programs. It has been based at the Belfer Center under the leadership of William Clark (Director) and Nancy Dickson (Executive Director). For more information visit <http://sust.harvard.edu>.

II. CLIMATE CHANGE RESEARCH

ENRP faculty and researchers have been actively involved in the climate debate since the mid-1980s. Bill Clark was one of the primary participants in the Villach Conference in the mid-80s – the findings from which had a major influence on both the policy and the science of this topic. In 1989, the School initiated a major program, the Harvard Global Environmental Policy Project, to explore policy responses and negotiation strategies for reducing carbon emissions. This work was linked to preparatory discussions at both the domestic and international levels leading up to the Rio Summit in 1992. A compendium of a portion of this work was published in 1994 – *Shaping National Responses to Climate Change: A Post-Rio Guide*.

In the past year, KSG faculty continued to be involved in major activities outside the School. Rob Stavins was actively involved in the Intergovernmental Panel on Climate Change's Workshop Group III and continues to work with EPA and the President's Council of Economic Advisors. John Holdren chairs the U.S. contingent of the National Academies of Science project on India and has been actively involved in the Academy's work with China. In addition, he is co-chair of the National Commission on Energy Policy. Dale Jorgenson continued his groundbreaking work on the economic impacts of greenhouse gas emission reductions in China.

As the Bush administration changes the direction of US government-sponsored research to projects focused more on science than policy, ENRP activities in this field are likely to be more international and less U.S. focused than in the past.

Energy R&D in China and India

In 1998 and 1999, researchers from the Belfer Center for Science and International Affairs worked with the President's Committee of Advisors on Science and Technology to produce a major report, *Powerful Partnerships: The Federal Role in International Cooperation on Energy Innovation*. This effort, chaired by John Holdren, put forth a blueprint for developing energy technology options in a world constrained by climate change.

In the past year, the program – a joint effort between ENRP and STPP – has focused its attention on India and China. Our initial research explored how each country develops research and development priorities in the energy area. Where in the government are policies developed? How are priorities reached? What is the status of programs in areas such as clean coal, nuclear, renewables, and energy efficiency technology? Reports were completed on energy initiatives in both India and China.

In 2002-2003, the project continued to focus on particular sectors. In the case of the China, the project is focusing on cleaner automobiles and clean coal techniques. While in the case of India, it has focused on the development of cleaner technologies for coal-fired electricity generation – most specifically coal gasification. (These projects are described in greater detail in the STPP section.)

Carbon Sequestration in the United States

Increased attention by policy makers to the threat of global climate change has brought with it considerable interest in the possibility of encouraging the expansion of forest area as a means of sequestering carbon dioxide. The marginal costs of carbon sequestration or, equivalently, the carbon sequestration supply function, will determine the ultimate effects and desirability of policies aimed at enhancing carbon uptake. In particular, marginal sequestration costs are the critical statistic for identifying a cost-effective policy mix to mitigate net carbon dioxide emissions.

Professor Robert Stavins is currently engaged in research on the costs of carbon sequestration in collaboration with Andrew Plantinga of Oregon State University, and Ruben Lubowski, of the U.S. Department of Agriculture. This work is supported by a three-year grant from the U.S. Department of Energy. The project is an econometric analysis of land use in the forty-eight contiguous United States and the results of the analysis can be used to estimate the carbon sequestration supply function.

The first stage of the research project focuses on estimating the probabilities that a parcel of land will switch from one land-use class to another (e.g., the probability that land will switch from agriculture to forest). Other work in this area has focused on one or two land use categories, but this work estimates the probability land in five categories (agriculture, forest, pasture, range, and urban) converts to each of the other potential uses. These estimates are a function of expected profits in each of the five uses, land quality, and other variables. The results provide the first evidence that option values associated with irreversible and uncertain land development are capitalized into current farmland values. The results also give a clearer indication of the magnitude of land development pressures and yield insights into policies to preserve farmland and associated environmental benefits. Results from the early part of this research project were published in the *Journal of Urban Economics* in 2002.

Future research will use these estimates of land use change to explicitly develop a carbon sequestration supply function. By estimating the opportunity costs of land on the basis of econometric evidence of landowners' actual behavior, this approach circumvents many of the shortcomings of previous sequestration cost assessments. By conducting the first nationwide econometric estimation of sequestration costs, endogenizing prices for land-based commodities, and estimating land-use transition probabilities in a framework that explicitly considers the range of land-use alternatives, this study provides the best available estimates of the true costs of large-scale carbon sequestration efforts.

In addition, Stavins is engaged in a related two-year project for the Pew Center on Global Climate Change, which frames the carbon sequestration analysis within the larger subject of

global climate change policy, describes the analysis and its results, and highlights the implications of this work for public policy and for ongoing research by economists and others.

International Permit Trading

Stavins completed a research project this year that focuses on the international dimensions of permit trading programs for climate change. Together with Scott Barrett of Johns Hopkins University, and Joseph Aldy, from the Harvard Department of Economics, Stavins examined alternative means of expanding participation and compliance in an international agreement regarding global climate change. Their paper “Thirteen Plus One: A Comparison of Global Climate Policy Architectures,” critically reviews the Kyoto Protocol and thirteen alternative policy architectures for addressing the threat of global climate change, employing six criteria to evaluate the policy proposals: environmental outcome, dynamic efficiency, cost effectiveness, equity, flexibility in the presence of new information, and incentives for participation and compliance. The Kyoto Protocol does not fare well on a number of criteria, but none of the alternative proposals fare well along all six dimensions. They identify several major themes among the alternative proposals: Kyoto is “too little, too fast”; developing countries should play a more substantial role and receive incentives to participate; implementation should focus on market-based approaches, especially those with price mechanisms; and participation and compliance incentives are inadequately addressed by most proposals. Their investigation reveals tensions among several of the evaluative criteria, such as between environmental outcome and efficiency, and between cost-effectiveness and incentives for participation and compliance.

III. MARKET-BASED ENVIRONMENTAL POLICY

Robert Stavins has been a major force in the Center’s work devising and analyzing market-based instruments to tackle environmental goals. Ten years ago, at the request of U.S. Senators Timothy Wirth (D-Colo.) and John Heinz (R-Penn.), Stavins assembled and directed a team of 50 persons from academia, government, private industry, and the environmental community in a bipartisan effort — “Project 88” — which produced the report “Harnessing Market Forces to Protect Our Environment: Initiatives for the New President.” The tradeable permit system for acid-rain reduction, recommended by Project 88, was included in the Clean Air Act amendments of 1990.

Robert Stavins continues to be a research leader in the field of market-based environmental policy. Stavins was invited to presented a paper that summarizes the lessons from the U.S. experience with market-based instruments at a conference at the University of California, Santa Barbara called “Twenty Years of Market-Based Instruments for Environmental Protection: Has the Promise Been Realized?”

In addition, Stavins together with Sheila Olmstead, of Yale University, and Michael Hanemann of the University of California, Berkeley, are completing research on a two-year grant from the National Science Foundation to study the relative effectiveness of price versus non-price instruments in allocating scarce water supplies. In many areas of the world, including large parts of the United States, scarce water supplies are a serious resource and environmental concern. The possibility exists that water is being used at rates that exceed what would be dictated by efficiency criteria, particularly when externalities are taken into account. Because of this, much

attention has been paid by policy makers and others to the use of demand management techniques, including requirements for the adoption of specific technologies and restrictions on particular uses. A natural question for economists to ask is whether price would be a more cost-effective instrument to facilitate water demand management.

Their working papers “Muffled Price Signals: Household Water Demand Under Increasing-Block Prices” and “Does Price Structure Matter? Household Water Demand Under Increasing-Block and Uniform Prices,” draw upon a newly-available set of detailed data to estimate econometrically the demand function for household use of urban water supplies. The authors find that the sensitivity of residential water demand to price is quite low, and that the effect of price structure may be more influential than the magnitude of marginal price itself. Residents facing an increasing-block price structure (the marginal cost of water increases with the quantity used in a step-wise fashion) are more sensitive to changes in the price of water than residents that face a uniform rate structure (the marginal cost of water is the same regardless of quantity).

ENRP’s market-based research has also focused on the effect of different policy instruments on technological change. Stavins, together with Lori Snyder, a Ph.D. student in Public Policy, and Nolan Miller of the Kennedy School, examined the effects of different types of environmental regulation on the incentives for technology diffusion in the chlorine manufacturing industry. They found that regulation has had an effect on technology diffusion in this industry, but not in the way many policy analysts would predict. Regulation has primarily affected the diffusion of new technology by accelerating the closure of older facilities using more polluting technologies rather than through the acceleration retrofitting by existing facilities. Their paper, “The Effects of Environmental Regulation on Technology Diffusion: The Case of Chlorine Manufacturing,” was presented at the American Economic Association conference in January 2003 and published in the papers and proceedings issue of the *American Economic Review* in May 2003.

IV. BENEFITS OF ENVIRONMENTAL PROTECTION

Stavins, together with Lori Snyder and Alex Wagner, the 2002-2003 Crump Fellow, is conducting research on alternative methods of estimating the benefits of improved environmental quality. One frequently used measure of the benefits of environmental quality is the value of a recreational fishing day. This measure is used in evaluating the benefits from improving water quality, and thereby improving fishing opportunities. In their paper “Private Options to Use Public Goods: Exploiting Revealed Preferences to Estimate Environmental Benefits,” Snyder, Stavins, and Wagner develop and apply a new method for estimating the economic benefits of an environmental amenity. Their method uses demand for state fishing licenses to infer the benefits of recreational fishing. Using panel data on state fishing license sales and prices for the continental United States over a fifteen-year period, combined with data on substitute prices and demographic variables, they estimate a license demand function. The econometric results lead to estimates of the benefits of a fishing license, and subsequently to the expected benefits of a recreational fishing day. In contrast with previous methods of estimating the value of a recreational fishing day, which have utilized travel cost or hypothetical market methods which focus on the benefits to one particular water body, their approach provides estimates that are directly comparable across geographic areas. The results of this work suggest that the benefits of recreational fishing days are generally less than previously estimated.

V. OIL AND SECURITY

Recent events and ongoing developments in the Middle East have brought the need to reassess the economic and political implications of the United States' growing dependence on imported petroleum, and to evaluate the changing relations between the United States and Middle East oil producing countries.

On May 14, 2003, the BCSIA and ENRP welcomed over 30 experts from industry, government, and academia for an executive session on Oil and Security. The session aimed to explore how the issue of oil and security has evolved over the two decades since the publication of "Energy Security" (Deese and Nye, 1981), and how it may unfold in the future.

Session participants engaged in a retrospective look at the evolution of the global oil market and at policy responses. Participants commented on the timely convocation of the session, noting a renewed interest in strategic, geopolitical and national security considerations. The issue of oil security, they noted, has taken on new dimensions, particularly given the focus on the threat of terrorism and its potential connection to oil. This connection can be either indirect, through the incapacity of governments to prevent the activities of terrorist organizations or to effectively curb the flow of capital to these organization, or more direct, through the use of oil proceeds to finance terrorist activities.

Participants explored the role played by Saudi Arabia as the swing producer, and examined the impacts that a potential regime change may have on the country's future policies, and on the stability of the global oil market. Participants also discussed the implications of the emergence of natural gas as a worldwide commodity, noting that on the one hand, it creates opportunities for /increased security through supply diversification, but that on the other hand, it also increases the risk of infrastructure disruption.

Growing energy consumption in the developing world, and China in particular, is expected to reshape the future geopolitics of oil. The increasing concern over global climate change and the environmental impacts of oil consumption will also greatly influence consumption choices, and transform the North-South debate, which is currently focused on economic and security concerns, towards one about meeting the challenges of curbing global carbon emissions.

In terms of policy responses, participants also discussed at length, without reaching a clear consensus, the function and use of the strategic petroleum reserve (SPR). Some participants suggested the need for clear rules on when and how to use the SPR, while others supported preserving the current flexibility.

The session identified a number of questions for future attention, including:

- a. Whether Saudi Arabia will continue to play the role of swing producer over the coming decades and whether that role is essential to a stable oil market;
- b. What will be the impact of the increasing role of natural gas on security;
- c. Whether it is desirable and achievable to integrate oil within international trade agreements; and

- d. What is the value of the strategic petroleum reserve?

VI. ENERGY TECHNOLOGY INNOVATION PROJECT

This joint ENRP-STPP project continued its work on identifying possible programmatic and economic triggers to stimulate the design, development, and dissemination of new technologies. A book summarizing much of the past work, authored by Vicki Norberg-Bohm and Theo de Bruijn, will be published by MIT Press early next year. In the 2002 -2003 academic year, the project focused on developing methodologies to evaluate government efforts to deploy new, cleaner technologies. Specifically researchers focused their work on assessing programs to deploy alternatively fueled vehicles in Sacramento, California and Baltimore, Maryland and to assess initiatives to stimulate the construction of cleaner and more energy efficient buildings. Reports on both topics will be submitted to the Department of Energy in October of 2003.

V. TRANSPARENCY POLICY PROJECT

The Transparency Policy Project (TPP) analyzes regulatory policies based on information disclosure to the public. Government-required disclosure of structured, factual information to the public at regular intervals– is an innovative and flexible regulatory tool that can protect the health and safety of consumers and workers, improve accountability in the public sector, reduce corruption, and inform the choices of investors and consumers alike.

Over the past year, the TPP has enlarged its database of disclosure policies by analyzing in depth the Home Mortgage Disclosure Act, the Hazard Communication Standard, the Labor Management Relations Disclosure Act, school report cards, the legislation promoting automobile safety through disclosure of crashworthiness tests and rollovers, the campaign finance disclosure legislation, and so-called Megans’s laws requiring criminal sexual offenders to disclose their presence in communities.

The TPP has analyzed why some of this policies grow and improve overtime, while others degrade into mere paperwork exercises and developed a theory on the sustainability of disclosure policies, including the role of costs and benefits for users and disclosers of information and the importance of intermediaries. In its next phase, the TPP will examine the sources of effectiveness of disclosure policies: under what circumstances does information disclosure influence the behavior of social actors, and when do these changes achieve public policy objectives?

Archon Fung, Mary Graham and David Weil are Co-Directors of the Transparency Policy Project; Elena Fagotto is the Project’s Senior Research Associate. Partial funding for the project came from the Roy Family Fund.

VII. FOREST CONSERVATION

ENRP staff, with the generous support from the Rockefeller Brothers Fund, examined the feasibility of “debt-for-nature” swaps and other financial instruments to secure and stabilize the

world's major forest reserves of sequestered carbon. The study, summarized in a final report submitted to the Fund, evaluated the strengths and weaknesses of prior debt-for-nature programs, suggested how a modified version of the concept might operate in the future, and discussed the suitability of a broader array of conservation mechanisms.

In addition to documenting the lessons learned from the past experience with debt-for-nature swaps, the study addressed two related questions: How do market mechanisms compare with incentive-based mechanisms as options for forest conservation? and What are the next steps in assessing the efficacy of the two categories of approaches?

The task of answering these two questions was submitted to a nationally-renown group of forest conservation experts convened for a two-day workshop. The nine workshop participants discussed the recent experience with different approaches, and assessed their success at meeting conservation and carbon sequestration objectives.

The review of the experience with debt-for-nature swaps revealed that, while swaps represent a useful conservation policy instrument, they rely on the convergence of very specific factors – the availability of debt on the secondary market, the commitment of the debtor government to conservation, and sustainable economic and political incentives. The difficulty of identifying cases where these factors are concurrently met explains in part the recent decline in the number of agreements.

The study noted that by focusing exclusively on carbon sequestration goals, other values, such as biodiversity or habitat protection could be ignored, or even compromised. Successful projects should thus consider the goals of forest preservation, protection of biodiversity and carbon sequestration together, rather than individually.

Alternative policy instruments fall primarily in two categories: market mechanisms – such as carbon trading and tradable development rights – and incentive-based mechanisms – such as easements. A review of the experience with each type of policy instrument shows that they both offer potential, but that only partial data are available. For instance, while workshop participants offered examples of successful implementation of incentive-based approaches, they also recognized the absence of a systematic analysis of strength and weaknesses.

The study concluded that given the limits of the various approaches and complexity of the goals, a successful conservation approach is likely to involve a combination of market and incentive-based mechanism. It also suggested that additional research be done to identify factors contributing to successful implementation.

IX. EXECUTIVE TRAINING INITIATIVES

ECONOMICS AND THE ENVIRONMENT: A COURSE FOR THE NON-ECONOMIST

Robert Stavins is Faculty Chair of this week-long executive education program, targeted to professionals with little or no prior economic training who are involved in environmental analysis, advocacy, decision making, or implementation. As a practical introduction to environmental economics and its applications, the program establishes the basic foundations of economics and applies them to a range of environmental and resource problems, including global climate change, corporate environmental management, and the effect of trade on environmental

quality. Instruction in the use of fundamental analytical methods, such as benefit-cost analysis and cost-effectiveness analysis, is included. The course also reviews the advantages and disadvantages of alternative policy instruments, including technology and performance standards, pollution charges, and tradeable permit systems, in addressing specific environmental problems.

Attendees in May 2003, the program's fifth year, included officials from U.S. federal and state environmental regulatory agencies, non-profit organizations, and state and regional governments worldwide.

In addition, in January 2003, Robert Stavins conducted a two-day version of this course in Annapolis, MD. The shortened course was designed for senior EPA staff and was attended by sixteen participants, representing key political and career officials from all parts of the agency. Participants included assistant administrators for several program offices, deputy assistant administrators and regional administrators. EPA requested the shorter course as a result of feedback that suggested the senior staff could not attend the week-long course due to the length and location. As a result, Professor Stavins worked with Albert McGartland at the National Center for Environmental Economics at EPA to construct a shorter course that could be taught in the D.C. area.

MANAGING PUBLIC INFRASTRUCTURE

In 2002-2003, the training program, Infrastructure in a Market Economy (IME), continued to grow under the leadership of Tony Gomez-Ibanez, Kathy Eckroad, and Henry Lee. The program was established five years ago to provide training to senior officials from the government, business and multilateral organizations on managing the development, financing and regulation of public infrastructure, including roads, power plants, water systems and telecommunication networks. The program teaches participants to analyze the economic and political implications of relying on private firms, to design concession agreements that are more sustainable and meet the needs of all income classes, to assess the economic benefits and costs of new infrastructure investments, to develop an effective management plan that maximizes short and long-term public benefits, and to design effective regulatory systems for factors such as price, quality of service, and access to the incumbent network.

Participants from 26 different countries attended the two-week session in July. Infrastructure segments were also built into the existing executive programs for Kuwait and the United Arab Emirates.

With the support of the Multilateral Investment Fund of the InterAmerican Development Bank, the Program is actively supporting the establishment of infrastructure programs in five Latin American universities, located in Columbia, Peru, Chile, Argentina, and Brazil. This network was formalized in a meeting in Cartagena and is now called the Latin American University Regulation and Infrastructure Network (LAURIN), and each of the universities set up executive training programs patterned after the IME program at the Kennedy School. Approximately twenty new case studies were developed and a web page established. This page links to an

expanded KSG page that allow researchers to access papers and documents from institutions throughout the world. The 2002-2003 annual meeting was held in Salvador, Brazil, and brought together officials from each of the member universities. In addition, the program hosted a one-day conference focusing on infrastructure in Brazil, that included officials from the newly elected Lula presidency.

In September of 2002, the IME offered a one-week program for sixty Chinese officials. Meetings with Chinese officials in Beijing laid the ground for the new program. The 2003 session is being expanded to include new classes and cases on urban infrastructure to assist Chinese officials in coping with the projected demographic shifts from rural areas to the cities. This program will be offered in each of the next four years both in Beijing and in Cambridge.

OTHER INITIATIVES

I. REGULATORY POLICY PROJECT

The Regulatory Policy Program (RPP) at the Center for Business and Government, under faculty chair Cary Coglianese, develops and tests leading ideas on regulation and regulatory institutions. During this past year, RPP continued its highly successful seminar series on “New Directions in Regulation” co-sponsored by ENRP and the KSG Infrastructure Project. This series has emerged as the nation's leading forum for dialogue on issues of regulatory policy research.

In May 2002, the program sponsored a major colloquium in Washington, D.C. on performance-based regulation, bringing together leaders from a dozen regulatory agencies and some of the nation's foremost experts in law, economics, engineering, and public policy. In January 2003, RPP convened a workshop that brought together regulatory officials and scholars to develop a research agenda on electronic rulemaking, a new approach that offers the potential to expand and enhance the public's involvement in the federal rulemaking process. In July 2003, RPP hosted a conference in Washington, D.C. on management-based environmental policies.

In response to recent concerns about the integrity of financial markets in the United States, RPP has also established a new initiative in the area of corporate governance. The program organized a series of seminars on corporate governance, two major Forum events at the Kennedy School on the recent crisis in corporate integrity, as well as workshops on the SEC and corporate whistleblowing.

RPP has also established an on-line working paper series, issued a series of major reports on regulatory issues, and established listservs to link researchers and analysts around the world. Information about RPP events and publications can be found on the program website at: www.ksg.harvard.edu/cbg/rpp/

II. ELECTRICITY POLICY

Based within the Center for Business and Government, the Harvard Electricity Policy Group (HEPG) provides a forum for the analysis and discussion of important policy issues related to the restructuring of the U.S. electricity industry. Participants in HEPG include the executives of

investor-owned and public power utilities, independent power producers, state and federal regulators, environmental and consumer advocates and academics. HEPG holds meetings around the country and in Cambridge throughout the year. ENRP faculty have collaborated with HEPG on a variety of electricity issues, and Henry Lee is a regular participant in HEPG's conferences.

HEPG's objectives are to address key problems related to the transition to a more competitive electricity market, to provide a forum for informed research and open debate, and to provide a vehicle for contributing to the broad public policy agenda. Priority issues include the economics of electricity production and use; electricity market design; the evolution of the industry and its regulatory institutions; transition paths and strategies; and related policy issues such as the environment and consumer protection.

Within ENRP, Henry Lee authored a paper on the competitiveness of distributive generation. Part of a series that looks at the implications and environmental impacts of the restructuring of electricity markets, the paper evaluates the economics of gas-fired microturbine generation compared to the costs of purchasing power from the grid. A version of the paper was published in the June 2003 issue of the *Electricity Journal*.

MEMBERS ACTIVITIES

FACULTY

William Clark is the Harvey Brooks Professor of International Science, Public Policy and Human Development. Trained as an ecologist, his research focuses on the interactions of environment, development and security concerns in international affairs, with a special emphasis on the role of science and technology in shaping those interactions. At Harvard, Clark is a member of the Center for Science and International Affairs, which he directed from 1993 to 1995; and is on the executive committees of the University Center on the Environment, the Center for International Development, and the Weatherhead Center for International Affairs, and is on the Board of Tutors for the College's concentration in Environmental Science and Public Policy. He directs the Sustainable Development Program at the Center for International Development.

Clark leads the Science, Environment and Development Group. The Group collaborates on a variety of research projects and outreach activities that seek to improve society's understanding of interactions between human development and the natural environment, and to harness that understanding in support of a transition toward sustainability. It focuses on three related fields of work: research on fundamental issues of sustainability science; design and evaluation of institutions for promoting collaboration between experts and decision makers in the production of usable knowledge; and building social capacity to acquire and deploy that knowledge for sustainable development.

He is a member of the U.S. National Research Council's Roundtable on Science and Technology for Sustainability and its Coordinating Committee on Global Change.

Clark co-led a major international research program designed to better understand the interaction of science and policymaking for global environmental change (*Learning to Manage Global Environmental Risks*, MIT Press, 2001). He directed the Global Environmental Assessment project (GEA), a 5-year international, interdisciplinary research effort to improve understanding of the role of formal scientific assessments in international environmental affairs that has trained 40 fellows from around the world and produced more than 50 research papers. Three monographs summarizing the project were submitted for publication in 2003. He has helped to conceive and direct the projects on Research and Assessment Systems for Sustainability (SUST) and the international Initiative on Science and Technology for Sustainable Development (ISTS).

Before coming to Harvard in 1987, Clark directed the Program on Sustainable Development of the Biosphere at the International Institute for Applied Systems Analysis in Austria. He worked with Alvin Weinberg at the Institute for Energy and with C.S. Holling at the Institute of Resource Ecology. Clark has taught at the Salzburg Seminar, the World Economic Forum, and the European University Institute. Clark co-chaired the U.S. National Academy of Sciences' sustainability transition study (*Our Common Journey: A Transition Towards Sustainability*, 1999) and, as a member of the Academy's Committee for Global Change, played a leading role in introducing social science and policy research dimensions into the emerging US Global Change Research Plan and the related International Geosphere-Biosphere Programme in the mid-1980s. He served on the Social Science Research Council's Committee on Global Environmental Change and the American Association for the Advancement of Science's Committee on Science, Engineering and Public Policy, plus steering committees for the International Institute for Applied Systems Analysis, the Office of Interdisciplinary Earth Studies, and Resources for the Future. He serves on the scientific advisory committees for International Human Dimensions Programme on Global Environmental Change and the Potsdam Institute for Climate Impact Research.

In 1997, the White House Office of Science and Technology Policy launched an effort to provide a periodic, succinct, and credible report on the health of the nation's ecosystems. Clark chairs the committee responsible for designing and producing the first report. Housed and staffed at the Heinz Center for Science, Economics, and the Environment in Washington, the report is meant to serve some of the functions provided by the nation's system of macroeconomic indicators — that is, an authoritative, nonpartisan, quantitative base for sound policymaking and an informed dialogue on how well the country is doing at crucial management tasks. The Design Committee chaired by Clark is a multisectoral group with members from all levels of government, the private sector, the environmental community, and academia. A report on The State of the Nation's Ecosystems focused on forests, croplands, and coastal/marine systems, *The State of the Nation's Ecosystems: Measuring the Lands, Waters, and Living Resources of the United States* (Cambridge University Press, 2002).

Clark continues to serve as co-editor of *Environment* magazine, along with colleagues Robert Kates, Alan McGowan, and Timothy O'Riordan. The magazine, which appears ten times a year, serves as a forum for timely, authoritative, and readable treatments of major issues at the intersection of environment, development, and public policy. He also serves on the editorial

boards of the *Annual Review of Environment and Natural Resources*, *Ecological Applications*, *Conservation Ecology*, and *International Security*.

Clark teaches the Kennedy School courses in “Environmental science for public policy,” and “Sustainable development.” He is also co-director of the sophomore tutorial in “Environmental Science and Public Policy” at Harvard College.

Professor Clark is a recipient of the MacArthur Prize, the Manuel Carballo Award as the Kennedy School’s outstanding teacher (2001), and the Humboldt Prize. He is a member of the National Academy of Sciences. He received his bachelor's degree from Yale University where he graduated magna cum laude, with honors of exceptional distinction in biology. His PhD. in ecology was granted by Canada's University of British Columbia.

Cary Coglianese, Associate Professor of Public Policy and Chair of the Regulatory Policy Program at the School’s Center for Business and Government, continued his research on regulatory law and the design of regulatory policy during 2002-2003. His interdisciplinary research continues to focus on issues of regulation and administrative law, with a particular emphasis on the empirical analysis of alternative regulatory strategies and the process of regulatory policymaking.

During the past year, one of Coglianese's major projects has focused on management-based regulatory strategies, including their application to issues of environmental policy. Management-based regulation differs from traditional, command-and-control regulation and instead requires firms to engage in planning and develop their own internal regulatory systems to address a public problem. A chief advantage of management-based regulation is that it gives firms flexibility to design responses appropriate to their own circumstances and needs, but this same flexibility also poses new challenges for government overseers. In July 2003, Coglianese moderated a Regulatory Policy Program conference in Washington, D.C. on management-based approaches to environmental protection. In addition, during the past year, he has given presentations on this research at places such as the Wharton School at the University of Pennsylvania, the rail safety subcommittee of the U.S. Transportation Research Board, the Stanford Law School, and the Canadian Ministry of Transportation. Some of Coglianese's recent publications on management-based strategies include: "Management-Based Regulatory Strategies" in John Donahue and Joseph Nye, eds., *Market-Based Governance* 201-224 (Brookings, 2002) (with David Lazer); "Policy Options for Improving Environmental Management in the Private Sector," 44 *Environment* 10-23 (November 2002) (with Jennifer Nash); and "Management-Based Regulation: Prescribing Private Management to Achieve Public Goals," 37 *Law & Society Review* 691-730 (2003) (with David Lazer).

Another major research focus in 2002-2003 has centered on the role of information technology in the regulatory process, with efforts to analyze the potential for so-called "e-rulemaking." E-rulemaking refers to the use of digital technologies by government agencies in the rulemaking process, and it includes technologies that can better link the public to the decisionmaking processes in regulatory agencies. The role of information technology in regulatory policymaking has become a core issue for government agencies, as e-rulemaking is part of the Bush Administration's government-wide management initiative and regulatory agencies will be

required to institute new uses of information technology under the E-Government Act of 2002. During 2002-2003, Coglianese helped organize two major conferences on e-rulemaking in Washington, D.C. and at Harvard University. These conferences brought together specialists from the information sciences, law, social sciences, and public management, as well as key regulatory officials from more than ten different government agencies, including the U.S. Environmental Protection Agency which is the lead agency for the Bush Administration's e-rulemaking initiative. In addition, Coglianese organized a panel discussion on e-rulemaking at the national Digital Government Research Conference held in Boston and he chaired a panel on digital government at the American Political Science Association's annual meeting. In the spring 2003, he presented a paper at Yale Law School on the role of the Internet in the rulemaking process. He has also drafted a major report on e-rulemaking for the National Science Foundation (available at the RPP-sponsored website, www.e-rulemaking.org), and he is completing a forthcoming article on e-rulemaking for the journal *Social Science Computer Review*. Coglianese also serves as the Vice Chair of the E-Rulemaking Committee of the American Bar Association's Section of Administrative Law and Regulatory Practice.

During 2002-2003, Coglianese published the following additional papers: "Is Satisfaction Success? Evaluating Public Participation in Regulatory Policy Making," in Rosemary O'Leary and Lisa Bingham, eds., *The Promise and Performance of Environmental Conflict Resolution* (RFF Press/Johns Hopkins University Press, 2003); "Collective Silence and Individual Voice: The Logic of Information Games," in Jac Heckelman & Dennis Coates, eds. *Collective Choice: Essays in Honor of Mancur Olson* (Springer-Verlag, 2003) (with Richard Zeckhauser and Ted Parson); "Bounded Evaluation: Cognition, Incoherence and Regulatory Policy," 54 *Stanford Law Review* 1217-1238 (2002); "Empirical Analysis and Administrative Law," 2002 *University of Illinois Law Review* 1111-1137 (2002); "Performance-Based Regulation: Prospects and Limitations in Health, Safety, and Environmental Protection," 55 *Administrative Law Review* (2003); and "Does Consensus Work? Pragmatism and Democracy in the Regulatory Process," in Alfonso Morales, ed., *Renascent Pragmatism: Studies in Law and Social Science* (Ashgate Press, 2003); and "The Pathologies of Consensus-Building," *Second Generation Issues Committee Newsletter* (2003) (an American Bar Association publication). In addition, Coglianese has research in progress on a variety of topics, including consensus-building, performance-based regulation, and information in regulatory decisionmaking.

In addition to serving as the faculty chair of the Regulatory Policy Program, Coglianese is an affiliated scholar at the Harvard Law School and the director of the Kennedy School's Politics Research Group. Coglianese received his J.D., M.P.P. (public policy), and Ph.D. in political science from the University of Michigan. For the coming academic year, Coglianese has received a fellowship from Resources for the Future to engage in a study of the Massachusetts Toxic Use Reduction Act, an innovative example of a management-based regulation. In the Spring 2004 term, Coglianese will be on leave from the Kennedy School and serving as the Irvine Visiting Professor of Law at Stanford Law School, where he will be teaching courses on legislation and regulatory policymaking.

Henry Lee, the Jaidah Family Director of the Environment and Natural Resources Program, is a Lecturer in Public Policy and the Co-Chair of the Kennedy School's project on privatizing and regulating public infrastructure. Lee's research has focused on four areas – climate change,

electricity policy and air pollution, international electricity markets, and privatization and regulation of public infrastructure in developing countries. He continues to teach the Infrastructure Management course and co-teaches with John Holdren the introductory energy course.

In 2002-2003, Lee completed an assessment of the political and economic impact of distributing U.S. electricity technologies spurred by reliability concerns and high prices for wholesale electricity. Officials in both the public and private sectors have expressed growing interest in decentralized electricity generators. Lee's conclusion is that these technologies must become significantly more efficient, cleaner and less expensive before they will be able to compete with grid-based alternatives. Niche markets, such as firms that have significantly higher reliability requirements, will remain and, in fact, may grow.

Lee, along with Professor Tony Gomez-Ibañez, Co-Chairs the Kennedy School's executive training program on Infrastructure in a Market Economy. The program, given twice a year, has over the past five years attracted more than 400 participants from around the world. In the context of this program, Lee has overseen the development of many case studies, including new cases on drinking water in India and the financing of oil and gas facilities in Brazil. In addition, Lee has participated in abridged versions of this program for officials from Brazil, Singapore, Kuwait, the United Arab Emirates, Taiwan, and Saudi Arabia. Lee and Gomez-Ibañez are also assisting the Inter-American Development Bank to establish a network of five Latin American universities (in Argentina, Brazil, Peru, Columbia, and Chile) to train regulators and policy makers on how to regulate and manage public infrastructure. Finally, Lee has been helping Professor Tony Saich organize the School's new training initiative in China. Specifically, he designed an 18-class segment on infrastructure and urban growth to be taught over five years to 300 future leaders from the Chinese government.

With John Holdren, Lee co-directs BCSIA's Energy Technology Innovation Project. Finally, he serves as the faculty chair of the KSG Committee on Environmental Resources, on the Board of BCSIA, the Board of the Middle East program, and is the School's representative to the University's Greening of Harvard Initiative.

William W. Hogan, Lucius N. Littauer Professor of Public Policy and Administration at the John F. Kennedy School of Government, Harvard University, is the Research Director of the Harvard Electricity Policy Group (HEPG). In 1993, Hogan co-founded HEPG, following Congressional passage of the Energy Policy Act. For more than a decade now, Hogan has been a major contributor to the design and improvement of competitive electricity markets in the United States and around the world.

Hogan's research has identified two integral components in the design of a successfully functioning spot market: a bid-based, security-constrained economic dispatch of generation with locational pricing that is directed by an independent system operator (ISO); and financial transmission rights, rather than physical rights, that allow market participants to hedge congestion costs. Increasingly, these ideas have gained acceptance, power pools have implemented them and Federal Energy Regulatory Commission (FERC) orders have enhanced

the concept. To a large extent, the plenary sessions organized by HEPG several times annually serve as an additional testing ground for discussion and debate about economic theory, practical application, and appropriate regulatory policy.

Hogan has long argued that only FERC with its national authority over interstate transmission systems is in a position to implement a standard market design. In August 2002, FERC issued a lengthy Notice of Proposed Rulemaking on the construction of such a market. Much of the intellectual underpinnings of its proposed design are based upon Hogan's work. Following extensive comment, FERC is now meeting with stakeholders throughout the US to fine-tune its proposal.

In the aftermath of California's market meltdown of 2000-2001, the demise of Enron, and a souring economy, it has become clear that US wholesale electricity markets and the nation's transmission grid patchwork require quite serious overhauls. Some argue that only a free-market philosophy will lead to success. Others demand that full regulation be re-established. Hogan and his colleagues at HEPG continue to analyze the pros and cons. Much of their work is posted on www.ksg.harvard.edu/hepg, a Web site that now contains more than 1,000 documents. In 2002, visits to the site increased significantly over previous years.

Hogan is a frequent speaker on electricity restructuring, market design and institution building at conferences and seminars throughout the world. Sponsors of these events have included the Electricity Regulatory Commission (CRE) in France, the Federal Electricity Commission (CFE) in Mexico, the International Association for Energy Economics (IAEE), International Bar Association, Edison Electric Institute. He also files comments on the issues before Congress, FERC and state public utility commissions.

Hogan also directs the Repsol YPF-Harvard Seminar on Energy Policy, an international forum on energy and public policy issues across the spectrum of the oil, natural gas and electricity industries. Co-sponsored by Repsol YPF, the Spanish-based oil company, the seminar has expanded from its initial focus on oil and energy security policy in Europe and North America to the hottest topics worldwide.

Beginning in 2003-04, a new program will bring selected scholars and industry professionals to Cambridge annually for research and study under the auspices of the Repsol YPF-Harvard Kennedy School.

In addition to his work as Research Director of the Harvard Electricity Policy Group, Professor Hogan is the Director of Graduate Studies for the Ph.D. Programs in Public Policy and in Political Economy and Government at the Kennedy School; a co-founder of the *Energy Journal* and a member of its editorial board; and a member of the editorial boards of *The Journal of Regulatory Economics* and *Energy Economics*. He graduated from the U.S. Air Force Academy and holds a doctorate from UCLA.

Robert Stavins has been a major force in the Belfer Center's work devising and analyzing market-based instruments to tackle environmental goals, as well as other areas of environmental

and resource policy. Ten years ago, at the request of U.S. Senators Timothy Wirth (D-Colo.) and John Heinz (R-Penn.), Stavins assembled and directed a team of 50 persons from academia, government, private industry, and the environmental community in a bipartisan effort — “Project 88” — which produced the report “Harnessing Market Forces to Protect Our Environment: Initiatives for the New President.” The tradable permit system for acid-rain reduction, recommended by Project 88, was included in the Clean Air Act amendments of 1990.

Stavins, Albert Pratt Professor of Business and Government, became in 1999 the first Chair of the School-wide Environment and Natural Resources Faculty Group (ENRFG), which coordinates research, teaching, and outreach activities across the Kennedy School, including faculty working within five different research centers. In 2001, he established a major new university-wide initiative, The Environmental Economics Program at Harvard University (EEPHEU). Stavins has served as Chairman of the U.S. Environmental Protection Agency’s Science Advisory Board Environmental Economics Advisory Committee since 1997. He is also a member of the Intergovernmental Panel on Climate Change and EPA’s Clean Air Act Advisory Committee and a University Fellow at Resources for the Future.

Professor Stavins' research has focused on diverse areas of environmental economics and policy, including examinations of: policy instrument choice under uncertainty; competitiveness effects of regulation; design and implementation of market-based policy instruments; innovation and diffusion of pollution-control technologies; and depletion of forested wetlands. His current research includes analyses of: climate policy; comparison of price and demand-management regulations for water conservation; technology innovation; and environmental benefit valuation.

In 2001-2002, Stavins was engaged in research on climate policy, both in terms of assessing the impacts of climate policy and in terms of helping shape future policy. Building upon previous econometric analysis and simulation modeling, Stavins has been working on a new econometric/simulation research project, in collaboration with Andrew Plantinga of Oregon State University, and Ruben Lubowski, of the U.S. Department of Agriculture. This work is supported by a three-year grant from the U.S. Department of Energy. In addition, Stavins is engaged in a related two-year project for the Pew Center on Global Climate Change, which frames the carbon sequestration analysis within the larger subject of global climate change policy, describes the analysis and its results, and highlights the implications of this work for public policy and for ongoing research by economists and others.

In the new project, an econometric analysis of land use in the forty-eight contiguous United States will be carried out and the results employed to estimate the carbon sequestration supply function. By estimating the opportunity costs of land on the basis of econometric evidence of landowners’ actual behavior, this approach circumvents many of the shortcomings of previous sequestration cost assessments. By conducting the first nationwide econometric estimation of sequestration costs, endogenizing prices for land-based commodities, and estimating land-use transition probabilities in a framework that explicitly considers the range of land-use alternatives, this study will provide the best available estimates of the true costs of large-scale carbon sequestration efforts. In this way, it will add significantly to public understanding of the costs and potential of this important strategy for addressing the threat of global climate change.

Stavins research during the past year has also focused on the international dimensions of permit trading programs for climate change. Together with Scott Barret of Johns Hopkins University, and Joseph Aldy, from the Harvard Department of Economics, Stavins examined alternative means of expanding participation and compliance in an international agreement regarding global climate change. Their paper “Thirteen Plus One: A Comparison of Global Climate Policy Architectures,” critically reviews the Kyoto Protocol and thirteen alternative policy architectures for addressing the threat of global climate change, employing six criteria to evaluate the policy proposals: environmental outcome, dynamic efficiency, cost effectiveness, equity, flexibility in the presence of new information, and incentives for participation and compliance. The Kyoto Protocol does not fare well on a number of criteria, but none of the alternative proposals fare well along all six dimensions. They identify several major themes among the alternative proposals: Kyoto is “too little, too fast”; developing countries should play a more substantial role and receive incentives to participate; implementation should focus on market-based approaches, especially those with price mechanisms; and participation and compliance incentives are inadequately addressed by most proposals. Their investigation reveals tensions among several of the evaluative criteria, such as between environmental outcome and efficiency, and between cost-effectiveness and incentives for participation and compliance.

Stavins is currently working with Professor Sheila Olmstead of Yale University and Professor Michael Hanemann of the University of California, Berkeley on a multi-year project analyzing alternative policy instruments for managing urban water supplies. The project, Urban Price and Non-Price Demand Management in U.S. Urban Water Markets, funded by the National Science Foundation, examines the potential of prices and price structures to influence water consumption in the urban residential sector. The research team has been comparing the water conservation potential and cost-effectiveness of price and non-price demand management tools in a framework similar to the comparison of market-based instruments vs. standards for pollution control.

Drawing on newly available data on residential end-uses of water in multiple U.S. cities, which disaggregate household water uses within total metered consumption, they examine the component end-uses of water, and compare end-use responses to price and non-price instruments. The research team will estimate the portion of cross-city variation in price elasticity that is due to factors beyond the control of policymakers, such as income and family size, as well as that portion that can be highly sensitive to policy, such as appliance choice. In doing so, the project will provide a useful approximation of the magnitude of water conservation achievable through reasonable price and non-price policies in the urban residential sector.

Stavins has continued to study the effects of environmental policy on technological change. Professor Stavins, together with Lori Snyder, a Ph.D. student in Public Policy, and Professor Nolan Miller of the Kennedy School, examined the effects of different types of environmental regulation on the incentives for technology diffusion in the chlorine manufacturing industry. They found that regulation has had an effect on technology diffusion in this industry, but not in the way many policy analysts would predict. Regulation has primarily affected the diffusion of new technology by accelerating the closure of older facilities using more polluting technologies rather than through the acceleration retrofitting by existing facilities. Their paper, “The Effects of Environmental Regulation on Technology Diffusion: The Case of Chlorine Manufacturing,” was

presented at the American Economic Association conference in January 2003 and published in the papers and proceedings issue of the *American Economic Review* in May 2003.

Stavins, together with Lori Snyder and Alex Wagner, both Ph.D. students at Harvard is conducting research on alternative methods of estimating the benefits of improved environmental quality. One frequently used measure of the benefits of environmental quality is the value of a recreational fishing day. This measure is used in evaluating the benefits from improving water quality, and thereby improving fishing opportunities. In their paper "Private Options to Use Public Goods: Exploiting Revealed Preferences to Estimate Environmental Benefits," Snyder, Stavins, and Wagner develop and apply a new method for estimating the economic benefits of an environmental amenity. Their method uses demand for state fishing licenses to infer the benefits of recreational fishing. Using panel data on state fishing license sales and prices for the continental United States over a fifteen-year period, combined with data on substitute prices and demographic variables, they estimate a license demand function. The econometric results lead to estimates of the benefits of a fishing license, and subsequently to the expected benefits of a recreational fishing day. In contrast with previous methods of estimating the value of a recreational fishing day, which have utilized travel cost or hypothetical market methods that focus on the benefits to one particular water body, their approach provides estimates that are directly comparable across geographic areas. The results of this work suggest that the benefits of recreational fishing days are generally less than previously estimated.

Senior Fellows and Staff

Ian Bowles completed his two-year term as Research Fellow in the ENRP and STPP programs. He continues to serve as Senior Advisor and Environment Program Director for the Gordon and Betty Moore Foundation. Until 2001, he served concurrently as Senior Director of Environmental Affairs at the National Security Council and as Associate Director for the Global Environment at the White House Council on Environmental Quality. In these capacities, he chaired or co-chaired interagency policy making committees on biotechnology, international economic policy and the environment, climate change and other global environmental issues. He was also appointed by President Clinton to the Enterprise for the Americas Board and was a member of the President's delegations for the 2000 G-8 Summit in Okinawa, Japan, the 1999 WTO Ministerial meeting, and state visits to India and New Zealand. Prior to joining the White House staff, he served as Vice President for Conservation Policy at Conservation International and, prior to that, as a Legislative Assistant in the U.S. House of Representatives where he worked on foreign policy, national security and global environmental issues. He recently co-edited *Footprints in the Jungle* (Oxford University Press, 2001), a book about natural resource industries and the environment and has also published several dozen articles on environmental, energy and economic policy issues. In the past academic year at ENRP, he served as a respondent to E.O. Wilson at the ARCO Forum John Sawhill lecture on "The Future of Life," published several articles including "The International Conservation Mandate of the United States Government," (*NYU Environmental Law Journal*), and participated in a range of seminars on environmental economics, U.S. energy policy and global biodiversity conservation. His research agenda focused on United States policy on international conservation issues and global climate change. He is a native of Falmouth, Massachusetts and was a candidate for Congress

from the Massachusetts 10th District in 1996. He holds an A.B. in Economics cum laude from Harvard College.

Nancy Dickson is Executive Director of the Research and Assessment Systems for Sustainability Program which seeks to contribute to the strategies with which the next generation of national and international global environmental change programs might more effectively integrate and support its research, assessment and decision support activities. She completed her term as Executive Director of the international Initiative on Science and Technology for Sustainability, an ad-hoc group of environment and development scholars devoted to linking science, technology and sustainable development and now serves on the Steering Group. She is working to accelerate social learning about how decisions bearing on the joint goals of human development and environmental stewardship can be better supported by science and technology.

J. Michael Hall, on leave from the position of Director of Global Programs at the National Oceanic and Atmospheric Administration, is working with the Research and Assessment Systems for Sustainability project and the Initiative on Science and Technology for Sustainability. He is working to broaden and deepen NOAA's expertise in science for sustainability and a scheme for its realization through a research-based decision support system. His research focuses on methods and models of vulnerability research, analysis and assessment.

Charles H.W. Foster served as an adjunct research fellow at ENRP in 2002-03, his seventeenth year in such a capacity. Trained in forestry, wildlife management, water resources, geography, and environmental engineering, he was formerly a department head and cabinet officer for the environment in Massachusetts, dean of the Yale School of Forestry and Environmental Studies, and president of the W. Alton Jones Foundation. On September 4, 2002, at ceremonies in Washington, Dr. Foster received the Department of the Interior's National Conservation Award for his years of involvement with the Cape Cod National Seashore and the National Park Service. His previous bioregionalism initiatives, carried out in cooperation with the Lincoln Institute of Land Policy, resulted in a prototype course for regional leaders held in Salt Lake City, UT, on April 8-9, 2003, and a first hands-on clinic for regional environmental practitioners held in the Upper Delaware Basin on May 28-29, 2003. Dr. Foster was interviewed for a background piece on the early days of the Massachusetts Executive Office of Environmental Affairs as part of a special cabinet-level oral history project conducted by the Bostonian and Massachusetts Historical Societies. His earlier advocacy of using the 2,100 mile Appalachian Trail as an environmental monitoring transect led to the first tri-region progress report session held at the New York Academy of Sciences on June 11, 2003. And as the 2002-03 academic year came to a close, Dr. Foster began two other special projects. One was involvement in the design of a new environmental citizenship academy at the University of Massachusetts (Boston) for the purpose of redefining environmentalism in terms meaningful to the state's urban residents, a recommendation of the 2001 "Memo to the Governor" he had helped author. The second initiative was the initiation of a special forest conservation stewardship project, to be led by Foster and Harvard Forest director David Foster under a grant from the Forest Service, to explore a new kind of "national forest without walls" (e.g., with little or no direct federal ownership). This is intended to address the situation in Massachusetts and other parts of the settled east where the forest is a mix of increasingly fragmented public and private ownerships. Finally, Dr. Foster was notified that his book chapter, "Bridging Borders: the Prospect for Environmental

Regionalism in New England and Atlantic Canada", had been accepted for publication by the Broadview Press.

Fellows and Associates

Jonathan Borck is a pre-doctoral candidate in Public Policy and a pre-doctoral Fellow of the Environmental Economics program. He has been involved in two major projects this past year. Along with David Cash and Tony Patt, he explored the role of science in local decision-making systems in the South Pacific, Mexico, and Africa. He is currently working with Richard Zeckhauser and David King on a study of free-riding behavior in coalitions and trade associations, including those in the environmental realm.

David Cash is a Research Associate with the Knowledge Systems for Sustainable Development project and the Initiative for Science and Technology for Sustainability, and a Lecturer in Environmental Science and Public Policy in the Faculty of Arts and Sciences. He is investigating how science and technology can effectively be harnessed to support social and economic development while maintaining environmental life-support systems. He is particularly interested in the management and negotiation of sustainable development with implications on multiple levels – from the international to local.

Wenhua Di is a predoctoral fellow of the Environment and Natural Resources Program at Harvard University and Environmental Economics Program at Harvard University. Her dissertation research areas include the political economy of local environmental governance in Chinese cities, the manufacturing FDI inflows to pollution-intensive sectors in China, as well as the design and implementation of market-based instrument in environmental protection in China.

Kate Emans is a pre-doctoral fellow in the Environment and Natural Resources Program and a Ph.D. student in Political Economy and Government. She has completed the first year of the Ph.D. program and is pursuing research interests in environmental economics and development economics, including the effects of international trade on the environment, market-based instruments for environmental policy, and the links between civic institutions and economic growth in developing countries.

Darby Jack is a doctoral candidate in Public Policy at the Kennedy School. Over the past year he developed a dissertation prospectus that maps out a research program focusing on factors that affect the demand for clean energy technologies in Latin America, and began analyzing data from Peru. He was also Teaching Fellow for two courses at the Kennedy School and one in the Faculty of Arts and Sciences.

In the past year, **Colin Polsky** contributed to the development of a multi-site, inter-disciplinary vulnerability assessment of several Arctic communities to the combined effects of climate change, atmospheric pollution, and globalization. This effort involved two trips to Norway, one of which involved giving an invited presentation. He contributed significant portions of two publications on the topic (Turner et al., 2003; McCarthy et al., submitted), and he constructed a web site for the project (AVS, 2003). On a more theoretical level, Polsky gave invited

presentations on vulnerability methods and models to the UCAR Postdoctoral Fellows group and the Department of Geography, Kansas State University. He organized an international workshop on "Methods and Models for Vulnerability Assessment," which resulted in a KSG publication (Polsky et al., 2003) and an invitation to present on the topic at the Potsdam Institute for Climate Impacts Research (Germany). He has been invited to write a book chapter on linking institutions and vulnerability, on which he is collaborating with KSG Fellow David Cash (Polsky and Cash, in preparation). Finally, he submitted publications on research associated with work he commenced prior to arriving at Harvard (Polsky and Munroe, forthcoming; Easterling and Polsky, forthcoming; Polsky, submitted; Polsky and Long Martello, in preparation).

Lori Snyder is a Ph.D. student in public policy at the Kennedy School of Government. She holds a Bachelors degree in Economics and Environmental Studies from Occidental College and a Masters degree in Economics from Yale University. Her dissertation research focuses on evaluating the effectiveness of different types of regulations on toxic chemicals. Her current work evaluates the effectiveness of management-based regulations in reducing pollution levels. Beginning in the late 1980s, thirteen states adopted pollution prevention programs that required mandatory pollution prevention planning and public filing of pollution prevention progress reports. Her paper uses panel data for just over 5,700 chemical manufacturing plants in the United States to investigate whether facilities located in states with mandatory planning requirements had larger changes in total quantities of toxic chemical air emissions, engaged in more pollution prevention activities or more advanced pollution prevention activities, or were more likely to eliminate use of toxic chemicals. In other recent work, she evaluated the relative importance of different regulatory programs in encouraging adoption of environmentally friendly technology in the chlorine manufacturing industry.

Vanessa Timmer is a pre-doctoral research fellow with the Initiative on Science and Technology for Sustainability and a Fulbright Research Fellow from the University of British Columbia. In her doctoral research, Vanessa applies social movement theory to analyze environmental non-governmental organizations operating at the global level to advance sustainability. Her fellowship work has included developing a research protocol and conducting case study analysis on harnessing science and technology for sustainability.

Alexander Wagner, the 2002-2003 Joseph Crump Fellow, is a Ph.D. student in Political Economy and Government. In his research on environmental economics, he is interested in the efficiency of tradable permits. He employs financial economics tools to understand market behavior in, for example, the US sulfur dioxide market. He also investigates implications of asymmetric information in the relationship between central authorities and firms or organizational units for optimal dynamic budgets, allowances, licenses, and standards. He is also engaged in work on the political economy of exchange rates. He works with Professors Alberto Alesina, Nolan Miller, Robert N. Stavins and Richard J. Zeckhauser.

Rui Wang is a pre-doctoral fellow in ENRP. His research interest is on land policy and sustainability in China through issues of urbanization, motorization, and reform of property right regime.

Fan Zhang is a Ph.D. student in Public Policy at Harvard University and a Pre-doctoral fellow

with EEPHU. Her current research focuses on the analysis of the regional socioeconomic and environmental implications of land use and land cover changes. She is working with IIASA to establish a model for integrated and consistent assessment of the spatial and inter-temporal interactions among various socioeconomic and biophysical factors related with land conversion policy in China. The results from the study will provide decision support tools enabling the formulation, simulation and evaluation of alternative land policy scenarios.

Staff

Mary Anne Baumgartner is Assistant to William Clark and Nancy Dickson. She is also Program Assistant for the Research and Assessment Systems for Sustainability project and the Initiative on Science and Technology for Sustainability. In 2002-2003, she provided support for both of these projects and coordinated events, including the Science and Technology for Sustainability research seminar, the Synthesis Workshop on Science and Technology for Sustainable Development held in Mexico City, and the Research and Assessment Systems for Sustainability project summer study.

Kristen Eddy is Manager of Collaboration Technologies for the Research and Assessment Systems for Sustainability Project and the Initiative on Science and Technology for Sustainability, as well as Managing Editor and Webmaster for the Forum on Science and Technology for Sustainability and Webmaster for the Global Environmental Assessment Project. Her work looks at the ways in which virtual conferencing technologies can facilitate and catalyze collaboration among members of a highly distributed research team. This involves synchronous technologies such as videoconferencing, web conferencing, and audio conferencing, and asynchronous technologies such as web sites (both static and database-driven), discussion forums, and listservs.

Jo-Ann Mahoney is ENRP Event and Publication Coordinator as well as conference coordinator for the Harvard Electricity Policy Group. In 2003, she also served as ENRP's liaison to the BCSIA web-site redesign, and organized ENRP's major events, including the Oil Security Executive Session. She teaches Humanities at MIT and writes fiction.

Zannah Marsh is assistant to Henry Lee. She provides administrative support for Professor Lee's teaching and research activities.

Isabelle Morin is research assistant to Henry Lee. She supported research on various policy issues, including the evolution of global LNG markets, the comparative economics of microturbine and centralized electricity generation, the use of debt-for-nature swaps to finance forest conservation, and oil and security. In 2003, she has also helped organize the first bi-annual Roy Family Award, which recognizes the outstanding achievements of a public-private partnership in the area of environmental conservation.

PUBLICATIONS

To review publications of the Environment and Natural Resources Program and its members, see page 152.

EVENTS

To review events of the Environment and Natural Resources Program and its members, see page 133.

International Security Program

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Intelligence and Policy Project (Ernest May, Director)
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BACKGROUND

Since its' founding in 1973, the Belfer Center for Science and International Affairs has been the home to a substantial program focused on major problems of international security. The Belfer Center's International Security Program (ISP) has rested on three pillars: a fellows program that brings to the Center pre- and postdoctoral scholars and occasional senior scholars; a vigorous publications program; and a research program aimed at producing policy-relevant work on the most important challenges to American and international security.

ISP has always embraced a broad definition of its substantive mandate, but traditional preoccupations of the program have included: security relations among the major powers, including Soviet-American relations during the Cold War and Russian-American relations subsequently; nuclear weapons, including questions of strategy, doctrine, force posture, and arms control and proliferation; America's relations with major allies, particularly NATO and Japan; American policy, power, and role in the world; and regional security in various regional contexts.

RESEARCH AGENDA AND POLICY OUTREACH

In recent years, the research and outreach activities of the International Security Program have been focused on a small number of important thematic areas. In each area, we seek to make a sustained commitment to large and important endeavors, and to build a stream of work that cumulates across time in terms of publications, activities, and individuals. The themes that broadly governed our work during 2002-2003 are:

- I. THE GLOBAL WAR AGAINST TERRORISM**
- II. WEAPONS OF MASS DESTRUCTION**
- III. INTERNAL CONFLICT**
- IV. REGIONAL SECURITY**
- V. PREVENTIVE DEFENSE**

I. The Global War on Terrorism

ISP has over recent years undertaken various and extensive efforts in the field of terrorism, and was in a position to play a vigorous and prominent role in the post-9/11 discussions and debates about the war on terrorism and about the future of American foreign and security policy in a post-9/11 world. Those issues have not disappeared, either from the public agenda or from the ISP agenda, but the present year witnessed the rise of new and hugely consequential debates about America's power, policy, and global role, in which ISP played an active role.

In terms of research and the policy debate, the threat and the use of force has been at the forefront of the international agenda. The crises of the past year have also raised fundamental questions about the character of the international order and of the role that the United States can and should play in that order. Meanwhile, in the bruising diplomacy associated with the war policies of the United States, central elements of the familiar international system – NATO, the EU, the UN – have been damaged or undermined, leading some to conclude that we have been, to paraphrase Dean Acheson's famous line, "present at the destruction" of what much of the world regards, ironically, as the American system of international order as constructed after World War II. Issues of fundamental importance are in play, to an extent perhaps not equaled in many decades.

In this wider context, the international security agenda and on the research agenda of ISP continued to focus on issues and crises of the post 9/11 world:

- The war on terrorism, as President Bush often reminds us, is only just begun. The past year has brought some successes, but many worries remain. Much of the Al Qaeda high command remains at large. Much of Afghanistan remains unsettled and recent reports indicate a resurgence of Al Qaeda and Taliban activity. Concern about WMD terrorism remains. The effort to enhance homeland security is in its early stages. And no one will be surprised if another significant terrorist attack takes place in the United States. ISP has been home to several activities that flow directly out of this set of concerns. The Executive Session on Domestic Preparedness, co-sponsored by ISP, has continued as in past years to explore the requirements for better protection against and more effective response to future terrorist attacks on the United States. Since 9/11, these exertions have found a much more responsive audience. The extensive written output of this project can be found on the BCSIA website. In addition, ISP has played a role in a series of seminars, hosted by BCSIA Director Graham Allison, which have drawn together relevant faculty, staff, fellows, and graduate students from around Cambridge to systematically examine the various aspects of the terrorism threat and the responses to that threat. And of course members of ISP have written on various aspects of this issue.¹
- The past year witnessed a remarkable, intense, damaging internal and international debate on the question of going to war with Iraq. Deeply wounded by 9/11 and determined to prevent

¹ Examples include Stephen Walt, "Beyond Bin Laden: Reshaping US Foreign Policy," *International Security*, Vol. 26, No. 3 (Winter 2001-2002), pp. 56-78; and Steven E. Miller, "After the 9/11 Disaster: Washington's Struggle to Improve Homeland Security," *Axess*, (Stockholm, Sweden) No. 2 (March 2003), pp. 8-11. Much more is available on the website.

any further attacks, the Bush Administration (along with much of the American public) concluded that war with Iraq for the purpose of regime change was a necessary, inevitable, and justifiable next step in the war on terrorism. Domestic critics and much of world opinion judged that war against Iraq was unwise, unnecessary, and unwarranted. The issues were extensively discussed and debated within ISP. The protracted melodrama associated with the Iraq crisis produced countless television, radio, and other media interactions, not only for senior faculty and staff, but also for many ISP fellows (some of whom became local TV “regulars.”). And ISP members played a very active and visible role in the public debate over Iraq. Steven Miller, for example, wrote the essay, “Gambling On War: Force, Order, and the Implications of Attacking Iraq,” which attempted to comprehensively assess the arguments for and against the war in Iraq.² It attracted approximately 500,000 hits on the web. Similarly, Stephen Walt co-authored an influential piece arguing against the war.³ It gave rise to an op-ed in the New York Times as well as a public debate at the Council on Foreign Relations.⁴ Other members of ISP contributed to this debate as well, as indicated on our website.

We now live in an age of unquestioned primacy, in an age of catastrophic terrorism, in an age of violence and war, in an age of weapons proliferation, in an age of international discord verging on disorder. These overlapping realities combine in complex ways to produce security challenges that are both dangerous and urgent and whose resolution will do much to shape the international order that emerges from the present dislocations. This new reality gives added relevance and urgency to ISP’s ongoing research agenda.

THE INTERNATIONAL SECURITY PROGRAM STUDIES IN INTERNATIONAL SECURITY (AND OTHER BOOKS): ISP’s abiding concern with the problem of terrorism is reflected in the output of our members and in the contents of our book series, *Studies in International Security*, which is published by MIT Press. This series includes not only books produced by our own staff, fellows, and projects, but also by affiliates and partners of ISP. Hence, as we reported last year, when the attacks occurred on September 11 (followed, of course, by the still unresolved anthrax attacks), the ISP book series contained a number of titles directly relevant to the crisis. In the past academic year, the list of terrorism-related books has been augmented by the following titles:

Heymann, Philip B. *Terrorism, Freedom and Security: Winning Without War*. Cambridge, MA.: The MIT Press, 2003.

Howitt and Pangi, *Countering Terrorism: Dimensions of Preparedness*, Cambridge, MA.: The MIT Press, 2003.

² Steven E. Miller, “Gambling on War: Force, Order, and the Implications of Attacking Iraq,” in Carl Kaysen, Martin Malin, Steven Miller, William Nordhaus, and John Steinbruner, *War With Iraq: Costs, Consequences, and Alternatives*, (Cambridge: The American Academy of Arts and Sciences, November 2002, pp. 7-50.

³ John J. Mearsheimer and Stephen M. Walt, “Can Saddam Be Contained? History Says Yes,” Cambridge: The Belfer Center for Science and International Affairs, November 12, 2002.

⁴ Stephen Walt and John Mearsheimer, “Keeping Saddam in a Box,” *New York Times*, February 2, 2003.

Kayyem, Juliet N. and Pangi, Robyn L., Editors, *First to Arrive: State and Local Responses to Terrorism*. Cambridge, MA.: The MIT Press, 2003.

Stern, Jessica. *Terrorism in the Name of God*. NY, NY, Harper & Collins, 2003.

II. WEAPONS OF MASS DESTRUCTION

ISP's research agenda focuses heavily on issues relating to weapons of mass destruction. It is pursuing five broad projects in this area: (1) the Soviet Nuclear Legacy: Avoiding Nuclear Anarchy; (2) Terrorism and Weapons of Mass Destruction (WMD); (3) Managing the Atom; (4) Chemical and Biological Weapons; and (5) Nuclear Nonproliferation and Nonproliferation Dialogues.

THE SOVIET NUCLEAR LEGACY: AVOIDING NUCLEAR ANARCHY

Background: Since 1991, ISP has had as one of its core concerns the fate of the Soviet nuclear arsenal. The abortive coup attempt in Moscow in August 1991 vividly raised the question of who was controlling the Soviet arsenal. The subsequent disintegration of the Soviet Union raised the question of who would inherit the Soviet nuclear arsenal.

BCSIA has produced a series of books and reports that have attempted to analyze the dangers, explore the possible remedies, and assess the progress of policies attempting to address the Soviet nuclear legacy. The first monograph, entitled *Soviet Nuclear Fission: Control of the Nuclear Arsenal in a Disintegrating Soviet Union*, was published in November 1991, just as the Soviet Union was collapsing. A second volume, *Cooperative Denuclearization: From Pledges to Deeds*, was published in January 1993. It focused on the ongoing efforts to consolidate within Russia the far-flung Soviet nuclear capabilities. 1996, ISP undertook the completion, publication, and promotion of its third book analyzing important dimensions of this problem: *Avoiding Nuclear Anarchy: Containing the Threat of Loose Russian Nuclear Weapons and Fissile Material*. This book examined the threat that Russian nuclear weapons or weapons-usable materials might leak out of Russia; assessed the adequacy of U.S. policies aimed at reducing the threat of nuclear leakage; and made recommendations for improving U.S. policy. More recent reports, which examine in detail the progress made in addressing nuclear leakage issue and highlight the problems that remain, have been produced under the auspices of our Managing the Atom Project.

In subsequent years, ISP has continued to address these issues through a range of products and activities, driven by the fact that the problem persists on the policy agenda and the potential dangers remain acute.

Activities in 2002-2003: BCSIA's major product in this area during the 2002-2003 academic year was the monograph by Matthew Bunn, Anthony Wier, and John P. Holdren, entitled *Controlling Nuclear Warheads and Materials: A Report Card and Action Plan* (Washington, D.C.: Nuclear Threat Initiative and the Project on Managing the Atom, Harvard University,

March 2003). It is the latest in the series of BCSIA publications, dating back to 1991, that analyzes in detail the current situation with respect to nuclear security in Russia and makes recommendations about how remaining dangers can be reduced or eliminated. This work was undertaken in the context of the Managing the Atom Project, described elsewhere in this report. Related work as well as the research fellows working in this area is described in the Managing the Atom section.

The nuclear legacy left behind by the Soviet Union has turned out to be one of the persistent security problems of the post-Cold War era. It still looms high on the US policy agenda. It remains the single largest nuclear proliferation threat facing the international community. Many problems remain unresolved. Accordingly, ISP continues to give sustained attention to this issue.

TERRORISM AND WEAPONS OF MASS DESTRUCTION

Background: ISP's work on avoiding nuclear anarchy in Russia argued that there was a growing potential risk of nuclear terrorism. This proposition turned out to be one of the more contentious and controversial points raised in *Avoiding Nuclear Anarchy*. Disputation on this issue inspired ISP to undertake a more detailed and intensive look at the intersection of terrorism and weapons of mass destruction. During academic year 1996–97, therefore, ISP launched a research project on this subject.

This research effort resulted in the completion of the book *America's Achilles' Heel: Nuclear, Biological, and Chemical Terrorism and Covert Attack*, which was published in the spring of 1998 in the BCSIA Studies in International Security series by MIT Press. A key feature of this book is a comprehensive prescriptive agenda for the U.S. government, focusing both on how to ensure that acts of NBC terrorism and covert attack remain infrequent, and on how to respond to such acts if they do in fact occur.

Subsequently, ISP continued work in this area on three tracks. First, there was substantial follow-on activity that flowed from the publication of *America's Achilles' Heel*. Second, as noted below, the Preventive Defense Project has included a strand of work devoted to the subject of "catastrophic terrorism." This work resulted in both a published report and an article, co-authored by Ashton Carter, John Deutch, and Philip Zelikow, that appeared in the November/December 1998 issue of *Foreign Affairs*. Third, 1998-99 witnessed the launch of a second major project focused on domestic preparedness. With financial support from the U.S. Department of Justice, this project undertook both research and workshops aimed at assessing and improving the capacity of the United States to prevent and respond to terrorist threats. The International Security Program co-sponsored this project, in collaboration with the Kennedy School's Taubman Center for State and Local Government. Much of our recent work on terrorism has taken place within the context of this project, which is detailed in the next section.

EXECUTIVE SESSION ON DOMESTIC PREPAREDNESS (ESDP)

Activities in 2002-2003: Large-scale vaccination campaigns, the transition to the Department of Homeland Security, evaluating and measuring homeland security; and evaluating and sustaining domestic preparedness were among the topics covered at the seventh and last meeting of the **Executive Session on Domestic Preparedness (ESDP)**, held at the Kennedy School of Government on February 20-22, 2003.

Because domestic preparedness for terrorism requires expertise that extends far beyond the capability of any single organization, the ESDP convened a multi-disciplinary task force of leading practitioners from state and local agencies, senior officials from federal agencies, and academic specialists from Harvard University. The members bring to the Executive Session extensive policy expertise and operational experience in a wide range of fields – emergency management, law enforcement, national security, law, fire protection, the National Guard, public health, emergency medicine, and elected office – that play important roles in an effective domestic preparedness program. The project combined faculty research, analysis of current policy issues, field investigations, and case studies of past terrorist incidents and analogous emergency situations. The ESDP was a successful joint collaboration of the Belfer Center and the Kennedy School's Taubman Center for State and Local Government, combining the expertise, faculty and resources of these two distinct fields – national security and local government -- that are so important to understanding homeland security.

Speakers at the February Session included **General Ralph Eberhardt**, Commander, United States Northern Command; **Dr. Harvey Fineberg**, President, Institute of Medicine, The National Academies; **Dr. Richard Falkenrath**, Senior Director for Policy and Plans, Office of Homeland Security; and **Dr. Amy Smithson**, Senior Associate, The Henry L. Stimson Center.

This year, ESDP continued to widely influence public policy arenas, presenting its findings at numerous conferences throughout the country as well as in the media. It released its 9/11 commemorative report, *Beyond the Beltway: Focusing on Hometown Security*, which contains recommendations for state and local domestic preparedness planning. The ESDP staff and affiliates also expanded their publication series with two books, both published by MIT Press. *First to Arrive: State and Local Response to Terrorism* (Kayyem, Pangi eds.) highlights the best of what has been learned in the year since 9/11 concerning homeland security. Most of its contributors are first responders or emergency managers who work daily in the field of domestic preparedness. They address the question: what are the best, most efficient methods and means to protect America? The second book entitled, *Countering Terrorism: Dimensions of Preparedness* (Howitt, Pangi eds.), focuses on how existing programs must evolve to meet emerging threats. This book is essential reading for those policymakers, academics, and students who are involved in counterterrorism and need to take the time to familiarize themselves with some of the critical issues in the field.

The ESDP has also been widely referenced in the media in 2002-2003. As experts in the field, ESDP members have been quoted extensively in news articles (e.g. *The New York Times*, *The Washington Post*, *The Boston Globe*, *The San Francisco Chronicle*, *Atlanta Journal and Constitution*, and numerous other sources.) Many members have also written insightful opinion editorials for print media or have appeared on television and radio shows.

In addition, the ESDP commissioned several new case studies that documented important events in domestic preparedness planning. “Charting a Course in a Storm: US Postal Service and the Anthrax Crisis” describes the response to America’s first major bioterrorism attack. “White Powders in Georgia: Responding to Cases of Suspected Anthrax after 9/11” shows how jurisdictions that were not affected by the 2001 anthrax attacks were overwhelmed by public fears and hoaxes. It is a comprehensive and important historical document covering America’s response to bioterrorism, specifically the trials that the U.S. Postal System faced during the fall 2001 anthrax attacks. “Smallpox Vaccinations for Healthcare Workers in Minnesota” (forthcoming) highlights how the federal government’s smallpox vaccination plan was implemented, or not implemented, in a single jurisdiction.

This year, the ESDP also cosponsored a conference with the Joan Shorenstein Center on the Press, Politics, and Public Policy in early April 2003, which focused on the role of the journalist when covering homeland security and how to improve the relationships between first responders, local and state government officials, and local and state reporters. Also, in early June, the ESDP – with co-sponsors Lincoln Laboratory, the Harvard School of Public Health, and the MIT Security Studies Program – organized an important bioterrorism conference for public health officials and emergency response professionals from throughout New England.

ESDP’s contributions were the impetus for the Kennedy School’s Executive Program in *Crisis Management*. This is a program designed to help people in senior management positions prepare for the rapid decision-making and intensive internal and external leadership that are critical in crisis situations. Program faculty members bring a wealth of specialized knowledge and practical crisis management experience to their teaching. Participants learn and practice a wide range of strategic, communication, and personnel skills that aids in facing extraordinary and unexpected challenges of major crises.

While the ESDP has ended, its faculty and members – including Taubman Center’s Executive Director and ESDP Director, Arnold Howitt, and ESDP’s Executive Director, Juliette Kayyem, now a senior fellow at the Belfer Center – will continue their important contributions to the field of domestic preparedness, with a variety of ongoing projects. These include executive training and partnerships with Harvard’s School of Public Health.

In addition, Belfer Center’s Juliette Kayyem and Harvard Law School’s Philip Heymann started Harvard University’s Long-Term Legal Strategy for Combatting Terrorism task force this year. This panel of leading experts in law, national security and terrorism met for the first of three times in May, 2003. Funded by the Oklahoma City’s Memorial Institute for the Prevention of Terrorism, the Task Force is examining questions regarding how best to combat the long-term threat of terror in a democratic society. Its findings and recommendations will be released throughout the year, culminating in a conference in Oklahoma City in 2004 on the anniversary of the Murrah Building bombing.

MANAGING THE ATOM

Background: Nuclear issues have always occupied a central place on the ISP agenda. During the Cold War, considerable attention was given to the nuclear doctrines and policies of the two superpowers, the nuclear arms control negotiations between the United States and the Soviet Union, and nuclear proliferation (including closely related dimensions of the nuclear fuel cycle). Such concerns remain very much relevant today, despite the demise of the Cold War antagonism. But the dramatically new international context demands rethinking of core nuclear issues. There is no reason to suppose that the solutions of the Cold War period will be appropriate for the new age that now exists.

This notion inspired the creation of the Managing the Atom Project, a standing research group within BCSIA. It is pursued in close collaboration with the Belfer Center's Science, Technology, and Public Policy Program and its Director, Professor John Holdren. ISP actively participates in the Managing the Atom Project, which is undertaking a thorough reassessment of key elements of both civilian and military nuclear programs in the aftermath of the Cold War. Initial priorities have included U.S.-Russia nuclear relations, international fissile material management and disposition, and nuclear non-proliferation.

Activities in 2002-2003: The collaborative activities of the Managing the Atom Project are detailed elsewhere in this report, in the section devoted to the Science, Technology, and Public Policy Program.

CHEMICAL AND BIOLOGICAL WEAPONS

Background: ISP provides the Harvard base for the Harvard-Sussex Program on CBW (Chemical and Biological Weapons) Armament and Arms Limitation, run by the Faculty Chair, Professor Matthew Meselson. The aim of the Harvard-Sussex Program on Chemical and Biological Warfare Armaments and Arms Limitation (HSP) is to promote the global elimination of chemical and biological weapons and to strengthen the constraints against hostile uses of biomedical technologies.

Activities in 2002-2003: The main focus this year was to continue the effort to develop and promote the adoption of an international legal instrument that would criminalize the use of chemical or biological weapons. The idea is that, under such a convention, individual leaders would be held personally accountable for ordering any such use. A stream of activities – including lectures and workshops – flowed from this priority. In addition, the program continued to sponsor a weekly colloquium on CBW issues that attracted scholars from Harvard, MIT, and Tufts and included speakers from the U.S. Departments of State and Defense, U.S. Arms Control and Disarmament Agency, the United Nations Special Commission on Iraq, and prominent scholars from research institutes and universities.

NUCLEAR NONPROLIFERATION

Background: From the time of its founding in the early 1970s, ISP has had an abiding preoccupations with the issue of nuclear proliferation. This has been a continuous thread throughout the entire history of the program. In the post-Cold War era, this issue has gained new urgency due to a series of problems and crises that have bedeviled the nuclear

nonproliferation regime. Indeed, in recent years, proliferation of weapons of mass destruction has become one of the most pressing security concerns for the United States and is a major issue on the international security agenda.

Activities in 2002-2003: ISP continued its thirty year tradition of supporting scholars working in the field of nonproliferation. During 2002-2003, ISP's fellows program included James Walsh, working on the factors that inhibited proliferation in instances where states chose not to acquire nuclear weapons despite possession of an active nuclear weapons program, and Hui Zhang, who works on aspects of Chinese nuclear weapons policy. Also, Bonnie Jenkins pursued a project aimed at identifying the factors that determine the success or failure on nonproliferation policies. And Gregory Mitrovich explored the early history of the US-Soviet nuclear interaction, among other things seeking lessons that might be applicable to new nuclear weapons states.

ISP also continued its long tradition of participating actively in public discussion of prominent nonproliferation issues. During the past year, there arose an escalating crisis over North Korea's pursuit of nuclear weapons. Starting in October 2002, Pyongyang undertook a series of increasingly provocative steps: admitting that it possessed an illicit nuclear weapons program; throwing out the inspectors of the International Atomic Energy Agency; taking possession of spent fuel rods formerly under international supervision; restarting the nuclear reactor that gives it a long-term option to reprocess plutonium and build up its nuclear capacities; and formal renunciation of its obligations under the Nuclear Nonproliferation Treaty. This culminated in April 2003, when North Korea claimed to possess a small nuclear arsenal and threatened to test, use, and export nuclear weapons unless the United States was forthcoming with a package of aid and concessions. North Korea's behavior and apparent nuclear policies is both a serious threat to regional and global security and a severe challenge to the nuclear nonproliferation regime. This issue has been followed closely within ISP, which has been preoccupied with nonproliferation issues for three decades. Several of our fellows are focused on this issue, and a number of faculty and staff have addressed this issue as well.⁵

III. INTERNAL CONFLICT

Background: As events in places as far-flung as Bosnia, Somalia, Sri Lanka, and Rwanda have demonstrated, internal conflict is a vexing international problem and a source of enormous human suffering. It is also unfortunately commonplace, with two or three dozen internal conflicts raging in any given year; internal conflict occurs far more frequently than war between states. Accordingly, this subject looms large in ISP's work.

The first of ISP's collaborative projects on internal conflict was a two-year study, involving nearly every resident ISP fellow as well as a number of outside experts, that sought to explore three sets of issues: the causes of internal conflict; the ways in which internal conflicts spread beyond the borders of a single state; and the efforts of the international community to prevent,

⁵ See, for example, Joseph Nye, "Bush Faces a Tougher Test in North Korea," *Boston Globe*, May 7, 2003; and Steven Miller, "The Real Crisis: North Korea's Nuclear Gambit," *Harvard International Review*, Vol. XXV, No. 2 (Summer 2003), pp. 83-84..

manage, or resolve internal conflicts. Specific attention was given to the question of international involvement in internal conflicts, examining the international actors who get drawn into internal conflicts, or who thrust themselves into an internal conflict, and assessing as well the instruments available to outside actors seeking to intervene.

A working group, consisting of nine members of BCSIA, several colleagues from Harvard's Olin Institute for Strategic Studies, and six scholars from outside Cambridge, was formed to address these topics. In addition, a regular speaker series on internal conflict was organized and two workshops were held to expose the efforts of the working group to critical scrutiny. The main purpose of the group was to produce an edited volume that would advance understanding of the problem of internal conflict. The group's efforts culminated in the publication of the book *The International Dimensions of Internal Conflict*, which was published by MIT Press in 1996 to laudatory reviews by the *Los Angeles Times*, *Foreign Affairs*, and *World Politics*.

ISP's second major project on internal conflict was an exploration of the policy instruments available to national governments seeking to avert ethnic conflict and minimize ethnic friction. In 1996, in collaboration with Harvard's Pacific Basin Research Center, ISP launched a project designed to examine policies pursued by Asian governments in their efforts to manage ethnic relations – a project that is, in a sense, a successor to the project and completed volume on internal conflict. The goal of this project was to produce a book that would undertake an analysis of what policies seem most effective at containing ethnic problems and preventing ethnic conflict.

The book *Government Policies and Ethnic Relations in Asia and the Pacific* was published by MIT Press in the fall of 1997. It consists of 12 case studies, each focused on a single Asian country, but carefully structured to provide the basis for comparative assessment of the impact and effectiveness of the ethnic policies of Asian governments. In its orientation, this project differs considerably from a growing number of ethnic conflict studies that examine existing or historical conflicts. The aim of this study has been to examine the instruments available to governments for averting or minimizing ethnic problems.

ISP's preoccupation with the topic of internal conflict has also influenced its wider publications program. It has encouraged, induced, or attracted numerous articles on these topics for its quarterly journal *International Security*. Some of these pieces were collected in the *International Security Reader, Nationalism and Ethnic Conflict*, published by MIT Press in 1997 and reissued in a revised edition in 2001.

Activities in 2002-2003: During academic year 2002-2003 a number of ISP fellows did work that fell under this rubric (often in collaboration with BCSIA's Program on Intra-State Conflict.) Indeed, this was one of the focal points for work by the fellows this year, reflecting the great importance of these issues on the international agenda. A number of diverse and interesting projects were undertaken this year. Brenda Shaffer, for example, followed internal conflicts in the greater Caspian basin and their implications for regional politics. Ivan Arreguín-Toft worked on asymmetric conflicts such as might arise when outside powers get drawn into local or internal conflicts. Roberto Belloni explored post-conflict reconstruction in the Balkans. Lucy Chester examined partition as a possible solution to intractable disputes. David Rezvani explored the

concept of federacy as a potential solution to acute ethnic disputes. Renske Doorenspleet studied democracy and conflict resolution in Africa. Arman Grigorian investigated the conditions under which third party interventions in internal disputes actually provoked an undesired and counterproductive escalation in violence. Sarah Lischer analyzed the conditions under which humanitarian intervention can become a cause of conflict. And Aronette White launched a study of the motives and fates of female guerilla fighters in African conflicts.

IV. REGIONAL SECURITY

Background: Many of the world's security problems manifest themselves in regional settings. With the end of the Cold War, dilemmas of regional security have become even more prominent on the international security agenda. In recent years, ISP has sought to expand and strengthen its coverage of regional security issues, in part by selection of pre- and postdoctoral fellows working on security in specific regions and in part by recruitment of distinguished senior fellows.

ISP also launched a strategic partnership with the Jaffee Center for Strategic Studies at the University of Tel Aviv. A first jointly activity was a large conference assessing the changed strategic environment for Israel and the United States, held in Tel Aviv in the summer of 1998. The conference report, *Challenges to Global and Middle East Security*, was published in the fall of 1998. In March 1999, the Jaffee Center and BCSIA cosponsored (with others) an international conference on "The Future of Military Doctrine," which examined in particular the doctrinal influences of the U.S. and Israeli militaries on each other. These were the beginnings of a fruitful ongoing collaboration that has included one or more joint workshops in each subsequent year.

Activities in 2002-2003: In 2002-2003, ISP focused in particular on the US-Israel strategic dialogue, in collaboration with the Jaffee Center. The essential idea is to provide an framework within which US and Israeli experts and officials can intensively discuss regional issues of mutual concern. This appeared to be particularly warranted in view of the actual or impending changes in many relevant governments (including the US and Israeli governments), the ongoing mutual concerns over the challenges posed by Iran, Iraq, the continuing worries of both governments about weapons proliferation in the region, and the momentous implications of the success or failure of the Middle East peace process. The first US-Israel strategic dialogue meeting was held in Washington DC in February 2000; it was followed by a meeting in New York in June 2000. Since that time, this group has continued to meet regularly, generally every three or four months, to discuss the latest developments in the Middle East and the implications for US and Israeli policy. Given the terrible downward spiral in the Israeli-Palestinian relationship over the past two years, these meetings have provided especially timely opportunities to evaluate the evolution of recent events and to consider possible approaches to ending the violence and putting the region back on a more hopeful path. The most recent gathering, held outside Washington DC in November 2002, focused on the implications for the Middle East of the crisis over Iraq.

ISP and the Jaffee Center also continued to work together to facilitate the publication of the annual volume, *The Middle East Military Balance*. The first of these to be published by ISP was

the 1999-2000 edition, which was published at the end of 1999 by the MIT Press. This Jaffee Center product is published in ISP's monograph series, BCSIA Studies in International Security.

As usual, ISP also supported research fellows engaging in work on various dimensions of regional security. Chris Twomey pursued work on East Asia. Brenda Shaffer continued her work on the Caspian basin. Jeremy Pressman focused on alliance relationships and also worked on the Middle East. John Garofano studied American policy toward regional security, focusing especially on the problem of US intervention. In the absence of the global cold war struggle, security issues most often manifest themselves in regional settings, and this is reflected in the ISP fellows program.

V. PREVENTIVE DEFENSE

Background: The Preventive Defense Project is a research collaboration of Stanford University and Harvard University's Kennedy School of Government, co-directed by William J. Perry and Ashton B. Carter. Preventive Defense is a concept for American defense strategy in the post-Cold War era, premised on the belief that the absence of an imminent, major, traditional military threat to American security presents today's leaders with an unaccustomed challenge and opportunity to prevent future Cold War-scale threats to international security from emerging. While the U.S. defense establishment must continue to deter major regional conflicts and provide peacekeeping and humanitarian relief missions when necessary, its highest priority is to contribute to forestalling developments that could directly threaten the survival and vital interests of American citizens.

To this end, the Project focuses on forging productive security partnerships with Russia and its neighbors, engaging an emerging China, addressing the lethal legacy of Cold War weapons of mass destruction (WMD), and countering WMD proliferation and potential acts of catastrophic terrorism. Through intense personal interaction with political and military leaders around the world, the Project nourishes a highly informed but non-governmental "track-two" dialogue that explores opportunities for international innovation, agreement and cooperation. In doing so, PDP seeks to devise creative new policy approaches that reflect a preventive defense posture. The Preventive Defense Project is also examining the U.S. government's structural capacity to deal with security challenges of a new era. (Click [here](#) to view PDP's new book entitled, *Keeping the Edge: Managing Defense for the Future*.)

The Project is a multi-year effort supported by the Carnegie Corporation of New York, the John D. and Catherine T. MacArthur Foundation, the Packard Foundation, the W. Alton Jones Foundation, the Nuclear Threat Initiative, the Compton Foundation, Inc., and private sources. The Project's Co-Directors are former Secretary of Defense William J. Perry and former Assistant Secretary of Defense for International Security Policy Ashton B. Carter. Former Chairman of the Joint Chiefs of Staff General John M. Shalikashvili and former Deputy Assistant Secretary of Defense for Russia, Ukraine and Eurasia Elizabeth Sherwood-Randall serve as Senior Advisors. Additional contributors to the Project include member of President Clinton's Foreign Intelligence Advisory Board Robert J. Hermann and former Deputy Secretary of Defense John P. White. The Project is pleased that the following experts have agreed to lend their expertise to our North Korea initiative: General John H. Tilelli, Jr., former Commander-in-Chief of the United Nations

Command, Republic of Korea/United States Combined Forces Command, and United States Forces Korea; Ambassador Stephen W. Bosworth, Dean of The Fletcher School of Law and Diplomacy at Tufts University and former U.S. Ambassador to the Republic of Korea; Dr. Kurt Campbell, former Deputy Assistant Secretary of Defense for East Asian and Pacific Affairs; and Dr. Michael H. Armacost, former President of the Brookings Institution and former Undersecretary of State and U.S. Ambassador to Japan and to the Philippines.

Activities in 2002-2003: This year the Preventive Defense Project focused particularly on defense management. It formed a core group on Defense Organization and Management that drew together a number of experts and former officials to consider how defense management might be improved. Its efforts culminated in the publication of the book, *Keeping the Edge: Managing Defense for the Future*, co-edited by Ashton Carter and John White.

In addition to this latest book, the Preventive Defense Project conducted many other activities in 2002-2003. The project continued its focus on helping to create a productive U.S.-Russia security partnership by visiting with senior Russian officials in Moscow. Members of the Project also continued their efforts to promote stable U.S.-China relations. In addition, Perry and Carter devoted considerable effort, at the behest of the Clinton Administration, to the problem of North Korea.

MEMBERS' ACTIVITIES

STEVEN E. MILLER

ACTIVITIES

Steve Miller attended the following conferences: 52nd Pugwash Conference on Science and International Affairs, "Science, Sustainability, Security," held at the University of California, San Diego, La Jolla, California, 7-14 August 2002. Meeting at the Center for Global Partnership, The Japan Foundation, New York, 28 August 2002. Task Force meeting of The Stanley Foundation, held at the Brookings Institution, Washington DC, September 20, 2002, entitled, "US Strategies for National Security: Securing Peace in the Twenty-First Century." Pugwash Workshop on Terrorism and Weapons of Mass Destruction, Como, Italy, 26-28 September 2002. Paper: "Force, Order, and the Implications of War Against Iraq." Committee on International Security Studies, American Academy of Arts and Sciences, Cambridge, MA, October 11, 2002. Seminar on The Future of Arms Control, the Royal Academy of Sciences, London, England, 14 November 2002. Lecture entitled, "The Bush Administration and Arms Control." Pugwash Workshop on No-First-Use of Nuclear Weapons, London, England, 15-17 November, 2002. Presented a paper on "The Utility of Nuclear Weapons and the Strategy of No-First-Use." Seminar on "Global Sikkerhet og Utvikling," Norwegian Labor Party, Oslo, Norway, 12-13 December 2002. A lecture on, "America's Global Strategy in the Bush Administration."

“US Strategies for National Security: Securing Peace in the Twenty-First Century,” Task Force meeting of The Stanley Foundation, held at the Carnegie Endowment for International Peace, Washington DC, January 17, 2003. A meeting at the Center for Global Partnership, The Japan Foundation, New York, January 30, 2003. A meeting of The Research Council on Global Investment at the Kennedy School, 12-13 February 2003, “World War III: Has it Started? How Can we Stop It?,” where he presented: International Reactions to the Iraq Crisis. In February, he attended the “The New Transatlantic Strategic Framework,” meeting of the Transatlantic Strategy Group, The Bertelsmann Foundation, Coral Gables, Florida. In March, a lecture on “The Perils of Hegemony: International Reactions to American Primacy,” at the Center for Peace and Security Studies, Georgetown University, CSPASS Distinguished Speaker Series, Washington DC, March 5, 2003. He presented a talk on, “US Foreign Policy in the Age of Terrorism: Implications for the Caspian,” Caspian Studies Dinner, Kennedy School of Government, March 7, 2003 and another, “KSG Symposium: Conversation on Iraq,” Kennedy School of Government, held in Washington DC, March 10, 2003. He was a panelist at the Caspian Studies Program, “The Forgotten Threat? Iran and Weapons of Mass Destruction,” where he spoke about “Iran and the International Nonproliferation Regime.” He attended a conference on “New Tasks and Dimensions of Nuclear Arms Control,” organized by the German Foreign Office and the Institute of Security Studies, University of Kiel, held at Potsdam, Germany, 13-15 March 2003 and the Task Force meeting of The Stanley Foundation, Washington DC, March 20, 2003, title, “US Strategies for National Security: Securing Peace in the Twenty-First Century.” He was part of the Distinguished Speaker Series, Harvard University Institute for Learning in Retirement and lectured on “The Wars of the Bush Administration,” in April 10, 2003. He attended the Committee on International Security Studies, American Academy of Arts and Sciences, Cambridge, Massachusetts, April 11, 2003 and a conference on “Global Risks and Realities: How Should America Lead?,” Kennedy School of Government, May 2-3, 2003 where he presented: The International Nonproliferation Crisis. He presented, Global Responses to American Power at a seminar on the Implications of American Primacy, Harvard, May 13, 2003. In May, he also attended a workshop on Russian Military Power, Organized by the Committee on International Security Studies, American Academy of Arts and Sciences, held at the International Institute for Strategic Studies, London, England. His presentation: The Evolution of Russian National Security Policy. He attended another Task Force meeting of The Stanley Foundation, in Washington DC, 21-22 May 2003 on US Strategies for National Security: Securing Peace in the Twenty-First Century,” and spoke about the future of arms control. At the Athens Conference on Nuclear Proliferation, Greek Ministry of Foreign Affairs, May 30-31, 2003, he presented his paper: “Is the NPT System Slowly Dying? Seven Challenges to the Regime.” He attended the Summer Institute on “Weapons of Mass Destruction: The Evolving Threat in the 21st Century,” Five College Program in Peace and World Security Studies, Amherst College, Amherst, MA, June 11, 2003. Lecture: Managing Russia’s Nuclear Arsenal. And in June, an International Summer Course on Disarmament (ISODARCO), Trento, Italy, 23-26 June 2003. Lectures included: Nuclear Weapons and Arms Control in the Bush Administration; International Order after Iraq.

Stephen Walt

Activities

Stephen Walt served as Academic Dean of the Kennedy School of Government. He also served as Faculty Chair of the International Security Program at BCSIA, and taught ISP110 (International Relations: Theory and Policy) during the autumn semester. He was co-author (with John J. Mearsheimer) of a BCSIA Occasional Paper "Can Saddam Be Contained?: History Says Yes," and a revised version of this paper was published as "An Unnecessary War" in the January-February 2003 issue of *Foreign Policy* and reprinted in over a dozen foreign countries. Walt made numerous TV and radio appearances during 2002-03, and also debated William Kristol and Max Boot at the Council on Foreign Relations in New York. He gave guest lectures at the University of Pennsylvania, the Naval War College, Bryn Mawr, La Salle University, and the State University of New York, New Paltz, and served on the external advisory committee for the Institute of International Studies at Stanford and a Council on Foreign Relations Task Force on U.S.-European relations. He continued to work on a book on foreign responses to U.S. primacy, and his essay "The Enduring Relevance of the Realist Tradition," was published in Ira Katznelson and Helen Milner, eds., *Political Science: State of the Discipline III*, (W. W. Norton, 2003).

Ashton B. Carter

Activities

During 2002-2003, Ashton B. Carter served as the Ford Foundation Professor of Science and International Affairs at the Kennedy School of Government. In this capacity he taught a class on American National Security Policy. This course analyzes the central threats to U.S. and international security in the post-Cold War era and the policy options available to reduce those dangers. The course encompasses military, diplomatic, and intelligence functions and agencies of the U.S. government. He also offered a course on Controlling Weapons of Mass Destruction. This course on the international security challenge presented by the proliferation of weapons of mass destruction to nations or terrorists and strategies for its control covered the spread to state and non-state actors of nuclear, biological, chemical, ballistic missile weapons and technology, and other technologies of destruction such as cyber attack.

Dr. Carter co-directs with Dr. William J. Perry the Preventive Defense Project, a research collaboration of Stanford and Harvard Universities that designs and promotes security policies aimed at preventing the emergence of major new threats to the United States. The Project supported by the Carnegie Corporation of New York, the John D. and Catherine T. MacArthur Foundation, the Nuclear Threat Initiative, the Compton Foundation, Inc., and private sources concentrates on countering proliferation of weapons of mass destruction (WMD) and potential acts of catastrophic terrorism, forging productive security partnerships with Russia and its neighbors, dealing with the lethal legacy of Cold War weapons of mass destruction, engaging an awakening China, dealing with North Korea, and national security organization and management. The Preventive Defense Project seeks to contribute to these objectives through invention of new policy approaches reflecting preventive defense, intense personal interaction with political and military leaders around the world, and through the establishment of highly informed but non-governmental "Track Two" initiatives that explore new possibilities for international agreement.

A major thrust of the Preventive Defense Project this year has been on the comprehensive overhaul of counterproliferation policies and tools required by the radically changed climate for WMD proliferation, especially the evident willingness of terrorists to use WMD and the new risks and responsibilities for the United States in a “unipolar” era. One such effort is the building of a global coalition against WMD terrorism, as called for by Sam Nunn and Richard Lugar. Others include a critical appraisal of “preemption” and its place in a comprehensive counterproliferation policy portfolio; the strengths and limitations of arms control regimes covering WMD; and the impact of changes in the U.S. nuclear posture and programs on efforts to combat proliferation.

Since Perry and Carter conducted the North Korea Policy Review for President Clinton, the Project is positioned to potentially launch a Track Two dialogue through existing contacts in the DPRK government. Toward this end the Project has assembled a small bipartisan group of American non-governmental experts and potential funding sources committed to such a dialogue if and when “Track One” government-to-government talks aimed at resolving the North Korean nuclear crisis begin, to which a Track Two effort can serve as complement. In the meantime, the Project has continued to highlight the profound importance of North Korea’s nuclear program to international security and to conduct research exploring the possibility of a diplomatic solution to the North Korean nuclear crisis, verification of such an agreement, and alternatives to a negotiated agreement. This research has resulted in articles, op-eds, numerous conference presentations, and prominent Congressional testimony.

Just as in previous years the Project focused on strengthening the U.S.-Russia security partnership, it also has a sustained interest in the U.S.-China relationship. In close cooperation with the National Committee on U.S.-China Relations, Project principals continued this year their “Track Two” dialogue involving Chinese president Jiang Zemin and his head of Taiwan affairs, Wang Daohan. The latest of these dialogues took place in Taipei, Shanghai, and Beijing in November, 2002 – a time of historic transition. The dialogue featured research papers on managing US-China crises and cooperation against WMD terrorism written by KSG students.

In light of Dr. Carter’s and PDP’s pre-9/11 work in the area of catastrophic terrorism, he has been involved with a number of counterterrorism-related activities. In addition to serving on several task forces, Carter continues to urge the Bush administration to make Governor Ridge the “architect” of a quantum increase in the nation’s capabilities for homeland security and makes recommendations for a multiyear, multiagency program that will cover all phases in the war against terrorism – detection, prevention, protection, interdiction, containment, attribution, analysis, and invention. Dr. Carter continues to serve on the board of the Kennedy School of Government’s Executive Session on Domestic Preparedness; this is an extension of his earlier work on catastrophic terrorism.

Finally, the PDP book *Keeping the Edge* continues to serve as the guide to DOD’s transformation effort. One senior DOD official noted, “We’re going through it page by page.”

In areas beyond teaching and the Preventive Defense Project, Dr. Carter continues to serve DOD as an advisor to the Secretary of Defense and as a consultant to DoD’s Defense Science Board.

He is currently a member of the National Missile Defense White Team and the National Security Advisory Group – a group chaired by William Perry at the behest of Senate Minority Leader Tom Daschle which has been advising the Senate Democratic Leadership this past year. Carter is a Senior Partner of Global Technology Partners, LLC, chairman of the Advisory Board of MIT Lincoln Laboratories, a member of the Draper Laboratory Corporation, and the Board of Directors of Mitretek Systems, Inc. He is a consultant to Goldman Sachs and the MITRE Corporation on international affairs and technology matters, a member of the Council on Foreign Relations, the American Physical Society, the Aspen Strategy Group, the International Institute for Strategic Studies, and the National Committee on U.S.-China Relations, and a fellow of the American Academy of Arts and Sciences and senior associate at the Center for Strategic and International Studies.

Sean M. Lynn-Jones is a Research Associate in BCSIA's International Security Program. He is also Editor of *International Security* and Series Editor of the BCSIA Studies in International Security book series. His research interests include American foreign policy and theories of international politics. He is a member of the Editorial Board of *Security Studies*. His articles have appeared in *Foreign Policy*, *International Security*, *Security Studies*, and other journals. He is the editor or co-editor of many books, including *Theories of War and Peace*, *The Cold War and After*, and *Debating the Democratic Peace*.

During 2002-2003, Sean devoted most of his time to overseeing the publication of four issues of *International Security* and several books in the BCSIA Studies in International Security series. He continued to work on a book, *Should America Spread Democracy? A Debate*, which he is writing with Christopher Layne. He also conducted research on theories of offense and defense in international politics.

Brenda Shaffer: See section on Caspian Studies Program.

Monica Duffy Toft is an Assistant Professor of Public Policy at the Kennedy School of Government and the Assistant Director of the John M. Olin Institute for Strategic Studies, Harvard University. She holds a Ph.D. and M.A. from the University of Chicago and a B.A. in Political Science and Slavic Languages and Literatures from the University of California, Santa Barbara. Professor Toft was a research intern at the RAND Corporation, and served in the US Army in southern Germany as a Russian voice interceptor. Professor Toft teaches four courses at the Kennedy School: Civil Wars-Theory and Policy, Sex and War, Intervention and Peacekeeping; and International Security and Political Economy. Her research interests include international relations, civil and interstate wars, nationalism and religion, the relationship between demography and national security, and military and strategic planning. Professor Toft is the author of *The Geography of Ethnic Conflict: Identity, Interests, and Territory*, (Princeton) and an edited volume, *The Fog of Peace: Strategic and Military Planning under Uncertainty* (in progress). Her current research is examining two aspects of civil war: the role of religion and the durable settlement of civil wars. The second project will culminate in her third book, tentatively titled *Peace through Victory: The Durable Settlement of Civil Wars*.

RESEARCH FELLOWS

IVAN ARREGUIN TOFT: Ivan Arreguín-Toft is a postdoctoral fellow in the International Security Program at BCSIA. He holds a Ph.D. in Political Science from The University of Chicago, where his dissertation research received support from the Smith-Richardson Foundation and the Institute for the Study of World Peace. His current research focuses the political and military utility of barbarism – systematic violations of the laws of war as a military strategy. His research demonstrates that although in rare cases, barbarism facilitates military victory, in most cases it is counterproductive in both military terms and in terms of political objectives sought by the use of force. His work at BCSIA in 2002–2003 included publication of a journal article in *The Cambridge Review of International Affairs*, and continuing research for a second book project (to be completed in 2003–2004), tentatively entitled *The [F]utility of Barbarism in War*.

Roberto Belloni: Roberto Belloni spent 2002-03 working on his dissertation titled “Post-Settlement Peacebuilding in Deeply Divided Societies: The Case of Bosnia-Herzegovina.” He is scheduled to defend it in early September at the Graduate School of International Studies at the University of Denver, before beginning a post-doctoral fellowship at the Belfer Center in Fall 2003. In late 2002, his article on minority return in Bosnia was published in the *East European Human Rights Review*. Another paper on Kosovar Albanians is forthcoming in the “Encyclopedia of Ethno-Political Groups in Europe,” edited by Stefan Wolff and Karl Cordell and published by Palgrave. In late August, he will present a paper on “peacebuilding at the local level” at the American Political Science Association’s Annual Meeting in Philadelphia.

Marie Besançon: Dr. Besançon divided her time between on-site primary data collection with interviews, compilation of hard data on income between men and women, and economic studies incorporating the gender factor and intrastate conflict. She completed and presented a paper at the Peace Science Society International, “Gender, Greed, and Grievance” with Dr. Gizelis in November. She completed a gender measures data set with yearly ratio values for women and men's income in the various sectors from the International Labor Organization historic books of 'hard data'. This data set covers forty-five countries from 1960-1997. Dr. Besançon re-coded the measures for levels of deaths in intrastate violence from the State Failures Task Force data to include all countries with no violence. She has used some of these data to retest the paper condensed from her dissertation and will soon resubmit for publication, “Relative Minimum Resource Thresholds”. She conducted over twenty interviews with party members and community workers in Northern Ireland participating directly in the peace talks, or in community work to support the peace talks. Among the interviewed were Baroness May Blood, Member of Parliament Monica McWilliams, Minister of Finance Dr. Sean Farren, PUP Representative David Ervine, and Sinn Féin Representative Sue Ramsey. Some of these interviewed provided data for an expected utility analysis of the peace process. These data also formed the basis for modeling a quantitative assessment of women’s influence in the peace process for a paper and a book chapter. Dr. Besançon will have completed and submitted her primary structural statistical

paper, "Gender, Resource Equality, and Conflict Intensity in Civil Wars" in May. Dr. Besançon participated in a conference on "Good Governance" at Harvard in February, and participated in planning and organizing a two-day conference on "Governance" at Harvard in May. She has presented a paper at the Claremont Conference on Global Political Economy Data, and is writing a paper on current measures of governance with Dr. Robert Rotberg and the World Peace Foundation.

Stephen G. Brooks: Stephen devoted much of this year to revising his dissertation for book publication. The book, which is entitled "Producing Security," examines how recent changes in the production strategies of multinational corporations are influencing international security. This past year, he presented different parts of the book at the International Studies Association meeting, the American Political Science Association meeting, the Davis Center for Russian and Eurasian Studies at Harvard, the Kennedy School of Government at Harvard, the Dickey Center at Dartmouth College, the Department of Government at Georgetown, the Department of Political Science at UC Berkeley, and the Department of Political Science at the Massachusetts Institute of Technology. In addition to completing his book, he is currently working on two article projects. The first, coauthored with Kendall Hoyt, analyzes how globalization changes the calculation of how best to conduct biodefense efforts. The second, coauthored with William Wohlforth, delineates what international relations theory can tell us about the new "unilateralist" course in US foreign policy. This line of research builds on an article entitled "American Primacy in Perspective," co-authored with William Wohlforth, that was published this year in *Foreign Affairs* and also reprinted in *America and the World: Debating the New Shape of International Politics* edited by Gideon Rose). Stephen gave lectures this year based on this article at Harvard's Weatherhead Center for International Affairs and at the University of Kentucky's Patterson School. In September 2003, Stephen will return to his position as an Assistant Professor in the Department of Government at Dartmouth College.

Lucy Chester: Dr. Chester spent the year revising her dissertation for book publication and writing several new articles. Her book, tentatively titled Mapping the End of Empire: Partition and the Indo-Pakistani Boundary, analyzes the creation and impact of the Indo-Pakistani line drawn during the 1947 division of South Asia. Dr. Chester explored the policy implications of her historical study in a paper titled "Why Does Partition Sometimes Exacerbate Conflict? Insights from the 1947 Partition of South Asia." Her conference presentations included work on "Mass Violence and the Indo-Pakistani Boundary," at the Sawyer Seminar on Mass Violence and Genocide at the Center for Advanced Study in the Behavioral Sciences at Stanford University, and "Cartographic Competition: Indian and Pakistani Maps of Kashmir," at the Western Association of Map Libraries meeting at Stanford University. Her forthcoming chapter on "Imperial Cartography in the End of Empire: Map Use During the 1947 Partition of South Asia" will appear in an edited volume on European cartography. She is currently at work on a study of the role of irrigation, communication, and transportation networks in the partition of Punjab, and her next major project will involve a comparative examination of British imperial decision-making about partition, with a focus on South Asia and the Middle East. While at BCSIA, Dr. Chester also served as chair of Women in Science and International Affairs.

Beginning in August, Dr. Chester will take a post as Assistant Professor of History and International Affairs at the University of Colorado at Boulder.

Renske Doorenspleet: Dr. Doorenspleet spent most of this year revising her dissertation 'Waves of Democratization; Identification and Explanation' for book publication. The manuscript is now under review with Lynne Rienner Publishers. She wrote a book chapter on party systems and democratization in Africa, which was published in *African Political Parties* (edited by Mohamed Salih, published by Pluto Press, 2003). Another paper 'The Structural Context of Recent Transitions to Democracy', which she also presented at the 2002 APSA meeting in Boston, has been accepted for publication in the *European Journal of Political Research*. Since May, a third paper 'Economic Development and Democracy (1976-2000): A Universal or Time-Dependent Relationship?' has been under review with an international journal. Four columns were published in *Mare* (weekly magazine of Leiden University). The *NRC*, a Dutch national newspaper, published her op-ed on the possible negative side-effects of democratization in Iraq. Currently, she is writing a paper on the problems of comparing political parties across countries, which will be presented at the ECPR General Conference September 2003 in Marburg, Germany. In January, she participated at the CRQM Annual Training Institute on Qualitative Research Methods, Consortium for Qualitative Research Methods, Arizona State University. During the year at the Belfer Center, she began studying the relationship between democratization and intrastate conflict. Finally, Doorenspleet was awarded NWO TALENT, an award of the Dutch National Science Foundation for a postdoctoral researcher who is 41 and who belongs to the top 10 percent of his or her generation in the scientific discipline concerned.

Kerry Fosher: During Fall 2002, Kerry Fosher completed her dissertation fieldwork among homeland security practitioners in Boston, Massachusetts. Her time in the response community spanned the pre-9/11 national disinterest in terrorism, the attacks of 9/11/01, two of which began in Boston, months of anthrax scares that immediately over-stretched local resources, implementation of the P.A.T.R.I.O.T. Act, the capture and trial of the "shoe bomber", and ended as the U.S. launched the Department of Homeland Security in what may be the largest federal reorganization in history. She is currently analyzing her data and writing her dissertation. Her thesis shows homeland security operations in this area to be taking place within a policy community, a processual network that spans organizational boundaries to allow inter-agency work within an uncertain and shifting bureaucratic structure. She continues to work with the response community through her affiliation with the Consequence Management Group of Boston's Operation Safe Commerce/Model Port Initiative.

Kerry has been working with the Radiological Weapons Working Group of ISP's Managing the Atom Project. She has drafted a chapter called "*Radiation Preparedness and Response: A Field Guide to US State and Local Variability*," for the group's forthcoming report on radiological weapons. In February, she co-organized a segment on Training and Capacity Building for the Executive Session on Domestic Preparedness meetings. She also authored a background reading for the session, "*Training and Capacity Building: An Introduction to Major Themes*." She is currently working on short papers on exercise administration and capacity building.

In November of 2002, she was invited to discuss her research in a panel on military studies at the annual meetings of the American Anthropological Association. She presented the paper, "*Sources and Methods: Ethical Considerations in Anthropological Fieldwork in National Security*

Communities,” in which she examined ethical and legal challenges to conducting research and protecting informants. She has made several informal presentations of her dissertation research in New England, most recently an invited, “students only” talk for Graduate Recruitment Weekend in the Anthropology Department at Syracuse University.

This April, Kerry will act as a facilitator for the state and local components of a three-day table-top exercise in the National Security Management Course at the National Security Studies Program at Syracuse University. She has organized a panel on the Ethnography of Work, which was accepted for the annual meetings of the American Ethnological Society in late April. She will also be presenting her paper, “*Defending the Homeland: The Social Construction of National Security at the Local Level*,” at the joint meetings of the Society for the Anthropology of North America and the Canadian Anthropology Society Annual Meetings in May in Halifax, Nova Scotia.

JOHN GAROFANO: John spent the fall working on several projects, including a book on U.S. military intervention since the second world war and, as a research assistant, on the memoirs of McGeorge Bundy, the National Security Advisor for President Johnson. John also co-edited and wrote an Introduction for a book on President Clinton's foreign policy speeches, wrote an article summarizing military operations theory for an encyclopedia of military sociology, and joined a research group funded by the Japan Foundation to examine the prospects for a security community in Asia. During the winter he took a position as Professor, National Security Affairs, in the National Security and Decision-making Department at the Naval War College. In that capacity he taught the core course on policy making and gave presentations on the Iraq war in Washington and San Diego.

Arman Grigorian: Mr. Grigorian spent the year working on his doctoral dissertation, which is a study of escalated violence in state-minority disputes in response to third party interventions or threats to carry them out. He has already completed the theoretical section of the dissertation, as well as the research for one of the cases. In addition to that, Mr. Grigorian has participated in two conferences - one on security and development in Armenia organized by the World Bank in January 2003, and another one on the conflicts in the Caucasus organized by the European Institute of Security Studies in May 2003. Mr. Grigorian has also completed drafts of two papers on intra-alliance bargaining and war termination. The paper on war termination has been accepted for presentation at the Annual Meeting of the American Political Science Association in August 2003.

In September, 2003 Mr. Grigorian will take the post of a visiting Assistant Professor of Government at Wesleyan University.

Peter Grose returns as a research fellow in the International Security Program, fresh on publication of his book “Operation Rollback: America’s Secret War Behind the Iron Curtain” (Houghton Mifflin 2000). He made numerous radio and personal appearances around the country - NPR, Council on Foreign Relations, etc. - to discuss the book, and is eager to plunge back in now at BCSIA with a welcome change of pace.

For the coming year, Peter will be switching from examining the intelligence community to a novel look at a private sector player in American foreign policy. He has been given unprecedented access to the archives of a large international insurance and financial services company, with a view to determining how a meaningful history of the company can be juxtaposed with US international relations during the 20th century and into the 21st.

Peter was Executive Editor of Foreign Affairs before coming to Harvard and continues as a consulting editor of the journal. Previously he was a foreign and diplomatic correspondent for The New York Times, and a member of The Times' editorial board. He served as deputy director of the State Department Policy Planning Staff early in the Carter administration, under Secretary of State Cyrus Vance.

Mark Haas: Dr. Mark Haas spent most of the year working on his book manuscript, entitled *Ideology, Threat Perception, and Great Power Politics*. The manuscript examines the effects of the degree of ideological differences dividing states' leaders on their perceptions of threat and consequent foreign policy choices. Haas not only revised and extended existing chapters, but added a new case study, which examines the importance of ideological variables to the rise and fall of the Sino-Soviet alliance from 1949 to 1960. In May he will send the manuscript to various university presses for review. During the year, Haas also had an article accepted for publication in the journal *Security Studies*. The article, entitled "Ideology and Alliances: British and French External Balancing Policies in the 1930s," examines how the ideological differences between British and French conservatives and socialists pushed most members of these groups to possess very different views of both how severe a threat Nazi Germany was to their interests, and of which great powers did and did not make acceptable allies in the balancing process. The essay is based on the causal logic developed in Haas's book manuscript, and a portion of the evidence from one of the manuscript's case studies. In September, Haas will become an assistant professor at Duquesne University in Pittsburgh.

Kendall Hoyt: Kendall Hoyt split her time between an ISP fellowship and working for ESDP. Under the fellowship, she co-authored an article with Stephen Brooks, "Globalization and Biosecurity," which is under review at *International Security*. This article examines the global economy for biodefense and advocates biosecurity measures that will not compromise the ability to develop medical countermeasures such as vaccines. She is in the process of writing another article on public and private sector strategies for the organization and management of research and development for biodefense. She has also been revising her dissertation into a book manuscript. This manuscript traces the evolving role of vaccines as an instrument of national security and examines the interplay of national security concerns and commercial interests in the history of vaccine innovation.

For ESDP, Dr. Hoyt has assessed public health surveillance strategies for biodefense and examined the scientific, legal, and managerial implications of smallpox vaccination policies. On these topics, she has drafted reports and grant applications and she has organized two panels for the February ESDP session. The first panel explored strategies for the development and application of emerging technologies for biodefense and the second examined the historical

lessons of large-scale vaccination campaigns for smallpox immunization policy. Most recently, she co-organized the New England Bioterrorism Conference and moderated the panel on innovations in public health surveillance.

Bonnie Jenkins: During the first half of the 2002 – 2003 academic year, Ms. Jenkins had an opportunity to present her dissertation ideas to three audiences: at an ISP brown-bag; at a Managing the Atom seminar; and, while attending the 2003 Qualitative Research Methods Institute in Phoenix, Arizona. The opportunity to present her ideas and obtain feedback from colleagues proved valuable and resulted in the refocusing of her dissertation question. While the dissertation will continue to explore the theoretical explanations for nuclear weapons decision-making by nations, the dissertation will now examine national decision-making in light of the role played by international efforts to prevent nuclear proliferation (e.g., sanctions, use of force, economic incentives, export controls). Specifically, why have these international efforts succeeded in preventing nuclear proliferation in some cases and not in other cases? The dissertation will conclude with an assessment of existing international efforts to prevent nuclear proliferation and whether the international community should look to new efforts that may prove successful in the future.

Ms. Jenkins spent the second half of the academic year reworking her dissertation outline in light of her revised question and then wrote the first three chapters of the dissertation. Currently she is interviewing and doing research on Chapter IV of the dissertation, which is the Ukraine case study. Her goal is to have the first draft of Chapter IV completed by the end of summer 2003, at which time I will turn to the second of the three case studies: India. She will do research and conduct interviews on her final case study, North Korea, in early 2004.

Dmitri Kovchegin: See section on Science, Technology and Public Policy Program

Sarah Kenyon Lischer: Dr. Lischer spent most of the year revising her dissertation for publication. The manuscript is titled "Catalysts of Conflict: Refugees, Rebels, and Humanitarian Aid." It is currently under review at Cornell University Press. Lischer also has an article forthcoming in *International Security* titled "Collateral Damage: Humanitarian Assistance as a Cause of Conflict." In April 2003, she published an op-ed in the *Christian Science Monitor* on the role of the military in humanitarian assistance to Iraq ("Humanitarian Aid Is Not a Military Business"). Lischer has book reviews forthcoming in *International Studies Review* and *Global Social Policy*.

Lischer presented her work in various fora during the year. She gave a paper at the 2002 APSA conference as part of a panel on intrastate conflict. In September, she presented her research at the 3rd annual New Faces Conference held at Duke University and sponsored by the Triangle Institute of Security Studies. She gave a talk on the military and political implications of humanitarian aid to Iraq at Sweet Briar College in March 2003. She will present a paper at the 2003 APSA conference as part of a panel on non-state actors and international security.

In August, Lischer will start as an Assistant Professor of Government at Sweet Briar College.

Maurizio Martellini: Maurizio is a professor of physics from Italy. He is also the General Secretary of the organization Landau Network-Centro Volta, based in Como, Italy, which sponsors work and workshops focused on major security issues, especially those having to do with weapons of mass destruction. In addition, he is one of the leaders of USPID, the Union of Italian Scientists for Disarmament, which undertakes activities relating to the global arms control agenda. A member of our Managing the Atom working group, Maurizio is working on nuclear non-proliferation. His work this year has centered on North Korea, but he is also examining the European role in managing the international nonproliferation regime and he has an abiding interest in the problem of “loose nukes” in Russia.

Gregory Mitrovich: During this year, Mitrovich has completed the research phase of his book project entitled "Avoiding Armageddon: American Strategic Thinking and the Emerging Nuclear Peace, 1945-1963." This project is a continuation of the work begun in his recently published prize winning book, "Undermining the Kremlin: America's Strategy to Subvert the Soviet Bloc, 1947-1956." The aim of Mitrovich's work is to restructure our understanding of the first two decades of the Cold War.

In "Avoiding Armageddon" Mitrovich seeks to challenge much of the conventional wisdom about the implications of the development of nuclear weapons on the early cold war. Mitrovich contends that in the era before MAD--before the development of assured second strike nuclear capabilities--the strategic balance favored first-strike and not deterrence. This instability dramatically influenced the course of cold war history. "Avoiding Armageddon" traces the evolution of American strategic thought from the first debates about the implications of nuclear power in the late 1940s, through the decisive middle years of the 1950s when America attained nuclear superiority, until the development of MAD forced a fundamental change in the nature of the cold war competition. Mitrovich expects to finish work on "Avoiding Armageddon" early in 2003.

Jean Mulot: During the academic year 2002-03, Jean Mulot actively supported the faculty group on “Strategies to Fight Terrorism” at Harvard around Prof Graham Allison and Prof Steve Van Evera. In this context he did background and preparatory research. He also supported Prof Allison with pointed research on issues related to terrorism.

The focus of his efforts was on developing his PhD thesis concept. He first reviewed the available extensive literature on terrorism in order to refine his approach and sharpen his project. Then he went in the field to gather data on one of his country cases, Jordan. There he gave special attention to the contribution of governance to the development of Islamic fundamentalism as ideology supporting terrorism. During this phase in Amman, which run in parallel to the Iraq war, he has also devoted time to improving both his knowledge of the region and his Arabic skills.

In parallel, Jean translated and significantly contributed to a book “Action, and the World System” by the Head of the French Council on Foreign Relations, Thierry de Montbrial.

Kevin Narizny: During the 2002-3 academic year, Dr. Narizny focused on the revision of his dissertation, “The Political Economy of Grand Strategy,” for the purpose of turning it into a book. He intends to complete the manuscript and submit it to publishers by the end of summer.

Dr. Narizny also worked on several shorter projects at the Belfer Center. First, he made revisions to “The Political Economy of Alignment: Great Britain’s Commitments to Europe, 1905-39.” The article, which explains how British governments’ diplomatic alignments between 1905 and 1939 were influenced by their partisan coalitions’ sectoral interests, is forthcoming in the Spring 2003 issue of *International Security*. Second, he completed “Both Guns and Butter, or Neither: Class Interests in the Political Economy of Rearmament.” The paper, which demonstrates how British, French, and American governments’ ability to undertake major rearmament programs was constrained by their parties’ class interests, will be published by the *American Political Science Review* in May 2003. Finally, Narizny began work on “Toward a Microfoundational Methodology: The Problem of Interest Aggregation in Preference-Based Theories of International Relations.” The manuscript examines the methodological challenges involved with using societal-level variables to explain strategic behavior.

In the coming year, Dr. Narizny will be returning as a postdoctoral fellow at the Belfer Center.

Alisa Peled: An Israeli, Alisa is on leave from the School of Management at Ben-Gurion University of the Negev. She did her PhD at Harvard in Middle Eastern History. She has been researching economic dimensions of the prospects for regional cooperation in the Middle East. This year she also taught a graduate seminar in the Political Economy of the Middle East at Brandeis University.

Jeremy Pressman: Dr. Pressman spent much of the year revising his dissertation for book publication. He is aiming to send his manuscript, “Alliance Restraint: How allies stop each other from going to war,” to presses by the end of his time at the center.

In the fall, he finished revising an article contrasting procedural and structural explanations for the failure of Israeli-Palestinian talks in 2000-01. The article, “What Happened at Camp David and Taba? Evaluating Israeli and Palestinian Narratives” is currently under review. A related article on the second intifada will appear in the fall 2003 issue of the *Journal of Conflict Studies*.

During this past year, Pressman has also written an essay on the U.S. role in Israeli-Palestinian relations (*International Studies Perspectives*, May 2003); two short essays on Israeli settlements and Palestinian refugees for an edited volume on the Middle East since 1945 that is part of the *History in Dispute* series (Columbia, SC: Manly Inc, 2003); a review of Henner Furtig’s *Iran’s Rivalry with Saudi Arabia between the Gulf Wars* (for Iranian Studies); and two op-eds in Lebanon’s *Daily Star* on the Bush administration’s reasoning for war against Iraq and on Ariel Sharon. He recently finished an article on forms of resistance to U.S. dominance (“If not balancing, what?”).

He presented his work in various fora, including a talk at MIT’s Security Studies series in October. He also participated in the World Peace Foundation’s conference on myths and

narratives in the Israeli-Palestinian conflict. Pressman will be presenting a paper at the APSA conference in Philadelphia entitled “Terrorism and Territoriality: Do terrorists need a nation-state base?”

Pressman will start as an assistant professor of political science at the University of Connecticut in late August 2003.

David Rezvani: David Rezvani spent much of the year revising the manuscript of his forthcoming book entitled, *Federacy: The Dynamics of Semi-Sovereign Territories*. His manuscript is now under review with Cambridge University Press and The Johns Hopkins University Press. He also completed a paper on the subject of U.S. constitutional structure entitled, “America’s Unwritten Constitutional Rules.” This paper is now circulating before review later this summer. In May he will also be presenting a paper at Oxford University’s Nuffield College entitled, “The Emergence of ‘Federacy’ in International Politics,” which examines the implications for international relations of the emergence of the newly apparent, semi-sovereign political entities known as federacies. He is also in the process of completing three additional papers on the subjects of political space in China, the parallels between municipal and international law, and terrorism.

Benjamin Runkle: A former officer in the US Army who served in the 82nd Airborne and spent time stationed in Korea, Ben has been working to complete his dissertation in the Department of Government at Harvard University. His dissertation explored the effects of arms racing on the likelihood of war. The completed dissertation was submitted in April, 2003. Ben is presently undergoing a security review in anticipation of a post in the US government.

Margaret Sloane: Ms. Sloane worked on her dissertation and restarted the Harvard-MIT Chemical and Biological Weapons Colloquium. Her dissertation examines the utility of coercive disarmament conducted by a coalition as a tool for counterproliferation policy, using the United Nations’ attempt to disarm Iraq of its biological weapons program from 1991 to 2003 as a case study. This fall she presented her preliminary research to both the ISP fellows at the Belfer Center and the Ph.D. colloquium at the Fletcher School of Law and Diplomacy. Also in the fall Ms. Sloane participated in a panel discussion, “Thinking about Iraq,” at the Fletcher School where she gave an analysis of Iraq’s biological weapons program. In the spring Ms. Sloane gave a guest lecture at Professor Alisa Peled’s class at Brandeis University on the subject of Iraq and the weapons inspections process. Also in the spring semester Ms. Sloane organized the Harvard-MIT CBW Colloquium. This seven-part series, which began in March, brought in experts from Cambridge, MA, Washington, DC, and England to speak on the subject of chemical and biological weapons. The colloquia raised some of the current issues facing those grappling with the control of chemical and biological weapons as well as providing two historical cases for consideration. In June Ms. Sloane participated in the National Security Seminar at the Army War College in Carlisle, PA, a week-long event, which is the last phase of the Army War College’s core curriculum. Finally, this spring Ms. Sloane was offered term membership at the Council on Foreign Relations.

Christopher Twomey: While at Belfer, Twomey has primarily focused on completing his dissertation. In addition to revisions of his theory chapter, he has completed the first two of his Korean War cases and completed the research for the next two cases in that war. The remainder of the spring semester at Belfer will be spent writing up those two cases. Beyond that, Twomey has also worked as a media consultant regarding the war in Afghanistan. In the first three months of the war in Afghanistan, he appeared on the local Fox 25 news broadcast over twenty times, gave nearly a dozen print interviews, and appeared live on CNN Headline News for two interviews of several minutes each. Finally, Twomey has continued work on a project focused on minimizing the threat perceived by China from the ongoing strengthening of the US-Japan alliance

James Walsh: See section on the Science Technology and Public Policy Program.

Aaronette M. White: Dr. White, a joint fellow in International Security and Women and Public Policy, spent the first part of her year writing a draft of a literature review on the recruitment, active war, and postwar experiences of women combat fighters who have participated in guerrilla warfare. She presented findings from her literature review on February 7, 2003 for her ISP colloquium and plans to submit the final draft of the review to Signs, an interdisciplinary Women's Studies journal.

Dr. White spent the second half of her year creating questionnaire items for a semi-structured interview that serves as her primary methodology for researching the pre-war, active war, and postwar lives of African guerrilla soldiers in particular. After completing the interview protocol, she traveled to South Africa and started collecting, transcribing, and analyzing interview data on 25 African women guerrilla soldiers who served in the former anti-apartheid guerrilla army "Umkhonto we Sizwe." In addition, she trained three South African undergraduate research assistants to transcribe the audiotaped interviews in a standardized format. Finally, Dr. White developed a coding key for analyzing the interview data.

In September Dr. White will begin a tenure-track joint appointment as assistant professor of African & African American Studies, Women's Studies, and Psychology at the Pennsylvania State University in University Park, PA. Pennsylvania State University also awarded Dr. White a faculty grant to complete her research on African women guerrilla soldiers in South Africa and to begin the second phase of her project on women guerrilla fighters in Rwanda

Chen Zak: An Israeli, Chen has served in the Israeli Defense Forces as a Lieutenant. She did an undergraduate degree in social science and a Masters's degree in security studies at Tel Aviv University. Prior to launching her doctoral studies, she worked for five years for the Atomic Energy Commission of Israel, including involvement in Israel's preparations of NPT review conferences. Now a doctoral student at the Fletcher School of Law and Diplomacy, she is working on a dissertation on the role of inspection and verification in the nuclear nonproliferation regime. Her monograph, *Iran's Nuclear Policy and the IAEA*, was recently published by the Washington Institute for Near East Policy. Chen is a member of our Managing the Atom Working Group.

Hui Zhang: is a Research Associate in the Project on Managing the Atom in the Belfer Center for Science and International Affairs at Harvard University's John F. Kennedy School of Government. His researches include verification techniques of nuclear arms control, the control of fissile material, nuclear terrorism, China's nuclear policy, nuclear safeguards and non-proliferation, policy of nuclear fuel cycle and reprocessing. Before coming to the Kennedy School in September 1999, he was a post-doctoral fellow at the Center for Energy and Environmental Studies, Princeton University from 1997-99, and in 1998-99, he received a post-doctoral fellowship from the Social Science Research Council, a MacArthur Foundation program on International Peace and Security. From 2002-2003, he received a grant for Research and Writing from the John D. and Catherine T. MacArthur Foundation. Hui Zhang received his Ph.D. in nuclear physics in Beijing in 1996. Dr. Zhang is the author of several technical reports and book chapters, and dozens of articles in academic journals and the print media including *Science* and *Global Security*, *Bulletin of Atomic Scientist* and the *Non-proliferation Review*. Dr. Zhang gives many oral presentations and talks in international conferences and organizations.

Associates

Clark Abt. In the past year, Dr. Clark C. Abt was involved in two research projects:

- Completion of his book-length manuscript, *Solar-Powered Economic Growth*, including case studies of cost-competitive and environmentally benign photovoltaic electricity supply in rural and urban Africa, Brazil, China, Europe, and the U.S.
- Initiation and supervision of a design study and financially competitive development process for the first solar-powered and solar-heated/cooled high rise office building construction in New England - and possibly the U.S. - in Cambridge, at a construction cost no greater than that of a conventional office building of similar size (50,000 square feet - 200 offices) and shape, intended for 2002 occupancy.

Charles Cogan. During the past year, Cogan embarked on a book project for which he is under contract with Praeger to complete by the end of the year 2001. The book, which will deal with the France-NATO relationship since the end of the Cold War, will be published under the auspices of Boston University's International History Institute in its International Relations series. In this connection, he has presented papers at three conferences which will form the basis of chapters in the book. These were in Seattle (May 2000) on the Euro-American Security Dilemma, 1994-2000; in Paris (June 2000) on the American attitude toward the European Security and Defense Identity; and in Oslo (August 2000) on "NATO and the EU: the Contest for Enlargement."

In addition, Cogan presented a paper at a conference of the Cold War International History Project in Hong Kong in January 2000. It is entitled, "Towards a Colonial War: the American Takeover of Responsibility in Vietnam, 1945-1956."

Owen R. Coté, Jr. In his capacity as the Associate Director of MIT's Security Studies Program, Coté continued his research and writing on the sources of innovation in military doctrine. In December 1999, he organized a conference on the technical and doctrinal shortcomings and opportunities in the U.S. military's approach to attacking mobile targets, as illustrated for example in operations during Allied Force against Serbian military and para-military forces in Kosovo. The report of the conference, entitled *Mobile Targets From Under The Sea*, has been widely cited and has informed research and development activity in this mission area in both the Navy and the Defense Advanced Research Projects Agency. It is available at the MIT/SSP website <http://web.mit.edu/ssp/>. Also, under the sponsorship of the Navy and the Johns Hopkins Applied Physics Laboratory, he completed a historical study of the U.S. Navy's Cold War antisubmarine warfare effort in April of 2000. He also wrote a chapter in *Holding the Line: U.S. Defense Alternatives for the 21st Century*, forthcoming from MIT Press in the BCSIA book series in January 2001. Finally, he continues to serve as an Editor of the Center's prestigious journal *International Security*.

Helen Fein. During the past year, Fein continued research and writing on *Wresting Human Rights/Arresting Human Wrongs*, a book integrating an explanation of gross violations of human rights in the 20th century with social theory and history. She is presenting a paper based on this before the conference of the American Sociological Association in August: "No Brave New World: Life Integrity Rights and Freedom in the World, 1997 and 1987" (also under journal review).

Philip Fellman, consulted on counter-terrorism and related security issues for the Ministry of Internal Affairs, United Arab Emirates and the Dubai Police Force. He published a brief article in "Emergence: A Journal of Complexity Studies", was invited to a seminar at the Joint Intelligence School, and generally answered intelligence related queries, primarily academically related as able. Fellman brought several doctoral students from New Hampshire to see BCSIA symposia and presentations and was particularly pleased to attend the symposium on the Carnegie Foundation Study on Limiting of Deadly Conflict.

Lisbeth Gronlund's Her primary activity for the year has been analyzing the planned US national missile defense system. She was a primary author of a technical analysis of potential countermeasures to the planned system that could be deployed by emerging missile states.

Robert J Hermann: His research this year included the following activities. Continuing analysis of the relationship between the management and financial systems of the Department of Defense and its processes for developing, acquiring and operating forces. This continues to lead to participation in advisory roles for the Department of Defense, for the National Security Agency and for the National Reconnaissance Office.

Continuing examination of the intelligence processes of the nation. As Chair of an advisory group for the Director, NRO, he participated in analyses and development of recommendations for space borne reconnaissance activities of the nation.

Study, as a member of a congressional commission, of the impact of electromagnetic pulse phenomena triggered by a high altitude nuclear explosion. This involves the fundamental understanding of the phenomena, their interaction with national infrastructure systems and the social and economic consequences of those interactions. The product of this examination should be available early in mid 2004.

Study of new directions for Manufacturing for the National Research Council. This will lead to a published NRC report later in 2003.

Study of the uses of nano-technologies for the U.S. Intelligence Community. This NRC activity will result in a published NRC report in early 2004.

Ambassador Robert E. Hunter: Robert Hunter is Senior Advisor at the RAND Corporation in Washington, D.C. He is also Chairman of the Council for a Community of Democracies, serves on the Advisory Board of RAND-Europe, is Associate at the Belfer Center for Science and International Affairs at Harvard University, and served on Secretary Cohen's Defense Policy Board (1998- July 2001) and as Vice Chairman of the Atlantic Treaty Association (1998-October 2001). He is also Senior International Consultant to Lockheed Martin Overseas Corporation and Senior Consultant to Arete Associates.

Marcel J. Lettre II: Lettre's activities and research this year focused on globalization and national security in three dimensions. First, Lettre conducted research on White House coordination of international economic and national security policy, with a focus on policy implications of different organizational approaches to policy and program coordination, including a joint staff shared between the National Security Council and the National Economic Council. Second, Lettre was a contributor on the Defense Organization and Management (DOAM) task force, a research assistant and co-author on the team's final report, and active in outreach after the release of the report. Third, Lettre co-founded the Council for Emerging National Security Affairs, and directed a team of 27 authors on its presidential transition memorandum project recommending actions on international security issues of concern over the next five to twenty years. The report involved all the junior members of the DOAM team, and was delivered to the presidential transition team and to more than 700 hundred members of the policy community.

George N. Lewis is an Associate Director of the MIT Security Studies Program. Trained as a physicist, his current research is on ballistic missile defenses and nuclear arms reductions. During the past year, he focused on the technical feasibility and strategic implications of the impending U.S. decision on deployment of a National Missile Defense (NMD) system. He participated in the joint Union of Concerned Scientists/Security Studies Program study on the operational effectiveness of the planned NMD system, the report of which, "Countermeasures," was released in April. He also published several other papers on these subjects during the last year and gave talks or participated in meetings at Cornell University and the University of Michigan, and in Beijing, Berlin, Boston, New York, Ottawa, Shanghai, and Washington D.C. (many times).

Michael Lippitz: His research this year focused on surveying and assessing science and technology management methods and organizational structures that have proved successful for large-scale government systems development programs and for “serial innovators” in the private sector. The emphasis has been on delineating how longer term research and radical innovation efforts have been integrated with ongoing systems development. In related research, he continued my ongoing work with DoD to develop new methods for gaining early access to worldwide technology from suppliers other than those that traditionally work in the defense arena. In January, he accepted an offer from a joint venture of the American Society of Mechanical Engineers to highlight this and other work through the development of a new “Defense Research and Engineering Conference and Exposition,” to be held in Washington, DC, in November 2003.

Martin Malin is Program Director of the Committee on International Security Studies (CISS) at the American Academy of Arts and Sciences, in Cambridge Massachusetts. His research has concerned great power relations with the Middle East and the sources of conflict in that region. He has taught courses on international relations, the causes of war, American foreign policy, and Middle Eastern politics at Columbia and Rutgers Universities. He has also worked as a consultant at the Social Science Research Council, with the SSRC-MacArthur Program on International Peace and Security. He recently published “Chickens, Eggs, and the End of Violence in Israel and Palestine,” in *Conflict Resolution Journal* (Spring 2000). Malin received a Master of International Affairs from Columbia University’s School of International and Public Affairs and his Ph.D. in political science from Columbia University.

Barry R. Posen is Professor of Political Science at the Massachusetts Institute of Technology and a member of the Executive Committee of SeminarXXI, an educational program for senior military officers, government officials and business executives in the national security policy community. He has written two books, *Inadvertent Escalation: Conventional War and Nuclear Risks* and *The Sources of Military Doctrine*. The latter won two awards: the American Political Science Association’s Woodrow Wilson Foundation Book Award, and Ohio State University’s Edward S. Furniss Jr. Book Award. Prior to coming to MIT, he taught at Princeton University, and has also been Guest Scholar at the Brookings Institution; Post-Doctoral Fellow at the Center for International Affairs at Harvard; Council on Foreign Relations International Affairs Fellow; Rockefeller Foundation International Affairs Fellow and Guest Scholar at the Center for Strategic and International Studies; and Woodrow Wilson Center Fellow, Smithsonian Institution. Dr. Posen’s current research interests are innovation in the U.S. Army, 1970-1980, and external military intervention in civil wars.

Elizabeth Rogers’ interests lie in the area of economic sanctions and US foreign policy. In particular, she is interested in asset freezing and other carefully targeted sanctions.

Jessica Stern, Lecturer in Public Policy, is a faculty affiliate at the Belfer Center for Science and International Affairs. From 1994–95, she served as Director for Russian, Ukrainian, and Eurasian Affairs at the National Security Council, where she was responsible for national security policy toward Russia and the former Soviet states and for policies to reduce the threat of nuclear

smuggling and terrorism. Stern earlier worked at Lawrence Livermore National Laboratory. In 1998–99, she was the superterrorism Fellow at the Council on Foreign Relations and, in 1995–96, she was a national Fellow at Hoover Institution at Stanford University. She is the author of *Terror in the Name of God* (HarperCollins, 2003), *The Ultimate Terrorists* (Harvard University Press, 1999), and of numerous articles on terrorism and weapons of mass destruction. She received a bachelor's degree from Barnard College in chemistry, a master's of science degree from MIT, and a doctorate in public policy from Harvard.

Stephen Van Evera is preparing a book on misperception and the causes of war. He published *Causes of War: Power and the Roots of Conflict* (Cornell University Press) and *Guide to Methods for Students of Political Science* (Cornell University Press).

David Wright's primary work over the past year has been on two issues. The first has been on the planned U.S. national missile defense system. He helped organize and co-authored a technical report analyzing the vulnerabilities of the proposed system to countermeasures that an attacker could deploy using technology that is simpler than the technology required to build a long-range missile and warhead. The second issue has been engaging Chinese scientists on a range of issues to improve understanding on arms control and security issues. In particular, Wright helped organize a joint U.S.-Chinese project looking at transparency and confidence-building measures that could improve relations between the two countries.

PUBLICATIONS

To review publications of the International Security Program and its members, see page 153.

EVENTS

To review events of the International Security Program and its members, see page 139.

Science, Technology, and Public Policy Program

MEMBERS

Core Faculty and Staff

John P. Holdren, Program Director and Faculty Chair; Teresa and John Heinz Professor of Environmental Policy

Matthew Bunn, Senior Research Associate

Robert Frosch, Senior Research Associate

Philip Auerswald, Program Assistant Director

Anthony Wier, Research Associate, Managing the Atom Project

Patricia McLaughlin, Program Assistant and Assistant to John Holdren

Vicki Norberg-Bohm, Director, Energy Technology Innovation Project, Research Fellow (on leave)

James Walsh, Director, Managing the Atom Project

Kelly Gallagher, Acting Director, Energy Technology Innovation Project

Annaliis Abrego, Research Assistant for the Managing the Atom Project

Dawn Hilali, Assistant to the Director of the Energy Technology Innovation Project

Brian Torpy, Assistant to Director of the Project and Science and Technology Policy for Development

Lewis M. Branscomb, Director Emeritus; Aetna Professor of Public Policy and Corporate Management, Emeritus

Harvey Brooks, Director Emeritus; Benjamin Pierce Professor of Technology and Public Policy, Emeritus

Jean Camp, Associate Professor of Public Policy

Ashton B. Carter, Ford Foundation Professor of Science and International Affairs

William Clark, Harvey Brooks Professor of International Science, Public Policy, and Human Development

Paul Doty, Director Emeritus, BCSIA, Mallinckrodt Professor of Biochemistry, Emeritus

Jane Fountain, Associate Professor of Public Policy; Director of the National Center for Digital Governance

Jeffrey Frankel, James W. Harpel Professor of Capital Formation and Economic Growth

David M. Hart, Associate Professor of Public Policy

William Hogan, Lucius N. Littauer Professor of Public Policy and Administration

Calestous Juma, Professor of the Practice; Director, Science, Technology and Globalization Project

David Lazer, Assistant Professor of Public Policy

Henry Lee, Lecturer in Public Policy, Director, Environment and Natural Resources Program

Viktor Mayer-Schönberger, Assistant Professor of Public Policy

Steven E. Miller, Lecturer in Public Policy, Director, International Security Program

F. Michael Scherer, Roy E. Larsen Professor of Public Policy and Management, Emeritus

Philip Sharp, Director Emeritus, Institute of Politics

Robert Stavins, Faculty Chair ENRP

Dorothy S. Zinberg, Lecturer in Public Policy

Associates and Visitors

Adolfo Chiri, Associate, STPP

Richard de Neufville, Associate, STPP, BCSIA

Steve Fetter, Senior Research Associate, Managing the Atom Project

Jeffrey Frankel, Associate, STPP

Megan Jones, Associate, Jeffersonian Science Project

Allison Macfarlane, Associate, Managing the Atom Project

Research Fellows

Nolan Bowie, Senior Research Fellow

Ian Bowles, Senior Research Fellow

Adinarayantampi Gopalakrishnan, Senior Fellow, Managing the Atom Project/ Energy Technology Innovation Project

Christian Duttweiler, Research Fellow, Policy for Innovation

Debyani Ghosh, Fellow, Energy Technology Innovation Project

Subrata Ghoshroy, Fellow, Managing the Atom Project

Bonnie Jenkins, Pre-Doctoral Fellow, Managing the Atom Project

Dmitry Kovchegin, Fellow, Managing the Atom Project

Maurizio Martellini, Fellow, Managing the Atom Project

Brian Min, Research Fellow, Policy for Innovation

John Park, Post-Doctoral Fellow, Managing the Atom Project

Ambuj Sagar, Research Associate, Energy Technology Innovation Project

Frederique Santerre, Fellow, Science, Technology, and Development Policy

Sabine Schaffer, Pre-Doctoral Fellow

Smita Srinivas, Fellow, Science, Technology, and Development Policy

Guodong Sun, Fellow, Energy Technology Innovation Project

Bob van der Zwaan, Fellow, Managing the Atom Project

Sara Wilford, Pre-Doctoral Fellow

Chen Zak, Pre-Doctoral Fellow

Hui Zhang, Research Associate, Managing the Atom Project

Jimin Zhao, Fellow, Energy Technology Innovation Project

MISSION

The mission of the Science, Technology, and Public Policy Program is to develop and promote policies that expand the contribution of science and technology to human welfare.

Specifically, STPP seeks to address the following three questions:

- How do science and technology influence public policy? How does public policy influence the evolution of science and technology?
- How the outcomes of these interactions affect well-being in the United States and worldwide?

- How the processes involved can be made more effective and their outcomes more beneficial.

Work at STPP addresses these questions using methods and insights drawn from the natural sciences, engineering, economics, political science, history, sociology, management, and law. Current research foci include: science and technology policy for competitiveness, sustainability, and security; energy technology innovation strategies; nuclear weapons and nuclear energy policy; and understanding and improving science and technology policy processes.

STPP was founded in 1976 by Dr. Harvey Brooks, now Benjamin Pierce Professor of Technology and Public Policy Emeritus and widely recognized as the senior statesman of science and technology policy studies in the United States. He was succeeded as Director of STPP in 1986 by Dr. Lewis Branscomb, formerly Chief Scientist at IBM and Director of the National Bureau of Standards and now Aetna Professor of Public Policy and Corporate Management Emeritus.

Research Agenda and Policy Outreach

STPP's research and policy outreach agenda for the 2002-2003 academic year included the following focus areas:

- I. ENERGY TECHNOLOGY INNOVATION PROJECT**
- II. MANAGING THE ATOM PROJECT**
- III. RESEARCH AND INNOVATION POLICY**
- IV. SCIENCE, TECHNOLOGY, AND GLOBALIZATION**
- V. INFORMATION, TECHNOLOGY AND GOVERNANCE**
- VI. INTERNATIONAL SCIENCE, TECHNOLOGY AND SOCIETY**

In addition to this research, STPP maintained a core focus on teaching, training the next generation of S&T policy researchers. These program areas are described in detail below.

I. ENERGY TECHNOLOGY INNOVATION PROJECT

A joint project of the Environment and Natural Resources Program and the Science, Technology and Public Policy Program of the Belfer Center for Science and International Affairs

Introduction: Issues, Audiences, and Scope of Activity

The goal of the Energy Technology Innovation Project (ETIP) is to contribute to the mitigation of risks posed by current energy approaches, with particular attention to the risks posed by greenhouse-gas-induced climate change. The ETIP research team pursues this goal by developing, proposing, and promoting policy and institutional changes supporting national and international efforts to stimulate energy technology innovation.

The Energy Technology Innovation Project (ETIP) of the Science, Technology, and Public Policy Program continues to pursue its mission of conducting policy-relevant research on the energy technology innovation process. In particular, ETIP researchers seek to determine the best strategies for developing and deploying cleaner energy technologies in three of the biggest energy-consuming nations in the world: China, India, and the United States. These three countries alone have enormous influence on the local, regional, and global environment through their energy production and consumption. ETIP researchers seek to identify and promote methods to reduce conventional urban air pollution, improve international security, facilitate poverty alleviation, promote economic development, and minimize future greenhouse gas emissions. Not only does ETIP focus on the energy technology innovation process in China, India, and the United States, but it also compares strategies and draws lessons among the three countries.

During the past year, ETIP scholars organized workshops for experts and policymakers, conducted policy briefings, chaired national assessments, performed extensive field research in developing countries, wrote scholarly articles, participated in academic conferences, and produced articles and op-eds for the popular press. In all, ETIP researchers produced more than 20 publications and gave more than 30 talks or presentations during the last year alone.

The Energy Technology Innovation Project is one of the few prominent research centers for scholars who wish to conduct interdisciplinary and policy-relevant research on energy topics.

ETIP attracts some of the best thinkers in the field from around the world, and provides a forum for students, doctoral and post-doctoral fellows, and senior academic experts to work together on some of the most challenging issues of the day. It is a central mission of ETIP to support and guide the best young researchers in the energy policy field from the three countries that we study. In our weekly seminar series and other interactions, the research fellows present ongoing research efforts and receive comments and recommendations from the other fellows, faculty, and senior staff. This rigorous peer review prepares the fellows for publishing and presenting their research results in policy and academic settings. In addition, fellows are exposed to (and contribute to the development of) useful methodologies for conducting interdisciplinary assessment in the energy field. Of the twelve members of the ETIP group in FY03, three post-doctoral researchers and two pre-doctoral fellows were supported by ETIP. Two other fellows contributed to ETIP on a non-stipendiary basis. In addition, ETIP supported three senior research associates, and two foreign visitors, aside from the principal investigators.

Research Agenda

The Energy Technology Innovation Project's work is most easily divided by country, although cross-country comparison is an important aspect of our work. Following is a survey of this year's efforts in the United States, China, and India.

Energy Technology Innovation in the United States

During this past year, ETIP scholars were engaged in a range of activities related to U.S. energy policy.

National Commission on Energy Policy

ETIP Faculty Director and principal investigator Dr. John Holdren was named Co-Chair of the National Commission on Energy Policy, a bipartisan commission of 18 members that is funded by a consortium of U.S. foundations. The goal of this commission is "to develop a long-term U.S. energy strategy that promotes national security, economic prosperity, and environmental safety and health." The other two chairs are John Rowe, CEO of Exelon, and William Reilly, former Administrator of the U.S. Environmental Protection Agency. The Commission has been meeting on a regular basis, commissioning studies, and hosting workshops on particular topics. The National Commission on Energy Policy will release its blueprint for a U.S. national energy strategy early in 2005. For more information, please see: <www.energycommission.org>.

The Government Role in Energy Technology Innovation and Public-Private Partnerships

During the past year, Dr. Vicki Norberg-Bohm led a research project on the role of government in technology innovation, seeking to better understand how and under what conditions public policy can effectively and efficiently support and stimulate private sector investments in the development and adoption of environmentally-enhancing radical technological innovations. In addition, Dr. Norberg-Bohm led a project that focused on evaluating the effectiveness of a new set of policies that are neither market mechanisms nor standards (command-and-control), but rather rely on voluntary, collaborative and information-based approaches. In collaboration with the Center for Clean Technology and Environmental Policy, University of Twente, The Netherlands, ETIP organized a workshop in 2002, "Voluntary, Collaborative and Information-Based Policies: Lessons and Next Steps for Environmental and Energy Policy in the United States and Europe," which was structured around presentations by academics followed by comments from senior managers from the government, private sector and NGO community in

Europe and the United States. A book manuscript entitled, *Sharing Responsibility for Industrial Transformation: Environmental Policy Innovation* in the United States and Europe that built on the workshop report was accepted by MIT Press in early 2003, and is moving toward publication. In addition, ETIP is completing an evaluation of the effectiveness of some of the U.S. Department of Energy's key public-private partnerships, under contract with DOE. Finally, Dr. Ambuj Sagar wrote and submitted two entries to the *Encyclopedia of Energy* entitled, "Energy Technology Innovation" and "Energy and NGO's."

Distributed Generation

In January 2003, Principal Investigator Henry Lee completed a study on distributed generation in the U.S. electricity market that focused on identifying the major challenges confronting distributive electricity generation. This prescient study was timely in light of the recent electricity blackout in the Northeast United States. For more information, see Environment and Natural Resources Program (ENRP).

Energy Technology Innovation in China

ETIP scholars are working primarily on two issues in China: clean-vehicle and clean-coal technologies—seeking in each case to promote more rapid deployment of these options in China, and eventually to find mechanisms for China to “leapfrog” to the relevant advanced energy technologies. We have established partnerships on both issues with and through China's Ministry of Science and Technology (MOST).

Development and Deployment of Cleaner Vehicles in China

In the past year, Dr. Jimin Zhao focused on evaluating the effectiveness of China's current policies and programs for cleaner vehicle development and deployment, studying in particular the China Clean Vehicle Action alternative fuel-vehicles program. Kelly Sims Gallagher endeavored to understand the role of technology transfer from foreign direct investment in helping to deploy cleaner vehicle technologies in China. Gallagher completed three very detailed case studies evaluating technology transfer and environmental performance within the U.S. Big Three automakers' Chinese joint ventures: Shanghai GM, Chang'An Ford, and Beijing Jeep, and extracted lessons from their experience as part of her doctoral dissertation, which she defended in June 2003.

In April 2002, ETIP hosted at Harvard our first joint workshop on clean vehicles with our research partners from the China Automotive Research and Technology Center (CATARC), Tongji University, and the Chinese Academy of Sciences (CAS). The workshop explored the lessons from the U.S. policy experience about how to deploy cleaner vehicles, drawing on top experts from academia and the U.S. government including Ed Wall, director of the FreedomCAR project on fuel-cell vehicles at DOE. Leading Chinese analysts and officials gave their perspectives on the evolving situation regarding automobiles and air pollution in China. Soon after, during the summer of 2002, Dr. Zhao and Gallagher traveled to China to cement the collaboration agreement and commence their field research. After working with CATARC researchers in Tianjin, they traveled to Shanghai, Beijing, Chongqing, and Changchun to visit almost every major automobile factory in China, interviewing dozens of company employees and government officials about the technology transfer and innovation process within the firms.

In October 2002, the ETIP China team traveled to Beijing for our second joint workshop on clean vehicles. ETIP researchers Holdren, Zhao, and Gallagher presented initial results based on the summer's field research. Top Chinese experts, including many researchers from our partner institutions, also presented their own views and analysis about Chinese vehicle policies and programs. Both sides agreed that the partnership was proving to be very fruitful and that the cooperation should be considerably deepened. A formal contract for cooperative research on "Clean Vehicle Development and Deployment in the United States and China" was negotiated with our research partners. A comprehensive policy report on clean vehicle development and deployment is being written and will be presented to policymakers in China and the United States in 2004. The report will focus on six areas for clean vehicle development: the current status of clean vehicle development, strategies for clean vehicle development, R&D policy, economic policy, standards and regulation, and international cooperation. At least one Chinese and one ETIP-Harvard researcher will jointly author each section. Public seminars and briefings, specialized policy reports for specific government agencies, academic journal articles, magazine and newspaper articles, and a more detailed edited book will supplement the comprehensive policy report. The partners also agreed to jointly produce a Sino-U.S. Databook on Clean Vehicles, which will fill a major gap in the Chinese data availability.

Zhao and Gallagher gave numerous presentations and talks during the course of the year. Gallagher's highlights included "U.S. Fuel Efficiency Policy: Lessons for China," China Automotive Research and Technology Research Center Workshop, Tianjin, China, 7 June 2002; "U.S. Energy Policy," Department of Strategy Research, National Research Center for Science & Technology Development, Ministry of Science & Technology, Beijing, China, 25 June 2002; and "Globalized China?" Interdisciplinary Lecture Series, Skidmore College, 13 November 2002. Zhao's highlights included "Clean Vehicle Development in China" at the University of Michigan, Ann Arbor, November 2002; and Moving to Cleaner Vehicle Technologies: Opportunities and Barriers for China's Auto Industry at the Colloquium on Innovative Approaches for Addressing Industrial and Urban Environmental Problems in China at Stanford University, June 2002.

Development and Deployment of Cleaner Coal Technologies in China

Building on the successful model of research and collaboration from its clean vehicle work, ETIP launched a clean-coal collaboration with the China Coal Research Institute (CCRI) in October 2002 at an inaugural clean coal technology workshop that was held in Beijing. Besides the ETIP researchers from Harvard University, attendees also included officials in charge of R&D of clean coal technology from China's Ministry of Science and Technology, and many top Chinese experts on clean coal technology. Dr. Li Wenhua from CCRI is our principal partner on this project and the lead expert on Clean Coal Technology under China's High-Tech R&D Plan ("863" Plan). After this workshop, Mr. Zheng Fangneng, Director of Energy at MOST, and Dr. Li Wenhua visited Harvard for three weeks in December 2002. At that time, a detailed work plan was developed and approved by both sides.

ETIP is hosting Dr. Li Wenhua as a visiting scholar at Harvard from March 2003-March 2004. Upon arrival, Dr. Li began working closely with Dr. Guodong Sun, who is leading ETIP's China clean coal efforts. Together Dr. Sun and Dr. Li wrote a survey for Chinese experts and officials from the coal industry in China to assess China's national innovation system for clean coal

technologies, and this research is ongoing. Sun and Li will be working together to organize the second major workshop on clean coal technologies in Fall 2003.

India

Development and Deployment of Biomass Technologies in India

Beginning in September 2002, Dr. Debyani Ghosh initiated a project to examine technological innovations in the biomass energy sector in India, along with climate change linkages. She conducted an extensive literature review, presented a research proposal at the ETIP seminar series, and then undertook extensive field research in India. While in India, she interviewed a large number of actors, and visited gasifier projects on-site to gain first-hand insight about the problems with deployment of this essential rural energy technology. She interacted with a number of high-level policymakers in India on this trip including Energy Advisor for the Planning Commission in New Dehli, the Inspector General for Forests at the Ministry of Environment and Forests, the Director of Biomass Energy at the Ministry of Non-Conventional Energy Sources, and many others. Dr. Ghosh co-authored two studies this year: one on future energy trends and greenhouse-gas emissions for India, and the other on future greenhouse-gas and local emissions for India.

Based on the strong results of this research, Dr. Ghosh and colleague Dr. Ambuj Sagar were asked to write a paper and organize a workshop for the World Bank on how to scale-up biomass gasification in developing countries along with noted biomass expert, Dr. V.V.N. Kishore, of the Tata Energy Research Institute. This work is currently underway.

Promotion of Cleaner Coal Technologies in India

ETIP's senior visiting scholar from India, Dr. A. Gopalakrishnan, continued his activities this year related to promoting Indo-U.S. cooperation in clean-coal technology projects of specific interest to both countries. A significant part of these efforts were aimed at planning and organizing an India-U.S Workshop on IGCC Power Generation Using High-Ash Indian Coals. This successful workshop was held in January in Hyderabad, India with the participation of key U.S. and Indian officials. More than 25 senior officials from the Government of India, the Indian power industry, and Indian energy research institutes used this Workshop as a forum to exchange information on technology and policy approaches with a corresponding group of U.S. government and industry representatives. The presentations and discussions primarily centered around the potential for U.S-India cooperation in the clean coal technology area.

Conceived by ETIP, the workshop was organized jointly with the Administrative Staff College of India (ASCI), under an ongoing collaborative project on clean coal between the two organizations. Dr. Gopalakrishnan planned the workshop to facilitate the implementation of a prior Indo-U.S. collaborative pact. In the Fall of 2000, the governments of the United States and India had entered into an agreement to cooperate in few energy-related areas, including completing a feasibility study for setting up a 100 MWe power plant in India based on coal gasification. With the extensive national coal reserves in India, a large fraction of the country's electricity production in the future will continue to depend on coal, since there are no significant national oil or natural gas resources available. Therefore, India is keenly interested in switching to more energy-efficient and environmentally benign coal-based power generation technologies in the coming years, such as integrated gasification combined cycle (IGCC) systems.

Work on IGCC technology development for utilization of high-ash coals is in its early stages in India. However, IGCC technologies for low-ash coals have already been commercialized for large-scale power generation in the U.S., under the Department of Energy's (DOE's) Clean Coal Technology Program. Thus, there exists a potential opportunity for the two countries to co-operate in the IGCC field.

Participants at the STPP-ASCI workshop included senior officials of the Planning Commission of India, the Ministry of Power, the Ministry of Science and Technology, and the Office of the Principal Scientific Advisor to the Prime Minister. Members of their board of directors also represented the National Thermal Power Corporation, India's major power utility, and the Bharat Heavy Electricals Limited, the premier power equipment manufacturer in the country. Directors of the two major national laboratories involved in coal research were also present. Prof. Holdren delivered a keynote address on U.S. energy policy. Mr. Nelson Rekos from DOE's National Energy Technology Laboratory, and Dr. T.P. Chen, Vice President of Nexant, Inc., San Francisco, also presented papers and contributed to the discussions. The detailed proceedings of the ETIP-ASCI Workshop are under preparation and it will be available in Winter 2003-04.

Promotion of Cleaner Vehicle Technologies in India

This year, ETIP researcher Dr. Ambuj Sagar reviewed the existing situation of automobiles in India in terms of the status and evolution of India's vehicle industry, the nature of the transport-related environmental problems in India and their impact on the automobile industry (and how this is mediated by emerging environmental policies), and the technological response of the industry. In November-December 2002, Dr. Sagar had discussions with experts in India to gather more information about these issues and to explore the appropriate next steps for studying them in India. As a result, a collaboration was established between ETIP and the Indian Institute of Management in Ahmedabad for doing case studies to examine the technological evolution and capabilities of automobile firms in India.

Dr. Sagar gave five talks in different forums this past year, including a talk at the International Studies Association in Oregon on "Capacity Building: North and South" with Stacy VanDeveer, and a talk on "Capacity Building for Climate Change: A Risk Management Approach" at the International Conference on S&T Capacity-Building for Climate Change in New Dehli.

U.S.-India National Academies Committee on Energy and Environmental Cooperation

Prof. John Holdren is the chair of the U.S. Committee of the US-India National Academies Committee on Energy and Environmental Cooperation, a joint venture of the National Academies of both countries. In this capacity, he is working with the Indian co-chair, C.N.R. Rao, to organize workshops on potentially high-leverage opportunities for U.S.-India cooperation on energy technology. This Committee's first meeting was held in New Delhi in May 1999, at which time it planned a series of five bilateral workshops on the following topics: (1) clean fossil fuels; (2) realistic applications of renewable energy sources; (3) approaches to reducing greenhouse-gas emissions; (4) reducing electrical power shortfalls; and (5) clean-vehicle technologies. As a next step, a meeting on clean coal technologies was held at the U.S. National Academies in Fall 2000. Prof. Holdren has continued to meet with the Indian leadership of this effort on an annual basis, and is currently planning a new meeting for Spring 2004.

Sponsors

The Energy Technology Innovation Project gratefully acknowledges the support of the following foundations (in alphabetical order): The E7 Sustainable Energy Development Scholarship Program; The Energy Foundation; The Heinz Family Foundation; The U.S. Department of Energy; The William and Flora Hewlett Foundation; The David & Lucile Packard Foundation; and, The Winslow Foundation. In addition, ETIP would like to acknowledge the granting of endowment funds of the Science, Technology, and Public Policy Program of the Belfer Center for Science and International Affairs, Kennedy School of Government, Harvard University.

People

Faculty Director, Principal Investigator

John P. Holdren is the Teresa and John Heinz Professor of Environmental Policy and Director of the Program on Science, Technology, and Public Policy in the John F. Kennedy School of Government, and Professor of Environmental Science and Public Policy in the Department of Earth and Planetary Sciences, at Harvard University. He is also a member of the Board of Tutors for Harvard's undergraduate major in Environmental Science and Public Policy; Distinguished Visiting Scientist and Vice Chair of the Board at the Woods Hole Research Center; and Professor Emeritus of Energy and Resources at the University of California, Berkeley (where he was co-founder in 1973 of the campus-wide, interdisciplinary, graduate-degree program in Energy and Resources in which he served variously as Vice Chair, Chair, and Chair of Graduate Advisors until 1996).

He is Chair of the Committee on International Security and Arms Control of the National Academy of Sciences, a member of the Board of the John D. and Catherine T. MacArthur Foundation, and was a member from 1994 to 2001 of President Clinton's Committee of Advisors on Science and Technology (PCAST). He chaired PCAST panels on protection of nuclear-bomb-materials (1995), the U.S. fusion-energy R&D program (1995), U.S. energy R&D strategy (1997), and international cooperation on energy (1999); and in 1996-7 he co-chaired with E. Velikhov the US-Russian Independent Scientific Commission on Plutonium Disposition (reporting to Presidents Clinton and Yeltsin). He also chairs National Academy panels on the spent-fuel standard for plutonium disposition, on the Comprehensive Test Ban Treaty, on US-India energy cooperation, and US-Russia cooperation on nuclear nonproliferation and counter-terrorism.

He is the author of about 300 articles and reports on plasma physics, fusion energy technology, energy and resource options in industrial and developing countries, global environmental problems, impacts of population growth, and international security and arms control, and he has co-authored and co-edited fifteen books on these topics -- including *Energy* (1971), *Human Ecology* (1973), *Ecoscience* (1977), *Energy in Transition* (1980), *Earth and the Human Future* (1986), *Strategic Defences and the Future of the Arms Race* (1987), *Building Global Security Through Cooperation* (1990), *Management and Disposition of Excess Weapons Plutonium* (2 vols., 1994 & 1995), *The Future of U.S. Nuclear Weapons Policy* (1997), and *Conversion of Military R&D* (1998).

Holdren earned bachelors and masters degrees from M.I.T. in aeronautics and astronautics (1965 and 1966) and the PhD from Stanford University in aeronautics/astronautics and theoretical plasma physics (1970). Before joining the UC Berkeley faculty in 1973, he worked on satellite and missile technology at the Lockheed Corporation, as a plasma physicist at the Lawrence Livermore Laboratory, and as a Senior Research Fellow in the Environmental Quality Laboratory and the Division of Humanities and Social Sciences at the California Institute of Technology.

He is a member of the National Academy of Sciences and the National Academy of Engineering, and a Fellow of the American Academy of Arts and Sciences, the American Physical Society, the American Association for the Advancement of Science, and the California Academy of Sciences. In 1981 he received one of the first MacArthur Foundation Prize Fellowships; in 1993 he shared the Volvo Environment Prize with Paul Ehrlich; and in 1994 he received the Forum Award of the American Physical Society ("for promoting public understanding of the relation of physics to society"). In December 1995 he delivered the Nobel Peace Prize acceptance lecture on behalf of the Pugwash Conferences on Science and World Affairs, which he served as Chair of the Executive Committee from 1987 to 1997. He received the 1999 Kaul Foundation Award in Science and Environmental Policy, the 2000 Tyler Prize for Environmental Achievement, and the 2001 Heinz Prize in Public Policy.

Dr. Holdren was born in Sewickley, Pennsylvania, and grew up in San Mateo, California. He is married to Dr. Cheryl E. Holdren, a biologist. John and Cheryl live in Falmouth and Cambridge. They have two children and four grandchildren.

Co-Principal Investigators

William C. Clark: See section on Environment and Natural Resources Program.

Henry Lee: See section on Environment and Natural Resources Program.

Vicki Norberg-Bohm has been leading two research projects: Technology Innovation for Global Change: The Role of R&D, Regulation and Assessment, which focuses on lessons for policy design from 3 energy technologies: gas turbines, wind turbines, and solar photovoltaics; and Voluntary, Collaborative and Information-based approaches to reaching energy and environmental goals, which examines the effectiveness of this new set of policy mechanisms. Prior to joining the Belfer Center, Dr. Norberg-Bohm was an assistant professor in the Department of Urban Studies and Planning at MIT. While at MIT, she was co-PI of the Environmental Technology and Public Policy Program, and part of the research team on "Creating Incentives for Environmentally Enhancing Technological Change" at MIT's Center for Environmental Initiatives. From 1998 -1999, she was also co-Director of the Program for Environmental Education and Research, which focused on developing multidisciplinary educational initiatives. She has a Ph.D. in Public Policy from Harvard University. Prior to returning to school to pursue a Ph.D., she was a practicing engineer in the area of energy and environmental systems. She also has M.S./B.s. in Mechanical Engineering from Washington University in St. Louis. Dr. Norberg-Bohm has been on leave since January 2003.

Acting Director

Kelly Sims Gallagher is Acting Director of the Energy Technology Innovation Project (ETIP) of the Science, Technology, and Public Policy program at the Belfer Center for Science and International Affairs at Harvard University. She has a M.A.L.D. and Ph.D. in International Affairs from the Fletcher School of Law and Diplomacy at Tufts University. Her research interests include energy technology innovation, international energy cooperation, energy policy, climate change, international environmental policy, and technology transfer. Her dissertation was on the topic of technology transfer through foreign direct investment in the Chinese automobile industry. Formerly, she was the Science Policy Director of Ozone Action in Washington, DC. She participated in more than a dozen rounds of international negotiations on global climate change and ozone depletion, and was an advisor to CNN in Kyoto and Buenos Aires for the climate negotiations. She was previously a Truman Scholar in the Office of Vice President Gore and also worked in strategic planning at the international engineering and construction firm, Fluor Daniel. She has an AB in international affairs and environmental studies from Occidental College. She speaks Spanish and basic Mandarin Chinese.

Senior Research Associates (in alphabetical order)

Robert A. Frosch is a theoretical physicist by education. (AB, Columbia College, '47 and Ph.D., Columbia University, '52). He conducted research in ocean acoustics at Columbia and later served as Director for Nuclear Test Detection, and Deputy Director of the Advanced Research Projects Agency (ARPA) in the Department of Defense, Assistant Secretary of the Navy for Research and Development (ASNR&D), Assistant Executive Director of the United Nations Environment Programme (UNEP), Associate Director for Applied Oceanography of the Woods Hole Oceanographic Institution (WHOI), Administrator of NASA, President of the American Association of Engineering Societies (AAES), and Vice President of General Motors Corporation (GM) in charge of Research Laboratories. He retired from GM in 1993 before joining the Kennedy School of Government at Harvard University. He is a member of the National Academy of Engineering, the American Academy of Arts and Sciences, a Foreign Member of the UK Royal Academy of Engineering, and a fellow or member of a number of professional societies.

Adinarayantampi Gopalakrishnan was the Chairman of India's nuclear regulatory agency, the Atomic Energy Regulatory Board, from 1993-96. Since his term as AERB Chairman ended, Dr. Gopalakrishnan has publicly criticized India's nuclear establishment for its insufficient attention to safety, excessive secrecy, and lack of accountability. He holds M.S. and Ph.D. degrees in Nuclear Engineering from the University of California, Berkeley; his area of specialization was nuclear safety. In the United States, he has held senior positions in the University of California, Berkeley, the Argonne National Laboratory, and the Electric Power Research Institute. In India, he has directed the government's Central Mechanical Engineering Research Institute, the advanced research projects of Bharat Heavy Electricals Limited (India's principal electricity technology supply firm), and the engineering staff of the College of India. In addition to his nuclear work, Dr. Gopalakrishnan holds a number of patents in clean coal technology.

Research Associates

Ambuj Sagar is a Research Associate in ETIP and the lead researcher for the India component of Energy Technology Innovation Project. Dr. Sagar's interests lie in technology policy and environmental policy as well as issues that are at the nexus of these two areas. While his current

research focuses mainly on energy technology innovation and the environment in India, he also studies, more broadly, various facets of technology innovation and global environmental issues. Dr. Sagar holds a Ph.D. and an M.S. in Materials Science, as well as an M.S. in Technology and Policy, from the Massachusetts Institute of Technology. His recent papers have focused on energy R&D in India, energy innovation policy, climate change, and capacity development for the environment. He was also a contributing author for the IPCC Third Assessment Report.

Visiting Researchers

Wenhua Li is Research Professor and Deputy Director of the Beijing Research Institute for Coal Chemistry, China Coal Research Institute. He is also the Lead Expert for the 863 “High Tech” research program on clean coal for the Ministry of Science & Technology in China. He holds a Ph.D. in coal chemistry.

Research Fellows (in alphabetical order)

Debyani Ghosh joined the program as a post-doctoral research fellow in Sept. 2002. She has expertise in policy analysis related to energy-environment systems that include micro and macro-economic policy analysis, global and national policies, regional and sectoral policies, technology policies and socio-economic policy analysis with emphasis on Energy and Environment systems. Other areas of interest are in management and implementation that involve strategy formulation at the enterprise level including financial analysis, structuring implementation plans, execution and monitoring. She has intensive experience and knowledge of working with models that are used internationally for energy and environment system and GHG mitigation strategy analysis. She holds a Ph.D. from Indian Institute of Management Ahmedabad with specialization in policy analysis of Energy-Environment systems. For her final dissertation she worked on Long-term Technology Strategies and Policies for Indian Power Sector. As part of the IIM research group, she had the opportunity to work on international projects and research activities with Pew Center on Global Climate Change, USA; Resources for the Future, U.S.A.; National Institute of Environment Studies (NIES), Japan; and University of Twente, Netherlands. She is a Chemical Engineering graduate and has two years’ work experience in the Energy Management Department of one of the largest integrated steel plants in India prior to joining graduate school.

Emi Mizuno is a pre-doctoral research fellow in ETIP. She is a second-year PhD student at International Development and Regional Planning Program at Massachusetts Institute of Technology. She is also a Martin Family Society of Fellow for Sustainability 2002-2003 at Laboratory for Energy and Environment at MIT. Her interests include energy policy, energy technology transfer and diffusion, international development, sustainable development, public-private partnership and international cooperation. Specifically, she focused on technological capacity building process in less developed countries to enhance economic development as well as research, development, demonstration and deployment of environmentally sound energy technologies. Her current research focus is the Indian wind energy sector development and the roles of public policy and international technology transfer played in technological capacity building process of the sector. For the past year she was a teaching assistant at both Department of Civil and Environmental Engineering and Department of Urban Studies and Planning at MIT. She has a BEng and MEng in Environmental Planning from Kobe University in Japan and MLA from University of California at Berkeley. She worked as a professional urban planner before she entered the PhD program at MIT.

Guodong Sun is a Research Fellow in ETIP, the E7 Scholar in Sustainable Energy Development, and Adjunct Research Fellow in the Carnegie Mellon Electricity Industry Center at Carnegie Mellon University. His research focus on the roles of government in advancing the research, development, demonstration and deployment of clean coal technologies (CCT) in the U.S. and China. He also leads the collaboration research on CCT between Harvard University and China's Ministry of Science and Technology. Prior to coming to Harvard, he was a post-doctoral research fellow at Carnegie Mellon University, and researched on advanced energy technologies and their environmental control systems including CO₂ separation/capture technologies. He earned his Ph.D. in Engineering and Public Policy from Carnegie Mellon University. Supported by National Science Foundation, his thesis examined various forces that have shaped the development of China's environmental management, implicit value of life-saving of air pollution control programs, and exposure-based regulatory framework for air pollution control. Prior to returning to school to pursue a Ph.D., he worked for the Energy Research Institute (ERI) of China's State Planning Commission. At ERI, he conducted research, managed research projects, and advised central government on matters of energy and global climate change policy. He also earned a master's degree in System Engineering and a bachelor degree in Turbomachinery from Tsinghua University, China.

Chad White is a doctoral student at UC Berkeley in the multi-disciplinary Energy and Resources Group. Prior to graduate school, Chad worked as an engineer/environmental consultant on regulatory development projects with the US EPA Office of Air. His graduate research examines the changing nature of regulatory institutions as environmental reform increasingly moves out from under direct state purview and into the realm of voluntary commitments and self-regulation. In particular, Chad is interested in the way in which "environmental performance" is defined, measured, and managed in the course of pursuing voluntary means of environmental protection.

Jimin Zhao's current research focuses on energy policy and technology in China and the Sino-US cooperation in energy field. She is leading a collaborative project between ETIP and China's Ministry of Science and Technology on clean vehicle development in China. She has a Ph.D. from the Department of Civil and Environmental Engineering at Stanford University. She also holds an M.A. in Environmental Planning and Management and a B.A. in Geography from Beijing University in China. Her research interests include development and implementation of environmental policies, implementation of international environmental agreements, cleaner technology, energy technology and climate change, and sustainable development in developing countries. Her dissertation, Implementing the Montreal Protocol in China, examines factors, including the Multilateral Fund, that have enabled China to comply with the requirements of the Montreal Protocol. She worked for four years at the Chinese Research Academy of Environmental Sciences in China, where she participated in projects on environmental impact assessment, pollution control and management, and implementation of China's environmental policies. Dr. Zhao has co-authored four books and published over ten papers on water quality planning and management, China's environmental policies, and development of cleaner technology in China.

II. MANAGING THE ATOM

Introduction: Issues, Audiences, and Scope of Activity

The Project on Managing the Atom (MTA) brings together scholars and practitioners who conduct policy-relevant research on issues related to nuclear technology. MTA addresses a broad array of topics in the nuclear field, from nuclear weapons to the future of nuclear power. In particular, MTA has focused on the intersections between nuclear energy and nuclear weapons, including, for example, the management and protection of fissile material and treatment of spent nuclear fuel.

The research produced by MTA takes many forms, including articles, books, op eds, databases, web content, Congressional testimony, briefings, and even documentaries. This research is intended for three core audiences. The first is comprised of policy makers: executive departments and agencies, members of Congress and their staffs, the White House, international organizations, and other bodies responsible for deciding and implementing nuclear policy. A second and equally important audience is the community of scholars. MTA engages scholars from around the world. Some are graduate students just starting their dissertations; some are post-doctoral fellows looking to start a career, while others are senior academics with a lifetime of achievement. Together, MTA and its BCSIA partners constitute one of the global centers for research on nuclear affairs.

A third audience—the public at large—has assumed particular importance in the last two years as the 9/11 attacks, the war in Iraq, and crises in North Korea and elsewhere have focused the attention on nuclear issues. MTA scholars participated in over 375 media interviews last year, including over 150 television appearances as well as interviews in newspapers, radio, and other media. Box 1 provides a sample of MTA media activity this past year.

Much of MTA's work is international in nature. MTA hosts research fellows from a variety of countries, and its members engage in collaborative projects with colleagues in other nations. Though MTA's interests are global, there are five countries, in particular, where MTA has concentrated its efforts: the United States, Russia, India, Japan, and China. Each of these nations is a critical player on both nuclear energy and nuclear weapons, and the future of these issues will likely depend on what these countries do.

This past academic year, MTA focused on its core programs, including the security of nuclear materials, cooperation with India against the threat of nuclear terrorism, nuclear energy, and most importantly, the MTA fellows program. The aim of the fellows program is to help train the next generation of nuclear researchers and scholars. MTA hosted several pre-doctoral and post-doctoral fellows this past academic year. These MTA fellows pursued their own research projects, participated in group seminars and a working group on radiological weapons, and prepared themselves for future careers in academia and policy.

Box 1. SAMPLE OF MTA MEDIA APPEARANCES

NBC	New York Times	New York News Day	BBC
CNN	Washington Post	Associated Press	Financial Times
CBS	Los Angeles Times	Miami Herald	Times of London
MSNBC	USA Today	Atlanta Journal	Guardian
CNBC	Christian Science Monitor	Boston Globe	Internat. Herald Tribune
Fox	Washington Times	Rocky Mountain News	Australia Broadcast Corp.
NPR	Minneapolis Star Tribune	New Yorker	Sydney Morning Herald
VOA	Philadelphia Inquirer	New Scientist	CBC
Newsweek	San Francisco Chronicle	Jane's Defense Weekly	Toronto Star
Science	Pittsburgh Post-Gazette	Agence France Presse	Montreal Gazette

Research Agenda

MTA's research activities span two broad areas: issues having to do with nuclear weapons and issues having to do with civilian applications of nuclear technology. This survey briefly examines this year's efforts in both areas.

Nuclear and Radiological Weapons

Research by MTA faculty, staff, student associates, and fellows addressed a variety of topics related to nuclear and radiological weapons. In general, this research analyzed four separate but related fields: (1) nuclear terrorism, (2) the protection of nuclear materials and weapons, (3) nonproliferation, and (4) nuclear arms control and disarmament. This review looks at the issues, activities, and research products associated with each field.

1. Nuclear Terrorism

This year, MTA scholars spent a great deal of time and attention on the problem of nuclear terrorism. In all, MTA's scholars authored or edited 28 books, working papers, op eds, and related publications on the topics related to nuclear terrorism. These efforts include Matthew Bunn's congressional testimony on preventing nuclear terrorism, Dmitry Kovchegin's article on terrorist threats to Russian nuclear facilities, and Jim Walsh's assessment of nuclear terrorism, which appeared in *Countering Terrorism: Dimensions of Preparedness* (MIT Press). Further a field, MTA members led a number of initiatives aimed at building international cooperation on the issue of terrorism. A. Gopalakrishnan and Matthew Bunn initiated a project to promote US-Indian cooperation in the protection of civilian nuclear facilities from terrorist attack. The project, which was supported by the Nuclear Threat Initiative, helped bring together

high-ranking American and Indian officials at a workshop convened by the IAEA. Given the difficulties in the American-Indian nuclear relationship, especially following the 1998 South Asian nuclear weapons tests, many analysts believed that these kinds of discussions would be all but impossible. Nevertheless, the MTA team was successful in its first venture. It helped bring the different parties to the table and successfully identified areas of common interest that could be the basis for future cooperation. MTA is now looking to build on that success with a second phase of discussion and dialogue.

Academic year 2002-2003 also witnessed the start of another MTA initiative—the International Working Group on Radiological Weapons. Of the various nonconventional weapons, radiological weapons or "dirty bombs" likely pose the fewest technical challenges to a terrorist group. In addition, the materials that could be used for such a weapon are widely available. Despite the risks and unusual challenges posed by a radiological attack, little has been written about the social, economic, psychological, and political dimensions of an attack. In addition, most of the research has focused on an attack against the US. In short, the study of radiological threats has lacked an international perspective. The Working Group, composed of roughly 30 scholars from 9 countries, met weekly to study the problem of radiological weapons. Individual group members focused on specific topics, made presentations to the group on those topics, and then wrote research notes and working papers based on their research.

MTA scholars also contributed to the work of BCSIA's Executive Session on Domestic Preparedness, helping state and local officials begin to grapple with the threat of nuclear terrorism. MTA also continues to maintain its library of resources on nuclear and radiological terrorism on the MTA website—a practice it began following the events of September 11th. Finally, much of the work described in the next section on security nuclear materials has direct relevance to the issue of nuclear terrorism.

2. Protection of Nuclear Materials and Weapons

Few issues are more important to U.S. security than ensuring that nuclear weapons and the materials and expertise needed to make them do not fall into the hands of terrorists or hostile states. During the 2002–2003 academic year, *Managing the Atom* produced a landmark study on the problem of securing nuclear weapons, materials, and expertise worldwide.

Controlling Nuclear Warheads and Materials: A Report Card and Action Plan—written by Matthew Bunn, John P. Holdren, and Anthony Wier, and sponsored by the Nuclear Threat Initiative—provided policy makers with an updated assessment of the threat of nuclear theft, in the former Soviet Union and around the world; a detailed analysis of how much progress had been made in programs to secure and account for these dangerous stockpiles; and an integrated action plan for rapidly reducing the nuclear terrorist threat. The report outlined the horrific consequences that would ensue were a terrorist nuclear bomb to be set off at Grand Central Station on a typical workday, and provided a step-by-step analysis of the "terrorist pathway to the bomb," and the actions that governments could take to block each step on the path. The book-length report was supplemented by an extensive website providing hundreds of pages of analyses of each U.S.-funded program to secure warheads, materials, and expertise, including scores of photographs, hundreds of annotated links to the best available information on the web, and the first-ever publicly accessible comprehensive threat reduction budget database. The

website provides "one-stop shopping" for congressional staff, reporters, and others seeking information on the current status of these critical programs to reduce the nuclear terrorist threat.

The report and website were released at a press conference featuring Senators Sam Nunn and Richard Lugar (who co-authored the foreword), and was extensively briefed to senior government officials, congressional staff, non-government experts, and the press. A number of the recommendations in the report are being pursued—three different pieces of legislation now pending in Congress, for example, call for a "global cleanout" program to remove nuclear material from the world's most vulnerable sites, as recommended in the study. The Nuclear Threat Initiative is now preparing a public education effort designed to bring some of the report's recommendations into the public debate in the upcoming presidential campaign.

John Holdren and Nikolai Laverov, Vice-President of the Russian Academy of Sciences, co-chaired a U.S. and Russian Academies of Sciences committee that looked at the problem of nuclear materials. They published a report that offers recommendations for immediate action and proposals for additional US-Russian cooperation on this issue.(See also section on "Nonproliferation.")

Other MTA scholars also contributed to work on this issue. Hui Zhang evaluated China's system of material protection, control, and accountancy; Dmitry Kovchegin wrote a paper that addressed the thorny issue of access to Russian facilities, and Maurizio Martellini continued his work in support of the G8 Global Partnership and the nuclear cities initiatives. In all, MTA scholars authored 10 publications on the topic of nuclear materials and provided numerous briefings to top-level policy makers.

3. Nuclear Nonproliferation

The spread of nuclear weapons has long been a concern of BCSIA in general and of MTA in particular. Given recent developments in North Korea, Iraq, and Iran, it is not surprising that MTA scholars were busy.

John Holdren co-chaired the U.S. National Academies and Russian Academy of Sciences Joint Committee on US-Russian Cooperation on Nuclear Non-Proliferation. The Committee was a post-September 11 initiative of the presidents of the US academies of sciences, engineering, and medicine and the president of the Russian Academy of Sciences to bolster inter-academy cooperation. The co-chair on the Russian side is Academician Nikolai Laverov, Vice President of the Russian Academy of Sciences and scientific secretary of the science and technology advisory committee to President Putin. In a related effort, Center Director Graham Allison continued work on his project to promote greater cooperation between the U.S. and Russia on nonproliferation.

MTA scholars also focused on the proliferation concerns raised by individual countries. Senior fellow, Maurizio Martellini participated in fact finding missions to North Korea and Iran. John Park traveled to South Korea, wrote extensively about the North Korean nuclear crisis, and helped organize a conference at Harvard that brought together some of the world's leading experts on North Korea. Jim Walsh met with Iranian officials, including the Deputy Foreign

Minister, in Rome to discuss the nuclear situation in Iran. MTA also created a new Iran list—serve that collects and sends news clippings relating to Iran.

Two MTA pre-doctoral fellows, Chen Zak and Bonnie Jenkins, continued work on their dissertations, both of which focus on nonproliferation. Zak's dissertation assesses the safeguards regime, while Jenkins looks at nuclear decision making in countries that acquired and countries that rejected nuclear weapons.

In all, MTA researchers produced 10 publications on topics related to nonproliferation. The papers span a range of topics, from Dmitry Kovchegin's article on US-Russian nonproliferation cooperation to Chen Zak's paper on Iran and the IAEA.

4. Nuclear Arms Control and Disarmament

If the purpose of nonproliferation is to prevent the spread of nuclear weapons, then the objective of arms control is to reduce the threat of nuclear weapons held by the existing nuclear weapons states. This year, MTA faculty and fellows addressed a number of arms control issues including the Comprehensive Test Ban Treaty, the Moscow Treaty, nuclear arms control in China, and the weaponization of space.

John Holdren chaired the National Research Council Committee on Technical Issues Relating to Ratification of the Comprehensive Test Ban Treaty. The book-length report of the committee, which endorses the proposition that it would be in the U.S. interest to ratify the treaty, was published by the National Academy Press in summer 2002.

John Holdren also chaired the National Academy of Sciences Committee on International Security and Arms Control. CISAC maintains regular bilateral interactions with counterpart groups of scientists and policy makers in Russia, China, and India, and regular multilateral interactions with working groups from the European science academies. This year, the Committee continued work on a major study on the monitoring and verification challenges of a prospective nuclear arms-control regime that included tactical and reserve nuclear weapons as well as the deployed strategic nuclear weapons covered by existing agreements.

Hui Zhang continued his work on a number of issues relating to China and arms control. His publications examined China's position on the Fissile Material Cut-off Treaty, the issue of weapons in space, and missile defense. MTA affiliated scholar Subrata Ghoshroy also conducted research on weapons in space and missile defense and organized a meeting on these topics with the Federation of American Scientists in Washington.

Finally, John Holdren testified before the Senate foreign relations committee on the promise and limitations of the Moscow Treaty to reduce strategic nuclear weapons. In all, MTA scholars produced 6 publications on the topic of arms control and disarmament.

5. Civilian Nuclear Technology

The civilian dimension of nuclear technology has traditionally been a major focus for MTA, and this year was no exception. Working with colleagues in ETIP and at MIT, MTA addressed a

number of issues relating to nuclear energy including the future of nuclear power, reprocessing versus the direct disposal of spent nuclear fuel, and the protection of civilian nuclear facilities from terrorist attack.

John Holdren participated in a major study on the future of nuclear power, organized by colleagues at MIT. The book-length report is due to be released in the fall of 2003. Another major study, *Economics of Reprocessing vs. Direct Disposal of Spent Nuclear Fuel*, written by Matthew Bunn, John Holdren, Steve Fetter, and Bob van der Zwaan was written for the Department of Energy and is also scheduled for release in the summer of 2003.

MTA fellow Dmitry Kovchegin wrote a paper examining the proposal that Russia import spent nuclear fuel. Bob van der Zwaan's research examined the potential role of nuclear power and its implications for the environment. In all, MTA scholars produced four publications relating to civilian nuclear technology. This does not include the extensive work done by Gopalakrishnan and also by the International Working Group on Radiological Weapons on the topic of terrorism against civilian nuclear facilities.

Outreach

MTA scholars engaged in a variety of outreach activities. The purpose of these activities is to share MTA sponsored research with the broader community of national and international scholars and with the public at large. In addition to the media interviews described above, MTA researchers participated in conferences and workshops, made presentations, delivered private briefings, and hosted special guests.

Conferences and Workshops

MTA faculty, staff, and fellows participated in over 20 conferences and workshops ranging from IAEA seminars to meetings of the Institute for Nuclear Materials Management, the Nuclear Energy Institute, and the International Nuclear Materials Policy Forum.

Presentations

MTA faculty and fellows delivered over 80 presentations on their research at varied institutions, including

- MIT;
- National Academy of Science;
- Council on Foreign Relations;
- Pacific Council on International Policy;
- Institute of Applied Physics & Computational Mathematics (PRC);
- Commonwealth Club of San Francisco;
- Cambridge University;
- U.S. National Laboratories;
- Nuclear Threat Initiative;
- University of Toronto;
- IAEA;
- Nuclear Energy Institute;
- Univ. of Texas, Austin

- University of Maryland;
- Pugwash;
- Tufts University;
- U.S. Air Force Academy;
- Los Angeles World Affairs Council;
- Stanford University;
- Boston World Affairs Council.

Briefings

MTA scholars also gave over 15 briefings to policymakers on subjects such as nuclear material security, proposals to develop bunker-busters and other new nuclear weapons, and the Comprehensive Test Ban Treaty. Among those receiving briefings were John Wolf, Assistant Secretary of State for Nonproliferation; Linton Brooks, National Nuclear Security Administrator; Susan Koch, Director for Proliferation Strategy, Counterproliferation, and Homeland Defense, National Security Council; the *Washington Post* editorial board; U.S. Senator Jack Reed; the staffs of the Senate Armed Services Committee, Senate Foreign Relations Committee, and Senate Energy and Water Appropriations Subcommittee; and the staffs of individual senators.

Special Events and Guests

This year, MTA co-sponsored a debate on the war in Iraq with the Boston World Affairs Council and an event with WGBH-TV on media coverage of the war in Iraq (which was broadcast on the WGBH website). On occasion, MTA also serves as a host for special guests. This year, MTA hosted Indian Foreign Minister Yashwant Sinha, Dean Robert Gallucci of Georgetown University, and U.S. Senator Jack Reed.

SPONSORS

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PEOPLE

PRINCIPAL INVESTIGATORS

John P. Holdren: See page 89.

Henry Lee: See section on Environment and Natural Resources Program.

Steven E. Miller: See section on International Security Program.

PROJECT STAFF

Annaliis Abrego is a research assistant for the Project on Managing the Atom, part of the Science, Technology and Public Policy Program at the Belfer Center at the Kennedy School of Government. She was previously affiliated with the Strengthening Democratic Institutions Project and Caspian Studies Program, also at the Belfer Center. She graduated from Williams College in June of 2001, receiving a B.A. in Political Science with a concentration in International Relations. In 1999 and 2000, Annaliis spent several months in Tbilisi, Georgia, where she interned at the Foreign Policy Research and Analysis Center at the Ministry of Foreign Affairs and collected information for her senior honors thesis on democratization in Georgia.

Matthew Bunn is a Senior Research Associate in the Project on Managing the Atom in the Belfer Center for Science and International Affairs at Harvard University's John F. Kennedy School of Government. His current research interests include nuclear theft and terrorism; security for weapons-usable nuclear material in the former Soviet Union and worldwide; verification of nuclear stockpiles and of nuclear warhead dismantlement; disposition of excess plutonium; conversion in Russia's nuclear cities; and nuclear waste storage, disposal, and reprocessing.

Before joining the Kennedy School in January 1997, he served for three years as an adviser to the Office of Science and Technology Policy, where he played a major role in U.S. policies related to the control and disposition of weapons-usable nuclear materials in the U.S. and the former Soviet Union, and directed a secret study for President Clinton on security for nuclear materials in Russia. Previously, Bunn was at the National Academy of Sciences, where he directed the two-volume study *Management and Disposition of Excess Weapons Plutonium*. He is a consultant to the Nuclear Threat Initiative, a member of the Russian-American Nuclear Security Advisory Council, an organization devoted to promoting nuclear security cooperation between the United States and Russia, and a member of the Board of Directors of the Arms Control Association.

Bunn is the author or co-author of several books and book-length technical reports, and dozens of articles in magazines and newspapers including *Foreign Policy*, *Scientific American*, *Science*, *Technology Review*, *Annual Review of Energy and the Environment*, *Arms Control Today*, *The Bulletin of the Atomic Scientists*, and *The Washington Post*, and appears regularly on television and radio. Bunn received his bachelors' and masters' degrees in political science, specializing in defense and arms control, from the Massachusetts Institute of Technology in 1985. He is married

to Jennifer Weeks, and lives in Watertown, Massachusetts. They have two daughters, Claire and Nina.

Dr. Jim Walsh is Executive Director of the Managing the Atom Project at the Belfer Center for Science and International Affairs at Harvard University's John F. Kennedy School of Government. His research and writings focus on weapons of mass destruction, terrorism, and the Middle East. Dr. Walsh's writings have appeared in the Boston Globe, the Washington Post, the LA Times, the Times of London, the Miami Herald, and numerous other domestic and foreign papers. His articles have also appeared in numerous scholarly publications including the Political Science Quarterly, the Nonproliferation Review, International Studies Review, and Contemporary Security Policy. He is currently working on a new book on Iran.

Most recently, Dr. Walsh has provided expert analysis for a number of network affiliates in the Boston area. He also recently completed work on a TV documentary for the Australia Broadcast Corporation.

Before coming to Harvard, he was a visiting scholar at the Center for Global Security Research at Lawrence Livermore National Laboratory, one of the country's three nuclear weapons labs. Previously, he was named a Jennings Randolph Peace Scholar by the United States Institute for Peace and won the Hubert Humphrey Fellowship from the U.S. Arms Control and Disarmament Agency.

Anthony Wier serves the Project on Managing the Atom as a Research Associate. Prior to coming to the Project, he was a participant in the Presidential Management Internship (PMI) program, serving as a Program Examiner in the International Affairs Division of the Office of Management and Budget. In that capacity he performed program and budget oversight on the State Department's nonproliferation, arms control, and verification and compliance efforts, as well as represented the International Affairs Division in interagency working groups on various nonproliferation and arms control matters. He has a Master of Public Affairs and a Master of Arts in Russian, East European, and Eurasian Studies from the LBJ School of Public Affairs at the University of Texas at Austin, and a Bachelor of Arts summa cum laude from Trinity University in San Antonio.

AFFILIATES

Steve Fetter is a professor in the School of Public Affairs at the University of Maryland, College Park, and associate director of the Joint Global Change Research Institute. A physicist by training, his research interests include arms control and nonproliferation, nuclear power and the health effects of radiation, and climate change and energy supply.

Prof. Fetter is vice chairman of the Federation of American Scientists and treasurer of the Arms Control Association. He serves on the National Academy of Sciences' Committee on International Security and Arms Control, the Department of Energy's Nuclear Energy Research Advisory Committee, the board of directors of the Sustainable Energy Institute, the board of governors of the RAND Graduate School, the advisory board of Human Rights Watch's Arms Division, and the Board of Editors of *Science and Global Security*. He is a fellow of the American Physical Society, a recipient of its Joseph A. Burton Forum Award, a member of its Panel on Public Affairs, and from 1998-2001 served on the Executive Committee of the Forum on Physics and Society.

In 1993-94, Fetter was special assistant to the Assistant Secretary of Defense for International Security Policy, for which he received an award for outstanding public service. He has been a Council on Foreign Relations international affairs fellow at the State Department and a visiting fellow at Stanford's Center for International Security and Arms Control, Harvard's Center for Science and International Affairs, MIT's Plasma Fusion Center, and Lawrence Livermore National Laboratory. He received a Ph.D. in energy and resources from the University of California, Berkeley, and a S.B. in physics from MIT.

His articles have appeared in *Science*, *Nature*, *Scientific American*, *International Security*, *Science and Global Security*, *Bulletin of the Atomic Scientists*, and *Arms Control Today*. He has contributed chapters to more than a dozen edited volumes, is author of *Toward a Comprehensive Test Ban*, and coauthor of *The Future of U.S. Nuclear Weapons Policy* and *The Nuclear Turning Point*.

Allison Macfarlane was a Senior Research Associate at MIT's Security Studies Program before coming to Tech. She has held the position of professor of geology and women's studies at George Mason University where she taught a wide variety of geology and environmental courses. In 1996-97 she held a Bunting Science Fellowship at Radcliffe College and a Kennedy School Fellowship at Harvard University where she worked with the Science Technology and Public Policy group at the Center for Science and International Affairs. From 1997-98 she was a science fellow at the Center for International Security and Arms Control at Stanford University. From 1998-2000 she was a Social Science Research Council-MacArthur Foundation fellow in International Peace and Security at the Belfer Center for Science and International Affairs at Harvard University. She has also served on a National Academy of Sciences panel on the spent fuel standard and excess weapons plutonium disposition. Her research focuses on the issues surrounding the management and disposal of high-level nuclear waste and fissile materials.

Dr. Lawrence Scheinman is a Distinguished Professor of the CNS office in Washington, D.C. Most recently, Dr. Scheinman was the Assistant Director for Nonproliferation and Regional Arms Control of the U.S. Arms Control and Disarmament Agency (ACDA). Prior to that, Dr. Scheinman served as Counselor for Nonproliferation in the Department of Energy, on leave from his position as Professor of Government (International Law and Relations), and Associate Director, Peace Studies Program at Cornell University. He has previously been a tenured member of the faculties of political science at UCLA and the University of Michigan from which he earned his M.A. and Ph.D. He also holds a J.D. from New York University School of Law and is a member of the Bar of the State of New York.

Dr. Scheinman has been involved in nuclear-related matters as an academic and as a government and international organization official for 25 years: as Senior Policy Analyst and Head of the International Policy Planning Office in the U.S. Energy Research and Development Administration (1976); as Principal Deputy to the Deputy Undersecretary of State for Security Assistance, Science and Technology (and Senior Advisor to the Undersecretary, 1977-1979); and as a special assistant to the Director General of the International Atomic Energy Agency (1986-1988 and 1991-1992). He is a member of the Council on Foreign Relations, of the Executive Committee of the Programme for the Promotion of Non-Proliferation, of the Washington

Council on Non-Proliferation, and of the Advisory Committee of the Atlantic Council of the United States Non-Proliferation Project. He has held grants from the National Science Foundation and from the Social Science Research Council and has held the Visiting Research Scholar position at the Carnegie Endowment for International Peace as well as being a Fellow of the Harvard Center for International Affairs. He is included in American Men of Science and in Who's Who in the East.

Dr. Scheinman has published extensively in the fields of nonproliferation, arms control and international nuclear cooperation. His books and monographs include *Atomic Energy Policy in France Under the Fourth Republic* (Princeton University Press, 1965); *EURATOM: Nuclear Integration in Europe* (Carnegie Endowment, 1967); *The Nonproliferation Role of the International Atomic Energy Agency: A Critical Assessment* (Resources for the Future, 1985); *The IAEA and World Nuclear Order* (Resources for the Future, 1987); *Non-Proliferation and the IAEA: A US-Soviet Agenda* (Atlantic Council of the United States, 1985); *Assuring the Nuclear Non- Proliferation Safeguards System* (Atlantic Council of the United States, 1992).

Associated Faculty and Staff

Graham Allison: See section on Caspian Studies Program.

Ashton Carter: See section on International Security Program.

Robert A. Frosch: See page 91.

William Hogan: See section on Environment and Natural Resources Program.

Philip R. Sharp, Lecturer in Public Policy, is the former director of the Institute of Politics at Harvard University, and an Associate of the Harvard Electricity Policy Group. He is a member of the board of directors of the Energy Foundation and the Cinergy Corporation, and he serves on the Secretary of Energy Advisory Board. Sharp was graduated from Georgetown University's School of Foreign Service in 1964, and received his PhD in government from Georgetown in 1974. He was a 10-term member of Congress from 1975-95 from Indiana, and served as chair of the Energy and Power Subcommittee of the House Committee on Energy and Commerce from 1981-95.

Dorothy Shore Zinberg is a Lecturer in Public Policy and a Faculty Associate in the Belfer Center for Science and International Affairs at the Kennedy School of Government, Harvard University. A founding member of the Belfer Center for Science and International Affairs, she teaches "Issues in Science, Technology and Public Policy" at KSG, and recently has taught "Law, Technology, and Society" at Harvard Law School. Her research focuses on several aspects of international science and technology: industry, university, and government arrangements as a function of the increasing commercialization of science; the changes in universities and industry brought about by the Information Technologies; and Human Resources--the education and career development of scientists and engineers. She has carried out extensive research on the training and employment of foreign scientists and engineers internationally.

Most recently, she has served on the National Academy of Sciences committee to evaluate the expenditure of Nunn-Lugar funds to aid in the denuclearization of the former Soviet Union. Dr. Zinberg has served in advisory positions on the Board of International Scientific Exchanges at the National Academy of Sciences (NAS), on the American Association for the Advancement of Science (AAAS) Committee on Science and Social Responsibility, and on the National Science Foundation (NSF) Program on Ethical and Human Value Implications of Science (EVIST). In addition, Dr. Zinberg has been chairperson of the Advisory Committee to the International Division of the NSF and a member of the NAS Commission for International Relations. She has been a member of numerous committees and panels: the AAAS Committee on Science, Engineering, and Public Policy (COSEPP); the Office of Technology Assessment's Advisory Panel: Sustaining the National Technological Base; the Committee on the International Exchange and Movement of Engineers at the National Academy of Engineering; and the Council of the Federation of American Scientists. Dr. Zinberg has been a consultant to the Chase Manhattan Bank, the MITRE Corporation, and also to the MacArthur, Carnegie, Sloane, and Ford Foundations. She has been a Distinguished Fellow of the Aspen Institute, and is a member of the International Council for Science Policy Studies, the International Institute for Strategic Studies, and the Council on Foreign Relations.

Dr. Zinberg is the editor and a contributing author of *Uncertain Power: The Struggle for a National Energy Policy* (Pergamon 1983). She is also the editor and contributing author of *The Changing University: How Increased Demand for Scientists and Technology Is Transforming Academic Institutions Internationally* (Kluwer 1991). Her work has been published in *American Scientist*, *Nature*, *Scientific American*, and many other journals and books. Her most recent publications include: "The Missing Link? Nuclear Proliferation and the International Mobility of Russian Nuclear Experts," UNIDIR, 1995); "Brain Drain, Brain Bank, and Brain Wall: The International Mobility of Former Soviet Union Scientists, Engineers, and Technologists," (OECD 1994); and "Putting People First: Education, Jobs, and Economic Competitiveness" in *Empowering Technology: Implementing a U.S. Strategy* ed. Lewis M. Branscomb (MIT Press 1993). Dr. Zinberg writes a monthly column, "World View", for *The Times* (London) Higher Education Supplement which is also published by the N.Y. Times Syndicate: New America News Service.

RESEARCH FELLOWS

Mr. Subrata Ghoshroy is a Senior Research Associate at the Belfer Center for Science and International Affairs at Harvard University. He holds the same position at the Federation of American Scientists in Washington, DC. Mr. Ghoshroy's areas of interest include the weaponization of space and nuclear weapons in South Asia.

Until his arrival at the Belfer Center, Mr. Ghoshroy was a Senior Defense Analyst at the U.S. General Accounting Office, which he joined in 1998. Mr. Ghoshroy's primary responsibility has been to provide independent technical advice to GAO staff and managers on GAO evaluation of weapons systems that employ sophisticated technology. In this capacity, Mr. Ghoshroy has contributed among others to reviews of National Missile Defense, Airborne Laser, Land Warrior, and Joint Tactical Radio. He was the technical leader in GAO's review of the allegations of fraud in a missile defense test. Mr. Ghoshroy did original analysis that led to the finding that a cooling

system problem in the infrared sensor on the interceptor missile resulted in very poor data quality.

From 1997 to 1998 Mr. Ghoshroy was a Professional Staff Member of the House Armed Services Committee. He was responsible for the Science and Technology programs in the RDT&E account. He was additionally responsible for the Department of Energy defense programs.

In 1996, Mr. Ghoshroy served as a Congressional Science and Engineering Fellow with the House International Relations Committee. He was awarded the Fellowship by the Institute of Electrical and Electronics Engineers. His responsibilities included non-proliferation of nuclear, chemical, and biological weapons; arms control, land mines ban, and ballistic missile defense. Before moving to the policy and legislative world, Mr. Ghoshroy worked for 20 years as an engineer. From 1984 to 1996, he was with Textron Defense Systems in Everett and Wilmington, Massachusetts. From 1984 to 1990, he was a Member of the Senior Technical Staff at Avco Research Laboratory, a division of Textron. From 1990 to 1996, Mr. Ghoshroy was a program manager for high-energy laser programs. He was credited with the development of a prototype laser for a satellite-based laser radar system for global atmospheric research. The laser operated for a number of years at the Air Force Maui Optical Station in Maui, Hawaii for space research. In his early professional career, Mr. Ghoshroy worked at Princeton Plasma Physics Laboratory in Princeton, New Jersey, where he developed pulsed energy conversion systems for the Tokamak fusion test reactor. He spent also two years at Brookhaven National Laboratory in Upton, New York. His contribution at Brookhaven was the development of a new beam extraction system for the AGS proton accelerator.

He has written numerous technical reports, and authored or coauthored several scientific papers. He has also written about science policy and arms control in South Asia. Mr. Ghoshroy holds B.S. and M.S. degrees in electrical engineering and an M.S. degree in Public Policy. He is a naturalized U.S. citizen. He is married and has one son.

Adinarayantampi Gopalakrishnan: See page 91.

Bonnie Jenkins: See section on International Security Program.

Dmitry Kovchegin graduated from the Moscow Engineering Physics Institute in May 2000. He received his bachelor's degree in physics with specialization in reactor engineering and a master's degree in physics with specialization in nuclear materials protection, control and accounting. He began his work in the field of nonproliferation studies in 1999 as an intern in the PIR Center for Policy Studies in Russia (Moscow) and was a visiting fellow in the Center for Nonproliferation Studies of the Monterey Institute of International Studies (Monterey, CA). In 2000-2002 Dmitry Kovchegin worked as a research associate at the PIR Center. He participated in a number of the Center's projects including *Russian Nuclear Regionalism*, *Educational Program on Arms Control for Russian Legislators*, *International Threat Reduction Programs: Assessment and Policy Recommendations*, and others. Dmitry is a regular author for *Yaderny Kontrol* (Nuclear Control) – the leading Russian journal in the field of international security, arms control, and nonproliferation. He is also one of the contributors to *Protecting against the*

Spread of Nuclear, Biological, and Chemical Weapons: An Action Agenda for the Global Partnership, published by CSIS in January 2003. He is currently working on his Ph.D. dissertation on international control of nuclear materials in the Institute of World Economy and International Relations (IMEMO) of the Russian Academy of Sciences. His research interests include problems of nuclear materials security; nuclear smuggling; nuclear materials management; and disposition and other nonproliferation issues.

Dr. Maurizio Martellini is a professor at the University of Insubria, Como, Italy and Secretary General for Landau Network-Centro Volta. He is a professor of theoretical physics, an expert on non-proliferation, disarmament, and energy security issues, and is a consultant to the Italian Ministry of Foreign Affairs.

Dr. John Park is a postdoctoral research fellow at the Belfer Center for Science and International Affairs at Harvard University's John F. Kennedy School of Government. Dr. Park received his Ph.D. from Cambridge University where he was a Canadian Government Social Sciences and Humanities Research Council Doctoral Fellow. While a predoctoral research fellow at Harvard from 1998-2000, he completed his dissertation on International Atomic Energy Agency inspections during the 1994 North Korean nuclear crisis. During his predoctoral research fellowship, he was also a government studies tutor at Harvard. Dr. Park has given lectures on North Korea at Harvard University's Belfer Center for Science and International Affairs, Cambridge University's Centre of International Studies, the Australian National University's Strategic and Defence Studies Centre, and the University of Toronto's Munk Centre for International Studies. In addition, he has presented papers at the Harvard Korea Institute and the British Association of Korean Studies Conference at Oxford University. His current research projects focus on nuclear issues on the Korean peninsula – specifically, China's role in resolving the North Korean nuclear crisis and South Korea's nuclear weapons program in the 1970s. Dr. Park's writings on the North Korean nuclear crisis have appeared in the *Asian Wall Street Journal*, the *Globe and Mail* and the *Japan Times*.

Bob van der Zwaan is a research fellow at the Belfer Center for Science and International Affairs at Harvard University (Cambridge, MA), while on leave from the Policy Studies department of the Energy Research Centre of the Netherlands (ECN) in Amsterdam. He received his PhD in particle physics in 1995 after a four-year employment at the European Organization for Nuclear Research (CERN, Geneva). In Geneva he also studied international relations at the Graduate Institute for International Studies (IUHEI). In 1997, he obtained an MPhil degree in economic theory and econometrics from the University of Cambridge, King's College. Since then, he has been researching various subjects related to energy economics, climate change and technological innovation. From 1997 to 1999 he was a researcher at the *Institut Français des Relations Internationales* (IFRI, Paris). In the Fall of 1999 he was a visiting scholar at the International Institute for Applied Systems Analysis (IIASA, Vienna/Laxenburg). He was a 1999-2000 Science Fellow at the Center for International Security and Cooperation (CISAC, Stanford University). At the Institute for Environmental Studies, *Vrije Universiteit Amsterdam*, he researched from 1999 to 2001 in the field of technological change and the integrated assessment modelling of global warming.

Chen Zak: See section in International Security Program.

Hui Zhang: See section in International Security Program.

STUDENT ASSOCIATES

Manav Bhatnagar is currently a sophomore at Harvard College, pursuing a joint degree in South Asian Studies and Government. He graduated from Marquette High School in Milwaukee, Wisconsin. His research with the Managing the Atom Project focuses on India and Pakistan.

Malini Daniel is a second-year student at Harvard College, and expects to concentrate in government or biology. She has done research for the Radiological Weapons Group comparing a potential radiological attack with that of the Three Mile Island incident. Her research at MTA is related to biological weapons terrorism. Malini is originally from Kalamazoo, Mi.

Leah Litman is a sophomore at Harvard College, pursuing a degree in either Chemistry or Biochemical Sciences. She graduated from Edina High School in Edina, Minnesota. Her research with the Managing the Atom Project includes topics such as radiological weapons and Iraq.

Joe Pace is a sophomore at the college pursuing a degree in social studies with a focus on international relations and foreign policy. He graduated from Greenhill School, in Dallas, Texas. His research with MTA focuses on Iran's nuclear program.

III. Research and Innovation Policy

Research and Outreach

Between Invention and Innovation: Funding for Early Stage Technology Development

In the United States, investments aimed at converting science-based inventions into radically new goods and services are small in absolute terms when compared to total industrial R&D. However, such investments significantly affect long-term economic growth by converting the nation's portfolio of science and engineering knowledge into innovations generating new markets and industries. Understanding early stage technology development is therefore important because a national and global capacity to sustain long term economic growth is important. In November 2002, the National Institute of Standards and Technology (NIST) published a report authored by STPP Director Emeritus Lewis Branscomb and STPP Assistant Director Philip Auerswald titled "Between Invention and Innovation: An Analysis of Funding for Early Stage Technology Development."⁶ An earlier version of this report was cited extensively in Sam Bodman, Deputy Secretary of Commerce, in his 2002 study of the merits of the ATP program; it also formed the basis of earlier testimony by Professor Branscomb before the Senate Committee on Commerce, Science, and Transportation.

The purpose of the "Between Invention and Innovation" project was to support informed design of public policies regarding technology entrepreneurship and the transition from invention to innovation by providing a better understanding of the sources of investments into early stage technology development projects. This project was carried out at Harvard University and sponsored by the Advanced Technology Program (ATP) which is administered by NIST, within the Department of Commerce.

Over the past two year, the Between Invention and Innovation project has sought to answer two sets of questions:

- What is the distribution of funding for early stage technology development across different institutional categories? How do government programs compare with private sources in terms of magnitude?
- What kinds of difficulties do firms face when attempting to find funding for early stage, high-risk R&D projects? To what extent are such difficulties due to structural barriers or market failures?

The BCSIA team, led by Lewis Branscomb and Philip Auerswald pursued two approaches in parallel to arrive at a reasonable estimate of the national investment in early stage technology development: (1) learning from the observations of practitioners in the context of a series of workshops held in the U.S., and (2) collecting the data available on early stage technology development investments from other studies and from public statistical sources. These approaches were supplemented by four case studies conducted by a team of Harvard researchers and a set of thirty nine in depth interviews of corporate technology managers, CEOs, and venture capitalists conducted on our behalf and with our direction by Booz Allen Hamilton.

We found that most funding for technology development in the phase between invention and innovation comes from individual private equity "angel" investors, corporations, and the Federal

⁶ The report is available at ATP's website
<<http://atp.nist.gov/eao/gcr02-841/contents.htm>>.

Government—not venture capitalists. Our findings support the view that markets for allocating risk capital to early stage technology ventures are not efficient. Despite (or in response to) market inefficiencies, many institutional arrangements have developed for funding early stage technology development. This suggests that funding mechanisms evolve to match the incentives and motivations of entrepreneurs and investors alike.

We also found that the conditions for success in science-based, high-tech innovation are strongly concentrated in a few geographical regions and industrial sectors, indicating the importance in this process of innovator-investor proximity and networks of supporting people and institutions. Among corporations, the fraction of R&D spending that is dedicated to early stage technology development varies both among firms and within industries. The latter variation may be related to industry lifecycles.

Overall, we found that the Federal role in early stage technology development is far more significant than would be suggested by an uncritical glance at aggregate R&D statistics. Federal technology development funds complement, rather than substitute for, private funds.

During the 2002-2003 the Between Invention and Innovation team also completed four case studies of early stage technology development and a separate study of early stage technology development in large corporations. These additional studies will be published by NIST in the coming year.

Also during 2002-2003, Auerswald was appointed to the research team for a multi-year National Academies study of the federal Small Business Innovation Research (SBIR) program.

Science and Technology for Countering Terrorism

Following up on his role as the co-chair (with Richard Klausner) of the National Academies' Committee on Science and Technology for Countering Terrorism, Professor Branscomb delivered multiple public lectures on the topic of S&T for counter-terrorism. Notable among these was the Brunel lecture delivered at MIT in September 2002, titled "Living with Catastrophic Terrorism: Can Science and Technology Make Us Safer?"

People

Lewis M. Branscomb. Lewis M. Branscomb is Aetna Professor of Public Policy and Corporate Management (emeritus) at Harvard University. He is emeritus director of Harvard's Science Technology and Public Policy Program in the Belfer Center for Science and International Affairs, and a member of the Center's Board of Directors. He is a recipient of the Vannevar Bush Award of the National Science Board, the Arthur Bueche Award of the National Academy of Engineering, the Gold Medal of the U.S. Department of Commerce, and the Okawa Prize in Communications and Informatics. He received the Centennial Medal of the Harvard University Faculty of Arts and Sciences in 2002. Prof. Branscomb has written extensively on information technology, comparative science and technology policy, and management of innovation and technology. In addition to more than 450 published papers, his recent books are *Taking Technical Risks: How Innovators, Executives, and Investors Manage High Tech Risk*, (with Philip Auerswald, 2000); *Industrializing Knowledge: University-Industry Linkages in Japan and the United States* (edited with Fumio Kodama and Richard Florida, 1999); *Investing in Innovation: A Research and Innovation Policy that Works* (edited with James Keller, 1998).

Philip E. Auerswald. Philip Auerswald was until September 2003 the Assistant Director of STPP and an Adjunct Lecturer at Kennedy School. He is now Assistant Professor and Director of

the Center for Technology Policy at the School of Public Policy, George Mason University. His research pertains to the economics of technological change, science and technology policy, and industrial organization. He has been a consultant to the National Academy of Sciences and the Commonwealth of Massachusetts's Department of Economic Development. He received his BA from Yale and his M.A. and Ph.D. from the University of Washington.

Brian K. Min. Brian Min was through July 2003 a researcher within the Kennedy Schools Science, Technology, and Public Policy program. He is currently a doctoral student in the Department of Political Science at UCLA. His research interests include regional economic development, technology policy, and the sociology of technology. At the New York Academy of Sciences he served as lead researcher on a major study examining the role of technology industries in the New York regional economy. He holds an M.P.P. from the Kennedy School and a B.A. in Science and Technology Studies from Cornell University.

IV. SCIENCE, TECHNOLOGY AND GLOBALIZATION

Program Description and Scope of Activity

Through its partnership with the Center for International Development, STPP's Project on "Science, Technology and Globalization" (formerly, the Project on Science, Technology and Development Policy) continued to focus on the role of science and technology in global development. The project, directed by Calestous Juma, undertakes policy research, training and outreach with particular emphasis on developing countries.

The Project examines innovation systems—local, regional, national, and global—as well as recent trends in globalization and their implications for the use of science and technology in the developing world. It focuses on how to mobilize the world's pool of scientific and technological knowledge to contribute to sustainable development, looking particularly at how knowledge is converted into goods and services. The key emphasis is on policy issues related to technology and innovation in global competitiveness, biotechnology and globalization, and biological diversity in developing countries.

The Project offers a fellowship program to support science and technology policy makers and researchers from developing countries. The aim of the fellowship is to equip policy makers and analysts with the skills needed to integrate science and technology issues into national decision-making. The need for capacity building in this area has been prompted by the growing recognition of the role of science and technology in addressing development challenges under conditions of globalization.

The Project began developing an executive program for ministers and senior policy makers designed to equip participants with the skills and knowledge necessary to incorporate science and technology into a national development policy. The first session of this program on Science, Technology, and Innovation Policy, led by Calestous Juma and faculty from the Kennedy School, other Harvard schools, and MIT, will be launched in November 2003.

The Project convened a number of international meetings and research seminars, in conjunction with its associated programs in the Kennedy School and the greater Harvard community, on science and technology issues. In particular, the Project launched a new seminar series on Technological Innovation and Development and sponsored another that focused on Science and Technology for Sustainable Development. The Project continued its sponsorship the *International Journal of Biotechnology*, published by Inderscience.

Juma is a member of the National Research Council's Roundtable on Science and Technology for Sustainability and a member of several committees of NRC dealing with biotechnology, science advice in the UN and geographical information sciences. He regularly provides advice to various agencies of the United Nations system as well as members of the diplomatic community. Juma is currently co-chairing a United Nations Task Force on Science, Technology and Innovation Policy established by the United Nations Secretary-General Kofi Annan as part of the implementation of the United Nations Millennium Development Goals (MDGs). The Task Force produced a background paper that examines the role of science, technology and innovation in meeting the MDGs. In the coming year the Task Force will orient its activities in five key areas: improving the policy environment; building human capabilities; promoting enterprise development; investing in research and development; and looking ahead through foresight activities.

Looking forward, the Project will continue to: further develop the executive program on Science, Technology and Innovation Policy and study issues related to biotechnology and globalization. New activities will focus on policy concerns in agriculture and human health and research on the role universities and institutions of higher learning in development.

People

Core Project Faculty and Staff

Calestous Juma: See section on Environment and Natural Resources Program.

Derya Honca was Coordinator of the Science, Technology and Innovation Program at Harvard University. She holds degrees in archaeology and anthropology, with research interests in exploring connections between health, morbidity and mortality in ancient and modern populations.

Brian Torpy is Coordinator of the Science, Technology and Globalization Project and Assistant to Calestous Juma. He is the financial administrator of the Project and contributes to the production, coordination and dissemination of the various research activities of which Prof. Juma is associated. He holds a degree in international relations.

2002-2003 Project Fellows

Frederique Santerre was a Ph.D. candidate in International Relations at the Graduate Institute of International Studies (Geneva, Switzerland). Her research focuses upon the interconnection and linkages between biodiversity, biotechnology and intellectual property rights. Her research examines the emergence and evolution of the international regulation of genetic resources, "bio-regulation", focusing on issues of conservation, trade and intellectual property rights, as well as biosafety. She adopts a multidisciplinary theoretical framework, relying on the theories of regime, institutional design, governance, as well as an empirical comparative approach to the

issue of bio-genetic regulation, drawing particular insights from the US, EU, Indian and Swiss case studies. In particular, Frederique is interested in the way in which new knowledge and technological innovation are integrated into the international policy-making of bio-governance and risk governance.

Smita Srinivas was a Ph.D. candidate in Economic Development and Regional Planning in the department of Urban Studies and Planning of the Massachusetts Institute of Technology (MIT). Smita studies S&T innovation, industrialization and economic development. Her current research is in biotech and pharmaceuticals in Finland, India and Singapore. She is an affiliate researcher at the MIT Industrial Performance Centre (IPC). She coordinates research of STG on industrial enterprises, human health and genomics, manages the research and publications of the Science, Technology and Innovation Task Force (TF10) of the UN Millennium Development Project. Her research focuses on the evolution of technology-related institutions within the context of economic development.

Vanessa Timmer: See section on Environment and Natural Resources Program.

2002-2003 Project Associates

Alice Amsden, Barton L Weller Professor of Political Economy, MIT

Lewis Branscomb, Professor Emeritus, Public Policy and Corporate Management and Director Emeritus, Belfer Center for Science and International Affairs, Kennedy School of Government, Harvard University

Jean Camp, Assistant Professor of Public Policy, Kennedy School of Government, Harvard University

William Clark, Harvey Brooks Professor of International Science, Public Policy, and Human Development, Kennedy School of Government, Harvard University

Lee Fleming, Associate Professor, Technology and Operations Management, Harvard Business School

Jane Fountain, Associate Professor of Public Policy and Director, National Center for Digital Government, Kennedy School of Government, Harvard University

Robert Frosch, Senior Research Associate, Science, Technology, and Public Policy Program, BCSIA

Merilee Grindle, Edward S. Mason Professor of International Development, Kennedy School of Government, Harvard University

David Hart, Associate Professor of Public Policy, Kennedy School of Government, Harvard University

John Holdren, Director and Faculty Chair, Science, Technology and Public Policy Program, Belfer Center for Science and International Affairs and Teresa and John Heinz Professor of Environmental Policy, Kennedy School of Government, Harvard University

Michael Kremer, Gates Professor for Developing Societies, Harvard College

Robert Lawrence, Albert L. Williams Professor of International Trade and Investment, Kennedy School of Government, Harvard University

Henry Lee, Director, Environment and Natural Resources Program, Belfer Center for Science and International Affairs and Lecturer in Public Policy, Kennedy School of Government, Harvard University

Robert Paarlberg, Associate at the Weatherhead Center for International Affairs, Harvard University; Professor of Political Science, Wellesley College

Dani Rodrik, Rafiq Hariri Professor of International Political Economy and Faculty Co-Chair, MPA/ID Program, Kennedy School of Government, Harvard University

Mark Rosenzweig, Mohamed Kamal Professor of Public Policy, Kennedy School of Government, Harvard University

John Ruggie, Weil Director, Center for Business and Government and Evron and Jeane Kirkpatrick Professor of International Affairs, Kennedy School of Government, Harvard University

Deborah Spar, Spangler Family Professor of Business Administration, Harvard Business School

Daniel Wikler, Professor of Ethics and Population Health, Harvard School of Public Health

2002-2003 Visiting Scholars

V.K. Samaranyake, Professor of Computer Science and Director, of the University of Colombo School of Computing

V. Information, Technology, and Governance

Jane Fountain

Associate Professor Jane Fountain founded and led the National Center for Digital Government, with support from the National Science Foundation Directorate for Computing, Information Sciences and Engineering, Digital Government Program (www.ksg.harvard.edu/digitalcenter). The National Center was established to build global research capacity at the intersection of information, institutions, and governance. It has established partnerships with scholars in South Asia, Latin America, and Europe. In August 2002, the report, *Digital Government: Advancing a Social Science Research Agenda*, based on a national workshop organized by Fountain, contributed to a new category of research funding at NSF focused on the political, institutional and social effects of information technology on government.

In January 2003, Professor Fountain's book, *Building the Virtual State: Information Technology and Institutional Change* (Brookings Institution Press, 2001) was named an Outstanding Academic Title for 2002 by Choice. Fountain continues to co-chair the Information, Technology, and Governance Faculty at the Kennedy School.

The National Center for Digital Government establishes the Kennedy School as a center for research on technology and governance with the following activities:

- An active, highly visible scholarly applied research program
- An international group of resident and nonresident research fellows
- A competitive, fully stipended fellowship program for pre-doctoral candidates
- A seminar series presenting the world's foremost researchers in information, institutions, and governance
- Workshops on research methodologies for the study of the Internet and governance
- National invitational research workshops convening approximately 30 outstanding scholars per workshop focused on critical governance issues
- Informal presentations of research in progress
- Small grants to support research
- National Center affiliated scholars building a global network for research and practice
- An active role in the strategic direction of major governmental and nongovernmental institutions (examples include the MacArthur and Ford Foundations and the National Science Foundation)

Jean Camp

Associate Professor Jean Camp's work during the year continued to focus on how societal values are integrated into technology, how public policies can force values to be hardwired into technology, and how technology develops values through adoption and innovation.

Camp's work with Carolyn Gideon in the past illustrated that certainty of bandwidth and certainty of price are mutually exclusive in a statistically shared network (of which the Internet is the canonical example). They are now proving this result and relaxing the assumptions of previous proofs to make the work stronger.

In the realm of privacy Camp has worked with two MIT doctoral students, Chan and Osorio.

With Chan, Professor Camp developed a paper on the interaction between surveillance technologies and privacy, comparing various media and regulations for privacy within the media.

We illustrated the opaque and uncertain nature of routing creates a new category of ethical problem with respect to privacy in communications. With Osorio, Camp worked on examining the trust assumptions built into privacy enhancing technologies. This paper won a best paper award at the Internet Society Annual Meeting: INET.

Camp pursued a number of outreach efforts designed to bring the insights from her research to bear in the making of policy. She continued her work in the Institute for Electrical and electronics Engineers, and has taken the lead in privacy in that organization. She was the principal author of a letter from the Computer Professionals for Social Responsibility opposing the creation of mandatory content control mechanisms in a bill introduced by Hollings.

Camp also continues to meet with representative from around the globe in cooperation with the State Department and the Harvard Marshall's Office.

Camp's presentations and publications from the year are available at <www.ljean.net>.

VI. International Science, Technology and Society

Dorothy S. Zinberg: See page 104.

TEACHING

In teaching, STPP oversees the Policy Area of Concentration (PAC) in Science, Technology, and Policy (STP) for the Kennedy School's Master of Public Policy Program. Courses offered for the STP PAC – such as STP100, Introduction to Science and Technology Policy, and STP312, Designing and Conducting Interdisciplinary Assessments for Policy – also attract students from the Kennedy School's MPA and PhD programs, from Harvard's other schools and colleges, and from Brandeis, MIT, and Tufts. No PhD is offered in STP *per se*, but students admitted to the Kennedy School's PhD program in public policy may choose an STP focus and affiliate with one or more of the STPP research projects. These projects are also populated with PhD students from elsewhere at Harvard and from the other area universities.

PUBLICATIONS

To review publications of the Science, Technology, and Public Policy Program and its members, see page 161.

EVENTS

To review events of the Science, Technology, and Public Policy Program and its members, see page 141.

WPF Program on Intrastate Conflict, Conflict Prevention, and Conflict Resolution

MEMBERS

Robert I. Rotberg, Director
Elisa Pepe, Program Manager
Deborah West, Program Associate
Mitsi Sellers, Research Assistant

BACKGROUND

On July 1, 1999, the WPF Program on Intrastate Conflict, Conflict Prevention, and Conflict Resolution was established in the Belfer Center of the Kennedy School as a result of an association between the Center and the World Peace Foundation. The Program analyzes the causes of ethnic, religious, and other intercommunal conflict, and seeks to identify practical ways to prevent and limit such conflict. It is concerned with the consequences of the global proliferation of small arms, with the failure and vulnerability of weak states, with UN peace building reform, with peace building and peace enforcement capabilities in Africa, with conflict resolution in war-torn countries, and with the role of truth commissions in conflict prevention and conflict resolution.

RESEARCH AGENDA AND POLICY OUTREACH

CHALLENGES TO PEACE IN THE NEW MILLENNIUM

Establishing world order is no easier in a new century than it was in the old. But in this era, the peace of the world is threatened by instabilities within nations much more than by disturbances between competing empires or power blocs. It is the low-tech wars that kill. Intercommunal hostilities fuel those conflicts, and sometimes become massacres and genocides. Perceived ethnic differences, religious differences, linguistic differences, racial differences, class differences, and access to resource differences, plus the real or imagined fears that sometimes arise from those differences, all stoke the flames of twenty-first century mayhem.

During the last decade an estimated 10 million persons were killed in little wars—the civil wars and insurgencies of modern times. The big wars are artifacts of big power rivalries that, thankfully, are past. Even potentially dangerous threats from intercontinental nuclear ballistic missiles have been contained and major multinational cross-border conflagrations avoided in Asia and Europe, if not in the Middle East.

Interneceine conflicts preoccupy policy makers and everyone concerned with the creation of a more peaceful world. Indeed, civil wars are the dangerous hot wars of any era: Afghanistan, Algeria, Angola, Bosnia, Burundi, Chechnya, the Congo, Côte d'Ivoire, Kosovo, Liberia, Rwanda, Sierra Leone, Sri Lanka, and the Sudan—to name but the more brutal—are the killing fields and continuing concerns of our times.

How to end the implacable conflicts, like those in Burundi, Liberia, the Sudan, and Sri Lanka, and how to prevent the emergence of new intrastate hostilities in a time of terror, is a compelling objective of the WPF Program on Intrastate Conflict. It studies conflict prevention and conflict resolution, both in general and with regard to particular civil wars, and attempts to create conditions or policy frameworks conducive to peacemaking and peace maintenance across the globe and in troubled theaters of violence.

The WPF Program is also concerned with promoting and measuring good governance, with reforming African leadership, with limiting the weapons of choice of civil wars and intrastate mayhem by reducing the spread of small arms and making the legal export trade more transparent and the illicit trade in those weapons easier to prevent and pursue. The WPF Program has examined methods of preventive diplomacy and early warning. It has worked with the military establishments of Africa to construct early action crisis response capabilities to meet the challenges of conflict prevention. It has analyzed how best to negotiate the end of deadly intrastate conflicts. It continues to be engaged directly in the resolution of long-standing intrastate antagonisms through facilitated dialogue and mediation. Although world order remains elusive as ever, the WPF Program continues to seek solutions to the main threats to global harmony.

PROMOTING PEACE WITHIN TROUBLED STATES: 2002–2003

In the past year, the WPF Program engaged in the following major endeavors:

Measuring Governance

The WPF Program is concerned to improve good governance in the developing world. One way to encourage and promote better methods of governance is to rank the countries of the developing world according to their performance as deliverers of political goods. That was the hypothesis of two meetings at the Kennedy School in 2003.

Although there are at least forty-nine data sets that provide approximations of measurements for such governance, none rank explicitly, many are drawn from opinion surveys and perceptions, and the most comprehensive of the existing governance compilations is an array of many other subjective indicators.

Are there objective ways to measure good governance attributes? Can such objective scales be developed? If so, would they serve the cause of improving good governance? Those are questions that continue to drive this project.

The project also seeks to discuss how improvements can be made to existing measuring devices. To that end, and to stimulate discussion about the governance project, the WPF Program anticipates a third meeting in 2003 and the publication of a full report.

African Leadership

There are many fewer effective democratic elected leaders in Africa than there are autocrats and despots. This project inquires why, and asks how African elected leadership may be strengthened. It does so not abstractly, but by gathering present and former elected African leaders of high stature together and working with them to analyze underlying problems and make recommendations about how to remedy the perceived leadership deficit in Africa.

This project held its first meeting at the Kennedy School in 2003. Second and third meetings are anticipated for late 2003, in Africa, and early 2004 at the Kennedy School.

Nigeria

Nigeria is the largest country in sub-Saharan Africa and a supplier of 7 percent of U.S. petroleum imports. It is and has been a largely dysfunctional polity, with a steady record of brutal dictatorship throughout large periods of its post-independent existence. Since the restoration of democracy in 1999, and the re-election in 2003 of President Olusegun Obasanjo, Nigeria is poised to achieve its vast potential as the western linchpin of Africa. Can it do so? If so, how? Both questions drove this project and produced a report by Deborah West, *Governing Nigeria: Continuing Issues after the Elections*. A book, edited by Robert I. Rotberg—*Crafting the New Nigeria: Strengthening the Nation*—is forthcoming.

Myths and Narratives in the Israeli-Palestinian Conflict

Is there a narrative capable of bridging, reconciling, and embracing the two vigorously competing narratives of Palestinians and Israelis from before 1948, but also incorporating the signal events of 1948, 1967, 1973, and 2001? At the first of what will be several meetings, scholars and writers from Palestine, Israel, Britain, and the U.S. discussed and argued about whether bridging narratives were useful and/or possible, whether the different myths were responses to or antecedents of the current conflict, and about the essential facts and reconstructions of the challenging events in their common and intertwined lives. A report on the heated first meeting of the group is contained in Deborah West, *Myth and Narrative in the Israeli-Palestinian Conflict*. A book, *History's Double Helix: The Intertwined Narratives of Israeli and Palestinian Conflict*, is being written.

UN Peacekeeping

How should the United Nations reform its overall approach to peacekeeping, peace enforcement, peace maintenance, and peace building—even state-building? Without a rapid reaction force of its own, or even national battalions ready to be dispatched to a UN-commanded operation, the UN bureaucracy remains severely handicapped by its need to secure a mandate from the Security Council on a basis that may or may not be timely, and by the necessity for the UN then to beg

both for financial support and for willing contributors of officers and troops to any peacekeeping or peace enforcement operation. As the failures in Rwanda and, initially, in Sierra Leone, suggest and the Brahimi Report underlined, the UN's capacity to act is seriously weakened by these and many other structural deficiencies. Few subjects are as compelling and as frustrating as reforming UN peace operations. The peace of the world clearly demands a UN with greater capacity to make and sustain peace within and across countries. How to provide that capacity practically and effectively continues to be the concern of the WPF Program. Rachel Gisselquist's report, WPF Report 31, *To Rid the Scourge of War: UN Peacekeeping Operations and Today's Crises* (2002) discusses these issues at length.

Failed States

The last decades of the twentieth century have experienced wholesale examples of state weakness, especially in Africa. Liberia, Sierra Leone, and Somalia—to cite but three of many cases where states have ceased for at least a time to function as states—are examples of collapsing or collapsed states. Others, not least in Central Asia, Southeast Asia, and Africa, are vulnerable. This project searched for effective guidelines on how best to restore states that have ceased to function well, and on how to prevent states (like the Democratic Republic of the Congo) from cascading into failure. This project was about reinvigorating and rejuvenating states such as Afghanistan. It was also about understanding why and how they stumble, and sometimes seem to collapse. The project asked whether some states should not be resurrected.

The project produced two major volumes and two articles. *When States Fail: Causes and Consequences*, edited by Robert I. Rotberg, will be published by Princeton University Press in late 2003. *State Weakness and State Failure in a Time of Terror*, Robert I. Rotberg (ed.), was published by the Brookings Institution Press in early 2003. Robert I. Rotberg's two articles are "The New Nature of Nation-State Failure" in *The Washington Quarterly*, and "Failed States in a World of Terror" in *Foreign Affairs*.

Cyprus

The Republic of Cyprus became independent from Britain in 1960, but intrastate conflict between Greek Cypriots and Turkish Cypriots soon became widespread, leading to a UN peacekeeping mission (United Nations Peace-keeping Force in Cyprus [UNFICYP], from 1964). From 1974, after a coup d'état in the Greek-speaking south and the landing of troops from Turkey in the Turkish-speaking north, the island became de facto partitioned. Approximately 18 percent of the island's total population and about 37 percent of the land of the island was thereafter situated north of the UN-monitored line that bisected the island, the remainder in the south. Over the years that separation became more complete, especially after various UN-brokered settlement attempts failed.

Meanwhile, as the separation intensified, the economy of the south prospered and the economy of the north, tied as it was Turkish mainland inflation, suffered significantly. By 2003, the south to north economic disparity per capita was about 5 to 1.

In 1998, the WPF Program turned its attentions to the problem of a Cyprus divided. The Program sought to determine if a resolution of this seemingly intractable conflict were possible and, if so,

how. After a conference held at the University of New Hampshire in 1998 and the publication of *Cyprus 2000: Divided or Federal?* (Cambridge, MA, 1998), a report and edited transcript by Robert I. Rotberg and Ericka A. Albaugh, and after consultations at the UN, in Cyprus, and in Washington and London, the Foundation was encouraged to initiate an exercise in Track II diplomacy.

Track II methods seek to improve the existing atmosphere for change by developing yes-able propositions and building trust between erstwhile antagonistic communities and their representatives. Ideally, too, Track II initiatives generate a set of ideas usable whenever an existing conflict, especially one of very long-standing, is ripe for settlement. Those ideas might address the political and economic structure of a settlement, suggest a range of confidence building measures, and/or provide a detailed blueprint for adoption by Track I negotiators. Sometimes, too, a successful Track II endeavor can help strengthen existing societal movements toward change. In 1999, 2000, and 2001, the Program's Cyprus Study Group—as it came to be called—formally met six times, and held several informal partial meetings.

Although the WPF Program's Track II work prepared a set of ideas that prepared the way for and informed the UN Secretary-General's elaborate 2002–2003 blueprint for a settlement of the Cypriot issue, the energetic diplomacy of the Secretary-General's special representative ended in failure in early 2003. That failure meant neither an end to the efforts of UN, the European Union, and the U.S. to arrange a settlement of the Cyprus conflict, nor a permanent victory for the (largely Turkish-speaking) leaders who had refused to accept the UN plan. The failure also reinvigorated the WPF Program's efforts to assist in negotiating a resolution of outstanding differences. Meetings and other activities were planned for late 2003 and early 2004.

THE WPF PROGRAM'S WEB SITE

Information about the WPF Program can be located at
<http://bcsia.ksg.harvard.edu/?program=WPF>.
Email reaches the WPF Program at world_peace@harvard.edu.

MEMBERS' ACTIVITIES

Robert I. Rotberg is Director, WPF Program on Intrastate Conflict, Conflict Prevention, and Conflict Resolution in the Belfer Center of the Kennedy School of Government, Harvard University, and President, World Peace Foundation. He was Professor of Political Science and History, MIT; Academic Vice President, Tufts University; and President, Lafayette College. He is a Presidential appointee to the Council of the National Endowment for the Humanities and a Trustee of Oberlin College. He is the author and editor of numerous books and articles on US foreign policy, Africa, Asia, and the Caribbean, most recently *State Failure and State Weakness in a Time of Terror* (2003), *Ending Autocracy, Enabling Democracy* (2002), *Peacekeeping and Peace Enforcement in Africa: Methods of Conflict Prevention* (2000), *Truth v. Justice: The Morality of Truth Commissions* (2000), *Creating Peace in Sri Lanka: Civil War and Reconciliation* (1999), *Burma: Prospects for a Democratic Future* (1998), *War and Peace in*

Southern Africa: Crime, Drugs, Armies, and Trade (1998), *Haiti Renewed: Political and Economic Prospects* (1997), *Vigilance and Vengeance: NGOs Preventing Ethnic Conflict in Divided Societies* (1996), *From Massacres to Genocide: The Media, Public Policy and Humanitarian Crises* (1996), and *The Founder: Cecil Rhodes and the Pursuit of Power* (1988).

Elisa Pepe joined the WPF Program on Intrastate Conflict, Conflict Prevention, and Conflict Resolution as Program Manager in October, 2001. Prior to joining the BCSIA, she was Staff Assistant for the WHO Commission on Macroeconomics and Health at the Center for International Development (CID) at Harvard. She holds a Master's degree in Development-Population-Environment from the Université Catholique de Louvain in Belgium and a B.A. in Political Science and French from Skidmore College. She has lived and worked in France, Belgium, South Korea, and India, and was a Peace Corps volunteer in the Comoros Islands.

Deborah West joined the WPF Program as a Program Associate in June, 1999. Prior to working at the BCSIA she served as Assistant to the Director of the Goethe-Institut Boston, a German cultural institute. She has a B.A. in German and History from Bowdoin College.

Mitsi Sellers, a Research Assistant with the WPF Program, recently completed her Master's degree in Theology from Harvard Divinity School. She is a graduate of Wheaton College with a degree in philosophy. She is a certified mediator through Harvard Law School and served as a trainer in capacity building in Mozambican refugee camps.

PUBLICATIONS

To review publications of the WPF Program on Intrastate Conflict, Conflict Prevention and Conflict Resolution and its members, see page 168.

EVENTS

To review events of the WPF Program on Intrastate Conflict, Conflict Prevention and Conflict Resolution and its members, see page 148.

CENTER-WIDE EVENTS

For more than two decades, the Center has had an extensive program of substantive seminars, events, and conferences. These regular meetings are sponsored by the Center's core, the four major programs, and many of its research projects within the programs — often in association with other academic institutions at Harvard or in the Cambridge area. These events serve all three of the Center's main purposes: research, training, and outreach.

BCSIA DIRECTOR'S SEMINAR SERIES

Director's seminars are designed primarily for important substantive presentations on subjects of interest to the Center by leading experts in the relevant field, whether from Harvard or beyond. Attendance is limited to BCSIA faculty, research fellows, and staff, and affiliated faculty and researchers from the Kennedy School, Harvard, and the Boston area. The seminars are held in the BCSIA Library and are catered.

September 10, 2002

Director's Seminar

"Sustainability, Science and International Affairs: A Look at the Johannesburg Summit"

William Clark, Faculty Chair, Harvey Brooks Professor of International Science, Public Policy, and Human Development, Member of the Board; Robert Corell, Senior Research Fellow

September 23, 2002

"Holy War, Inc."

Peter Bergen, Author and terrorism analyst

October 1, 2002

Director's Seminar

"Intervention and State Sovereignty"

Gareth Evans, President and CEO, International Crisis Group

October 8, 2002

Director's Seminar

"U.S. – German Relations"

AMB Wolfgang Ischinger, Ambassador of the Federal Republic of Germany to the U.S.

October 10, 2002

Director's Seminar

"Lessons from the Cuban Missile Crisis for the Nuclear Age"

Andrei Kokoshin, Member, Russian State Duma

October 18, 2002

Director's Seminar

"NATO and Iraq"

Nick Burns, U.S. Ambassador to NATO

October 30, 2002

Director's Seminar

"A Rip in Time: How the Bush Administration is Attempting to Reshape the World"

David Sanger, White House Correspondent, *The New York Times*

November 4, 2002

Director's Seminar

"America's Superpower and the World: A Progress Report from London"

Bill Emmott, Editor, *The Economist*

November 6, 2002

Director's Seminar

"Democratization of Satellite Images – Transparency or Threat?"

Dan Dubno, Producer and Technologist for CBS News

November 14, 2002

Director's Seminar

"Democracy and Russia"

Vladimir Pekhtin, Igor Dines and Yury Medvedev, Members of Russian State Duma

December 9, 2002

Director's Seminar

"The Role of the Nuclear Threat Initiative in Project Vinca"

Laura Holgate, NTI Vice President for Russia/NIS Programs

December 16, 2002

Director's Seminar

"Catastrophic Terrorism: What is to be Done?"

Richard Danzig, Director of National Semiconductor Corporation (NYSE) and the Human Genome Sciences (NASDAQ)

January 23, 2003

Director's Seminar

"A Perspective from the Russian General Staff"

Gen-Col Yury Baluyevsky

February 19, 2003

Director's Seminar

"The Future of Climate Negotiations"

Jan Pronk, Chair of the International Institute for Environment and Development (IIED)

February 21, 2003

Director's Seminar

"Securing the Homeland Against Terrorism"

Richard Falkenrath, Senior Director for Policy and Plans, Department of Homeland Security

February 27, 2003

Director's Seminar

"Nuclear Conflicts of the 21st Century"

Andrei Kokoshin, Member, Russian State Duma

March 10, 2003

Panel Discussion

"Keeping Terrorists Out of the Box: Examining Policies to Counter Seaborne Container Terrorism"

Graham Allison, Director, BCSIA; Jayson P. Ahern, Assistant Commissioner, Office of Field Operations, U.S. Customs Service; Rear Admiral Larry Hereth, Director Port Security, U.S. Coast Guard; Stephen M. Miller, Team Leader Maritime and Land Transport, Office of Transportation Policy, Bureau of Economic and Business Affairs; Brian D. Starer, Senior Partner, Holland and Knight, LLP

March 12, 2003

Chemical and Biological Weapons Colloquium

“The U.S., Europe and Iraq”

Andrew Gowers. Editor, *Financial Times*

March 20, 2003

“The Uncertainly Horrifying Prospect of BW: International Risks, Responses and Dilemmas”

Paul Schulte, U.K. Ministry of Defence

March 27, 2003

Chemical and Biological Weapons Colloquium

“The Legacy of Hiroshima”

Thomas C. Schelling, Distinguished Professor, Department of Economics and School of Public Affairs, University of Maryland and Lucius N. Littauer Professor of Political Economy, Emeritus, Harvard University

March 31, 2003

Director’s Seminar

“Policy Frontiers in Preventing Deadly Conflicts”

David Hamburg, President Emeritus of Carnegie Corporation of New York

April 2, 2003

Joint seminar with the Institute of Politics

“Terrorism, the Middle East and the World’s Future”

George McGovern, Former Ambassador and Senator

April 3, 2003

Panel Discussion

“Beyond Duct Tape: How Citizens Can Prepare to Meet Coming Terrorist Attacks”

Juliette N. Kayyem, Executive Director, Executive Session on Domestic Preparedness; Graham Allison, Director, BCSIA; Ralph Timperi, Assistant Commissioner of Massachusetts Dept. of Public Health; Richard Swenson, Office of Commonwealth Security, State of Massachusetts; Robert Blendon, Professor of Health and Political Analysis, Harvard School of Public Health; Joe Bergantino, Investigative Reporter, WBZ4 TV

April 3, 2003

Chemical and Biological Weapons Colloquium

“Biological Weapons in the International System: Future Prospects”

Ambassador Donald Mahley, Acting Deputy Assistant Secretary for Multilateral and Conventional Arms Control, U.S. Department of State

April 17, 2003

Director’s Seminar

“Transatlantic Relations”

Kurt Biedenkopf, Former Minister President of Saxony

April 17, 2003

Chemical and Biological Weapons Colloquium

“The Future of the Chemical Weapons Ban”

Robert Mikulak, Director, Office of Chemical and Biological Weapons Conventions, Bureau of Arms Control, U.S. Department of State

April 21, 2003

Director's Seminar

"An Update on Iraq and Terrorism"

Peter Rodman, Assistant Secretary of Defense of International Security Affairs

April 24, 2003

Panel Discussion

"U.S. and R.O.K. Relations"

Mr. Sung-min Jang, Visiting Scholar, Duke University; Dr. Sung-yoon Lee, Fletcher School of Law and Diplomacy;

Mr. Robert Carlin, Korean Energy Development Organization; COL Richard Parker, United States Army

April 24, 2003

Chemical and Biological Weapons Colloquium

"Making Threats: The History of the British Biological Weapons Programme"

Dr. Brian Balmer, Senior Lecturer in Science Policy, Science and Technology Studies, University College London

April 28, 2003

Brown Bag Lunch

"National Security Fellows Discussion with Rear Admiral Murrett"

Rear Admiral Robert B. Murrett, United States Navy, Vice Director for Intelligence, J2, Joint Staff

May 3, 2002

"Security and Conflict in Central Asia and the Caspian Region: Does 'the Caspian Smell Blood' or Peace?"

Boris Shikhmuradov, Former Minister of Foreign Affairs of Turkmenistan

May 15, 2002

"U.S. Diplomacy After 9/11"

Marc Grossman, Under Secretary for Political Affairs, U.S. Department of State

BCSIA FORUM EVENTS

The Kennedy School's ARCO Forum of Public Affairs is an internationally acclaimed venue for speeches by heads of state; leaders in politics, government, business, labor, and the press; policy analysts; and community organizers. Forum events, which can hold up to 500 people, are open to the public and are often recorded for television and radio broadcast. BCSIA cosponsors and helps to invite speakers from all four of its program areas.

September 18, 2002

"Public Service in the Aftermath of 9/11"

The Honorable Bill Cohen, U.S. Secretary of Defense (1997-2001); U.S. Senator (R-ME, 1978-1996)

October 17, 2002

"Iraq: Should We Attack Now?"

Panel discussion with Graham Allison, Director, BCSIA; William Kristol, Founder and Editor of *The Weekly Standard*; John Deutch, Institute Professor, MIT

October 18, 2002

"40th Anniversary of the Cuban Missile Crisis"

Panel discussion with Graham Allison, Director, BCSIA; Robert McNamara, Defense Secretary under Presidents Kennedy and Johnson; Theodore Sorenson, Former special counsel and adviser to President John F. Kennedy

January 27, 2003

“How Political Corruption Fueled the SUV Explosion”
Arianna Huffington, Syndicated Columnist and Author

January 29, 2003

“Crisis on the Korean Peninsula”
Ashton Carter, Co-Director, Preventative Defense Project

February 3, 2003

“The Promise and Problems of American Power”
Bill Emmott, Editor, *The Economist*

February 10, 2003

“Reinstituting the Draft”
Charles Rangel, (D-NY), U.S. House of Representatives

April 2, 2003

“Assessing the Military Campaign”
Panel discussion with Graham Allison, Director, BCSIA; John Reppert, Executive Director, BCSIA; Tad Oelstrom, National Security Program, KSG; Sarah Sewall, Program Director, Carr Center for Human Rights Policy; John White, Lecturer in Public Policy, KSG

BCSIA BOARD OF DIRECTORS’ MEETINGS

The BCSIA Board of Directors meets every Tuesday of the academic year. The purpose of the meetings is to allow Board Members to keep abreast of the research projects under way across the Center’s areas of expertise, and to maintain the sense of community and ownership among the Center’s leaders. The focus of these meetings is an interdisciplinary seminar, about half of which are led by Board members, and the other half by distinguished outside guests. Most meetings take place in the BCSIA Library over lunch; the third meeting of each month, however, takes place off-site over dinner.

September 24, 2002

“Iraq: How Did We Get to Where We Are and What Should we Do Next?”
Senator Warren Rudman

October 1, 2002

“Managing International Crises”
Gareth Evans, President and CEO, International Crisis Group

October 8, 2002

“German-American Relations”
Ambassador Wolfgang Ischinger, German Ambassador to the United States

October 15, 2002

“Military Options for Iraq”
James Roche, Secretary of the Air Force

October 22, 2002

“Economic Aspects of Globalization”

Lawrence Summers, President, Harvard University

October 29, 2001

Business meeting

November 5, 2002

“Energy Policy in the Bush Administration”

Frank Blake, Former Deputy Secretary of Energy

November 12, 2002

“Debating Iraq”

Discussion led by BCSIA members, Graham Allison, Ash Carter, Stephen Walt

November 19, 2002

“American Elections and American Foreign Policy”

David Gergen, Professor of Public Service, Kennedy School of Government

November 26, 2002

“An Update from the Middle East”

Shai Feldman, Head of the Jaffee Center for Strategic Studies at Tel Aviv University

December 3, 2002

Business meeting

December 10, 2002

“The North Korean Crisis: What are Our Options”

Ash Carter, Co-Director, Preventive Defense Project

December 17, 2002

Holiday Dinner

February 11, 2003

“Current Issues Facing the UN Security Council”

John Ruggie, Director, Center for Business and Government

February 25, 2003

Business meeting

March 4, 2003

“The Challenges of Military Diplomacy in Africa”

General Carlton Fulford (ret), USMC, former Deputy Commanding General for US European Command

March 11, 2003

“An Update on the North Korean Dilemma”

Ash Carter, Co-Director, Preventive Defense Project

March 18, 2003

“Betting about War with Iraq and Its Consequences”

Internal Board discussion

April 1, 2003

“Humanitarian Intervention: The Lessons from UNHCR”

Sadako Ogata, Research Fellow and Scholar in Residence at the Ford Foundation

April 8, 2002

“Biodefense Strategies”

Tara O’Toole, Director of the Johns Hopkins University Center for Civilian Biodefense Strategies and a member of the faculty of the School of Hygiene and Public Health

April 14, 2002

"The Evolution of the Intelligence Community from 9/11 to Iraq"

Stanley Moskowitz, Director of Congressional Affairs for the CIA

April 22, 2003

Business meeting

April 29, 2003

“The War in Iraq: What Does it Mean for the Middle East”

Dennis Ross, Distinguished Fellow and Counselor at the Washington Institute for Near East Policy

May 6, 2003

“Thirteen Plus One: A Comparison of Global Climate Policy Architectures”

Rob Stavins, Albert Pratt Professor of Business and Government, Kennedy School of Government

May 13, 2003

“Pheidole in the New World”

Edward O. Wilson, Pellegrino Research Professor in Entomology at Harvard

May 20, 2003

Final Dinner

OTHER BCSIA EVENTS**September 17, 2002**

BCSIA Orientation

November 22-23, 2002

Security Transformation Conference

Co-sponsored with the Army War College

November 14-16, 2002

Russian Investment Symposium

December 20, 2002

Holiday Party

April 9-10, 2003

International Council Meeting

May 22, 2003

BCSIA End of the Year Party

Events and Seminar Series

July 11, 2002

Mehmet Ogutcu, Organization for Economic Cooperation and Development's Non-Members Liaison Group and Global Forum on International Investment, "Turkey's Energy Policies In the Context of Eurasian Geopolitics"

September 18, 2002

Wasfi Kailani, University of Yarmouk
"Chechens in the Middle East: Between Original and Host Cultures"

October 22, 2002

Ilham Aliyev, First Vice-President of the State Oil Company of Azerbaijan (SOCAR) and Member of the *Milli Majlis* (Parliament),
"South Caucasus and the Caspian: A View from Baku" (Co-sponsored with SAIS and USACC in Washington D.C.)

November 26, 2002

Miriam Lansky, Jessica Stern, and Monica Toft, panel discussion on "Russia's Struggle with Chechnya: Implications for the War on Terrorism."

February 21, 2003

Kanat Bozumbayev, President of the Kazakhstan Electricity Grid Operating Company (KEGOC), "Lessons from Kazakhstan's Successful Electricity Reform"

March 7, 2003

Steven E. Miller, ISP Director,
"Current Trends in U.S. Foreign Policy: Implications for the Caspian"

March 12, 2003

Brenda Shaffer, Chen Zak, and Steven E. Miller, panel discussion on
"The Forgotten Threat? Iran and Weapons of Mass Destruction"

April 23, 2003

Kalman Mizsei, Assistant Administrator and Director of the Regional Bureau for Europe and the Commonwealth of Independent States of the UN Development Program (UNDP) and Assistant Secretary-General of the UN, "Eastern Europe and the Commonwealth of Independent States: UNDP's Perspective of Development and Integration Challenges."
(Co-sponsored by the Center for International Development and the Kokkalis Program on Southeastern and East-Central Europe)

May 8, 2003

Richard Morningstar, Former special advisor to President Clinton on Caspian energy issues and former U.S. ambassador to the European Union, “From Pipedream to Pipeline: The Realization of the Baku-Tbilisi-Ceyhan Pipeline.”

May 13, 2003

Elman Agayev, Mamuka Kudava, and Ashot Voskanian, panel discussion on “U.S. Security and Military Cooperation with the Countries of the South Caucasus: Successes and Shortcomings.”

ENVIRONMENT AND NATURAL RESOURCES PROGRAM

ENVIRONMENT AND NATURAL RESOURCES PROGRAM EVENTS

As part of its outreach initiative, ENRP brings key players to the Kennedy School of Government. ENRP co-sponsors Forum events at which environmental leaders give major policy addresses and seminars where ENRP researchers confer with policy-makers and leading academics. ENRP in concert with other programs convenes research seminars, workshops and executive sessions that bring together senior officials from government, industry, academia, and interest groups to discuss critical policy issues in a neutral setting.

September 10, 2002

BCSIA's Director's Luncheon

Sustainability, Science and International Affairs: A Look at the Johannesburg Summit

William Clark, Calestous Juma, Robert Corell

September 19, 2002

Science and Technology for Sustainable Development Seminar

Technology and Sustainability: Implications of the Outcomes of the World Summit on Sustainable Development, Calestous Juma

September 26-27, 2002

Conference

Harvard Electricity Policy Group Twenty-Ninth Plenary Session

September 26, 2002

ARCO Forum

Designing Power Markets that Work

William Massey, Federal Energy Regulatory Commissioner; Theresa Flaim, Senior Vice President, TVA

October 1, 2002

ARCO Forum -- The John Sawhill Lecture

The Future of Life: The Global Conservation Challenge

Edward O. Wilson; respondents: Ian Bowles, Senior Research Fellow, ENRP; Laura Johnson, President, Massachusetts Audubon Society

October 3, 2002

Science and Technology for Sustainable Development Seminar

Geographic Information and Sustainable Development in Africa: Opportunities for International Partnerships, Calestous Juma

October 11, 2002

Science and Technology for Sustainable Development Seminar

Development Studies and the Sustainability Challenge: Institutional Challenges for the 21st Century

Kurt Hoffman, Director, Shell Foundation, London, UK

October 16, 2002

Seminar in Environmental Economics and Policy

Endogenous Technological Change in the DICE Model of Global Warming

David Popp, Syracuse University

October 17, 2002

Science and Technology for Sustainable Development Seminar

International Environmental Policy Making in the White House: Inside Perspectives, Ian Bowles, Senior Research Fellow, ENRP

October 31, 2002

Science and Technology for Sustainable Development Seminar

After the Johannesburg Summit: The Politics of Sustainable Development

Leslie Carothers, Vice President, Environmental Health and Safety, United Technologies Corporation

November 5, 2002

BCSIA's Director's Luncheon

Energy Policy in the Bush Administration

Frank Blake, former Deputy Secretary for the U.S. Department of Energy

November 7, 2002

Science and Technology for Sustainable Development Seminar

A Comparative Analysis of Research Systems in Agriculture and Climate Forecasting

David Cash, Research Associate, ENRP, and Jonathan Borck, Ph.D. candidate

November 13, 2002

Lecture

The Near Term Impacts on Public Health from Greenhouse Gas Emissions

Devra Davis, Heinz School of Public Policy, Carnegie Mellon University

November 14, 2002

Science and Technology for Sustainable Development Seminar

Technology Investments in Aerospace Among Asian NIEs: Sustainable Policy or Not?

Sören Eriksson, Assistant Professor of Economic Geography, Jönköping International Business School, Jönköping, Sweden

December 5, 2002

Science and Technology for Sustainable Development Seminar

Induced Technical Change for Sustainability, Arnulf Grübler, Senior Research Scholar,

International Institute for Applied Systems Analysis, Laxenburg, Austria

December 12, 2002

Seminar

Facilitating Partnerships: Engaging the Private Sector, Governments, and Nongovernmental Organizations in the Dialogue to Accelerate the Use of Science and Technology for Sustainable Development

Sir Crispin Tickell, Chairman Board of Directors, Climate Institute, Washington DC, and Chancellor, University of Kent; Co-sponsored with STPP and CID

January 30, 2003

Science and Technology for Sustainable Development Seminar

Local Action Moves the World, Julian Agyeman, Assistant Professor, Department of Urban and Environmental Planning, Tufts University

January 30-31, 2003

Conference

Harvard Electricity Policy Group Thirtieth Plenary Session, Rancho Mirage, California

February 5, 2003

Seminar in Environmental Economics and Policy

Discounting the Future When Technological Progress is Uncertain

Martin Weitzman, Harvard University

February 6, 2003

Science and Technology for Sustainable Development Seminar

Science and Technology for Livable Cities: The Implications for Water and Wastewater

Arthur Goldstein, Chairman, Ionics

February 11, 2003

Science and Technology for Sustainable Development Seminar

A Water Resource Threshold and Its Implication for Food Security, Alexander J.B. Zehnder, Director, Swiss Federal Institute for Environmental Science and Technology (EAWAG), Zurich, Switzerland

February 14, 2003

Roundtable Discussion

Fostering Development of Low-Carbon Technology: Insights from the United Kingdom's \$2 billion/year Programme

Michael Grubb, Visiting Professor of Climate Change and Energy Policy, Imperial College, London

February 19, 2003

Lecture

The Future of Climate Change Negotiations

Jan Pronk, Chair, International Institute for Environment and Development, UN Secretary-General's Special Envoy to the Johannesburg Summit, and former Environment Minister, The Netherlands

Co-sponsored with the student Environment and Energy Professional Interest Council

February 19, 2003

Seminar in Environmental Economics and Policy

"Optimal" Pollution Abatement: Whose Benefits Matter and How Much?

Wayne Gray, Clark University and Ronald Shadbegian, University of Massachusetts at Dartmouth

February 20, 2003

Science and Technology for Sustainable Development Seminar

Can Reactive Nitrogen Be Managed Sustainably? William Moomaw, Tufts University

March 5, 2003

Seminar in Environmental Economics and Policy

The Economics of Brownfields - with an Application to Somerville, Massachusetts

Jeffrey Zabel, Tufts University

March 6, 2003

Science and Technology for Sustainable Development Seminar

Technology and Development in Africa

Mark Shuttleworth, Founder, Thawte Digital Certificates, South Africa

March 19, 2003

Seminar in Environmental Economics and Policy

Governance and Global Timber Supplies

Jeffrey Vincent, University of California, San Diego

April 2, 2003

Seminar in Environmental Economics and Policy

International Environmental Agreements and the Veil of Uncertainty

Charles Kolstad, University of California, Santa Barbara

April 3, 2003

Panel Discussion and Ceremony

2003 Roy Family Award Recipient: The Noel Kempff Mercado Climate Action Project

Pushing the Frontiers of Environmental Conservation: Public-Private Partnerships

for Sustainable Development -- E. Linn Draper, Chairman, CEO and President, American Electric Power; Hon. Jaime Aparicio, Bolivian Ambassador to the US; Gregory Miller, Vice President & Director, Andes Division, The Nature Conservancy; Jaime Rozenman, President, Fundacion Amigos de la Naturaleza, Bolivia; Bill Edmonds, Director of Environmental Policy, PacifiCorp; and Donna Kraisinger, Vice President, Health, Safety & Environment, BP

April 9, 2003

Seminar in Environmental Economics and Policy

Devolution, Political Markets, and Market Power with an Application to the Clean Water Act

J.R. DeShazo, University of California, Los Angeles

April 15, 2003

Awards Dinner and Lecture

Annual Environmental Awards Dinner for Students and Members of the Kennedy School Environmental Council, Speaker: Ellen Roy Herzfelder, Massachusetts Secretary of the Environment

April 17, 2003

Science and Technology for Sustainable Development Seminar
Vulnerable Witnesses: Indigenous Peoples and Understanding Environmental and Social Change in the Arctic, Marybeth Long Martello, Research Associate, ENRP

April 23, 2003

Seminar in Environmental Economics and Policy
Global Disease Eradication, Scott Barrett, John Hopkins University

May 1, 2003

Science and Technology for Sustainable Development Seminar
Exploring Sustainability Through Vulnerability Assessment: The Case of Downscaling Climate Projections in Northern Norway, Colin Polsky, Research Fellow, ENRP

May 8, 2003

Seminar
Discussion with Carol Browner, Former Administrator, U.S. Environmental Protection Agency, 1993-2001

May 14, 2003

Executive Session
Oil and Security Executive Session
Topics: How has oil security changed over the past 20 years? Designing oil security policy for the next 20 years

May 15, 2003

Science and Technology for Sustainable Development Seminar
Case Studies on Harnessing Science and Technology for Sustainability
Vanessa Timmer, Research Fellow, ENRP and David Cash, Research Associate, ENRP

May 15, 2003

Science and Technology for Sustainable Development Seminar
Perspectives on the Emergence and Settlement of Biodiversity: Reconciling Approaches in the Context of Sustainable Development, Frederique Santerre, Research Fellow, STPP

May 22, 2003

Science and Technology for Sustainable Development Seminar
The Institutional Dimensions of Fisheries Stock Assessments, Frank Alcock, Research Fellow, ENRP

May 25-26, 2003

Conference

Harvard Electricity Policy Group Thirty-First Plenary Session

June 10, 2003

Science and Technology for Sustainable Development Seminar

The Thirty-Year Quest for Sustainability: A Historical Look at the 1972 Stockholm Conference and Beyond, Henrik Selin, Wallenberg Fellow in the Environment and Sustainability, MIT, and Björn-Ola Linnér, Assistant Professor, Department of Water and Environmental Studies, Linköping University, Sweden

INTERNATIONAL SECURITY PROGRAM

ISP BROWN BAG SEMINARS

The brown bags provide an opportunity for BCSIA research fellows and visiting scholars to discuss their ongoing projects in an informal setting. Speakers present their work and then field questions from the audience.

- 19 September Monica Toft, Assistant Professor in International Relations
"The Demographic Death of States".
- 26 September Kevin Narizny, Fellow, International Security Program
"Rational Idealism: The Political Economy of Internationalism in the United States and Great Britain, 1870-1945"
- 3 October Lucy Chester, Fellow, International Security Program,
"Drawing the Indo-Pakistani Boundary During the 1947 Partition of South Asia"
- 10 October Jeremy Weinstein,
"When Revolutionaries Become Killers: Sources of Violence in Civil War".
- 24 October Arman Grigorian, Fellow, International Security Program,
"Causal Mechanisms Explaining the Escalation of State-Minority Disputes in Response to Interventions".
- 31 October Ben Runkle Fellow, International Security Program,
"Symptom or Disease?: Arms Races and the Causes of War"
- 7 November Roberto Belloni, International Security Program
"Peacebuilding in Divided Societies"
- 14 November Jeremy Pressman, Fellow, International Security Program,
"Alliances as Restraining Devices"
- 21 November Sarah Lischer, Fellow, International Security Program
"Humanitarian Assistance and the Spread of Intrastate Conflict"
- 5 December Margaret Sloane, Fellow, International Security Program
Iraq's Forced Admission of its Biological Weapons Program
- 12 December Bonnie Jenkins, Fellow, International Security Program
"Theories of Nuclear Weapons Decision Making: The Cases of India and Japan"

- 6 February Aaronette White, ISP/WAPPP Fellow,
African Women Guerilla Soldiers: Engineering War and Peace
- 13 February Kerry Fosher, International Security Fellow
Anthropological Approaches to Homeland Security in the Boston Area
- 20 February Marie Besancon, ISP/WAPPP Fellow,
Gender, Greed, and Grievance Causes in Ethnic Conflicts
- 27 February David Rezvani, International Security Fellow
Federacy: The Dynamics of Se,mi-Sovereign Territories
- 6 March Jean Mulot, International Security Fellow
Terrorism – The Bird’s Eye Perspective Belfer Center for Science and
International Affairs
- 13 March Renske Dooresnpleet, ISP/WPF Fellow
Democratic Institutions, Political Stability and the Lack of Violence in New
Democracies
- 3 April Kendall Hoyt, International Security Fellow
Asymmetric Advantages: Organizing Science for Biodefense
- 10 April Matthew Bunn, Senior Research Associate, Managing the Atom Program
Downsizng andConverting Russia’s Nuclear Weapons Complex: Is There Any
Hope?
- 17 April Chen Zak, ISP/STPP Fellow
Iraq’s and North Korea’s Nuclear Weapons Program – an IABA’s Regime
Failure?
- 24 April Mark Haas, International Security Fellow
Ideology, Threat Perception, and Great Power Politics
- 1 May Christopher Twomey, International Security Fellow
How Different Theories of Victory Worsen International Conflict: Cases from
Early Cold War Sino-American Relations

SCIENCE, TECHNOLOGY, AND PUBLIC POLICY PROGRAM

STPP SEMINARS

09/23/2002

International Conference on Science and Technology: Emerging Policy Options
Conference
Weatherhead Center for International Affairs (WCFIA)

10/04/2002

Biotechnology Opportunities and Challenges in the Amazon Region
Seminar

10/09/2002

BCSIA New Research Fellow Orientation
Special Event

11/19/2002

STPP Seminar on Living with Terrorism: Can Science and Technology Make Us Safer?

11/26/2002

STPP/TPP Seminar on Improving Urban Air Quality: The Mexico City Project

12/04/2002

STPP Seminar on Science, Technology and Innovation and the UN Millennium Project

12/12/2002

Seminar on Information, Institutions and Governance

12/16/2002

BCSIA Director's Luncheon Catastrophic Terrorism: What is to be Done?

01/17/2003

STPP Seminar: Radiological Weapons Working Group Meeting
MTA Project

02/18/2003

Beyond Late Development: Upgrading Policies in Taiwan
Seminar

02/19/2003

STPP Seminar: War In Iraq: Regional Repercussions and the Impact on American Foreign
Policy
Special Event
MTA Project

02/20/2003

STPP Seminar: Energy Technology Innovation Policy

02/28/2003

STPP Seminar: Fostering U.S.-Indian Dialogue on the Security of Indian Nuclear Installations
MTA Project

03/05/2003

STPP Seminar: Weapons of Mass Destruction
MTA Project

03/06/2003

STPP Seminar: Foreign Direct Investment as a Vehicle for Deploying Cleaner Technologies:
The Big Three in China
ETIP Project

03/06/2003

Technology and Development in Africa
Seminar

03/10/2003

Challenges and Opportunities of Biotechnology and Development

03/13/2003

STPP Seminar: Chinese Perspectives on US Space Plans
MTA Project

03/13/2003

What Is a Knowledge-based Organization?
Seminar
National Center for Digital Government Project

03/17/2003

STPP Seminar: Global Environmental Assessment: What Works?
Joint with MIT

03/19/2003

STPP Seminar: Weapons of Mass Destruction 101
Round Table Discussion
MTA Project

03/20/2003

STPP Seminar: Moving to Cleaner Vehicle Technology: Opportunities and Barriers for China's
Auto Industry
ETIP Project

03/25/2003

STPP Seminar: Co-operative Learning and Knowledge Exchange Networks - Concept, Taxonomy and Cases

03/25/2003

STPP Seminar: Competitive Learning and Knowledge Exchange Networks - Concept, Taxonomy and Case

04/07/2003

Bridging the Digital Divide: An Impact Assessment in Rural India
Seminar

04/08/2003

STPP Seminar: Catastrophic System Failure: All for the Loss of a Horseshoe Nail
Seminar

04/14/2003

Growing Up and Moving Out: Globalization of 'Traditional' Industries in Taiwan
Seminar

04/17/2003

Information and Communication Technologies for Development: Fostering International Cooperation
Lecture

04/21/2003

Institutionalizing On-Line Democratic Deliberation
Seminar
National Center for Digital Government Project Administrator

04/21/2003

Taiwan's Acquisition of Technology
Seminar

04/24/2003

STPP Seminar: Clean Coal Technologies for Electricity Generation: Comparison of Plant Performance and Costs
ETIP Program

04/28/2003

The Virtual Citizen: Identity, Autonomy, and Accountability: A Civic Scenario Exploration of the Role of Identity in On-Line Governance
Workshop
National Center for Digital Government Project

04/30/2003

Institution-building for Technology Innovation in Developing Countries
Seminar

05/05/2003

STPP Seminar: Digital Government in Developing Countries – Issues and Strategies

05/12/2003

The Political Economy of Transparency: What Makes Disclosure Policies Sustainable?
Seminar
National Center for Digital Government Project Administrator

05/22/2003

STPP Seminar: Long-term Transition Paths Towards Sustainable Energy Systems

06/11/2003

Managing the Atom Seminar Series: Summer Brown Bags
Brown Bag Lunch
MTA Project

06/25/2003

STPP Seminar: Summer Brown Bags
MTA Project

06/30/2003

STPP Seminar: Summer Brown Bags
An Informal Discussion of the History of Negotiation of the Nonproliferation Treaty and Its
Safeguards Provisions
MTA Project

MTA SEMINARS AND RELATED EVENTS

MTA SEMINARS

John Holdren, "Civilian and Military Applications of Nuclear Technology: Current Issues and
Challenges," September 24, 2002

Matthew Bunn, "Cleaning Out Vulnerable Nuclear Material Sites and Building Stringent Global
Nuclear Security Standards: Two Steps to Prevent Nuclear Terrorism and Proliferation," October
1, 2002

Clark Abt, "Container Security at the Nation's Ports: Preventing Illicit Nuclear and Biological
Cargo," October 8, 2002

Chen Zak, "Trust, Verification and Effective Safeguards: Loopholes in the Nuclear Verification
Regime," October 15, 2002

Bob van der Zwaan, "On the Future of Nuclear Energy," October 22, 2002

Subrata Ghoshroy, "Science, National Security and Accountability: The Missile Defense Program," October 29, 2002

Open Discussion, Research and Current Events (Iraq), November 5, 2002

Open Discussion, Research and Current Events Part II, November 12, 2002

Lewis Branscomb, "Living with Terrorism: Can Science and Technology Make Us Safer?" November 19, 2002

Luisa and Mario Molina, "Improving Urban Air Quality: The Mexico City Project," November 26, 2002

Bonnie Jenkins, "State Compliance with Nuclear Nonproliferation Norms and Rules: Why States do not Choose the Nuclear Option," December 3, 2002

Arjun Makhijani, "The Nuclear Legacy: DOE and the Clean-up of America's Nuclear Facilities," December 10, 2002

Matthew Bunn and Anthony Wier, discussion of draft report, "Controlling Nuclear Warheads and Materials: A Report Card and Action Plan," February 13, 2003

Matthew Bunn and A. Gopalakrishnan, "Fostering U.S.-Indian Dialogue on the Security of Indian Nuclear Installations," February 27, 2003

Hui Zhang, "Chinese Perspectives on U.S. Space Plans," March 13, 2003

Maurizio Martellini, "Some Considerations about the States of Concern: A Road Map for the DPRK", April 17, 2003

John Park, "Resolving the North Korean Nuclear Crisis," May 1, 2003

Dmitry Kovchegin, "Problems of Access in U.S.-Russian Nonproliferation Cooperation," May 29, 2003

MTA/IOP "WMD 101" SEMINARS

James Walsh, February 26, 2003

John Park and Adinarayantampi Gopalakrishnan, March 5, 2003

Anthony Wier, March 19, 2003

Matthew Meselson and Jeanne Guillemin, April 2, 2003

Bob Gallucci, April 9, 2003

US Senator Jack Reed April 16, 2003

RADIOLOGICAL WEAPONS WORKING GROUP MEETINGS

10/08/02

Rad Group meeting #1: Introduction

10/22/02

Rad Group #2: Summaries and discussions of readings; topic discussions: Chen Zak: defining Radiological Weapons/Attacks; Bonnie Jenkins: International Legal Instruments; Jim Walsh: Terrorism and WMD

10/29/02

Rad Group #3: Discussion of definitions: not nuclear weapons, deliberate regardless of motivations; goals? Topic Discussions: Annaliis Abrego: Caspian/Caucasus radiological weapons; Alex Glaser: Scenarios; Margaret Sloane: Fed System to handle rad events; Jim Walsh: terrorism

11/05/02

Rad Group #4: Summaries and discussions of readings; topic discussions: Alex Glaser: Scenarios; Bonnie Jenkins: International Legal Instruments; Margaret Sloane: Federal Response; Jim Walsh: Terrorism

11/19/02

Rad Group #5: Discussion of recent Boston rad drill by Joe Ring and Julie Hanlon; presentations and Discussions: Ken Czerwinski, radiation; Alex Glaser: scenarios; Jim Walsh: terrorism.

12/03/02

Rad Group #6: Presentations and discussions: Andrea Gabbitas: Chernobyl; Malini Daniel/Jim Walsh, "Terrorism"

12/10/02

Rad Group #7: Presentations and discussions: Leah Litman: Goiania, Anthony Wier: Oklahoma City

1/21/03

Rad Group #8: Assignment of outlines for papers; Joe Pace presentation, Aum; Hui Zhang presentation, Sabotage of SFP.

1/28/03

Rad Group #9: Collection and discussion of outlines for papers, Paul Schulte presentation

2/04/03

Rad Group #10: Discussion of outlines, preliminary papers; presentation, Whitney Wraas, environmental remediation

2/18/03

Rad Group #11: Continued discussion of outlines, preliminary papers

2/25/03

Rad Group #12: Discussion of Rad Group trip to Vienna for conference; preliminary papers; Subrata Ghoshroy presentation, Tokaimura; Leah Litman presentation, Goiania; Andrea Gabbitas presentation, Chernobyl

3/04/03

Rad Group #13: Presentation by Paul Schulte and John Park; distribution of papers for reading and editing

3/18/03

Rad Group #14: Continued distribution of papers and general discussion

5/13/03

Rad Group #15; Discussion of papers

5/27/03

Rad Group #16: Discussion of papers; break for summer

OTHER MTA EVENTS

2/19/03

Debate on Iraq (James Walsh and John Garofano), co-sponsored by World Affairs Council (WorldBoston).

4/10/03

“Media Coverage and the War in Iraq,” co-sponsored by World Affairs Council (WorldBoston); panel discussion with Jim Walsh as moderator.

WPF PROGRAM ON INTRASTATE CONFLICT, CONFLICT PREVENTION AND CONFLICT RESOLUTION

In fulfilling its mission to understand and prevent intrastate conflict, the WPF Program sponsors meetings, conferences, and occasional lectures aimed at bringing together academics, policymakers, and diplomats to discuss ways to move toward peace in specific conflicts, as well as larger issues in the area of conflict prevention.

December 12, 2002

“After the Riots: Islamic Law and the Future of Nigeria”

A Kennedy School Forum with Ayesha Imam, Baobab for Women’s Human Rights; Ayo Obe, Civil Liberties Organization, Lagos; and Aliyu Modibbo Umar, Office of the Chief of Staff of President Olusegun Obasanjo; chaired by Robert I. Rotberg.

December 12–14, 2002

“Nigeria: Unity, Governance, Law, and Conflict”

A conference at the Kennedy School with 40 U.S. and Nigerian participants, including former Head of State General Yakubu Gowon; chaired by Robert I. Rotberg.

January 16–19, 2003

“Post-Conflict Reconciliation”

A conference in Botswana with participants including President Festus Mogae; co-chaired by Robert I. Rotberg.

February 19, 2003

“Measuring Governance I”

A conference at the Kennedy School to discuss measuring governance in the developing world.

February 27–March 1, 2003

“Myth and Narrative in the Israeli/Palestinian Conflict”

A conference at the Kennedy School with 40 participants, including scholars from Israel, Palestine, Europe, and the United States; chaired by Robert I. Rotberg.

March 13, 2003

“Misery in Zimbabwe: an Informed Insider’s View”

A seminar at the Kennedy School with Geoff Nyarota, Nieman Fellow at Harvard University and founding editor of Zimbabwe’s only independent newspaper.

April 8, 2003

“Roundtable: The Future of Cyprus”

A roundtable at the Center for European Studies with Mustafa Akinci, deputy prime minister of TRNC and former mayor of Nicosia (North); chaired by Robert I. Rotberg, co-sponsored by the Kokkalis Program.

May 9–10, 2003

“Measuring Governance II”

A conference at the Kennedy School with 40 participants from academia, government, and NGOs, including Jeffrey Herbst, Princeton University; Stephen Krasner, Stanford University; and Bruce Russett, Yale University; chaired by Robert I. Rotberg.

May 15–17, 2003

“African Leadership”

A conference with current and former African leaders, chaired by Robert I. Rotberg.

Publications

ARTICLES AND PAPERS

Graham Allison, "Prospects for Containing Future Terrorism," chapter in *Investing Under Fire: Winning Strategies from the Masters for Bulls, Bears, and the Bewildered*, Bloomberg Press, 2003.

Graham Allison, "The New Containment," *The National Interest*, Fall 2002 with Andrei Kokoshin

Graham Allison, Introduction to *Epicenter of Peace*, Nursultan Nazabayev, Hollis Publishing, 18 April 2002

Graham Allison, "Deepening Russian Democracy," *Harvard International Review*, Summer 2002

NEWSPAPER COLUMNS

Graham Allison, "We're Still Vulnerable," *Boston Globe*, 12 September 2003

Graham Allison, "Political Prosecutions Threaten Russia's Ambitions," *Wall Street Journal Europe*, 1 September 2003

Graham Allison, "Nuclear Terrorism Poses the Gravest Threat Today," *Wall Street Journal Europe*, 14 July 2003

Graham Allison, "A War Played to Many Audiences," *Boston Globe*, 31, March 2003

Graham Allison, "Dirty Bombs: Preparing for Terrorism," *NOVA online*, 21 February 2003

Graham Allison, "Unprepared for Smallpox," *The Washington Post*, 26 December 2002

Encounter article on Graham Allison in *The Boston Globe Magazine*, 1 December 2002

Graham Allison, "Time Isn't On America's Side," *LA Times*, 15 November 2002

Graham Allison, "Is Iraq like the Cuba crisis? It's worth Bush considering," *Christian Science Monitor*, 31 October 2002

Graham Allison, "Is Bush Provoking an Attack?" *Boston Globe*, 12 October 2002

Graham Allison, "The View from Baghdad," *The Washington Post*, 31 July 2002

CASPIAN STUDIES PROGRAM

BOOKS AND Research Reports

Allison, Graham and John Grennan, "U.S. Policy on Russian and Caspian Oil Exports: Addressing America's Oil Addiction," (Cambridge, Mass.: Caspian Studies Program, 2002).

Shaffer, Brenda, *Borders and Brethren: Iran and the Challenge of Azerbaijani Identity* (Cambridge, Mass.: The MIT Press, 2002).

Articles AND Book Chapters

Allison, Graham, “Geopolitical Overview of the Caspian Region: Sharing the Caspian Bathtub with the American Elephant,” *USACC Investment Guide to Azerbaijan 2003* (Washington, D.C.: United States–Azerbaijan Chamber of Commerce), 2003.

Byford, Grenville, “Turkish Politics and an Unwanted War: Give Erdogan Support,” *International Herald Tribune*, January 15, 2003.

Shaffer, Brenda, “Iran’s Nuclear Program: The Russians May Be Ready to Help,” *International Herald Tribune*, June 12, 2003.

Shaffer, Brenda, “Righting a UN Wrong,” *The Christian Science Monitor*, May 21, 2003.

Shaffer, Brenda, “Don’t Focus Just on Terrorist Bullies,” *The Christian Science Monitor*, January 14, 2003.

Shaffer, Brenda, “Azerbaijan: Security Challenges and Strategy” *USACC Investment Guide to Azerbaijan 2003* (Washington, D.C.: United States–Azerbaijan Chamber of Commerce), 2003.

Shaffer, Brenda, “Is There a Muslim Foreign Policy,” *Current History*, November 2002.

Shaffer, Brenda, “A Border Conflict Resolved—Without War,” *The Christian Science Monitor*, October 11, 2002.

Shaffer, Brenda, “Opportunités et Menaces en Asie Centrale et Caucase,” *Géopolitique*, No.79, September 2002. (In French).

Shaffer, Brenda “Azerbaycan Cumhuriyetinin Kuruluşu: İran’daki Azeriler Uzerinde Etkisi”, in Emine Gursoy-Naskali and Erdal Sahin, eds., *Türk Cumhuriyetleri* (Amsterdam/Istanbul, SOTA Publications, 2002), pp.261–284.(In Turkish).

Shaffer, Brenda, “East of the Oder: One Conflict That Can Be Solved,” *Wall Street Journal Europe*, July 26, 2002.

Shaffer, Brenda, “Azerbaijanis,” in David Levinson and Karen Christensen, eds., *Encyclopedia of Modern Asia* (New York: Charles Scribner’s Sons, 2002), pp. 205–207.

SERIES

Caspian Studies Program Newsletter (Editor: John Grennan)

Issue #6: October 2002

ENVIRONMENT AND NATURAL RESOURCES PROGRAM

ENRP DISCUSSION PAPERS

Aldy, Joseph, Scot Barrett, and Robert N. Stavins. 2003. "Thirteen Plus One: A Comparison of Global Climate Policy Architectures." BCSIA Discussion paper 2003-10.

Barrett, Scott and Robert N. Stavins. 2002. "Increasing Participation and Compliance in International Climate Change Agreements." BCSIA Discussion paper 2002-17.

Kasemir, Bernd and Andreas Suess. 2002. "Sustainability Information and Pension Fund Investment." BCSIA Discussion paper 2002-13.

Lee, Henry. 2003. "Assessing the Challenges Confronting Distributive Electricity Generation." BCSIA Discussion paper 2003-03.

Lubowski, Ruben, Andrew Plantinga, and Robert N. Stavins. "Determinants of Land-Use Change in the U.S." BCSIA Discussion paper 2003-09.

Polsky, Colin. 2003. "Assessing Vulnerabilities to the Effects of Global Change: An Eight-Step Approach." BCSIA Discussion paper 2003-05.

Rapporteur's Report. 2003. "Oil and Security Executive Session: May 14, 2003." BCSIA Discussion paper 2003-08.

Snyder, Lori. 2003. "The Effects of Environmental Regulation on Technology Diffusion in the Chlorine Manufacturing Industry." BCSIA Discussion paper 2003-06.

Stavins, Robert N., Alexander F. Wagner, and Gernot Wagner. 2002. "Interpreting Sustainability in Economic Terms: Dynamic Efficiency Plus Intergenerational Equity." BCSIA Discussion paper 2002-12.

Stavins, Robert N. 2003. "Market-Based Environmental Policies: What Can We Learn from US Experience." BCSIA Discussion paper 2003-07.

Wils, Annababette. 2002. "On Accelerating the Global Literacy Transition." BCSIA Discussion paper 2002-18.

Index to Volume 27

Belkin, Aaron, and Melissa Sheridan Embser-Herbert, "A Modest Proposal: Privacy as a Flawed Rationale for the Exclusion of Gays and Lesbians from the U.S. Military," 27:2 (Fall 2002), pp. 178–197.

Burgess, Stephen F., see Purkitt, Helen E., and Stephen F. Burgess.

Cha, Victor D., "Hawk Engagement and Preventive Defense on the Korean Peninsula," 27:1 (Summer 2002), pp. 40–78.

Cooley, Alexander, and James Ron, "The NGO Scramble: Organizational Insecurity and the Political Economy of Transnational Action," 27:1 (Summer 2002), pp. 5–39.

Cronin, Audrey Kurth, "Behind the Curve: Globalization and International Terrorism," 27:3 (Winter 2002/03), pp. 30–58.

Desch, Michael C., "Democracy and Victory: Why Regime Type Hardly Matters," 27:2 (Fall 2002), pp. 5–47.

Elbe, Stefan, "HIV/AIDS and the Changing Landscape of War in Africa," 27:2 (Fall 2002), pp. 159–177.

Embser-Herbert, Melissa Sheridan, see Belkin Aaron, and Melissa Sheridan Embser-Herbert.

Heginbotham, Eric, "The Fall and Rise of Navies in East Asia: Military Organizations, Domestic Politics, and Grand Strategy," 27:2 (Fall 2002), pp. 86–125.

Jervis, Robert, "Correspondence: Institutional Disagreement," 27:1 (Summer 2002), pp. 174–185.

Johnston, Alastair Iain, "Is China a Status Quo Power?" 27:4 (Spring 2003), pp. 5–56.

Kang, David C., "Getting Asia Wrong: The Need for New Analytical Frameworks," 27:4 (Spring 2003), pp. 57–85.

Kapstein, Ethan B., "Two Dismal Science Are Better Than One—Economics and the Study of National Security: A Review Essay," 27:3 (Winter 2002/03), pp. 158–187.

Levite, Ariel E., "Never Say Never Again: Nuclear Reversal Revisited," 27:3 (Winter 2002/03), pp. 59–88.

Liberman, Peter, "Correspondence: South Africa's Nuclear Decisions" [reply to Purkitt and Burgess], 27:1 (Summer 2002), pp. 186–194.

Mistry, Dinshaw, "Beyond the MTCR: Building a Comprehensive Regime to Contain Ballistic Missile Proliferation," 27:4 (Spring 2003), pp. 119–149.

Mousseau, Michael, "Market Civilization and Its Clash with Terror," 27:3 (Winter 2002/03), pp. 5–29.

Narizny, Kevin, "The Political Economy of Alignment: Great Britain's Commitments to Europe, 1905–39," 27:4 (Spring 2003), pp. 184–219.

Nau, Henry R., "Correspondence: Institutionalized Disagreement," 27:1 (Summer 2002), pp. 174–185.

Powell, Robert, "Nuclear Deterrence, Nuclear Proliferation, and National Missile Defense," 27:4 (Spring 2003), pp. 86–118.

Purkitt, Helen E., and Stephen F. Burgess, "Correspondence: South Africa's Nuclear Decisions," 27:1 (Summer 2002), pp. 186–194.

Ron, James, see Cooley, Alexander, and James Ron.

Ross, Robert S., "Navigating the Taiwan Strait: Deterrence, Escalation Dominance, and U.S.-China Relations," 27:2 (Fall 2002), pp. 48–85.

Sagan, Scott D., and Jeremi Suri, "The Madman Nuclear Alert: Secrecy, Signaling, and Safety in October 1969," 27:4 (Spring 2003), pp. 150–183.

Schweller, Randall L., "Correspondence: Institutionalized Disagreement" [reply to Jervis and Nau], 27:1 (Summer 2002), pp. 174–185.

Slater, Jerome, "Lost Opportunities for Peace in the Arab-Israeli Conflict: Israel and Syria, 1948–2001," 27:1 (Summer 2002), pp. 79–106.

Snyder, Glenn H., "Mearsheimer's World—Offensive Realism and the Struggle for Security: A Review Essay," 27:1 (Summer 2002), pp. 149–173.

Stern, Jessica, "Dreaded Risks and the Control of Biological Weapons," 27:3 (Winter 2002/03), pp. 89–123.

Stigler, Andrew L., "A Clear Victory for Air Power: NATO's Empty Threat to Invade Kosovo," 27:3 (Winter 2002/03), pp. 124–157.

Suri, Jeremi, see Sagan, Scott B., and Jeremi Suri.

Tucker, Jonathan B., "A Farewell to Germs: The U.S. Renunciation of Biological and Toxin Warfare, 1969–70," 27:1 (Summer 2002), pp. 107–148.

Weiner, Sharon K., "Preventing Nuclear Entrepreneurship in Russia's Nuclear Cities," 27:2 (Fall 2002), pp. 126–158.

BOOKS

Brown, Michael E. and Ganguly, Sumit, Editors, *Fighting Words: Language Policy and Ethnic Relations in Asia*. Cambridge, MA.: The MIT Press, 2003.

Ashton B. Carter, Lewis Branscomb, Richard D. Klausner, et al. Washington *Making the Nation Safer: The Role of Science and Technology in Countering Terrorism*, Richard D. Klausner, et al. Washington, DC: The National Academies Press, 2002.

De Nevers, Renee, *Comrades No More: The Seeds of Change in Eastern Europe* (Cambridge, Mass.: MIT Press, 2003).

Elman, Colin and Elman, Miriam Fendisu, *Progress In International Relations Theory: Appraising the Field*. The MIT Press, 2003

Heymann, Philip B. *Terrorism, Freedom and Security: Winning Without War*. Cambridge, MA.: The MIT Press, 2003.

Howitt, Arnold M. and Pangi, Robyn L., *Countering Terrorism*, Cambridge, MA.: MIT Press, 2003.

Kayyem, Juliet N. and Pangi, Robyn L., Editors, *First to Arrive: State and Local Responses to Terrorism*. Cambridge, MA.: The MIT Press, 2003

Steven E. Miller, Co-editor, with Michael Brown, Owen Cote, and Sean Lynn-Jones, *The Rise of China* (Chinese language edition), (Military History and Translation Office, Ministry of National Defense, Republic of China, 2002).

Shaffer, Brenda, *Borders and Brethren: Iran and the Challenge of Azerbaijani Identity* (Cambridge, Mass.: MIT Press, 2002).

Monica Duffy Toft. *The Geography of Ethnic Violence: Identity, Interests, and the Indivisibility of Territory*, Princeton University Press, 2003.

INTERNATIONAL SECURITY DISCUSSION PAPERS

2003-02, March 2003

Saradzhyan, Simon. "Russia: Grasping Reality of Nuclear Terror."

February 2003

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Robert I. Rotberg, "What Bush's Man in Iraq Must Do to Win the Peace," *Boston Globe* (May 10, 2003)

Robert I. Rotberg, "Mbeki Is Avoiding the Right Course on Zimbabwe," *Financial Times* (May 18, 2003)

BOARD OF DIRECTORS

Graham Allison: See section on Caspian Studies Program

Robert D. Blackwill is the current Ambassador to India. A former Lecturer in International Security at Harvard University's John F. Kennedy School of Government and Associate Dean of the Kennedy School, he was also faculty chairman of the School's Executive Programs for U.S. and Russian General Officers and for members of the Russian State Duma; of the Executive Program for Senior Chinese Military Officers; and of the Kennedy School's Initiative on U.S. China relations. He is an adjunct senior fellow at the Council on Foreign Relations in New York; on the board of *International Security*; a member of the International Institute of Strategic Studies and the National Committee on U.S.-China Relations; on the academic advisory board of the NATO Defense College in Rome; on the advisory council of the Nixon Center for Peace and Freedom; and a consultant to the World Bank, the RAND Corporation and U.S. Government agencies. He is the author of many articles on European security and East-West relations and co-editor of *Conventional Arms Control and East-West Security* (1989), and *A Primer for the Nuclear Age* (1990). His articles include "The Grand Bargain: The West and the Future of the Soviet Union" with Graham Allison, "The U.S.-German Security Relationship in the 1990's," "Coordinating a New Western Strategy for the 1990s," "The Evolution of U.S.-French Relations," "American Diplomacy and German Unification," "Russia and the West," and "American Leadership in the New Era." His book *New Nuclear Nations* with Albert Carnesale was published in 1993 by the Council on Foreign Relations. Other books include *Damage Limitation or Crisis? Russia and the Outside World* edited with Sergei Karaganov, and *Engaging Russia* with Rodric Braithwaite and Akihiko Tanaka. He is the co-author of "Can NATO Survive?," which appeared in the Spring, 1996, issue of *The Washington Quarterly* and author of *Arms Control and the U.S.-Russian Relationship* (1996). His latest book with Michael Stürmer of Germany's Research Institute for International Affairs is *Allies Divided: Transatlantic Policies for the Greater Middle East* (1997). His most recent publication, *The Future of Transatlantic Relations* (1998) was published by the Council on Foreign Relations. A career diplomat from 1967, he had previously been a Peace Corps Volunteer in Malawi, Africa. During his foreign service career, he served as Director of West European Affairs on the National Security Council staff; Principal Deputy Assistant Secretary of State for Political-Military Affairs; Principal Deputy Assistant Secretary of State for European Affairs; and U.S. Ambassador and Chief Negotiator at the negotiations with the Warsaw Pact on conventional forces in Europe. He was Special Assistant to President George Bush for European and Soviet Affairs in 1989-90. In December 1990, he was awarded the Commander's Cross of the Order of Merit by the Federal Republic of Germany for his contribution while at the White House to German unification.

Lewis M. Branscomb: See section on Science, Technology and Public Policy Program.

Harvey Brooks is Benjamin Pierce Professor of Technology and Public Policy, Emeritus, in the Kennedy School of Government; Gordon McKay Professor of Applied Physics, Emeritus, in the

Division of Applied Sciences at Harvard University; and emeritus member of the BCSIA Board of Directors. Dr. Brooks graduated from Yale University. He did graduate physics at Cambridge University, England, and at Harvard University, receiving his Ph.D. in physics from Harvard with J. H. Van Vleck in 1940. He was a Junior Fellow in the Society of Fellows at Harvard from 1940 to 1942, and a staff member of the Harvard Underwater Sound Laboratory from 1941 to 1945. He joined General Electric in 1946, where he served as Associate Head of the Knolls Atomic Power Lab. He returned to Harvard in 1950 as Gordon McKay Professor of Applied Physics. From 1957 to 1975 he served as Dean of the Division of Engineering and Applied Physics at Harvard. Besides numerous technical articles in the three scientific fields, he has published a book, *The Government of Science* (MIT Press, 1968) and numerous articles in the field of science policy. In 1957 he founded the *International Journal of the Physics and Chemistry of Solids*, of which he remained Editor-in-Chief until the mid-1970s. Since 1975 he has devoted most of his teaching and research effort to the field of science, technology, and public policy in the Kennedy School of Government. From 1968 to 1972 he was chairman of the university-wide faculty committee for the IBM-funded Program on Technology and Society. Brooks has served on many committees related to science policy, including the President's Science Advisory Committee in the Eisenhower, Kennedy, and Johnson administrations. Dr. Brooks is a member of the National Academy of Sciences, and the National Academy of Engineering, and a Senior Member of the Institute of Medicine. He is a member of the American Philosophical Society, a member and former president of the American Academy of Arts and Sciences, and a member of the Council on Foreign Relations. Most recently Dr. Brooks has been a member of several committees of the National Academy of Engineering dealing with issues of technology in relation to U.S. competitiveness in the world economy. He co-chaired, with Dr. John Foster, the Committee on Technology Policy Options in a Global Economy of the National Academy of Engineering, whose report, "Mastering a New Role: Shaping Technology Policy for National Economic Performance," was released in March 1993. He is also involved in a research program at the Kennedy School dealing with the recasting of national technology policy. He is the author of numerous publications on global environmental policy and risk analysis. Brooks has received six honorary D.Sc. degrees from Kenyon College, Union College, Yale University, Harvard University, Brown University, and the Ohio State University. He is also the 1993 recipient of the Philip Hauge Abelson Prize of the American Academy of Arts and Sciences.

Albert Carnesale Albert Carnesale is the Chancellor of the University of California, Los Angeles and a member of the BCSIA Board of Directors. Prior to his position at UCLA, he was at Harvard University for 23 years (1974-97), initially as Associate Director of the Center for Science and International Affairs, which later became BCSIA. He served at the John F. Kennedy School of Government as Lucius N. Littauer Professor of Public Policy and Administration, as Academic Dean (1981-91), and as Dean (1991-95). He was Provost of Harvard University from 1994 to 1997. His research and teaching have focused on international relations and national security policy, with emphasis on issues associated with nuclear weapons and arms control. After earning B.S. and M.S. degrees in Mechanical Engineering at Cooper Union and Drexel University, he earned a Ph.D. in Nuclear Engineering at North Carolina State University. Dr. Carnesale has held positions in industry (Martin Marietta Corporation, 1957-62) and government (U.S. Arms Control and Disarmament Agency, 1969-72). He participated in the U.S. delegation to the Strategic Arms Limitation Talks (1970-72) and led the U.S. delegation to the International Nuclear Fuel Cycle Evaluation (1978-80), a 66-nation study of the relationship between civilian

nuclear power and proliferation of nuclear weapons. In academia, Dr. Carnesale was professor at North Carolina State University from 1962-69 and 1972-74. He has consulted and written extensively on international affairs, defense policy, and nuclear energy issues, and has testified often before Congressional committees. He is co-author of *New Nuclear Nations: Consequences for U.S. Policy* (1993); *Fateful Visions: Avoiding Nuclear Catastrophe* (1988); *Superpower Arms Control: Setting the Record Straight* (1987); *Hawks, Doves, and Owls: An Agenda for Avoiding Nuclear War* (1985); and *Living with Nuclear Weapons* (1983). He is a member of the Council on Foreign Relations and of the International Institute for Strategic Studies, and he was a founding editor of the quarterly journal *International Security*.

Ashton B. Carter: See section on International Security Program.

William Clark: See section on Environment and Natural Resources Program

Richard Darman is Public Service Professor at Harvard University's John F. Kennedy School of Government. He returned to the School in January 1998, having been a Lecturer in Public Policy and Management from 1977-80. In the intervening years, he served as a member of President Bush's cabinet and Director of the U.S. Office of Management and Budget (1989-93); Deputy Secretary of the U.S. Treasury (1985-87); and Assistant to the President of the United States (1981-85). His prior government experience included service as Assistant Secretary of Commerce in the Ford administration and staff positions at Justice, Defense, and HEW in the Nixon administration. In the private sector, he has been a managing director of Shearson, Lehman Brothers and a partner of The Carlyle Group (a global private investment firm), with which he remains associated as a Senior Advisor. He is a director of several public and private corporations and a trustee of The New England Funds and the Council for Excellence in Government. A graduate of Harvard College and Harvard Business School, and a former Fellow of the Woodrow Wilson International Center for Scholars, he is the author of *WHO'S IN CONTROL? Polar Politics and the Sensible Center* (Simon & Schuster, 1996).

John M. Deutch is an Institute Professor at the Massachusetts Institute of Technology. He served as Director of Central Intelligence from May 1995-December 1996. From 1994-95, he served as Deputy Secretary of Defense and served as Undersecretary of Defense for Acquisition and Technology from 1993-94. John Deutch has also served as Director of Energy Research (1977-79), Acting Assistant Secretary for Energy Technology (1979), and Undersecretary (1979-80) in the United States Department of Energy. In addition, John Deutch has served on the President's Nuclear Safety Oversight Committee (1980-81); the President's Commission on Strategic Forces (1983); the White House Science Council (1985-89); the President's Intelligence Advisory Board (1990-93); the President's Commission on Aviation Safety and Security (1996); and the President's Commission on Reducing and Protecting Government Secrecy (1996); the President's Committee of Advisors on Science and Technology (1997-2001). He served as Chairman of the President's Commission to Assess the Organization of the Federal Government to Combat the Proliferation of Weapons of Mass Destruction (1998). Dr. Deutch has been a member of the MIT faculty since 1970, and has served as Chairman of the Department of Chemistry, Dean of Science and Provost. Dr. Deutch has published over 140 technical publications in physical chemistry, as well as numerous publications on technology, international security and public policy issues.

Paul Doty is the Founder and Director Emeritus of the Center for Science and International Affairs and Mallinkrodt Professor of Biochemistry, and an emeritus member of the BCSIA Board of Directors. Professor Doty's early scientific work began in the physical chemistry of high polymers but soon gravitated to proteins and nucleic acids. The discovery of the molecular resulting of DNA and its renaturation, on which much of modern recombinant DNA technology rests, is the best known work of his laboratory. He was one of the founding editors of the *Journal of Polymer Science* and the *Journal of Molecular Biology*, and he was a member of the Department of Chemistry during his first 20 years at Harvard. In 1967 he helped found the new Department of Biochemistry and Molecular Biology, serving as its first chairman and Mallinkrodt Professor of Biochemistry. He retired from biochemistry in 1988 and has since been Professor of Public Policy in the Kennedy School of Government. In keeping with his interest in national and international security affairs and arms control that had their origin in his work on the Manhattan Project, Professor Doty became a member of the President's Science Advisory Committee under Kennedy and Johnson, chaired the first committee of the National Academy of Sciences to oversee Soviet-American exchange in science, chaired the American Pugwash Committee in its early days, as well as a Soviet-American Scientists' group examining arms control from 1965-75. In 1973, with the help of the Ford Foundation, he began the Program in Science and International Affairs at Harvard. It developed into the Center for Science and International Affairs in 1978. Professor Doty served as Director of the Center until 1981.

Shai Feldman is Head of the Jaffee Center for Strategic Studies at Tel Aviv University. He served as a Senior Research Fellow at BCSIA until October of 1997 and is a member of the Board of Directors. In 1989 he established and directed the Jaffee Center's project on Security and Arms Control in the Middle East and was a Senior Research Fellow there. Dr. Feldman has written extensively on issues related to Israel's national defense, nuclear policy, proliferation, and arms control, as well as on U.S. policies in the Middle East. He is the author of *Israeli Nuclear Deterrence* and a monograph on *The Future of U.S.-Israeli Strategic Cooperation*. Dr. Feldman has two recent books: *Nuclear Weapons and Arms Control in the Middle East* (MIT Press); and *Bridging the Gap: A New Security Architecture for the Middle East*, co-authored with the Jordanian scholar Abdullah Toukan. He received his Ph.D. from the Department of Political Science at the University of California at Berkeley.

John P. Holdren: See section on Science, Technology and Public Policy Program.

Calestous Juma: See section on Environment and Natural Resources Program.

Henry Lee: See section on Environment and Natural Resources Program.

Ernest R. May is Director of the Charles Warren Center for Studies in American History and an authority on the history of international relations. He has been Professor of History since 1963 and Charles Warren Professor of History since 1981. In 1969-72 he was Dean of Harvard College and Associate Dean of the Faculty of Arts and Sciences. He was Director of the Institute of Politics from 1971-74 and Chairman of the Department of History from 1976-79. In 1997-1998 he was on leave, serving as Alfred Vere Harmsworth Professor in the University of Oxford.

Born in Fort Worth, Texas, Professor May holds A.B. and Ph.D. degrees from the University of California at Los Angeles. He is a member of the Council on Foreign Relations and a Fellow of the American Academy of Arts and Sciences. He has been a consultant at various times to the Office of the Secretary of Defense, the National Security Council, the Lawrence Livermore National Laboratory, the National Endowment for the Humanities, the Smithsonian Institution, and committees of the Congress.

His publications include *The World War & American Isolation 1914-17* (1959), *The Ultimate Decision: The President as Commander in Chief* (1960), *Imperial Democracy: The Emergence of America as a Great Power* (1961), *American Imperialism: A Speculative Essay* (1968), *'Lessons' of the Past: The Use and Misuse of History in American Foreign Policy* (1973), *The Making of the Monroe Doctrine* (1975), *A Proud Nation* (1983), *Knowing One's Enemies: Intelligence Assessment Before the Two World Wars* (1985), and with Richard E. Neustadt *Thinking in Time: The Uses of History for Decision-Makers* (1986). In 1988 he and Richard Neustadt received the Grawemeyer Award for Ideas Improving World Order. His most recent publications are *American Cold War Strategy: Interpreting NSC 68* (1993) and with Philip D. Zelikow *The Kennedy Tapes: Inside the White House during the Cuban Missile Crisis*.

In addition to teaching undergraduate courses on the Cold War and the Vietnam War and undergraduate and graduate courses on the history of international relations, Professor May teaches in the John F. Kennedy School of Government courses on reasoning from history and assessing other governments. In the Kennedy School he also directs an Intelligence Policy Program, studying relationships between intelligence analysis and policy-making.

Matthew Stanley Meselson is the Thomas Dudley Cabot Professor of the Natural Sciences. He received Ph.D. degrees from the University of Chicago in 1951 and from the California Institute of Technology in 1957. He was a research fellow and then Assistant Professor of Physical Chemistry at California Institute of Technology until he joined the Harvard faculty in 1960, where he conducted research primarily in the field of molecular genetics. Currently he is studying mechanisms of molecular evolution. Since 1963 Dr. Meselson has been interested in chemical and biological defense and arms control and has served as a consultant on this subject to various government agencies. He is co-director of the Harvard-Sussex Program on CBW Armament and Arms Limitation and co-editor of its quarterly journal, *Chemical Weapons Convention Bulletin*. Dr. Meselson is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, the American Philosophical Society, the Académie des Sciences (Paris), the Academia Sanctae Clarae (Genoa), the Royal Society (London), the Institute of Medicine, and the Council on Foreign Relations. He has received the Award in Molecular Biology from the National Academy of Sciences, the Eli Lilly Award in Microbiology and Immunology, the Alumni Medal of the University of Chicago, the Public Service Award of the Federation of American Scientists, the Legman Award of the New York Academy of Sciences, the Alumni Distinguished Service Award of the California Institute of Technology, the Presidential Award of the New York Academy of Sciences, a MacArthur Fellowship, the Scientific Freedom and Responsibility Award of the American Association of the Advancement of Science, and the 1995 Thomas Hunt Morgan Medal of the Genetics Society of America. He has also been awarded numerous honorary degrees. Dr. Meselson is presently a member of the

Committee on International Security and Arms Control of the U.S. National Academy of Sciences.

Steven E. Miller: See section on International Security Program.

Joseph S. Nye, Jr. is Dean of the Kennedy School, Don K. Price Professor of Public Policy, and a member of the BCSIA Board of Directors. He joined the Harvard Faculty in 1964, and has served as Director of the Center for International Affairs, Dillon Professor of International Affairs and Associate Dean of Arts and Sciences at Harvard University. From 1977-79 he served as Deputy to the Undersecretary of State for Security Assistance, Science and Technology and chaired the National Security Council Group on Nonproliferation of Nuclear Weapons. In 1993 and 1994 he was chairman of the National Intelligence Council, which coordinates intelligence estimates for the President. In 1994 and 1995 he served as Assistant Secretary of Defense for International Security Affairs. In all three agencies, he received distinguished service awards. Dr. Nye is a Fellow of the American Academy of Arts and Sciences and the American Academy of Diplomacy, and a member of the Executive Committee of the Trilateral Commission. He has served as Director of the Aspen Strategy Group, Director of the Institute for East-West Security Studies, Director of the International Institute for Strategic Studies, the American representative on the United Nations Advisory Committee on Disarmament Affairs, and a member of the Advisory Committee of the Institute of International Economics. Dr. Nye received his bachelor's degree summa cum laude from Princeton University in 1958. He was a Rhodes Scholar at Oxford University and earned a Ph.D. in political science from Harvard University. In addition to teaching at Harvard, Dr. Nye has also taught for brief periods in Geneva, Ottawa, and London. He has lived for extended periods in Europe, East Africa, and Central America.

John C. Reppert is Executive Director (Research) for the Belfer Center for Science and International Affairs. He joined the Center in 1998 after serving nearly 33 years in the U.S. Army. His military duties included three tours at the U.S. Embassy in Moscow, service as Military Assistant to the Assistant Secretary of Defense for International Security Policy, and as Principal Director of the Office for Russia, Ukraine, and Eurasia, concluding his service as Director of the On-Site Inspection Agency. He is fluent in Russian and has traveled for the last 25 years in all the newly independent states of the former Soviet Union. He received his Ph.D. in International Affairs from George Washington University; his M.A. in Soviet Studies from the University of Kansas; and his M.S. and B.A. in Journalism from Kansas State University. He is a military member of the International Institute of Strategic Studies and the American Association for the Advancement of Slavic Studies.

Robert I. Rotberg: See section on WPF Program on Intrastate Conflict, Conflict Prevention, and Conflict Resolution.

Robert N. Stavins: See section on Environmental and Natural Resources Program.

Stephen M. Walt: See section on International Security Program.

John P. White is a faculty member of the John F. Kennedy School of Government, Harvard University. Dr. White has held several senior federal government positions during his career, including U.S. Deputy Secretary of Defense from 1995-97, Deputy Director of the Office of Management and Budget from 1978-81 and Assistant Secretary of Defense, Manpower, Reserve Affairs and Logistics, from 1977-78. Prior to his most recent government service, Dr. White was the Director of the Center for Business and Government at Harvard University and the Chairman of the Commission on Roles and Missions of the Armed Forces.

Dr. White also has extensive private sector experience, having served as Chairman and CEO of Interactive Systems Corporation from 1981-88 and, following its sale to the Eastman Kodak Company in 1988, as General Manager of the Integration and Systems Products Division and a Vice President of Kodak until 1992. Dr. White also spent nine years with The RAND Corporation where he was the Senior Vice President for National Security Research Programs and a member of the Board of Trustees.

Dr. White is currently a Senior Partner of Global Technology Partners, LLC, which, in partnership with DLJ Merchant Banking Partners, specializes in private equity investments in technology, defense, aerospace and related businesses worldwide. He also is a Senior Fellow at The RAND Corporation and a member of the Council on Foreign Relations. He serves as a director of Wang Laboratories and IRG International as well as the Concord Coalition and Center for Excellence in Government. He is a member of the Global Advisory Committee of Mitsubishi Electric Corporation, Tokyo, Japan. Dr. White received a B.S. from Cornell University and earned his M.A. and Ph.D. in economics from the Maxwell Graduate School, Syracuse University.

Shirley Williams has been a Liberal Democrat member of the British House of Lords since 1993. She was a Visiting Professor at the University of Essex in 1994-95, and a member of the Advisory Council to the UN Secretary-General on the Fourth World Women's Conference. She served in the British Cabinet (1974-79) as secretary of state for education and science, secretary of state for prices and consumer protection, and paymaster general, the House of Commons as a Labour MP from 1964-79 and as a Social Democrat MP from 1981-83. She co-founded the Social Democratic Party in 1981 and served as its president from 1982-88. Her published work includes *Politics is for People* (1981), *A Job to Live* (1985), and *Ambition & Beyond Career Paths of American Politicians* (1993) co-edited with Edward L. Lasher, Jr. In 1980, she hosted the BBC-TV series Shirley Williams in Conversation. In 1980 she was a fellow at the Institute of Politics (IOP), and was interim director in 1989-90. Williams focuses on issues related to the European Union, Central and Eastern Europe, North American politics, and careers in elective politics.

STAFF

Jeanie M. Barnett is Communications Officer for the Belfer Center for Science and International Affairs at Harvard University's John F. Kennedy School of Government. She joined the Center in August 2002 after earning a Master's degree in Public Administration at KSG, where she concentrated in Press Relations and Leadership. Prior to attending the Kennedy School, she spent 15 years as a writer and editor in California specializing in entrepreneurship development, and public/private contracting and procurement policies targeting minority and women business owners. She was co-founder and editor-in-chief of a national newsletter for entrepreneurial women; served as editor-in-chief of MBE magazine; wrote articles for a variety of publications and websites; and was an instructor of magazine writing for undergraduate students at the University of Redlands in Redlands, California. She is the author of a high-school textbook about Ghana, West Africa, where she served from 1982-1984 as a U.S. Peace Corps volunteer and emergency food-aid monitor with the U.S. Agency for International Development and Office of Foreign Disaster Assistance. Born and raised in the Chicago area, she holds a B.A. in Rhetoric from the University of Illinois, Urbana-Champaign.

Arnold Bogis is the Assistant to the Director and Executive Directors at the Belfer Center for Science and International Affairs. He received his B.A. in Physics from Johns Hopkins University in 1997. Arnold held various administrative positions before coming to Harvard, where he hopes to pursue an advanced degree in International Relations.

Anne Cushing Jenkins is the Librarian and Web Systems Specialist for the Belfer Center for Science and International Affairs. She has been working in the Harvard library community for six years. Anne previously worked at the Harvard Botany Libraries as a reference and retrospective conversion assistant; and more recently she was the Automation Specialist for Widener Library's Government Documents Division. She is the co-founder of the Boston Area Library Web Managers and the Secretary of the Harvard University Mac Users Group. She has a B.A. in English and Photography from the University of Massachusetts.

Danielle Lussier is a Research Assistant. After receiving her B.A. in Russian and East European Studies from Wesleyan University, Danielle worked for the EastWest Institute as a Research Analyst on Russian regional development. While at EWI she was the senior editor for the EWI Russian Regional Report and the EWI Russian Regional Investor and was one of the compilers of *The Republics and Regions of the Russian Federation: A Guide to Politics, Policies, and Leaders*. Danielle left EWI in 2000 to accept a Russian-US Young Leadership Fellows for Public Service award, which brought her to Yaroslavl, Russia, where she conducted research on the local women's movement, judicial reforms, and social issues while implementing public service projects on HIV/AIDS outreach education, drug abuse, trafficking of women, and other related public health issues. Her research interests include civil society development in Russia's regions, particularly as it pertains to women, as well as political party development and human rights.

Grant Mainland is a Research Assistant at the Belfer Center for Science and International Affairs. He graduated from Reed College in 1999, and received an A.M. in Slavic Languages and Literatures from Harvard University in 2002. Grant's research interests include Russian legal

reform, international law, and the links between terrorism and transnational organized crime. He ultimately hopes to pursue a law degree with an emphasis on both public and private international law.

Steve Nicoloro is the Financial Officer for BCSIA. Prior to joining the Center, Steve worked at the Kennedy School in the Office for Budget and Finance where he was primarily responsible for overseeing the budgets for the School's research centers. Prior to the start of his career at the Kennedy School, Steve worked within the Controller's Office at Tufts University and is a veteran of the U.S. Air Force. Steve holds a B.A. from the University of Maine at Presque Isle.

Peggy Scannell is the Financial Assistant at the Belfer Center for Science and International Affairs. She spent seventeen years working in the Director's Office of Harvard Dining Services before joining the Center in 1989. Previously, she had been quite busy raising a family. Peggy enjoys travelling, most recently she visited Ireland and Las Vegas.

Kathleen Siddell is the Staff Assistant to the Executive Directors. Previously, she worked as an Editorial Associate at Delphi.com. She received a BA in American Studies from Franklin and Marshall College. She graduated from the University of Essex, UK, in 1999 with an MA in International Relations. Her dissertation focused on the affects of gender in foreign policy decision making. She hopes to continue studying the role of women in International Relations.

Alper Tunca is the Administrative Coordinator at the Belfer Center for Science and International Affairs as well as the Assistant to Graham Allison. He received his B.A. in International Relations and French from Boston University in 1997. Previously, Alper worked in U.S. Senator John F. Kerry's Boston office as Assistant to the Senator. Alper hopes to pursue an advanced degree in International Relations focusing on the Middle East and Caucasus regions.

Patricia Walsh is the Executive Director for Administration at the Belfer Center for Science and International Affairs, Kennedy School of Government, Harvard University. She has been at Harvard for 17 years and has held several administrative positions. She worked in the Kennedy School Dean's Office ending as Special Assistant to the Dean; as Administrative Coordinator of the Strengthening Democratic Institutions Project; and as Executive Assistant to the Provost. She has a B.S. in Elementary Education.

Lawrence Woocher is a Research Associate/Special Projects Manager with the Belfer Center for Science and International Affairs. In June 2001, he completed his Master in Public Policy from the Kennedy School of Government with a concentration in International Security and Political Economy. His recent publications include "Deconstructing 'political will': explaining the failure to prevent deadly conflict and mass atrocities." (*Journal of Public and International Affairs*, 2001); and "The 'Casamance question': an examination of the legitimacy of self-determination in southern Senegal." (*International Journal on Minority and Group Rights*, 2000). His previous work experience includes four years of mental health policy research with the Human Services Research Institute in Cambridge, Massachusetts, and internships with the International Crisis Group in Brussels and Sarajevo and the Conflict Management Group in Cambridge, Massachusetts. He earned a Bachelor of Science from Brown University in 1995 with a concentration in Neuroscience.

INTERNATIONAL COUNCIL

The International Council provides a forum for distinguished international leaders from business and government to interact with faculty and research directors of the Belfer Center on matters of mutual interest. As globalization shapes a new security environment, propels economic development, promotes democratic reform, and expands international trade among new global partners, Kennedy School faculty must strengthen their interaction with leaders from business and government to help inform their thinking. The Center hosts an annual meeting for International Council members. Most importantly, the Belfer Center benefits from one-on-one consultations with members.

Responsibilities of members of the International Council include:

- Participating at the annual meeting of the Council with members and faculty at the Center in discussion and debate about the role of public policy in international security and trade, economic development, and new business development;
- Introducing the Belfer Center and Kennedy School to executives, entrepreneurs, and business leaders interested in global economic and security issues, public policy, and international trade;
- Broadening perspectives of the Belfer Center and its faculty through dialogue between members of the Council and the Center.

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Financial Report

The Belfer Center for Science and International Affairs had an operating surplus of \$460,235 in fiscal year 2003, compared to an operating surplus of \$1,673,056 in fiscal year 2002. The Center's restricted endowment and gift balances increased to \$6.26 million in fiscal 2003 compared to \$5.65 million in fiscal 2002.

The market value of the Center's research endowment funds increased to \$50.4 million from \$46.7 million. As of June 30th, the market value of all endowment funds associated with this Center was \$81.2 million.

Total income increased 9% from \$9.24 million to \$10.04 million. The Center realized increases of income in endowment of 1 percent (from \$1.91 million to \$1.92 million), temporary investment/interest income of 227 percent (from \$58,933 to \$192,728), miscellaneous 27 percent (from \$520,160 to \$661,268), and sponsored 71 percent (from \$3.35 million to \$5.71 million). The Center realized decreases of income in gifts of 62 percent (from \$2.24 million to \$849,144), publication 30 percent (from \$87,898 to \$61,090), residence fee 42 percent (from \$408,418 to \$235,526), overhead credit 23 percent (from \$458,942 to \$354,812), and faculty assistant 51 percent (from \$106,867 to \$52,829). The final payment for the renovation credit was received in fiscal 2002.

The Center's expenses decreased 8 percent from \$8.80 million to \$8.14 million. Salaries, fellows, other personnel, extra compensation, fringe benefits and services represent 58 percent of the Center's total expenditures in fiscal 2003 (\$4.70 million) and in fiscal 2002 (\$4.96 million). KSG rent increased 12 percent (from \$743,380 to \$833,614). All other categories of expenses decreased in fiscal 2003; office expenses (4 percent) from \$356,968 to \$343,972, travel and meetings (11 percent) from \$506,570 to \$449,581, KSG indirect (14 percent) from \$653,701 to \$560,623, residence fee (42 percent) from \$408,418 to \$235,526, and overhead (13 percent) from \$1.17 million to \$1.02 million.

The Belfer Center for Science and International Affairs consists of five programs for this fiscal reporting period: Core, the International Security Program (ISP), the Environment and Natural Resources Program (ENRP), the Science, Technology, and Public Policy Program (STPP), and the WPF Program on Intrastate Conflict, Conflict Prevention and Conflict Resolution (WP). The Strengthening Democratic Institutions (SDI) is a research project associated with BCSIA, but whose finances are administered separately. Although each program is required to support itself, the distribution of the Ford endowment, the Center's largest, supports both the Core and International Security Program. For this reason, the financial report reflects them as a combined program.

The Core/International Security program is the largest program within the Center, incurring 51 percent (\$4.1 million) of the Center's expenses in fiscal 2003. The \$4.1 million of expenses was funded from the following sources: 52 percent (\$2.15 million) from endowment funds, 6 percent (\$231,452) from gift funds, 4 percent (\$185,019) from unrestricted funds, and 38 percent (\$1.56 million) from sponsored research grants and contracts from the Department of Justice, the

Nuclear Threat Initiative, the Carnegie Corporation of New York, the John D. and Catherine T. MacArthur Foundation, the Dubai School of Government, Oklahoma City National Memorial Institute for the Prevention of Terrorism, and the Compton Foundation.

The Environment and Natural Resources program incurred 19 percent (\$1.57 million) of the Center's expenses. The \$1.57 million of expenses was funded from the following sources: 4 percent (\$69,556) from endowment funds, 9 percent (\$135,146) from gift funds, 9 percent (\$138,139) from unrestricted funds, and 78 percent (\$1.23 million) from research grants and contracts from the National Science Foundation, the National Renewable Energy Laboratory, the Environmental Protection Agency, and the Gordon and Betty Moore Foundation.

The Science, Technology, and Public Policy program incurred 24 percent (\$1.93 million) of the Center's expenses. The \$1.93 million of expenses was funded from the following sources: 14 percent (\$264,496) from endowment funds, 5 percent (\$102,439) from gift funds, 3 percent (\$53,584) from unrestricted funds, and 78 percent (\$1.51 million) from research grants and contracts from the Nuclear Threat Initiative, the John D. and Catherine T. MacArthur Foundation, the William and Flora Hewlett Foundation, the David and Lucile Packard Foundation, the Heinz Family Foundation, the Winslow Foundation, the Energy Foundation, the Department of Energy, Ontario Power Generation, the United Nation Development Program, the Rockefeller Foundation, the National Institute of Standards, and the W. Alton Jones Foundation.

The WPF Program on Intrastate Conflict, Conflict Prevention and Conflict Resolution (WP) incurred 6 percent (\$515,289) of the Center's expenses all of which was funded with unrestricted funds.

Graphs should appear as follows:

Header on all should read:

**Belfer Center for Science and International Affairs
Annual Report for the Fiscal Year 2002
July 1, 2002 – June 30, 2003**

1 st page:	FY02 All
2 nd page:	FY02 by Prog.
3 rd page:	FY03 All
4 th page:	FY03 by Prog.
5 th page:	Income Chart FY03
6 th page:	Expense Chart FY03