

# Bulletin

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## American Academy Welcomes New Members

*On Saturday, October 11, the Academy inducted its 223rd class of members.*



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## Environmental Change and the Human Condition

*John P. Holdren*



Stated Meeting Report, Page 32

## Race, Art, and Integration: The African American Soldier During the Korean War

*Gerald Early*

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# Calendar of Events

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### Saturday, September 13, 2003

1871st Stated Meeting,  
Western Center – Los Angeles

*“Impressionists and Moderns:  
French Masterworks from the State  
Pushkin Museum, Moscow: A Study  
of Collecting”*

**Speaker: Stephanie Barron**, Los  
Angeles County Museum of Art

*“Collecting and Display as Subjects  
of History”*

**Speaker: Thomas Crow**, Getty  
Research Institute

**Location:** Los Angeles County  
Museum of Art

### Saturday, October 11, 2003

National Induction Ceremony  
and 1872nd Stated Meeting –  
Cambridge

**Speakers:** Tom Leighton,  
MIT and Akamai Technologies,  
Carolyn Bertozzi, UC Berkeley,  
William H. Gates, Sr., Bill and  
Melinda Gates Foundation, and  
Michael Wood, Princeton Uni-  
versity, with a musical perform-  
ance by Sherrill Milnes, North-  
western University

**Location:** Sanders Theatre,  
Harvard University

### Wednesday, October 29, 2003

1873rd Stated Meeting –  
Research Triangle Park

*“The Supreme Court and American  
Democracy 2004”*

**Speaker: Walter E. Dellinger**,  
III, Duke University; Introduc-  
tion by John Hope Franklin,  
Duke University

**Location:** National Humanities  
Center

### Saturday, November 1, 2003

1874th Stated Meeting,  
Midwest Center – Chicago

*“The Absurd Universe”*

**Speaker: Michael Turner**,  
University of Chicago

**Location:** Adler Planetarium  
and Astronomy Museum

### Monday, November 3, 2003

1875th Stated Meeting –  
New York

*“The Economic Outlook and Current  
Policy Issues”*

**Speaker: Robert E. Rubin**,  
Citigroup, Inc.

Memorial Tribute to Daniel  
Patrick Moynihan by Nathan  
Glazer, Harvard University

**Location:** New York

### Wednesday, November 12, 2003

1876th Stated Meeting –  
Cambridge

*“In Memory of Robert K. Merton”*

**Speakers: Robert M. Solow**,  
MIT, and **Robert C. Merton**,  
Harvard University

Presentation of the 2003 Talcott  
Parsons Prize in Social Sciences to  
William Julius Wilson, Harvard  
University

**Location:** House of the Academy

### Wednesday, December 3, 2003

1877th Stated Meeting and  
Holiday Concert – Cambridge

*“Beethoven and His Royal Disciple”*

**Speaker: Lewis Lockwood**,  
Harvard University; Introduction  
by **Jessie Ann Owens**, Brandeis  
University

Performance by **The Boston Trio**,  
“Archduke” Trio, Opus 97

**Location:** House of the Academy

### Wednesday, February 11, 2004

1878th Stated Meeting –  
Cambridge

*“What’s the Point of Democracy?”*

**Speaker: Amartya Sen**, Harvard  
University

**Location:** House of the Academy

**Time:** 5:30 p.m.

### Wednesday, March 10, 2004

1879th Stated Meeting –  
Cambridge

*“Voting with Dollars”*

**Speakers: Bruce Ackerman**,  
Yale Law School, with response  
by **Barney Frank**, U.S. House of  
Representatives

**Location:** House of the Academy

**Time:** 5:30 p.m.

### Wednesday, April 14, 2004

Joint Meeting of the Academy  
and the Boston Athenaeum –  
Cambridge

**Speaker: Peter L. Galison**,  
Harvard University

**Location:** House of the Academy

**Time:** 5:30 p.m.

### Wednesday, May 12, 2004

Stated Meeting and 224th  
Annual Meeting – Cambridge

*“Insects, Molecules, and Biodiversity”*

**Speakers: Tom Eisner**, Cornell  
University, **John G. Hildebrand**,  
University of Arizona, and **Jerrold  
Meinwald**, Cornell University

**Location:** House of the Academy

**Time:** 5:30 p.m.

*For information and reservations,  
contact Sheri Landry (phone: 617-576-  
5032; email: slandry@amacad.org).*



# Academy News

## American Academy Welcomes New Members

On Saturday, October 11, 2003, the Academy inducted its 223rd class. With over 400 current Fellows and their guests attending, Academy officers welcomed 153 new Fellows and Foreign Honorary Members – 70 percent of the 2003 electees. Induction speakers included Tom Leighton (MIT and Akamai Technologies), Carolyn R. Bertozzi (UC Berkeley), William H. Gates, Sr. (Bill and Melinda Gates Foundation), Michael Wood (Princeton University), and Sherrill Milnes (Northwestern University).

The day began with an orientation session at the House of the Academy. President Patricia Meyer Spacks (University of Virginia) greeted and congratulated the new members, and then gave a brief account of the Academy's history, institutional character, and mission. Highlighting the Academy's independence from the pressures and constraints that affect government and the university, she stated that "such freedom has enabled the Fellows to shape the Academy's agenda," adding that "their distinction, integrity, and wide range of interests provide the impetus for ever new forms of thought and action."

Vice President Louis Cabot (Cabot-Wellington, LLC) observed that the Academy is one of the few interdisciplinary institutions in the nation whose members represent every field and profession, and he called intellectual collaboration the "hallmark" of the Academy's projects and studies. Secretary Emilio Bizzi (MIT) reviewed the rights and privileges of Academy membership and invited the new class's "active involvement with all aspects of our work."

Executive Officer Leslie Berlowitz spoke of the Academy's "dedication to advancing scholarship as the critical basis for thoughtful action." Then, in introducing the leaders of several current Acad-

*Continued on page 8*



Induction Ceremony speakers Tom Leighton (MIT and Akamai Technologies), Carolyn Bertozzi (UC Berkeley), William H. Gates, Sr. (Bill and Melinda Gates Foundation), Michael Wood (Princeton University), and operatic baritone Sherrill Milnes (Northwestern University), who performed for the attendees

## William Julius Wilson Awarded the Talcott Parsons Prize

One of the most distinguished scholars in America on issues of urban poverty, race and class relations, and social inequality, William Julius Wilson has been named the 2003 recipient of the Academy's Talcott Parsons Prize, awarded for outstanding contributions to the social sciences. The Lewis P. and Linda L. Geyster University Professor at Harvard University, and a Fellow of the Academy since 1988, Wilson received the prize at the 1876th Stated Meeting of the Academy in Cambridge on November 12.



The author of *Power, Racism, and Privilege* (1973), *The Declining Significance of Race* (1978), *The Truly Disadvantaged* (1987), *When Work Disappears* (1996), and *The Bridge Over the Racial Divide* (1999), Wilson was a MacArthur Fellow from 1987 to 1992. He was awarded the National Medal of Science in 1998.

Doug McAdam (Stanford University), chair of this year's Talcott Parsons Prize Committee, noted that Wilson "brings the highest level of empirical social science to bear on questions of demonstrable social and scholarly importance. His work has served to sustain a tradition of engaged, real-world scholarship that, for many people, speaks to the ultimate value of the social sciences. He should be credited with almost single-handedly resuscitating the study of race and urban inequality and putting a host of related issues back on the public agenda."

Along with McAdam, members of the selection committee were John Mark Hansen (University of Chicago), Nannerl Keohane (Duke University), John Reed (New York Stock Exchange), Robert Solow (MIT), Eric Wanner (Russell Sage Foundation), and Harriet Zuckerman (Andrew W. Mellon Foundation).

First awarded in 1974, the Talcott Parsons Prize was established to honor the noted sociologist who served as President of the Academy from 1967 to 1971.

Previous recipients include:

- Clifford Geertz (Institute for Advanced Study, anthropology, 1974),
- Robert Dahl (Yale University, political science, 1977),
- Robert K. Merton (Columbia University, sociology, 1979),
- Albert Hirschman (Institute for Advanced Study, economics, 1983),
- C. Vann Woodward (Yale University, history, 1988),
- Daniel Bell (Harvard University, sociology, 1992), and
- Joseph H. Greenberg (Stanford University, anthropology and linguistics, 1997). ■



# Project Update

## Congress, the Supreme Court, and Judicial Independence

At a time of increasingly contentious hearings over federal judicial appointments and growing disagreements about the fundamental roles of the legislative and judicial branches of the federal government, the Academy continues its exploration of the changing relationship between Congress and the Court.

As co-chairs of the project Jesse Choper (Boalt Hall School of Law, UC Berkeley) and Robert Post (Yale Law School) have observed: “When the framers of the U.S. Constitution separated the federal government into three distinct branches, Congress and the Supreme Court were designed to face each other at arm’s length. Following a period of considerable tension and conflict, the relationship between the federal legislature and judiciary stabilized in the last years of the New Deal. Although it has subsequently encountered various periods of discord, the equilibrium has been significantly disrupted since the mid-1990s. The controversy now building between Congress and the Court could reach historic proportions.” The Academy project brings to-

gether scholars, members of Congress, Supreme Court justices, and federal judges for discussion and analysis of the issues underlying this increasingly adversarial relationship.

Last spring, the second in a series of public meetings and private conversations about Congress and the Court took place in Washington, D.C. On May 25, 2003, Fellows and guests attended a meeting on “The Independence of the Federal Judiciary,” held at the Library of Congress. Speakers included Professor Judith Resnik (Yale Law School), Judge Danny Boggs (U.S. Court of Appeals, Sixth Circuit), and Representative Howard Berman (D-California), with former White House Counsel, Congressman, and Federal Judge Abner Mikva (University of Chicago) serving as moderator. Panelists considered whether, how, and to what extent Congress has recently used its constitutional prerogatives to encroach on judicial independence.

Professor Resnik focused on the proliferation of federal judges in both courthouses and administra-



**Attending the May Stated Meeting: Supreme Court Justices Ruth Bader Ginsburg and David Souter, President of the Academy Patricia Meyer Spacks, Supreme Court Justice Stephen G. Breyer, and President of the Carnegie Institution of Washington Richard Meserve**

tive agencies that has made the federal judiciary increasingly reliant on Congress for its staffing and funding needs. In particular, she pointed to the large numbers of judges who have neither life tenure nor protected salaries – two conditions established by the Constitution as what she termed “hallmarks of judicial independence.” At the same time, she noted that the federal judiciary, through the Judicial Conference of the United States (a group of fewer than thirty life-tenured judges), now collectively “educates, plans, lobbies, and opines” on behalf of “the Judiciary” on issues including whether Congress should create new federally enforceable rights. Despite the new challenges they pose, neither the many judges who lack life tenure nor the changing activities of judges who have life tenure have become a focus of discussions about judicial independence.

Judge Boggs expressed confidence that the “independence of the judiciary remains intact and largely unthreatened.” The chief perils to judicial independence, he said, stem from administrative encroachments by Congress – notably, its refusal to raise judges’ pay in pace with inflation – and the increasing politicization of the confirmation process.

Congressman Berman – while asserting that there is no “bright line” between “appropriate and inappropriate” forms of regulation – maintained that “it’s appropriate for Congress to regulate the administration of the judicial branch, but not so appropriate for it to try to regulate the judicial function.” As an example of unwarranted congressional interference in judicial matters he cited mandatory minimum sentencing, which substitutes uniform, externally imposed rules for the exercise of discretion by individual judges.

Also in May, a second off-the-record conversation between Supreme Court Justices Stephen G. Breyer, Ruth Bader Ginsburg, Sandra Day O’Connor, and David Souter, as well as federal judges, members of Congress, legal scholars, and political scientists, was held at the Supreme Court. This exchange was intended to facilitate communication between Congress and the federal courts and to develop an agenda for future scholarly research.

A full account of the May 2003 panel will appear in the *Bulletin*’s Winter 2004 issue. ■



**Speakers at the May 2003 Congress and the Court Stated Meeting: Judith Resnik (Yale Law School), Abner Mikva (moderator, University of Chicago), Judge Danny Boggs (U.S. Court of Appeals, Sixth Circuit), and Representative Howard Berman (D-California)**

## Energy, Ecology, and Security

Scientists know a good deal about the overall nature, direction, and significance of human-induced climate change, and about the patterns of global energy use that appear to be causing it. Experts on energy and global security have studied the economic and security ramifications of current patterns of oil production and demand. Yet no one so far has examined the complex interactions among energy use, climate change, economic development, and security that any comprehensive response to the problem of global warming must consider.

A new Academy project aims to lay the groundwork for just such a comprehensive approach. Co-chaired by John Steinbruner (University of Maryland) and John Holdren (Harvard University), the project on Energy, the Environment, and Global Security will bring together experts on climate change, ecology, energy, economics, and global security to address one of the most urgent and complex problems facing the world community today. (See page 24 for the Stated Meeting Report "Environmental Change and the Human Condition," based on John Holdren's address at the 1864th Stated Meeting of the Academy in November 2002.)

A steering committee, consisting of Steinbruner, Holdren, Ralph Cicerone (UC Irvine), and William Schlesinger (Duke University), has agreed that the project should focus on the varying regional impacts of climate change, their likely socioeconomic effects, and the political and security questions that will arise from efforts to mitigate and distribute the resulting burdens. Steinbruner is currently supervising a survey of existing research in these relevant areas.

## Fostering Corporate Responsibility

In the wake of the recent scandals at Enron, WorldCom, Tyco, and many other large publicly held American corporations, Congress passed the Sarbanes-Oxley Act of 2002, and the stock exchanges began amending their listing requirements to provide new protections for investors. Yet in the view of many scholars and practitioners, regulation alone will not suffice to make corporate America and its related institutions more trustworthy.

This spring, the Academy's project Corporate Responsibility: Beyond Regulation sponsored workshops focused on two key topics: the importance of values in guiding corporate conduct, and the roles of various groups in upholding or, in many recent cases, failing to uphold basic values. The Corporate Responsibility project is co-chaired by Fellows Martin Lipton (Wachtell, Lipton, Rosen & Katz) and Larry Sonsini (Wilson Sonsini Goodrich & Rosati) and Professor Jay Lorsch of Harvard Business School.

In a paper presented at the House of the Academy on April 28, 2003, Fellow John Reed, the recently ap-



Two of the co-chairs of the Corporate Responsibility project: Martin Lipton (Wachtell, Lipton, Rosen & Katz) and Jay Lorsch (Harvard Business School)

pointed interim chair of the New York Stock Exchange, attributed today's failures of "integrity and responsibility" in corporate America to an overemphasis on short-term shareholder value. As an alternative he proposed a standard of "evolutionary success," a way of evaluating corporate performance that considers not just the immediate interests of shareholders, but also a firm's place within a broader "environment" of customers, competitors, regulators, and society at large. Reed also addressed the responsibilities of boards of directors; structural risks to corporate integrity, such as the links between the underwriting and retail distribution functions of investment banks;

and the need for greater professionalism among groups such as auditors and lawyers.

The project's second workshop, held at NYU's Center for Law & Business on May 19 - 20, 2003, consisted of panel discussions on each of six "gatekeeper" professions and profession-like groups: regulators, auditors, journalists, lawyers, investment bankers, and corporate directors. Workshop participants addressed such topics as the links between lax professional conduct and confusion about who the "client" is (e.g., auditors serving management rather than boards or shareholders); the distorting effects of market-based relationships and incentives on professional values; and the meaning of professionalism in a business context.

The Academy will publish the essays developed in connection with the spring workshops as an Occasional Paper. It also plans to issue a set of recommendations for practice and an agenda for future research. Lead papers are being prepared by John Reed, William Kinney, Donald Langevoort, Geneva Overholser, William Allen and Geoffrey Miller, Felix Rohatyn, and Martin Lipton and Jay Lorsch, among others. ■



William Allen (NYU School of Law), Geoffrey Miller (NYU School of Law), Richard Painter (University of Illinois Law School), and other members of the New York workshop on Corporate Responsibility

"We know that we will need protective policies. We do not yet know enough to devise them," said Steinbruner regarding the effects of human activity on the global environment. "In this situation, it will be important to develop a much better understanding of the relationships between economic

growth, social equity, environmental impact, and security policy."

Previous work in this area by the Academy and its Committee on International Security Studies has helped to broaden the definition of "international security" to reflect the changed realities of the post-cold war world. "The sub-

ject of this new project is exactly the kind of complex, politically difficult problem that the Academy, with its interdisciplinary focus and reputation for non-partisanship, is especially well positioned to address," said Neal Lane (Rice University), one of the project's advisors. ■

## The Humanities Reconsidered

According to Patricia Meyer Spacks (University of Virginia), president of the Academy and co-chair of the Humanities and Culture Initiative, “There is a real need to explain the humanities to people who are not directly or professionally concerned with them, just as there is a need to remind ourselves of the enormous diversity of what constitutes the humanities in practice in this country.” Two projects in the Initiative – one focused on gathering data about the current state of the humanities, the other on exploring their development over the course of the twentieth century – are advancing knowledge about the role of the humanities in contemporary American life.

The Humanities Indicators project, led by co-chairs Francis Oakley (Williams College) and Stephen Raudenbush (University of Michigan), has been designed to provide educators, policymakers, and the public with reliable data on topics such as funding (public and private), faculty positions, undergraduate and graduate interests, curricula, enrollments and degrees, and prospective job markets. In October, a small advisory committee met to review two survey instruments developed by the Academy to bring consistency and structure to the future data

collection efforts of the national service organizations in the humanities.

As part of the Humanities Indicators project, the Academy has also commissioned in-depth studies to review existing research and the limitations of current databases in three areas: the career paths of undergraduate humanities majors, curricular and departmental changes in the liberal arts, and changing patterns of financial support for the humanities within universities.

Mapping the Humanities, a second project in the Initiative, is developing research studies on the evolution of humanities disciplines and the broad social and intellectual changes that affected these fields in the twentieth century. The first volume, to be edited by Patricia Meyer Spacks, will consider how seven core disciplines – American literature, comparative literature, history, African American studies, philosophy, art history, and law – have responded to the pressures of specialization and the fragmentation of knowledge. At a workshop in June 2003, essayists considered how the study of their respective disciplines would help to clarify both the causes and consequences of transformation in the humanities.

In early November Academy Fellow David Hollinger (UC Berkeley) convened an authors’ conference for the second volume in the series, *The Humanities and the Dynamics of Inclusion: 1945 – 2000*. This study, to which sixteen humanities scholars are contributing essays, examines the role played by the humanities in incorporating diverse cultural and ethnic groups, as well as new ideas, disciplines, and subject matter, into American universities. Topics to be considered include the entry of women, Jews, African Americans, and Catholics into college and university faculties; the relationship between demographic and curricular change; and European intellectual influences on humanities disciplines in America.

Other projects and lectures are also being developed as part of the Initiative. In an effort to improve public understanding of the humanities, the Academy is constructing an online Humanities Resource Center, which will appear as a separate section on the Academy’s website. Users will be able to easily access information about the Humanities and Culture Initiative, about current databases in the humanities, and about other organizations working in the humanities. The online resource will also serve as a clearinghouse for information about fellowships and other funding opportunities and will provide a bibliography of work on the development of the humanities disciplines.

In addition to Patricia Meyer Spacks and Francis Oakley, the Executive Committee of the Humanities and Culture Initiative includes Denis Donoghue (NYU), Steven Marcus (Columbia University), and Leslie C. Berlowitz (American Academy). Malcolm Richardson (American Academy) directs the Initiative. ■



Two participants at the November authors’ conference: Rolena Adorno (Yale University) and David Engerman (Brandeis University)



Patricia Meyer Spacks



David Hollinger



Denis Donoghue



Francis Oakley



Leslie C. Berlowitz



Malcolm Richardson



## Examining the History of Education

As of early 2000, 113 million children of primary school age remained out of school, according to the UNESCO Institute for Statistics. Meanwhile, “the total number of young people aged 6 to 17 in the less-developed regions is expected to grow by more than 100 million in the next quarter century,” observes Joel E. Cohen (Rockefeller and Columbia Universities), co-chair of the Academy’s Universal Basic and Secondary Education (UBASE) project. “The challenge of educating all the world’s children will not get smaller soon.”

On September 6–7, 2003, the Academy’s UBASE project convened a group of historians, economists, sociologists, anthropologists, educational policymakers, and public health experts from

around the world to discuss the history of educational expansion and its significance for ongoing efforts to achieve universal education.

In the past, the project of nation-building and economic development provided the political energy for expanding education systems. But today the political and economic rationales of the past are proving inadequate for mobilizing the political will necessary to reach universal enrollment, observed Academy Fellow Kenneth Prewitt (Columbia University). This is especially true in countries where only a minority of children still lack access to schools. Several participants noted a shift in the discourse among education advocates. Past arguments linking education to economic development have given way to those empha-



Aaron Benavot and Julia Resnick

sizing social justice and, more recently, national security.

At the workshop, Aaron Benavot and Julia Resnick (both of the Hebrew University of Jerusalem) presented a paper examining the origins of compulsory education and the means by which the relatively standard model of education emerged and spread globally. Benavot and Resnick also considered the role of international and nongovernmental organizations in promoting the spread of education. The group discussed the relevance of historical experience to solving contemporary problems such as restricted access to school caused by poverty, gender, race, ethnicity, and rural locale.

The UBASE project, co-chaired by Cohen and David E. Bloom (Harvard School of Public Health), is investigating the rationale, feasibility, and consequences of provid-

ing every child in the world with an education of high quality. The study will produce a series of Occasional Papers and other communications on topics ranging from the cost of achieving universal education to the use of new technologies for educational expansion. A forthcoming paper, “Assessment: Measuring Progress Toward Universal Education,” by Henry Braun (Educational Testing Service) and Anil Kanjee (Human Sciences Research Council, South Africa), examines the way in which standardized evaluative tools affect contemporary efforts at educational expansion. The first Occasional Paper published by the project, “The Consequences of Global Educational Expansion: Social Science Perspectives,” appeared in April 2003 and can be downloaded from the Academy’s website at [www.amacad.org/publications/occasional.htm](http://www.amacad.org/publications/occasional.htm). ■



Co-chair of the UBASE project Joel E. Cohen (Rockefeller and Columbia Universities) with Javier Corrales (Amherst College)

## Selected Grants and Gifts

In the fiscal year that ended March 31, 2003, the Academy continued to receive important support for its projects and other activities from foundation grants and restricted gifts from individuals. Selected recent grants and gifts to program areas (for the 2002–2003 and 2003–2004 fiscal years) include:

### Science and Global Security

*Carnegie Corporation of New York* – \$168,740, second installment of a three-year \$497,000 grant for “Governance of the Military and Commercial Uses of Space.”

*Carnegie Corporation of New York* – \$135,606, final year of a three-year

\$548,500 grant to support “International Security in the Post-Soviet Space.”

*National Science Foundation* – \$118,318 to support the International Institute for Applied Systems Analysis.

### Humanities and Culture

*The William and Flora Hewlett Foundation* – \$155,000, second installment of a four-year \$750,000 grant to support the development of humanities indicators.

*The Rockefeller Foundation* – \$125,000, second installment of a two-year \$250,000 grant to support the development of humanities indicators.

### Visiting Scholars Program

*41 University Affiliates* – \$600,000 to support the program.

*The Annenberg Foundation* – \$250,000 to support the program.

*The Virginia Wellington Cabot Foundation* – \$200,000 installment of a four-year \$500,000 grant in support of the program and community outreach.

*The Charles and Suzanne Haar Fund at The Jerusalem Foundation, Inc.* – \$25,000 to establish the Esther Haar Scholar Exchange Program within the Visiting Scholars Program.

### Other

*Elizabeth and Stephen Bechtel, Jr. Foundation* – \$250,000 for renovation and improvements to the first floor of the House of the Academy.

*Restricted Individual Gifts* – \$149,423.

*University of California, Irvine* – \$50,000 for the Western Center.

### With Special Thanks To

Fidelity Investments and the Microsoft Corporation. ■

# Visiting Scholars Program

The Academy welcomed its second group of Visiting Scholars to its headquarters in Cambridge in September 2003. In characterizing the new class, the Chair of the Visiting Scholars Program (VSP), novelist and historian James Carroll, observed, "The 2003 – 2004 group of post-doctoral fellows and junior faculty exhibit a broad range of interests as well as a deep level of engagement with some of the most important issues in their fields. Their presence at the House in Cambridge will be stimulating for all of us, while their projects will make significant contributions to scholarship in areas of vital concern to the Academy." Representing the fields of international relations, law, political science, African American studies, American history, and American literature, the Visiting Scholars will carry out research on a variety of topics ranging from race and ethnicity in modern America to intercultural dialogue and co-existence.

Now in its second year, the VSP was founded to stimulate and support research by promising scholars and practitioners in the early stages of their careers, and to foster ties between an emerging generation of scholars and Academy members with shared scholarly and social concerns. As Executive Officer Leslie Berlowitz notes, "The Visiting Scholars work in a genuinely interdisciplinary center, with all the opportunities this brings for their intellectual development and future careers. At the same time, the Academy benefits from having scholars in residence to add to the intellectual vitality of its studies and activities."

The Academy's 41 University Affiliates are providing crucial support and guidance for the VSP. The program is also funded by grants from the Annenberg Foun-

ation, the Virginia Wellington Cabot Foundation, and the Charles and Suzanne Haar Fund at The Jerusalem Foundation. The Academy is grateful to Marjorie Garber, Director of the Harvard Humanities Center, for providing library privileges for the scholars, and to other Boston institutions, including the Boston Public Library and the Boston Athenaeum, that have joined with the Academy to enrich the experience of the Visiting Scholars during their year in residence. ■



Front (left to right): Robert Chodat, Eileen Babbitt, Ann Mikkelsen, Matthew Lindsay, Crystal Feimster; back (left to right): Adam Webb, Jonathan Hansen, James Carroll

## Profiles of the Visiting Scholars

**Eileen Babbitt** – Assistant Professor of International Politics, Fletcher School, Tufts University. *Refugee Repatriation after Civil War: The Tension between Coercion and Trust*. An examination of whether coercive laws and structures are the only way to keep "enemies" together when refugees return and try to reintegrate into communities where they are not welcome, and whether this coercive strategy leads to voluntary coexistence or undermines peace-building efforts.

**Robert Chodat** – Postdoctoral Scholar, Stanford University. *The Patterns of Persons: Ideas of Agency in American Literature and Philosophy*. A study of meaning and action in twentieth-century American literature and philosophy, focusing on how certain writers, including Gertrude Stein, Don DeLillo, and Saul Bellow, articulate competing pictures of mind, intention, and personhood.

**Crystal Feimster** – Assistant Professor of African American History, Boston College. *Lynching Women: Racial and Sexual Violence in the American South*. An analysis of the varied roles played by black and white women in the history of lynching in the southern regions of the United States.

**Jonathan Hansen** – Postdoctoral Scholar, Boston University. *Apostate's Return: American Expatriates and the Dilemmas of National and Ethnoracial Identity*. An exploration of the cultural criticism of twentieth-century American expatriates whose return home reveals the ineluctable grip of national allegiance on twentieth-century selfhood, while providing a fresh perspective on American national identity.

**Matthew Lindsay** – J.D. Yale Law School, Ph.D. candidate, University of Chicago. *Equal Protection in the Age of "Ethnicity" – Racial Equality and the "Colorblind" Constitutionalism Since the Second Reconstruction*. A historical analysis of the constriction of citizenship rights post Reconstruction, leading to insight into the retrenchment of anti-discrimination law since 1970.

**Ann Mikkelsen** – Lecturer, Committee on Degrees in History and Literature, Harvard University. *Voices from the Field: Pastoral, Pragmatism, and Twentieth-Century American Poetry*. A project on twentieth-century poets who called attention to social, economic, and political inequities and attempted to reconcile these with their own relatively privileged, but simultaneously marginal, status as representative voices of a democratic society.

**Adam Webb** – Postdoctoral Scholar, Princeton University. *A World, Not a Globe: Towards an Alternative Vision of Intercivilizational Dialogue and Political Cosmopolitanism*. An exploration of encounters among the major premodern civilizations, and of the lessons they provide for an ethically richer view of cross-cultural collaboration and a future world order.

### Chair of the VSP

**James Carroll** – Historian and columnist for *The Boston Globe*. Books include *An American Requiem*, *Constantine's Sword*, *The Church and the Jews: A History*, and, most recently, the novel *Secret Father*. During his tenure at the program, he is working on a history of the Pentagon.

The VSP will be hosting two Senior Scholars in spring 2004: Israeli novelist and Foreign Honorary Member Aharon Appelfeld and Academy Fellow Jerrold Meinwald, Goldwin Smith Professor of Chemistry at Cornell University. ■



## Academy Trust

Four years ago, a strategic plan – *2000 and Beyond* – called for the Academy to expand its project and outreach activities, create a Visiting Scholars Program, revitalize its publications, and enhance its national visibility. Over the past several years, the American Academy has made significant progress in advancing all aspects of this work. It has become increasingly national and diverse, and a growing number of Fellows throughout the country are now involved directly in Academy programs and activities.

Last year, the Council established an Academy Trust to help strengthen the Academy's stewardship and its financial and resource development strategies. The Trust will provide critical advice and guidance for Officers, Councilors, and the Executive Office. Vice President Louis Cabot chairs the group, which includes Academy leaders and major supporters with a deep understand-

ing of the current and long-term needs of nonprofit associations, their goals, and their management.

Meeting for the first time on April 27 – 28, 2003, the Trust reviewed the Academy's overall operations and finances and met with program directors to learn about their objectives. Cabot described the session as "an excellent opportunity to talk about where the Academy is now and how we can help it achieve its long-term aspirations." Executive Officer Leslie Berlowitz said that she was "delighted by the enthusiasm of the Trust members for this special institution" and that she looks forward to benefiting from their expertise in advancing an organization's mission. The Trust plans to meet two or three times annually. Its second meeting was held in October. ■



Front (left to right): John S. Reed (New York Stock Exchange), Michael E. Gellert (Windcrest Partners), Vice President Louis W. Cabot (chair of the Trust), Executive Officer Leslie C. Berlowitz, and E. John Rosenwald (Bear Stearns Companies); back (left to right): Peter Nicholas (Boston Scientific Corporation), Secretary Emilio Bizzi (MIT), Richard Meserve (Carnegie Institution of Washington), and Arthur Gelb (Four Sigma Corporation); absent: President Patricia Meyer Spacks, William T. Golden (New York City), and Walter B. Hewlett (William and Flora Hewlett Foundation)

## From the Archives

At a meeting held on May 29, 1781, Fellows heard a report from a committee that had been appointed "to arrange the several subjects which . . . should principally engage the attention of the Academy." The committee's recommendations were:

1. That one class examine the various soils of the Country . . . Also what have been and are the various methods of culture . . .
2. That a second class examine the growth of vegetables . . .
3. That a third class collect samples of the various minerals and fossils in the country . . .
4. That a fourth class make a chemical analysis of vegetables, minerals and fossils and ascertain their medicinal and other properties.
5. That a fifth class examine the various diseases of the Country . . .
6. That a sixth class attend to mathematical disquisitions and astronomical observations . . .
7. That a seventh class make meteorology their special object . . .
8. That an eighth class examine into the progress of the mechanical arts in America . . .
9. That the object of a ninth class be the rationale of Language, particularly the rationale, genius and idiom of the English language.
10. That it be the business of a tenth class to attend to the subject of the Commerce of America . . .
11. That the Antiquities of the Country . . . be subjects of special enquiry by the eleventh class.

Over the past 223 years, the "several subjects" recommended for Academy study have grown and changed but, now as in the past, the rich insights and perspectives the Academy provides reflect the historic collaboration of distinguished individuals working at the interface of thought and action. ■

## Induction

continued from page 1

emy projects, she emphasized that Academy studies focus on long-term societal and scholarly challenges and are addressed to both policymakers and the broader intellectual community (see pages 2–5 for more on these projects).

- Patricia Meyer Spacks (University of Virginia) described the three aspects of the Academy’s Humanities and Culture Initiative: the development of a systematic approach to databases in the humanities; the publication of research studies on the evolution of the humanities in the twentieth century; and the creation of an online Humanities Research Center.

- New Fellow William Allen (NYU) outlined the work of the Academy’s project on Corporate Responsibility: Beyond Regulation. He focused on its investigation of the responsibilities of key “gatekeepers” – auditors, regulators, journalists, lawyers, investment bankers, and corporate directors – in promoting ethical corporate conduct.

- Robert Post (Yale Law School) and Linda Greenhouse (*The New York Times*) described the study on Congress and the Court, which is exploring the tensions underlying the changing relationship between the federal legislature and the judiciary.

- Joel Cohen (Rockefeller and Columbia Universities) provided an overview of the project on Universal Basic and Secondary Education (UBASE) and gave a detailed description of this project’s efforts to calculate the cost of achieving universal education.

In addition, Carl Kaysen (MIT), co-chair of the Academy’s Committee on International Security Studies, and writer James Carroll, a Committee member, discussed the policy issues involved in the Academy’s program on security and international relations, including its study on the commercial and military uses of space.

At the Induction Ceremony held at Harvard University’s Sanders Theatre, five Academy Inductees addressed the audience. Full texts of their remarks will be reprinted in the Winter 2004 *Bulletin*.

- Mathematician and computer scientist Tom Leighton spoke about how the same underlying protocols that have enabled the Internet to serve hundreds of millions of users around the world have rendered it increasingly vulnerable to misuse. Leighton outlined the challenge of protecting society from the malevolent exploitation of the Internet: “Today, we worry about spam, viruses, and e-crime. Soon, we will need to worry about the possibility that a government or a terrorist will use the Internet to attack critical infrastructure, with far more serious effect than an overflowing mailbox or a loss of money or of confidentiality.”

- Calling herself “a chemist who studies biological systems,” Carolyn R. Bertozzi explained that the new field of chemical biology is using tools developed by other disciplines to study the body from the standpoint of individual atoms and molecules. She pointed out that, in her own research, the newfound ability to “study cell surfaces just like we explore the landscape of the planet Earth” is illuminating the role of cell-

surface interactions in cancer, inflammation, and bacterial infections. Yet the practical value of such knowledge, Bertozzi said, should not blind us to the importance of “fundamental scientific discovery” as part of “our natural drive to make sense of the world.”

- Lawyer and philanthropist William H. Gates, Sr., addressed the current debate about the federal estate tax and how it relates to “fundamental national axioms.” Noting that American entrepreneurs benefit significantly from a market economy protected by the rule of law and subsidized by \$96 billion in annual federal support for basic research, Gates asserted that one way some Americans “manage to get so rich” is simply by “being born in the United States.” Under these circumstances, he asked, “Can there be a serious question about the rectitude of society recovering from its most successful citizens a significant fraction of the fortune they leave at the time of their death?”

- Literary scholar and critic Michael Wood discussed the kind of knowledge that literature offers

1. Orientation speakers Joel E. Cohen (Rockefeller and Columbia Universities), Linda Greenhouse (*The New York Times*), William Allen (NYU), and Robert Post (Yale Law School)



1

2. Academy President Patricia Meyer Spacks (University of Virginia)



2

3. Arthur Levitt, Jr. (The Carlyle Group), Sidney Harman (Harman International Industries), Jane Harman, and Sharon Percy Rockefeller (WETA)



3

4. Archie H. Brown (St. Antony’s College, University of Oxford) and Kenneth L. Judd (Stanford University)



4



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2

1. Hue-Tam Ho Tai (Harvard University)
2. Adele Bacow, Lawrence S. Bacow (Tufts University), and John S. Reed (New York Stock Exchange)



3



4

3. Linda Hutcheon (University of Toronto) and Elizabeth F. Loftus (UC Irvine)
4. Kenneth L. Sokoloff (UCLA), Bruce Mazlish (MIT), Secretary Emilio Bizzi (MIT), and Louis Sokoloff (National Institutes of Health)



5



6

5. William G. Unruh (University of British Columbia), Henry Petroski (Duke University), and Dennis A. Ausiello (Harvard Medical School and Massachusetts General Hospital)
6. Zena Werb (UC San Francisco) and Samuel C. Silverstein (Columbia University)

by proposing that there are things that works of literature “know” but do not explicitly tell us. He affirmed the value of “soft” and “silent” knowledge. “Every story has a story it is not telling,” Wood declared, “and if we listen, we can hear it in the silence, and we cannot only guess what it means, we can know what it knows. We can hear the kindness in the anger; the generosity in the rage; the certainty in the doubt; and the hope in the very articulations of despair.”

- World-renowned operatic baritone Sherrill Milnes, accompanied on piano by Assistant Professor Sean Gallagher of the Harvard

Music Department, sang two pieces, “Surely the Presence of the Lord is in this Place” by the contemporary Gospel composer Lanny Wolfe, and an arrangement of “At the River” by Aaron Copland (Academy Fellow, 1951 – 1990). On concluding his performance, Milnes spoke about his ancestor Matthew Lyon – the first American to be indicted under the Alien and Sedition Acts signed by U.S. President and Academy co-founder John Adams. “I am not sure how Matthew Lyon would feel about my being inducted into this Academy, but I am extremely honored,” Milnes remarked.

Following these presentations, Academy officers welcomed the new inductees by class. Each member was called forward to sign the members’ book – a tradition that goes back to the Academy’s founding. President Spacks closed the ceremony by quoting John Adams’s exhortation “Let us dare to read, think, speak, and write,” and urging the new members to play an active role in the “community of daring” that is central to the mission of the Academy. ■



# Induction 2003



1



2

1. 2003 Nobel Prize Laureate Peter C. Agre (Johns Hopkins University School of Medicine) and Mary Agre
2. Laura L. Kiessling (University of Wisconsin, Madison) and Carolyn R. Bertozzi (UC Berkeley)



3



4

3. Sir Anthony Kenny (St. John's College, University of Oxford), Lawrence S. Bacow (Tufts University), and Robert A. Katzmann (U.S. Court of Appeals, Second Circuit)
4. Corinne Schelling (American Academy) and Bernd Giese (University of Basel)



5



6

5. The Honorable Richard W. Fisher and Nancy Fisher (Kissinger McLarty Associates)
6. Friedrich Katz (University of Chicago), Thongchai Winichakul (University of Wisconsin, Madison), and Harry D. Harootunian (NYU)



7



8

7. Steven B. Sample (University of Southern California), Katherine Sample, and Larry William Swanson (University of Southern California)
8. Vinay Chowdhry and Uma Chowdhry (DuPont Engineering)

# New Members: Class of 2003

## Class I: Mathematical and Physical Sciences

### Section 1: Mathematics

#### Percy A. Deift

*Courant Institute of Mathematical Sciences, New York University, New York, NY*

Professor of Mathematics. Made seminal contributions to the theory of integrable systems and their applications in spectral theory, mathematical physics, combinatorics, and probability theory.

#### Lawrence Craig Evans

*University of California, Berkeley, CA*  
Professor of Mathematics. Leader in the field of nonlinear partial differential equations. Established key estimates, regularity, existence, and other properties of solutions important to applications in many fields such as control, geometric motion, level set methods, the calculus of variations, and homogenization.

#### Richard Hamilton

*Columbia University, New York, NY*  
Professor of Mathematics. Made contributions to geometry, partial differential equations, and applied mathematics. Did influential work on mean curvature flow and harmonic maps. Solved outstanding problems, including the topology and geometry of manifolds with positive curvature and Kahler-Einstein metrics.

#### Iain M. Johnstone

*Stanford University, Stanford, CA*  
Professor of Statistics. With collaborators, introduced wavelets into the field of statistics and developed concepts, such as that of statistical "oracle," that have since become fundamental in prediction more generally.

#### Nicholas M. Katz

*Princeton University, Princeton, NJ*  
Professor of Mathematics. Made contributions to number theory and arithmetical geometry, particularly with work on p-adic interpolation, exponential sums and L-functions over finite fields, and

related monodromy groups and their scaling limits.

#### Wilfried Schmid

*Harvard University, Cambridge, MA*  
Dwight Parker Robinson Professor of Mathematics. Leader in the representation theory of Lie groups. Gave the first construction of the discrete series and proved Blattner's conjecture. Work on Hodge theory has produced wide-ranging applications.

#### James Grieg Arthur (FHM)

*University of Toronto, Toronto, Ontario, Canada*  
University Professor of Mathematics. Research focuses on unifying the mathematical fields of algebra and analysis. Invented the "trace formula," which, along with one of its products, the so-called Arthur packets, is recognized as an important step in the ongoing development of Robert Langlands's theories.

### Section 2: Physics

#### Paul M. Chaikin

*Princeton University, Princeton, NJ*  
Henry DeWolf Smyth Professor of Physics. Experimentalist working in condensed matter physics. Discovered field-induced spin density waves. Co-authored a text that summarizes the "modern synthesis" in that field.

#### Michel Henri Devoret

*Yale University, New Haven, CT*  
Professor of Applied Physics and Physics. Condensed matter physicist. Demonstrated macroscopic quantum effects in superconducting devices. Pioneer of the experiment and theory of the single electron transistor (SET), electron pump, and superconducting SET. Leader in the field of solid-state devices for quantum computing.

#### Matthew P. A. Fisher

*University of California, Santa Barbara, CA*  
Professor of Physics. Condensed matter theorist. Made seminal contributions to the vortex-glass phase, the superconductor-insulator transition, and the theory of electron fractionalization. Deepened our understanding of strongly correlated electron materials.

#### Donald Glaser

*University of California, Berkeley, CA*  
Professor of Physics and Neurobiology. Invented the bubble chamber to detect and study the properties of elementary particles. Developed automatic systems to find genetic mutants of microbial and mammalian cells. Co-founded the biotech company Cetus, now merged with Chiron. Received the Nobel Prize in physics in 1960.

#### Randall Gardner Hulet

*Rice University, Houston, TX*  
Fayez Sarofim Professor of Physics and Astronomy. Leader in the development of laser cooling and the trapping of atoms. Achieved the first Bose-Einstein condensation in a gas with attractive interactions ( $^7\text{Li}$ ). Produced a degenerate Bose-Fermi mixture of  $^7\text{Li}$  and  $^6\text{Li}$  atoms, and demonstrated matter wave soliton trains of Bose-Einstein condensates.

#### R. G. Hamish Robertson

*University of Washington, Seattle, WA*  
Professor of Physics. Made contributions to direct mass measurements and to the Sudbury Neutrino Observatory that led to a demonstration that the origin of the solar neutrino problem is neutrino oscillations.

#### Ellen Dudley Williams

*University of Maryland, College Park, MD*  
Distinguished University Professor; Director of the Materials Research Science and Engineering Center. Provided a quantitative thermodynamic analysis of faceting transitions on stepped crystal surfaces through tunneling microscopy and low-energy electron diffraction. Developed a general experimental and theoretical approach describing surface growth and evolution under a variety of nonequilibrium driving forces.

#### William G. Unruh (FHM)

*University of British Columbia, Vancouver, British Columbia, Canada*  
Founding Director of the CIAR Cosmology Program; Professor of Physics and Astronomy. Changed our understanding of the notion of "particles" by discovering that

uniformly accelerating observers feel themselves to be immersed in a thermal bath at a nonzero temperature. Made numerous other contributions to general relativity, cosmology, quantum gravity, and quantum measurement theory.

### Section 3: Chemistry

#### Fred Colvig Anson

*California Institute of Technology, Pasadena, CA*  
Elizabeth W. Gilloon Professor of Chemistry Emeritus. Electrochemist recognized for the invention of chronocoulometric methods for analysis of adsorbed layers on electrodes, for the demonstration (together with James Collman) of the four-electron reduction of dioxygen to water, and for the development of the principles for predicting and manipulating the adsorption of species on electrodes.

#### Phaedon Avouris

*IBM Thomas J. Watson Research Center, Yorktown Heights, NY*  
Manager of Nanometer Scale Science and Technology. Performed the first atomically resolved surface chemistry study, developed techniques to selectively break individual covalent bonds, and dissociated individual molecules using the scanning tunneling microscope. Demonstrated the first atomic-scale device, pioneered the fabrication and study of carbon nanotube transistors, and was first to fabricate a fully functional logic circuit on a single carbon nanotube molecule.

#### Carolyn R. Bertozzi

*University of California, Berkeley, CA*  
Associate Professor of Chemistry and Molecular and Cell Biology; Investigator, Howard Hughes Medical Institute. Made contributions to the understanding of biological sulfation pathways. Developed "metabolic interference" techniques for perturbing cell surface glycosylation with unnatural sugars in order to study their function. Demonstrated that Golgi localization of polysaccharide biosynthetic enzymes determines their *in vivo* substrate specificity.

### **Charles H. DePuy**

*University of Colorado, Boulder, CO*  
Professor Emeritus of Chemistry. Made contributions to the fundamental understanding of organic reaction mechanisms, especially those involving strained rings. Provided detailed mechanisms, kinetics, stereochemistry, and thermochemistry of many important processes. Applied mass spectrometric flow techniques to the study of ionic organic reactions.

### **Paul Lyon Houston**

*Cornell University, Ithaca, NY*  
Professor of Chemistry. Innovator in the field of molecular reaction dynamics. Performed seminal work on vector correlations in photodissociation dynamics, co-invented the product imaging technique, and discovered a new channel in the ultraviolet photodissociation of ozone.

### **Thomas Joseph Katz**

*Columbia University, New York, NY*  
Professor of Chemistry. Performed the first syntheses of 10- $\pi$  aromatics, prismane, pentaalkylphosphorus compounds, helical and oligomeric metallocenes, and helicenes and benzvalene in quantity; the first demonstrations of isolable metal-carbenes alone initiating olefin metatheses and acetylene polymerizations, enyne metathesis, rhodium catalyzed cycloadditions, the current photocyclization procedure, and columnar helix aggregates; and the first mechanistic analyses of olefin metathesis regiochemistry and metal-catalyzed cycloadditions.

### **Laura L. Kiessling**

*University of Wisconsin, Madison, WI*  
Professor of Chemistry and Biochemistry. Applied organic synthesis, particularly ring-opening metathesis polymerization, to construct defined multivalent ligands used to solve biological problems. Known for work on L-selection inhibitors, which defined new strategies for anti-inflammatory drugs and the biological effects of multivalency.

### **Michael Lawrence Klein**

*University of Pennsylvania, Philadelphia, PA*  
Hepburn Professor of Physical Sciences; Director of the Materials Research Science and Engineering Center. Advanced

molecular dynamics simulations by raising them to the limits of obtaining realistic descriptions of complex condensed phases. Work has led to physically significant and predictive descriptions of hydrogen-bonded liquids, self-assembled monolayers, supercooled liquids, conducting fluids, and biological membranes.

### **David Charles Clary (FHM)**

*University of Oxford, Oxford, United Kingdom*  
Professor of Chemistry; Head of Mathematical and Physical Sciences. Developed new quantum theories for predicting the rates of chemical reactions and the structures of molecules with weak bonds. Editor of *Chemical Physics Letters*.

### **Bernd Giese (FHM)**

*University of Basel, Basel, Switzerland*  
Professor of Organic Chemistry. Contributed to the modern application of free radical chemistry to stereoselective organic synthesis, to the fundamental understanding of radical-induced DNA strand scission, and to the action of ribonucleotide reductase. Discovered that electron transfer in DNA occurs by a multistep charge-hopping mechanism.

## **Section 4: Astronomy (including Astrophysics) and Earth Sciences**

### **Alan Paul Boss**

*Carnegie Institution of Washington, Washington, DC*  
Research Staff Member. Astrophysical theorist in the area of star and planet formation. Demonstrated that binary star formation can be a common outcome of the fragmentation that accompanies the collapse of an interstellar molecular cloud. Revived and developed the hypothesis that Jupiter-mass planets form from gravitational instabilities in the circumstellar nebular disk.

### **William Eric Dietrich**

*University of California, Berkeley, CA*  
Professor of Geography; Chair of the Department of Earth and Planetary Science. Leader in the quantitative study of Earth-surface processes. Combined field observations, laboratory experiments, and numerical modeling to develop a mechanistic understanding of landform evolution. Applied cosmogenic radionuclides to measure

landscape development rates in studies of runoff processes, landsliding, soil formation, and stream-channel networks.

### **Joseph L. Kirschvink**

*California Institute of Technology, Pasadena, CA*  
Professor of Geobiology. Magnetogeobiologist with research interests focusing on geomagnetic reversals, paleomagnetism and magnetostratigraphy, geomagnetic sensitivity in animals, the biological effects of electromagnetic fields, and the biomineralization of ferromagnetic materials.

### **Donald Quincy Lamb, Jr.**

*University of Chicago, Chicago, IL*  
Louis Block Professor in Astronomy and Astrophysics. Contributed to our understanding of the structure and evolution of white dwarfs and neutron stars; the physics of X-ray and gamma-ray bursts; and fundamental physical processes at high densities, temperatures, and magnetic field strengths. Applied advanced statistical methods to the analysis of astronomical data.

### **S. George H. Philander**

*Princeton University, Princeton, NJ*  
Professor of Geosciences. Theoretician of tropical ocean circulation and dynamics. Contributed new information to our present understanding of the complex oceanic-atmospheric phenomenon known as El Niño, La Niña, and the Southern Oscillation.

### **George H. Rieke**

*University of Arizona, Tucson, AZ*  
Professor of Astronomy and Planetary Sciences; Deputy Director of the Steward Observatory. Infrared astronomer. Co-discoverer of ultraluminous and starburst galaxies. Carried out pioneering infrared observations of active galactic nuclei, the Galactic Center, low mass stars, brown dwarfs, and the solar system. Developed methods for infrared telescope optimization and many instruments for ground-based telescopes. Leader of space instrumentation programs for SIRTf and JWST.

### **Alexander Sandor Szalay**

*Johns Hopkins University, Baltimore, MD*  
Alumni Centennial Professor of Physics and Astronomy. Astrophysicist and leader in the study of large-scale structure in the universe and the application of ad-

vanced statistical and computational techniques, including the introduction of powerful database software to cosmology and astrophysics.

### **Lynne Talley**

*University of California, San Diego, CA*  
Professor of Oceanography. Made fundamental contributions to both the theory and observation of large-scale ocean circulation. Former co-chairperson of the international working group planning global observations as part of the World Ocean Circulation Experiment.

### **J. Richard Bond (FHM)**

*University of Toronto, Toronto, Ontario, Canada*  
University Professor; Director of the Canadian Institute for Theoretical Astrophysics. Made contributions to physical cosmology and astrophysics through seminal research that has improved our understanding of supermassive objects, the nature of dark matter in the universe, and the origin and growth of a large-scale structure. Developed the fluctuations in cosmic background radiation into a cosmological tool of exceptional power.

### **Konrad Mauersberger (FHM)**

*Max-Planck-Institut für Kernphysik, Heidelberg, Germany*  
Director of the Division of Atmospheric Physics. Leading researcher in the mass-spectrometric analysis of ozone and other gases in the stratosphere and phases in polar stratospheric clouds. Discovered unexpected isotope effects in ozone formation leading to new mechanisms causing isotopic shifts.

## **Section 5: Engineering Sciences and Technologies**

### **Uma Chowdhry**

*DuPont Engineering, Wilmington, DE*  
Vice President of Central Research and Development. Made contributions in the fields of catalysis/surface science, electronic ceramics, high-temperature superconductors, and electronic packaging.

### **Ray Dolby**

*Dolby Laboratories, Inc., San Francisco, CA*  
Founder and Chairman. Known for innovations in the quality of audio and video recording. Recipient of the National Medal of Technology.



### **James Economy**

*University of Illinois at Urbana-Champaign, Urbana, IL*

Professor of Materials Science and Engineering. Developed original ideas for endowing composite materials with important properties for engineering applications. Materials include boron nitride, metal matrix composites, and high-performance aromatic copolyesters. Designed advanced materials for electronic applications and environmental control.

### **Morris E. Fine**

*Northwestern University, Evanston, IL*

Walter P. Murphy and Technological Institute Professor Emeritus. Created the first materials science department. Played a key role in transforming materials research and education by emphasizing the common principles that govern the behavior of all materials.

### **Julio Mario Ottino**

*Northwestern University, Evanston, IL*

R. R. McCormick Institute Professor; Walter P. Murphy Professor of Engineering. Launched the discipline of modern mixing with a series of papers and a book that defined the field. Clarified important aspects of the dynamic behavior of granular matter and the competition between chaos and order.

### **Henry Petroski**

*Duke University, Durham, NC*

Aleksandar S. Vesic Professor of Civil Engineering, Department of Civil and Environmental Engineering; Professor of History. Authority on the failure of structures. Has written about bridges, pencils, paper clips, books and bookshelves, engineering errors, and delivering newspapers as a boy. Latest book concerns why there is no perfect design.

### **Kathleen C. Taylor**

*General Motors Research and Development Center, Warren, MI*  
Former Director of the Materials and Processes Laboratory. Developed automobile exhaust pollution control through research on catalysis, which resulted in the use of palladium and platinum in catalytic converters. Served as president of the Materials Research Society.

## **Section 6 : Computer Sciences (including Artificial Intelligence and Information Technologies)**

### **Alfred V. Aho**

*Columbia University, New York, NY*  
Professor of Computer Science at the Fu Foundation School of Engineering and Applied Science; Chair of the Department of Computer Science. Authority in the field of computer science. Research contributions include both theoretical results and associated applications. Managed R&D at Bell Laboratories and Bellcore. Authored or co-authored ten textbooks.

### **Paul Baran**

*Novo Ventures, Inc., Milpitas, CA*  
Founder. Made contributions to the technique for data transmission, which later came to be called packet switching, and to the building of a distributed network that were significant in the development of the ARPANET.

### **Thomas M. Cover**

*Stanford University, Stanford, CA*  
Kwo-Ting Li Professor of Engineering; Professor of Statistics. Contributed to the fields of information theory, mathematical statistics, pattern recognition, and investment theory.

### **Solomon W. Golomb**

*University of Southern California, Los Angeles, CA*

University Professor. Worked on the theory of linear shift-register sequences (basic components in spread spectrum communication systems) and on prime number theory. Contributed to number theory (twin primes), combinatorics, error-correcting and cryptographic codes, digital communication, and academic administration.

### **William Kahan**

*University of California, Berkeley, CA*  
Professor of Computer Science and Electrical Engineering. Mathematician. Led the design of a mathematically reliable "floating-point" arithmetic standard built into commercially significant fast computers since 1985. Honored by the Association for Computing Machinery, the Society for Industrial and Applied Mathematics, and the Institute of Electrical and Electronic Engineers.

### **Leonard Kleinrock**

*University of California, Los Angeles, CA*

Professor of Computer Science. Developed the basic principles that led to packet switching, the technology underpinning the Internet. Led the laboratory where the Internet was born and directed the transmission of the first message to pass over the Internet. Introduced and extended the theory of queuing systems to model, analyze, design, and optimize packet switching networks.

### **Frank Thomson Leighton**

*Massachusetts Institute of Technology and Akamai Technologies, Cambridge, MA*

Professor of Applied Mathematics; Chief Scientist. Co-founder of Akamai Technologies. Specialist in algorithms for network applications. Author of research papers, patents, and a text on parallel algorithms and architectures.

### **Silvio Micali**

*Massachusetts Institute of Technology, Cambridge, MA*  
Professor of Computer Science. Provided the foundation for modern cryptography, introducing (with Goldwasser) probabilistic encryption and semantic security of encryptions. Invented (with Goldwasser and Raccoff) Zero Knowledge Proofs. Created the theory of pseudo-random generators central to cryptography.

### **Richard M. Stallman**

*Free Software Foundation, Boston, MA*

President. Launched the Free Software Movement, which advocates users' freedom to study, change, and redistribute software, and led the development of the GNU operating system. Widely used GNU/Linux variant of GNU, which uses Linux as the kernel, is often inaccurately called "Linux." Also developed Emacs and GCC.

### **Niklaus Wirth (FHM)**

*ETH Zentrum, Zurich, Switzerland*  
Professor of Computer Science Emeritus. Designer of programming languages, including EULER, ALGOL-W, MODULA, PASCAL, and OBERON. Had an impact on language design and implementation.

## **Class II : Biological Sciences**

### **Section 1 : Biochemistry and Molecular Biology**

#### **Philip Beachy**

*Johns Hopkins University School of Medicine, Baltimore, MD*

Professor of Molecular Biology and Genetics; Investigator, Howard Hughes Medical Institute. Elucidated the structure and processing of the hedgehog signaling protein and its modification by cholesterol, and demonstrated its role as a crucial developmental morphogen. Conducted studies of signal transduction and of pathway inhibition by the potent teratogen cyclopamine, which have provided a foundation for future mechanism-based therapies in human cancer.

#### **Jennifer A. Doudna Cate**

*University of California, Berkeley, CA*

Professor of Molecular and Cellular Biology; Investigator, Howard Hughes Medical Institute. Solved the high-resolution X-ray structures of large RNA molecules: a group I intron fragment, the hepatitis delta virus ribozyme, and the bacterial signal recognition particle. Revealed novel principles of RNA folding (motifs such as adenine platforms and ribose zippers, how helices fold around a magnesium core) and provided insights into the basis of RNA catalysis.

#### **Stephen Elledge**

*Baylor College of Medicine, Houston, TX*

Robert A. Welch Professor of Biochemistry; Investigator, Howard Hughes Medical Institute. At the forefront of the field of cell cycle checkpoints and DNA damage control. Discovered three related but independent control systems key to the regulation of the cell cycle. Developed several technologies, including the Univector plasmid fusion system, the lambda-Yes cDNA expression system, and a membrane two-hybrid system.

#### **Perry Allen Frey**

*University of Wisconsin, Madison, WI*

Professor of Biochemistry; Co-director of the Institute for Enzyme Research. Studied enzyme-catalyzed reactions using substrates chirally labeled with isotopic elements, site-directed

mutations, and substrate analogs. Demonstrated chemical insight that has defined the molecular mechanism of many enzyme functions.

#### **Carol W. Greider**

*Johns Hopkins University,  
Baltimore, MD*

Professor of Molecular Biology and Genetics. Co-discoverer of the enzyme telomerase, which is responsible for the synthesis of the ends of chromosomes (telomeres). Analyzed many aspects of the biochemistry of telomerase and provided insights into the role of the enzyme in genome stability, cellular senescence, and tumorigenesis.

#### **Peter Bartlett Moore**

*Yale University, New Haven, CT*

Sterling Professor of Chemistry with joint appointment in Molecular Biophysics and Biochemistry. With colleagues, developed and used neutron scattering procedures and NMR methods to probe structural features of the ribosome. With the recent discovery of the atomic structure of the 50S ribosomal subunit, has provided new insights into the architecture of an RNA-protein machine and the role of RNA in catalysis.

#### **Maynard V. Olson**

*University of Washington,  
Seattle, WA*

Director of the Genome Center. Invented techniques essential to the completion of the genome project, including novel implementation of pulsed field gel electrophoresis, determination of physical maps based on clone fingerprints, development of yeast artificial chromosome cloning systems, and use of sequence tagged sites for mapping of mammalian genomes.

#### **William Tobey Wickner**

*Dartmouth Medical School,  
Hanover, NH*

Chilcote Distinguished Professor of Biochemistry. Investigated the biochemical dissection of two essential membrane assembly events: protein translocation and bilayer fusion. Led the team that purified the bacterial Sec apparatus required for protein assembly into the envelope and dissected the regulation and mechanism of membrane fusion that accompanies the segregation of vacuoles into daughter yeast cells.

## **Section 2 : Cellular and Developmental Biology, Microbiology, and Immunology (including Genetics)**

#### **Frederick M. Ausubel**

*Massachusetts General Hospital and  
Harvard Medical School, Boston, MA*

Professor of Genetics. Made seminal contributions to the knowledge of the genetics and molecular biology of nitrogen fixation in plants and microorganisms. Opened the way to understanding the molecular and biochemical interactions between plants and microbial pathogens. Identified common virulence factors between plant and animal pathogens.

#### **Kathryn Lee Calame**

*Columbia University, New York, NY*

Professor of Microbiology and Biochemistry. Leader in gene regulation in lymphocytes. Discovered the IgH intronic enhancer and characterized its mechanism. Discovered the translocation of *c-myc* proto-oncogene to the IgH locus, studied the regulation of normal and translocated *c-myc* genes, and identified regulatory cascades in terminal B-cell development.

#### **Martin Chalfie**

*Columbia University, New York, NY*

Professor of Biological Sciences. Revolutionized many aspects of biological research by introducing the technique of vitally labeling cells in intact organisms with the jellyfish green fluorescent protein. Established the touch neurons of the nematode *Caenorhabditis elegans* as among the most fully genetically characterized nerve cells in biology.

#### **Robert N. Eisenman**

*Fred Hutchinson Cancer Research  
Center, Seattle, WA*

Member. Studies cancer causation and progression, with a focus on the MYC oncogene. Has shown that the oncogenic MYC protein is only one member of a network of interacting gene regulatory factors that act to control cell behavior.

#### **Rochelle Easton Esposito**

*University of Chicago, Chicago, IL*

Professor in the Department of Molecular Genetics and Cell Biology and Professor in the Committee on Genetics. Pioneered the identification of genes required for meiosis in budding yeast and

developed genetic tools to analyze mechanisms regulating genetic recombination and chromosome segregation. Isolated key controlling genes for meiotic progression, established the requirement of recombination for chromosome segregation, and provided the paradigm for further studies of meiosis.

#### **Thomas B. Kornberg**

*University of California,  
San Francisco, CA*

Professor of Biochemistry and Biophysics. Researcher who has worked in several fields, including DNA replication and developmental biology. Has studied the function of *Drosophila* genes that regulate patterning during embryogenesis, such as engrailed and hedgehog.

#### **Robert Eugene Krumlauf**

*Stowers Institute for Medical  
Research, Kansas City, MO*

Scientific Director. Made contributions to our understanding of the role of Hox master control genes in patterning the basic body plan of the vertebrate embryo. Helped to establish the structural and regulatory conservation among the *Drosophila* and mammalian Hox genes. Identified upstream regulators of the Hox genes and established a direct role for retinoic acid in their regulation.

#### **Dan Littman**

*New York University School of  
Medicine, New York, NY*

Professor of Pathology and Microbiology; Investigator, Howard Hughes Medical Institute. Leading scientist in the field of immunology. Clarified our understanding of the biology of T-cell development and how HIV infects immune cells.

#### **Andrew P. McMahon**

*Harvard University, Cambridge, MA*

Frank B. Baird, Jr. Professor of Science; Chairman of the Department of Molecular and Cellular Biology. Identified the molecules responsible for regulating the development of the vertebrate body plan and elucidated the diverse roles of the wingless and hedgehog signaling pathways in the vertebrate embryo.

#### **Peter Gruss (FHM)**

*Max-Planck-Gesellschaft,  
Göttingen, Germany*

President. Developmental biologist who has defined the function of Cdx, Evx, Hox, and Six mamma-

lian gene families. Played a fundamental role in defining the Pax gene, which encodes master regulators of the organogenesis of the eyes, brain, and pancreas.

#### **Jules Alphonse Hoffmann (FHM)**

*Centre National de la Recherche  
Scientifique, Strasbourg, France*

Director of Research. Through molecular and genetic studies of *Drosophila*, has illuminated the mechanisms leading to resistance to microbial infection, providing a model system of innate immunity in animals.

#### **Janet Rossant (FHM)**

*Samuel Lunenfeld Research Institute  
and University of Toronto, Toronto,  
Ontario, Canada*

Senior Investigator; University Professor of Medical Genetics and Microbiology. Studies the genetic control of normal and abnormal development in the early mouse embryo. Uses new techniques to genetically manipulate the mouse genome to address problems that may arise in development. Produced studies on early mammalian embryogenesis that will have an impact on studies of birth defects.

## **Section 3 : Neurosciences, Cognitive Sciences, and Behavioral Biology**

#### **Thomas D. Albright**

*The Salk Institute for Biological  
Studies, San Diego, CA*

Professor of Neurobiology; Investigator, Howard Hughes Medical Institute. Leader in the study of brain systems underlying primate visual perception. Emphasized the importance of context in sensory information processing and provided evidence for an object-based motion system in area MT, based on both form and color.

#### **Allan Basbaum**

*University of California,  
San Francisco, CA*

Professor of Anatomy; Chairman of the Department of Anatomy. Performed studies leading to an understanding of the mechanisms that underlie the generation and control of acute and persistent pain and to the development of novel therapies for the treatment of these conditions.



### **Michael Eldon Greenberg**

*Children's Hospital and Harvard Medical School, Boston, MA*

Professor of Neurology and Neurobiology. Discovered that the c-fos proto-oncogene is induced rapidly by extracellular factors and controls programs of gene transcription that regulate the response of cells to their environment.

### **Jerome B. Posner**

*Memorial Sloan-Kettering Cancer Center and Cornell University Medical College, New York, NY*

Cotzias Chair of Neuro-Oncology. Leader in understanding paraneoplastic neurological disorders and their treatment. Author of books and articles about coma and neurologically related cancer problems. Trained many teaching neurologists and oncologists to recognize and treat neurologic complications of cancer.

### **Rae Silver**

*Columbia University and Barnard College, New York, NY*

Helene L. and Mark N. Kaplan Professor of Natural and Physical Sciences. Leader in the study of circadian rhythmicity. Through studies of neural tissue transplants, gene activation, and formal modeling has contributed to our understanding of how the brain circadian clock functions to regulate biological processes.

### **Mriganka Sur**

*Massachusetts Institute of Technology, Cambridge, MA*

Sherman Fairchild Professor of Neuroscience. Research centers on understanding how the cortex develops and changes. Defined the mechanisms by which the environment interacts with intrinsic programs in order to regulate the development of cortical areas. Combined a range of disciplines to examine how the pattern of electrical activity in inputs to the cortex influences networks, function, and plasticity in a cortical area.

### **Larry William Swanson**

*University of Southern California, Los Angeles, CA*

Milo Don and Lucille Appleman Professor of Biological Sciences; Director of the NIBS Neuroscience Program. Developed a comprehensive description of the organization of the hypothalamus, produced the best brain atlases of both the developing and adult rat brain, and developed a

new four-system proposal for the basic plan of the vertebrate nervous system.

### **Alain Berthoz (FHM)**

*Collège de France, Paris, France*

Director of the Laboratory of Physiology of Perception. Examined the neural mechanisms controlling gaze by focusing primarily on the vestibular system and demonstrated the way in which moving visual scenes affect body posture. Discovered the existence of eye position signals in second-order vestibular neurons and that the brainstem nuclear prepositus is the site of the neural integrator responsible for holding gaze.

### **Geoffrey E. Hinton (FHM)**

*University of Toronto, Toronto, Ontario, Canada*

Professor of Computer Science. Developed the use of distributed representations and described how they can be used for semantic knowledge representation. Introduced the Boltzmann Machine, a neural network architecture for finding globally optimal solutions to difficult constraint satisfaction problems, and proposed a learning algorithm for use in such networks. Introduced the back-propagation learning algorithm.

## **Section 4: Evolutionary and Population Biology and Ecology**

### **William R. Atchley**

*North Carolina State University, Raleigh, NC*

William Neal Reynolds Professor of Genetics and Statistics. Made contributions in computational biology, quantitative genetics, and evolutionary biology. Known for work in theoretical and computational analyses of protein structure and evolution, developmental quantitative genetics, epigenetic maternal effects, experimental phylogenetics, and morphometrics.

### **James Jeffrey Bull**

*University of Texas at Austin, Austin, TX*

Professor of Integrative Biology. Developed the field of experimental molecular evolution. Devised systems of investigation to enable evolutionary processes and phenomena that are typically studied in the context of millions of years to be studied in experimental settings over a period of weeks or months.

### **Paul G. Falkowski**

*Institute of Marine and Coastal Sciences, Rutgers University, New Brunswick, NJ*

Professor of Biological Oceanography and Geobiology. Leader in shaping our understanding of the evolution of biogeochemical cycles in the oceans and their coupling to climate change. Co-authored the text *Aquatic Photosynthesis* and co-invented several novel instruments that are used in oceanography to assess phytoplankton photosynthetic rates.

### **Stephen P. Hubbell**

*University of Georgia, Athens, GA*

Professor of Plant Sciences. Developed a long-term global research program on tropical forest ecology and contributed to theoretical community ecology, particularly the unified neutral theory of biodiversity and biogeography. Founder and chairman of the National Council for Science and the Environment.

### **Stephen W. Pacala**

*Princeton University, Princeton, NJ*

Frederick D. Petrie Professor. Leader in ecological theory. Made contributions in areas ranging from evolutionary biology to ecosystem ecology. Has studied global biogeochemistry and global change, spatial ecology, and the role of neighborhood interactions in community ecology.

### **Craig Packer**

*University of Minnesota, St. Paul, MN*

Distinguished McKnight University Professor. Behavioral ecologist and field mammalogist. Has studied the evolution of sociality and cooperation in lions and baboons and the dynamics of infectious disease in social mammals.

### **Douglas W. Schemske**

*Michigan State University, East Lansing, MI*

Hannah Professor in the Department of Plant Biology. Investigates the ecological and genetic mechanisms of adaptation and speciation, and the origin of tropical diversity. Received the Mercer Award from the Ecological Society of America and the E. O. Wilson Naturalist Award from the American Society of Naturalists.

### **Marvalee H. Wake**

*University of California, Berkeley, CA*

Professor of Integrative Biology. Leader in the practice and promotion of integrative biology and

scientific studies of biodiversity. Combines neural, muscular, and osteological data with studies of development and reproduction to illuminate major evolutionary innovations. Expanded our understanding of the origin of live-bearing modes of reproduction in vertebrates.

### **Oswaldo E. Sala (FHM)**

*University of Buenos Aires, Buenos Aires, Argentina*

Professor of Ecology. Research focuses on a wide variety of topics in plant physiological ecology, ecosystem ecology, and the response of biological communities to climate change. Leader in organizing and coordinating the scientific community's responses to global change.

## **Section 5: Medical Sciences (including Physiology and Pharmacology), Clinical Medicine, and Public Health**

### **Peter Courtland Agre**

*Johns Hopkins University School of Medicine, Baltimore, MD*

Professor of Biological Chemistry and Medicine. Discovered the prototype of a family of proteins called aquaporins, which function as water channels in the membranes of animal and plant cells. Led efforts to find new family members and to elucidate the structure, distribution, physiology, and pathophysiology of the aquaporins. Recipient of the Nobel Prize in chemistry in 2003.

### **Dennis A. Ausiello**

*Harvard Medical School and Massachusetts General Hospital, Boston, MA*

Physician-in-Chief. Made contributions as a renal cell biologist, leading to a better understanding of diseases such as cystic fibrosis. Educator of M.D. – Ph.D.s and translational researchers. Has published widely on medicine in the twenty-first century.

### **Barry Morton Brenner**

*Harvard Medical School, Boston, MA*

Professor of Medicine; Director Emeritus of the Renal Division. Benefited millions of patients with diabetes, hypertension, and other life-threatening kidney diseases by elucidating the mechanisms of the progression of kidney disease and performing experimental and clin-



ical studies demonstrating that angiotensin blockade effectively stems this progression.

### **Samuel C. Silverstein**

*Columbia University, New York, NY*  
Professor of Physiology and Cellular Biophysics and Professor of Medicine. Studies the roles of phagocytic white blood cells in inflammation, immunity, infection, and chronic degenerative diseases. Past president of the Federation of American Societies for Experimental Biology, and founder and director of Columbia's Summer Research Program for Secondary Science Teachers.

### **Patricia G. Spear**

*Feinberg School of Medicine of Northwestern University, Chicago, IL*  
Guy and Anne Youmans Professor. Leader in studying the molecular basis of infectious diseases. Research focuses on herpes simplex virus. Identified viral proteins and cell surface molecules that interact to enable viral entry into cells, and demonstrated that a cascade of receptor-ligand interactions is required.

### **Ellen S. Vitetta**

*University of Texas Southwestern Medical Center, Dallas, TX*  
Professor of Microbiology. Discovered a biochemical technique to study surface molecules on lymphocytes and characterized the B cell antigen-specific receptor and peptide differences between membrane and secreted IgM. Co-discoverer of an important cytokine, IL-4. Leader in antibody-based strategies to treat B cell lymphomas. Translated basic research findings into clinical applications.

### **Arthur Weiss**

*University of California, San Francisco, CA*  
Ephraim P. Engleman Distinguished Professor of Rheumatology; Investigator, Howard Hughes Medical Institute. Demonstrated that the T cell antigen receptor initiates signal transduction via the CD3 and zeta chains. Identified the ZAP-70 cytoplasmic tyrosine kinase, defined its role in a congenital immunodeficiency disease, and delineated the mechanisms by which cytoplasmic tyrosine kinases and the CD45 transmembrane phosphatase regulate TCR signaling.

### **Zena Werb**

*University of California, San Francisco, CA*  
Professor of Anatomy. Recognized for studies on extracellular matrix proteolysis. Defined the critical role of matrix metalloproteinases in embryonic implantation, mammary and bone development, and angiogenesis *in vivo*. Achieved a new understanding of how MMPs are central players in stem cell biology and neoplastic progression.

## **Class III: Social Sciences**

### **Section 1: Social Relations (Anthropology, Archaeology, Sociology, Social and Developmental Psychology, Education, Demography, Geography)**

#### **John T. Cacioppo**

*University of Chicago, Chicago, IL*  
Tiffany and Margaret Blake Distinguished Service Professor. Leader in the fields of social psychophysiology and social neuroscience. Psychologist who has integrated social psychology and biology with studies relating physiological processes to social attitudes, emotion, and cognition.

#### **William A. V. Clark**

*University of California, Los Angeles, CA*  
Professor of Geography. Provided fundamental insights into the role of preferences, discrimination, and public intervention in generating ethnic and racial separation in America's large urban regions. Crafted multiple survey-based tests of the Schelling segregation model and contributed innovative analyses of the connections among mobility, migration, and housing choice.

#### **Richard J. Davidson**

*University of Wisconsin, Madison, WI*  
Vilas Research Professor of Psychology and Psychiatry. Investigator of the psychobiology of affect, affective style, and affective disorders. Director of the NIMH-funded center concerned with the social and psychobiological substrates of affective styles. Organized the continuing series of Wisconsin Symposia on Emotion.

### **Elizabeth F. Loftus**

*University of California, Irvine, CA*  
Distinguished Professor in the Department of Psychology and Social Behavior. Experimental researcher who explores the reliability of eyewitness testimony, the nature of repressed memories about significant childhood events, and the methods to induce false "memories" with particular applicability to legal decisions.

### **Tanya Marie Luhmann**

*University of Chicago, Chicago, IL*  
Professor in the Committee on Human Development. Conducted important studies of witchcraft in contemporary London, the Parsi of India, and the current state of psychiatric practice in the United States.

### **Ellen M. Markman**

*Stanford University, Stanford, CA*  
Professor of Psychology. Authority on the development of language and communication in young children. Performed theoretical and experimental studies of the whole object, taxonomic, and mutual exclusivity constraints that guide the young child's acquisition of word meanings. Author of *Categories and Naming in Children*.

### **Doug McAdam**

*Stanford University, Stanford, CA*  
Professor of Sociology; Director of the Center for Advanced Study in the Behavioral Sciences. Theoretician and empirical researcher. Leading figure in the development of the dominant approach to the study of social movements, the "political process" model. Applied this model in several prize-winning studies of the civil rights movement.

### **Adrian E. Raftery**

*University of Washington, Seattle, WA*  
Professor of Statistics and Sociology. Made fundamental contributions to the application of Bayesian statistical methods in the social sciences, including procedures for model selection. Served as editor of major journals in statistics and is the founding director of the Center for Statistics and the Social Sciences.

### **Shelley E. Taylor**

*University of California, Los Angeles, CA*  
Professor of Psychology. Founder and leader in the fields of health psychology and social cognition.

Author of many scientific papers on these topics. Known for work on positive illusions, coping with stress, and psychosocial cofactors in illness progression.

### **Martin Trow**

*University of California, Berkeley, CA*  
Emeritus Professor of Public Policy, Richard and Rhoda Goldman School of Public Policy. Leads research in comparative studies of national systems of higher education, focusing on social trends and public policies affecting access to and performance of universities in the United States, United Kingdom, Sweden, Japan, and elsewhere. Member of numerous boards and commissions advising universities in the United States and abroad, as well as ministries of higher education.

### **Edward F. Zigler**

*Yale University, New Haven, CT*  
Sterling Professor of Psychology Emeritus. First director of the Office of Child Development and chief of the U.S. Children's Bureau. Member of the planning committee of Head Start. Founder of the Bush Center in Child Development and Social Policy and of the School of the 21st Century.

### **Section 2: Economics**

#### **Colin Camerer**

*California Institute of Technology, Pasadena, CA*  
Rea A. and Lela G. Axline Professor of Business Economics. Pioneer in the area of behavioral economics, initially studying decision biases. Published numerous articles covering the areas of behavioral economics, business strategy and organization, and laboratory experimental research in games, decisions, and markets.

#### **David Cass**

*University of Pennsylvania, Philadelphia, PA*  
Paul F. and E. Warren Shafer Miller Professor of Economics; Director of the Center for Analytic Research in Economics and the Social Sciences. Deals with the careful refinement and extension of neoclassical theory, especially the specification of utility functions and conditions for existence of general equilibrium. In collaboration, investigated the existence of equilibrium under conditions of overlapping generations.

### Vincent Paul Crawford

University of California,  
San Diego, CA

Professor of Economics. Game theorist whose analysis (with Sobel) of strategic information transmission has defined the direction of subsequent research on communication in games. Has conducted research on contract theory with applications to international lending, bargaining, arbitration, matching, and learning. Recent work focuses on behavioral and experimental game theory.

### Boyan Jovanovic

New York University, New York, NY  
Professor of Economics. Theorist in industrial organization and macroeconomics. Known for analyses of turnover in the labor market and wage mobility, entry and exit of firms incorporating liquidity constraints, mergers, technology diffusion and adaptation, and the sources of technological progress.

### Kenneth L. Judd

Stanford University, Stanford, CA  
Senior Fellow of the Hoover Institution. Has defined a new field that makes dynamic theory operational, and has written several influential papers about industrial organization on patents, price dispersion, and credible entry deterrence. Developed the application of dynamic models in public finance.

### Michael Kremer

Harvard University, Cambridge, MA  
Professor of Economics. Development economist who applies economic theory to wide-ranging topics, such as the link between population and economic growth, the transmission of AIDS, and the development of vaccines for diseases in poor countries.

### Kenneth L. Sokoloff

University of California,  
Los Angeles, CA

Professor of Economics. Economic historian who has enriched our understanding of innovation, productivity growth, and democratization of inventive activity in early industrial America and in East Asia. Recent work clarifies the divergent paths of development and equity in North and South America.

### Aloisio Araujo (FHM)

Institute for Pure and Applied  
Mathematics and Getulio Vargas  
Foundation, Rio de Janeiro, Brazil  
Professor of Mathematics and Professor of Economics. Mathemat-

ical economist who served on the Council of the Econometric Society and played a key role in the promotion of economic research in Latin America. Early work on central limit theorems in Banach spaces is used in probability theory. Has recently studied bankruptcy in incomplete markets and signaling models without single crossing. Recipient of the Brazilian President's Order of Scientific Merit.

### Martin F. Hellwig (FHM)

University of Mannheim,  
Mannheim, Germany

Professor of Economics. Chairman of the German Monopolies Commission. Has written on many topics in economic theory, including dynamic debtor-creditor relationships, aggregation of information through market prices, the asymptotic properties of Bertrand-Edgeworth equilibria, optimal debt contracting, risk and regulation in banking, and the foundations of the linear agency model.

### Guido Tabellini (FHM)

Bocconi University, Milan, Italy  
Professor of Economics; President of Innocenzo Gasparini Institute for Economic Research (IGIER). Elucidated how the institutional, economic, and political features of a country determine economic policy outcomes. Has done extensive work on the design of monetary and fiscal institutions, especially in the context of the European Union.

## Section 3: Political Science, International Relations, and Public Policy

### Henry E. Brady

University of California, Berkeley, CA  
Professor of Political Science. Has studied campaigns and elections, the media, political participation, mass mobilization, political attitudes, political and social inequality, democratic transitions, and welfare reform using innovative methods.

### James MacGregor Burns

University of Richmond,  
Richmond, VA  
Senior Scholar at the Jepson School of Leadership Studies. Author of *Roosevelt: The Lion and the Fox*, *The Deadlock of Democracy*, and *Leadership*. Winner of the Pulitzer Prize and the National Book Award. Past president of the American Political Science Association.

### Donald Philip Green

Yale University, New Haven, CT

Director of the Institution for Social and Policy Studies; A. Whitney Griswold Professor. Conducted the first large-scale randomized field experiments in political science. Contributed to the study of voter turnout, hate crime, political partisanship, campaign finance, preelection polling, and response error in surveys. Invented the strategy game OCTI, designed to defy computer analysis.

### John Mark Hansen

University of Chicago, Chicago, IL

Dean of Social Sciences. Has worked on the development of interest group activity in legislative politics, on mass participation in politics, and on congressional policy-making. Member and chair of the National Election Studies Board of Overseers.

### John J. Mearsheimer

University of Chicago, Chicago, IL

R. Wendell Harrison Distinguished Service Professor. Exponent of the realist approach to understanding international relations. Books and articles examine military deterrence, military strategy, the end of the Cold War, international institutions, and ethnic partition. Author of *The Tragedy of Great Power Politics*.

### Benjamin Ingrim Page

Northwestern University,  
Evanston, IL

Professor of Political Science. Brings empirical evidence to bear on rational choice theories. Helped promote the view that collective public opinion is considerably more stable and coherent than was previously suggested by studies of individual behavior. Provided some of the first solid evidence that collective public opinion has substantial effects on the making of both foreign and domestic policy.

### Michael J. Sandel

Harvard University, Cambridge, MA

Anne T. and Robert M. Bass Professor in the department of Government. Member of the President's Council on Bioethics. Political philosopher. Author of *Democracy's Discontent: America in Search of a Public Philosophy* and *Liberalism and the Limits of Justice*. Current work is on the moral limits of markets.

### Kay Lehman Schlozman

Boston College, Chestnut Hill, MA

J. Joseph Moakley Professor of Political Science. Has written on a broad range of topics in American politics, including interest groups, elections, citizen participation, and gender politics. Work on stratification in relation to interest groups and citizen activity has been basic to the field.

### Archibald (Archie) H.

### Brown (FHM)

St. Antony's College, University of  
Oxford, Oxford, United Kingdom

Fellow; Professor of Politics. Brings together diverse academic and policy communities in the United Kingdom, the United States, and Russia. Author of *The Gorbachev Factor* and co-editor of *The British Study of Politics in the Twentieth Century*. Former chair of the Political Studies Section of the British Academy.

## Section 4: Law (including the Practice of Law)

### Thomas M. Franck

New York University School of Law,  
New York, NY

Murray and Ida Becker Professor of Law Emeritus. Served as legal advisor to eight countries and argued cases before international tribunals. Former president of the American Society of International Law.

### Thomas C. Grey

Stanford Law School, Stanford, CA

Nelson Bowman Sweitzer and Marie B. Sweitzer Professor of Law. One of the foremost writers on American legal theory and history. Works in constitutional law and torts. Editor of *The Legal Enforcement of Morality*.

### Samuel Issacharoff

Columbia Law School, New York, NY

Harold R. Medina Professor in Procedural Jurisprudence. Leading figure in the law governing the political process and in the law of employment. Work combines innovative approaches to law with newer interdisciplinary scholarship.

### Louis Kaplow

Harvard Law School,  
Cambridge, MA

Professor of Law. Scholar of economics and law. Made contributions to antitrust, competition policy, intellectual property, tax policy, and distributive justice. Recent co-authored work on nor-



mative foundations of social policy draws on philosophy, economics, and psychology. Research associate at the National Bureau of Economic Research.

#### **Robert A. Katzmann**

*United States Court of Appeals, Second Circuit, New York, NY*  
U.S. Circuit Court Judge. Author of numerous books and articles on a wide range of subjects, including the regulatory state and the relationship between the legislative and judicial branches. Formerly Walsh Professor of Government, professor of law, and professor of public policy at Georgetown University. Former senior fellow and acting program director of the Governmental Studies Program at the Brookings Institution.

#### **Robert F. Nagel**

*University of Colorado, Boulder, CO*  
Rothgerber Professor of Constitutional Law. Leading scholar on the United States Supreme Court. Author of numerous articles and three books: *Constitutional Cultures: The Mentality and Consequences of Judicial Review*; *Judicial Power and American Character: Censoring Ourselves in an Anxious Age*; and *The Implosion of American Federalism*.

#### **Antonin Scalia**

*Supreme Court of the United States, Washington, DC*  
Associate Justice of the Supreme Court of the United States and, for more than three decades, leading intellectual force in American jurisprudence. Eloquent opinions and scholarly writings emphasize the importance of text and of structure in the Constitution. Previous positions include Chairman of the Administrative Conference of the United States, Assistant Attorney General of the United States, and professor of law at the Universities of Virginia and Chicago.

#### **Harry N. Scheiber**

*University of California, Berkeley, CA*  
Director of the Earl Warren Legal Institute; Stefan Riesenfeld Professor of Law and History. Cited for pathbreaking work in U.S. constitutional and legal history. With writings on government and the economy, federalism, freedom of contract, and other subjects in American economic and legal history has set a standard of research, analysis, and interpretation that has shaped the field. Honorary Fellow of the American Society for Legal History.

## Class IV: Humanities and Arts

### *Section 1: Philosophy and Religious Studies*

#### **David Carrasco**

*Harvard University, Cambridge, MA*  
Neil Rudenstine Professor of Latin American Studies. Historian of religion who specializes in Mesoamerican, Latin American, and Latino religions. Has written extensively on the rituals and sacred sites of Mesoamerica. Served as editor in chief of the *Oxford Encyclopedia of Mesoamerican Cultures*.

#### **Fred Dretske**

*Duke University, Durham, NC*  
Senior Research Scholar. Introduced the distinction between non-epistemic and epistemic seeing. Developed the relevant-alternatives approach to knowledge and skepticism. Advocate of the account of intentionality in terms of information.

#### **Hartry Field**

*New York University, New York, NY*  
Professor of Philosophy. Specializes in metaphysics, philosophy of mathematics, philosophy of logic, and philosophy of science. Author of *Science Without Numbers*, which won the Lakatos Prize, *Realism, Mathematics and Modality*, and *Truth and the Absence of Fact*. Current interests include objectivity and indeterminacy, a priori knowledge, causation, and the semantic and set-theoretic paradoxes.

#### **Stanley M. Hauerwas**

*Duke University, Durham, NC*  
Gilbert T. Rowe Professor of Theological Ethics. Theologian who challenges Christians to lead courageous and ethical lives. Numerous books address systematic and philosophical theology, ethics, political theory, social science, and medical ethics.

#### **Thomas English Hill, Jr.**

*University of North Carolina at Chapel Hill, Chapel Hill, NC*  
Kenan Professor of Philosophy. Leading Kantian scholar. Has studied moral psychology and the moral dimensions of self-respect and has written extensively on ethics and political philosophy.

#### **Mary Mothersill**

*Barnard College and Columbia University, New York, NY*  
Professor of Philosophy Emeritus. Philosopher of art. Author of *Beauty Restored*, a discussion of art in analytic philosophy.

#### **Philip L. Quinn**

*University of Notre Dame, Notre Dame, IN*  
John A. O'Brien Chair in Philosophy. Author of *Divine Commands and Moral Requirements* and numerous articles and reviews in philosophy of religion and philosophy of science, and co-editor and contributor to *A Companion to Philosophy of Religion* and *The Philosophical Challenge of Religious Diversity*. Formerly Faunce Professor of Philosophy at Brown University and chair of the APA National Board of Officers.

#### **Ed Parish Sanders**

*Duke University, Durham, NC*  
Arts and Sciences Professor of Religion. Author of nine monographs on Jesus, Paul, and Judaism. Holds honorary doctorates from the Universities of Oxford and Helsinki. Fellow of the British Academy. Previously Dean Ireland's Professor of Exegesis at Oxford.

#### **Sir Anthony John Patrick Kenny (FHM)**

*St. John's College, University of Oxford, Oxford, United Kingdom*  
Emeritus Fellow. Authority on Aquinas, Aristotle, Descartes, and Wittgenstein. Served as Master of Balliol College, president of the British Academy, and chairman of the British Library.

### *Section 2: History*

#### **Thomas A. Brady, Jr.**

*University of California, Berkeley, CA*  
Peder Sather Professor of History. Historian of the Protestant Reformation. Author of many books and articles stretching back to the early 1970s, including *Community, Politics, and Reformation in Early Modern Europe*.

#### **Harry D. Harootunian**

*New York University, New York, NY*  
Professor of History; Chair of East Asian Studies. Brought the study of Japanese intellectual history into dialogue with the concerns of scholars of modernity around the world. Writes on subjects as diverse as samurai activism, early modern nativism, and twentieth-century

modernism. Author of *Overcome by Modernity: History, Culture, and Community in Interwar Japan*.

#### **Thomas C. Holt**

*University of Chicago, Chicago, IL*  
James Westfall Thompson Distinguished Service Professor. Scholar of African American history. Transformed how a generation of scholars conceptualizes African American history by situating it in an international context that includes the Caribbean as well as the United States, and by locating freedom in a context of "race-making."

#### **Friedrich Katz**

*University of Chicago, Chicago, IL*  
Morton D. Hull Distinguished Professor of History. Historian of nineteenth- and twentieth-century Mexico. Writes on modern Mexican history, emphasizing agrarian change and popular movements, and studies ancient Aztec civilizations. Author of *Ancient American Civilizations* and, most recently, of a biography of Pancho Villa.

#### **Hue-Tam Ho Tai**

*Harvard University, Cambridge, MA*  
Kenneth T. Young Professor of Sino-Vietnamese History. Historian of modern Vietnam. Publications include *Millenarism and Peasant Politics in Vietnam*; *Radicalism and the Origins of the Vietnamese Revolution*; and *The Country of Memory: Remaking the Past in Late Socialist Vietnam*.

#### **Laurel Ulrich**

*Harvard University, Cambridge, MA*  
James Duncan Phillips Professor of History; Director of the Charles Warren Center for Studies in American History. Author of three books on colonial and women's history, including *A Midwife's Tale: The Life of Martha Ballard Based on Her Diary*, which won the Pulitzer Prize.

#### **Thongchai Winichakul**

*University of Wisconsin, Madison, WI*  
Professor of History and Southeast Asian Studies. Model for the younger generation of Southeast Asia historians. Author of *Siam Mapped: A History of the Geo-Body of a Nation*.

#### **Lawrence Wolff**

*Boston College, Chestnut Hill, MA*  
Professor of History. Made contributions to the study of European history with *The Vatican and Poland in the Age of Partitions*; *Postcards from the End of the World*; *Inventing*



*Eastern Europe*; and *Venice and the Slavs*. Has published on a wide range of interests, from Mozart to Rebecca West.

**Fergus Graham Burtholme Millar (FHM)**

*Oriental Institute, University of Oxford, Oxford, United Kingdom*  
Camden Professor of Ancient History Emeritus. Authority on Roman and Near Eastern history. Fellow of the British Academy and Foreign Member of the Finnish and Russian Academies. Former Fellow of All Souls College and Queen's College, Oxford, and former professor at University College London.

**Lutz Niethammer (FHM)**

*Friedrich-Schiller-Universität, Jena, Germany*  
Professor of Modern and Contemporary History. Founding president of the Cultural Studies Institute in Essen. Advisor to the German Chancellor on reparations for forced labor under the Nazi regime. Member of the Kuratorium for the Buchenwald Memorial. Has published on oral history methods, post-history theory, the industrial life in the German Democratic Republic, concentration camps, national memory, and the concept of identity.

**Section 3: Literary Criticism (including Philology)**

**Rolena Adorno**

*Yale University, New Haven, CT*  
Reuben Post Halleck Professor of Spanish. Leading scholar in the field of colonial Latin American literature. Specialist in seventeenth-century Inca historian and artist Felipe Guaman Poma de Ayala. Author of work on Álvaro Núñez Cabeza de Vaca's account of Spanish exploration in North America.

**Charles F. Altieri**

*University of California, Berkeley, CA*  
Professor of English; Director of the Consortium for the Arts. Poetry critic. Created some of the parameters by which we judge twentieth-century poetry today. Literary theorist concerned with links between the concepts of action, expression, and the nature of affects.

**Anne Ferry**

*Boston College, Chestnut Hill, MA*  
Professor of English Emeritus. Literary critic and historian of expres-

sive forms in poetry in English, ranging from the sixteenth century to the present. Author of seven books, including *Milton's Epic Voice*, *The "Inward" Language*, and *The Title to the Poem*, which won the Christian Gauss Prize.

**Peter Uwe Hohendahl**

*Cornell University, Ithaca, NY*  
Jacob Gould Sherman Professor of German and Comparative Literature. Leader in German studies in the United States, expert on Adorno and the Frankfurt School, and historian of the institution of literary criticism in Germany. Devoted a lifetime to the study of literature and literary criticism as social and cultural phenomena. Founder of the Institute for German Cultural Studies.

**Geoffrey Keith Pullum**

*University of California, Santa Cruz, CA*  
Professor of Linguistics. Co-author of the encyclopedic *Cambridge Grammar of the English Language*. Researches syntax, phonology, mathematical linguistics, phonetics, computational linguistics, and the history and philosophy of linguistics. Advocate for endangered languages; observer and critic of the academic scene in linguistics.

**Andrew Baruch Wachtel**

*Northwestern University, Evanston, IL*  
Herman and Beulah Pearce Miller Research Professor in Literature; Chair of the Department of Slavic Languages and Literatures; Director of the Program in Comparative Literary Studies. Conducted research on the breakup of Yugoslavia from a cultural perspective. Contributed to Russian literary and cultural studies in *longue durée* historical perspectives and by focusing on the interrelationship of literature and other arts.

**Michael Witzel**

*Harvard University, Cambridge, MA*  
Wales Professor of Sanskrit. Recognized Sanskritist and Indologist. Deals with the linguistic and text-critical study and the analysis and interpretation of Vedic texts and pieces of evidence for early religious and social history.

**Michael Wood**

*Princeton University, Princeton, NJ*  
Charles Barnwell Straut Professor of English; Chair of the English Department. Has published books on Stendhal, Nabokov, Kafka, and

other areas of modern fiction. Authority on Hollywood and world cinema. Has written extensively on Latin American literature and culture.

**Linda Hutcheon (FHM)**

*University of Toronto, Toronto, Ontario, Canada*  
University Professor. Literary theorist and prolific writer. Author of more than a dozen books, ninety chapters in books, and a hundred refereed articles. Expert on post-modernism, opera, and Canadian literature. Past president of the MLA of America.

**Section 4: Literature (Fiction, Poetry, Short Stories, Nonfiction, Playwriting, Screenwriting)**

**Paul Auster**

*New York, NY*  
Poet, novelist, and essayist. Volumes of poetry include *Fragments From Cold*, *Facing the Music*, and *Disappearances: Selected Poems*. Nonfiction includes *The Invention of Solitude* and *The Art of Hunger*. Novels include *City of Glass*, *Ghosts*, *The Locked Room*, *In the Country of Last Things*, *Moon Palace*, *The Music of Chance*, *Leviathan*, *Mr. Vertigo*, *Timbuktu*, *The Book of Illusions*, and the forthcoming *Oracle Night*.

**Peter Carey**

*Hunter College, New York, NY*  
Director of Creative Writing. Novelist. Author of *Oscar and Lucinda*, *True History of the Kelly Gang*, and *Jack Maggs*. Two-time recipient of both the Booker and the Commonwealth Writers Prizes.

**Robert Creeley**

*Brown University, Providence, RI*  
Distinguished Professor of English. Key figure in twentieth-century American poetry. Has published more than sixty books of poetry, including *Just in Time: Poems 1984 - 1994* and *Life & Death*. Honors include the Lannan Lifetime Achievement Award, the Bollingen Prize, and the Before Columbus Lifetime Achievement Award. Was New York State Poet from 1989 - 1991 and is a member of the American Academy of Arts and Letters.

**Michael Cunningham**

*Brooklyn College, Brooklyn, NY*  
Distinguished Professor of English. Novelist. Recipient of the

Pulitzer Prize for *The Hours*. Author of *A Home at the End of the World* and *Flesh and Blood*. Prominent for his work with PEN.

**Richard Ford**

*New Orleans, LA*  
Novelist. Recipient of the PEN/Faulkner Award and Pulitzer Prize for *Independence Day*. Other works include *The Ultimate Good Luck* and *The Sportswriter*.

**Charles Johnson**

*University of Washington, Seattle, WA*  
S. Wilson and Grace M. Pollock Endowed Professor of English. Novelist, literary critic, screenwriter, philosopher, and cartoonist. Works include *Dreamer*, *Oxherding Tale*, *Faith and the Good Thing*, and *Middle Passage*, which received the National Book Award; *The Sorcerer's Apprentice and Soulcatcher*; and *Africans in America: America's Journey Through Slavery*, *King: The Photobiography of Martin Luther King Jr.*, and *Turning the Wheel: Essays on Buddhism and Writing*. Recipient of the Academy Award in Literature from the American Academy of Arts and Letters.

**Sigrid Nunez**

*New York, NY*  
Novelist. Author of *Feather on the Breath of God*, *Naked Sleeper*, and *For Rouenna*. Has won numerous prizes, most recently the Rome Prize for Literature.

**Alan Shapiro**

*University of North Carolina at Chapel Hill, Chapel Hill, NC*  
William R. Kenan, Jr. Distinguished Professor. Poet, critic, translator, and author. Wrote eight books of poems including *After the Digging*, *The Courtesy*, *Happy Hour*, *Mixed Company*, *The Dead Alive and Busy*, and *Song and Dance*. Author of three books of prose, *In Praise of the Impure: Poetry and the Ethical Imagination*, *The Last Happy Occasion*, and *Vigil*. Recipient of the Lila Wallace-Reader's Digest Writer's Award.

**Dario Fo (FHM)**

*Milan, Italy*  
Playwright, director, stage and costume designer, and occasional musical composer. Often works in collaboration with Franca Rame. Recipient of the Nobel Prize in Literature in 1997.

**Hermione Lee (FHM)**

*University of Oxford, Oxford, United Kingdom*  
Goldsmiths' Professor of English Literature; Fellow of New College Oxford. Writer, reviewer, and broadcaster. Publications include critical studies of Virginia Woolf, Philip Roth, Elizabeth Bowen, and Willa Cather. Author of *Virginia Woolf: A Biography*, which received the British Academy's Rose Mary Crawshay Award and was chosen as a *New York Times Book Review* Best Book of the Year. Fellow of the British Academy and of the Royal Society of Literature.

**Section 5: Visual and Performing Arts – Criticism and Practice (including Art, Architecture, Sculpture, Music, Theater, Film, Dance)**

**Robert A. Falls**

*Goodman Theatre, Chicago, IL; Northwestern University, Evanston, IL*  
Artistic Director of the Goodman Theatre since 1986; Adjunct Professor. Past artistic director of Northwestern University's graduate directing program. Recipient of Tony, Drama Desk, Obie, National Broadway Theatre, and Joseph Jefferson Awards for direction. Directing work spans classic and contemporary plays, as well as new American musicals and opera.

**Martin Filler**

*New York, NY*  
Architecture critic, historian, editor, lecturer, museum curator, and filmmaker. Longtime contributor to *The New York Review of Books*. Known for broad perspective in evaluating both historical topics and contemporary developments in architecture and urban planning.

**Eric Fischl**

*New York, NY*  
Painter; sculptor. Has exhibited internationally since the early 1980s. Work has been the focus of two monographs and numerous exhibition catalogues.

**Jan LaRue**

*New York University, New York, NY*  
Professor of Music Emeritus. Author of fundamental articles on the music of Haydn, Mozart,

and Beethoven, a catalogue of eighteenth-century symphonies, and *Guidelines for Style Analysis*, a book on the analysis of Western European music. Developed computer-assisted research in musicology.

**Fred S. Licht**

*Collezione Peggy Guggenheim, Venice, Italy; Boston University, Boston, MA*  
Curator; Professor Emeritus of Art History. Brought the eye of the humanist to bear on the work of Goya, Canova, Fuseli, and many other painters and sculptors ranging from the Renaissance to the present day.

**Sherrill Milnes**

*Northwestern University, Evanston, IL*  
John Evans Distinguished Professor of Music. Recognized as one of the foremost operatic baritones of his generation. Made more than eighty recordings and appeared in all of the world's major opera houses, including the Met, where he gave more than six hundred fifty performances over a thirty-two-year span. A three-time Grammy winner.

**Jessie Ann Owens**

*Brandeis University, Waltham, MA*  
Louis, Frances and Jeffrey Sachar Professor of Music; former Dean of Arts and Sciences. Past president of the American Musicological Society and vice president of the Renaissance Society of America. Author of *Composers at Work: The Craft of Musical Composition 1450 – 1600* and articles on Italian and English Renaissance music. New work centers on early modern English musical theory and practice.

**Cindy Sherman**

*New York, NY*  
Photographer. Uses herself as the model for most of her photographs. Work is the subject of much writing and many exhibits around the world. Recipient of the MacArthur Foundation Genius Award.

**Helmuth Rilling (FHM)**

*Internationale Bachakademie Stuttgart, Stuttgart, Germany*  
Conductor. Interpreter of Bach. Established the Oregon Bach Festival, the Internationale Bachakademie Stuttgart, and Bach academies throughout the world. Ardent believer in the power of music to cross political and ethnic boundaries.

## Class V: Public Affairs, Business, and Administration

### Section 1: Public Affairs, Journalism, and Communications

**William Allen**

*New York University School of Law and Stern School of Business, New York, NY*  
Nusbaum Professor of Law and Business; Director of the NYU Center for Law & Business. Author of many articles on corporate law and governance. Former chair of the Independence Standards Board and former chancellor of the Court of Chancery of the State of Delaware.

**John S. Carroll**

*Los Angeles Times, Los Angeles, CA*  
Executive Vice President and Editor. Set a standard of ethical probity and journalistic excellence. Former editor of the *Baltimore Sun* and the *Lexington [KY] Herald-Leader*. As a reporter, served in Vietnam, the Middle East, and Washington. Former member and chairman of the Pulitzer Prize Board.

**Walter Cronkite**

*CBS, Inc., New York, NY*  
Special correspondent. Covered virtually every major news event during his more than sixty-five years in journalism. Became a special correspondent for *CBS News* when he stepped down as anchorman and managing editor of the *Evening News* after nineteen years. Accomplishments – both on-air and off – have won acclaim and trust from journalism colleagues and the American public alike.

**Gretchen C. Daily**

*Stanford University, Stanford, CA*  
Bing Interdisciplinary Research Scientist. Pioneered the field of countryside biogeography to evaluate and enhance the ability of human-dominated ecosystems to maintain biodiversity and deliver ecosystem services. Leader in interdisciplinary efforts to translate scientific knowledge of the environment into sound policy initiatives, and in bringing that knowledge to the public.

**Joel L. Fleishman**

*Duke University, Durham, NC*  
Professor of Law and Public Policy Studies; Director of the Heyman Center for Ethics. Founding director of the Terry Sanford Institute of Public Policy at Duke. Served as university vice president and senior vice president. Former president and current senior advisor of Atlantic Philanthropies (USA). Author and editor of writings that span public policy, the nonprofit sector, and ethics.

**William H. Gates, Sr.**

*Bill and Melinda Gates Foundation, Seattle, WA*  
Co-Chairman. Known for civic contributions. Serves on the board of directors of United Way of America. Distinguished regent of the University of Washington. Provided the impetus for the creation of the Bill and Melinda Gates Foundation.

**Jeri Laber**

*Human Rights Watch, New York, NY*  
Founder and advisor. Former executive director of Helsinki Watch. Author of *The Courage of Strangers: Coming of Age with the Human Rights Movement*; co-author of *A Nation is Dying: Afghanistan Under the Soviets, 1979 – 1987* and of numerous articles on human rights issues.

**Arthur Levitt, Jr.**

*The Carlyle Group, Washington, DC*  
Senior Advisor. Chairman of the Securities and Exchange Commission (1993 – 2001), the longest serving official in this position. Member of several advisory and pro-bono boards. Previously chairman and CEO of the American Stock Exchange, as well as chairman of the Levitt Media Company and owner of *Roll Call*, a Capitol Hill newspaper.

**Lloyd Axworthy (FHM)**

*University of British Columbia, Vancouver, British Columbia, Canada*  
Director of the Liu Centre for the Study of Global Issues. Served as Canada's Minister of Foreign Affairs (1996 – 2000), leading efforts to develop an international treaty to ban land mines, to focus world attention on the need for an international criminal court, and to address the problem of children affected by wars. First elected to Parliament in 1979. Served as Minister of Employment and Immigration, Minister of Transport, and Minister of Human Resources Development.



## Section 2 : Business, Corporate, and Philanthropic Leadership (Private Sector)

### James A. Block

*Block Asset Management, Inc., New York, NY*

President. Chairman of the board of the publicly held Block Drug Company, recently sold to Smith-Kline Beecham. Trustee of the National Museum of the American Indian and chairman of the Museum's development committee. Recipient of the Smithsonian Institution's James Smithson Society Founders Medal. Honorary president of the Associated YM-YMHA's of Greater New York.

### Lewis B. Cullman

*Cullman Ventures, LLC, New York, NY*

CEO. Philanthropist and major benefactor and supporter of the arts and education. Senior vice chairman of the New York Botanical Garden, honorary trustee of the Museum of Modern Art and the Metropolitan Museum of Art, and vice chairman of the Neurosciences Research Foundation, Inc. Chairman of Chess-in-the-Schools, Inc.

### Richard W. Fisher

*Kissinger McLarty Associates, Washington, DC*

Vice Chairman. Served as deputy U.S. trade representative with responsibility for Asia, Latin America, and Canada (1997 – 2001) and as chief operating officer of the U.S. government for NAFTA. Had oversight responsibilities for bilateral trade issues in the Western hemisphere, the development of the Free Trade Area of the Americas, the American deregulation of the Japanese Economy, and the U.S.-Singapore Free Trade Agreement.

### Sidney Harman

*Harman International Industries, Inc., Washington, DC*

Executive Chairman. Founder of Harman International, a major world manufacturer of audio equipment. Awarded the Electronic Industries Alliance Medal of Honor and the Aspen Institute Award for Corporate Leadership. Has served as a trustee of the Carter Center, the Aspen Institute, the Martin Luther King, Jr. Center for Social Change, the Public Agenda Foun-

ation, the Los Angeles Philharmonic Association, and the National Symphony Orchestra.

### Robert P. Henderson

*Greylock Management Corporation, Boston, MA*

Special Limited Partner; Former Chairman. As chairman of Greylock (1992 – 1997), led the corporation's involvement in companies such as Numatics, Filene's Basement, DBS, Simonds, and SDRC. Former CEO of Itek Corporation, group vice president of Honeywell, chairman of Dartmouth's Tuck Board of Overseers, and chairman of the board of the Boston Federal Reserve Bank. Board member of the Cabot Corporation, Allmerica Financial Corporation, and Filene's Basement.

### Martin L. Leibowitz

*TIAA-CREF, New York, NY*

Vice Chairman and Chief Investment Officer. Previously served at Salomon Brothers, devising many new investment products. Author of four books and more than one hundred forty published articles.

### Judy C. Lewent

*Merck & Company, Inc., Whitehouse Station, NJ*

Executive Vice President, CFO, and President of Human Health Asia. Member of Merck's senior executive team that manages business operations and formulates growth strategies and corporate policies. Responsible for worldwide finance, business development, licensing, joint ventures, and Asia human health. Life member of the Corporation of the Massachusetts Institute of Technology, a trustee of the Rockefeller Family Trust, and a member of the National Bureau of Economic Research.

### C. D. Spangler, Jr.

*University of North Carolina at Chapel Hill, Chapel Hill, NC; National Gypsum Company, Charlotte, NC*

President Emeritus; Chairman. Played an active role in the expansion of the University of North Carolina at Chapel Hill. Rose to prominence in family's construction and real estate firm, and in banking where he led a merger in the early 1980s of the Bank of North Carolina with the North Carolina National Bank Corporation. President-elect of the Harvard University Board of Overseers.

### Laurence Alan Tisch

*Loews Corporation, New York, NY*

Co-Chairman of the Board. Former chairman of CBS and of New York University. Philanthropic interests include the arts, medical research, Jewish philanthropies, and education. Trustee of the Metropolitan Museum of Art and the New York Public Library and past trustee of the Whitney Museum. Member of the Council on Foreign Relations.

### Lord Browne of Madingley (John Browne) (FHM)

*BP plc, London, England*

Group Chief Executive. Non-executive director of Intel and Goldman Sachs, and trustee of the British Museum. Fellow of the Royal Academy of Engineering. Knighted in 1998 and made a life peer in 2001.

## Section 3 : Educational, Scientific, Cultural, and Philanthropic Administration (Non-profit Sector)

### Drew E. Altman

*Henry J. Kaiser Family Foundation, Menlo Park, CA*

President and CEO. Head of one of the nation's leading private health foundations, supporting efforts to improve health policy and health care in the United States and abroad. Former director of the Health and Human Services Program at the Pew Charitable Trust.

### Lawrence S. Bacow

*Tufts University, Medford, MA*

President. Social scientist, attorney, planner, and scholar. Contributed to environmental policy, bargaining and negotiation theory, and university leadership through scholarly work, teaching, and engagement with civic and governmental agencies. Author of four books and numerous scholarly papers.

### Catherine Ann Bertini

*United Nations, New York, NY*

Under-Secretary-General for Management. As Chief Executive of the World Food Program, led one of the world's largest efforts at humanitarian intervention, targeting women and children in need of food all over the globe. Honored as the 2003 World Food Prize laureate.

### William R. Brody

*Johns Hopkins University, Baltimore, MD*

President. Former head of the department of radiology at Johns Hopkins and provost of the University of Minnesota Academic Health Center. Recognized for contributions to the literature in radiology, cardiology, and engineering.

### Larry R. Faulkner

*University of Texas at Austin, Austin, TX*

President. Previously served as provost, dean of liberal arts and sciences, and professor of chemistry at the University of Illinois. Developed the field of electrogenerated chemiluminescence, and helped to design a cybernetic electrochemical instrument, which marked a major step toward the use of artificial intelligence in cybernetic chemical instrumentation. Recipient of the American Chemical Society Award in analytical chemistry.

### Paul Kellogg

*New York City Opera, New York, NY; Glimmerglass Opera, Cooperstown, NY*

General Director; General and Artistic Director of Glimmerglass Opera since 1979. Serves on the boards of OPERA America, The New York State Historical Association, and Shen Wei Dance Arts; on panels for the National Endowment for the Arts; and as an adjudicator for the Metropolitan Opera National Council Auditions.

### Sharon Percy Rockefeller

*WETA, Arlington, VA*

President and CEO. Continues to guide WETA, Washington, D.C.'s flagship public television and radio stations, to accomplishments in broadcasting and production. Chairman of the Corporation for Public Broadcasting for four years. Active in a number of areas including education, fine arts, government, and women's issues. Serves on the boards of PepsiCo, Sotheby's, the Public Broadcasting Service, the National Gallery of Art, and the Museum of Modern Art.

### Steven B. Sample

*University of Southern California, Los Angeles, CA*

President. Past president of SUNY Buffalo (1982 – 1991). Credited with establishing the University



of Southern California as a top-ranked research university and with leading SUNY Buffalo to greater levels of academic excellence. Author of *The Contrarian's Guide to Leadership*.

**Ralph J. Snyderman**

*Duke University, Durham, NC*  
Chancellor for Health Affairs; President and CEO of Duke University Health System; James B. Duke Professor of Medicine, Duke University Medical Center. Physician, scientist, administrator. Conceptualized and developed the Duke integrated academic health system as the model for prospective health care. Earlier career was distinguished by seminal research on the mechanisms of inflammation and leukocyte chemotaxis.

Provided leadership in biotechnology while senior vice president for research and development at Genentech.

**Kofi A. Annan (FHM)**

*United Nations, New York, NY*  
Secretary-General. First Secretary-General to be elected from within the staff, as well as the first black African to serve in this post. Has overseen growth in the size and scope of peacekeeping operations and worked to reestablish UN centrality in emergencies across the globe.

**Neil MacGregor (FHM)**

*British Museum, Bloomsbury, London, United Kingdom*  
Director. Immediate past director of the National Gallery, London.

One of the leading museum directors in Europe. Champion of scholarship and public access to museums.

**Lord Sainsbury of Turville (David Sainsbury) (FHM)**

*Parliament, London, United Kingdom*  
Parliamentary Under-Secretary of State for Science and Innovation. Formerly chairman and CEO of J Sainsbury plc. Author of *Governance and Industry: A New Partnership*. ■



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1. **Marvalee H. Wake (UC Berkeley), Jules Alphonse Hoffmann (Centre National de la Recherche Scientifique), and Daniele Hoffmann**

2. **Thomas B. Kornberg (UC San Francisco) and Robert Eugene Krumlauf (Stowers Institute for Medical Research)**

3. **Paul Baran (Novo Ventures, Inc.) and William Allen (NYU)**

4. **Kathryn Lee Calame (Columbia University) and Arthur Weiss (UC San Francisco)**

5. **Alexander Sandor Szalay (Johns Hopkins University) and Michael Eldon Greenberg (Children's Hospital and Harvard Medical School)**

6. **Philip L. Quinn (University of Notre Dame), Stella Kleinrock, Leonard Kleinrock (UCLA), and Lynne Talley (UC San Diego)**

# Regional Events



1



2

## Minneapolis

1. Midwest Center Vice President Martin Dworkin (University of Minnesota), George Schatz (Northwestern University), and President Patricia Meyer Spacks (University of Virginia)
2. Maria Antonia Calvo (Twin Cities artist), Gerald Early (Washington University in St. Louis), and Steven J. Rosenstone (University of Minnesota)



3



4

## Berkeley

3. Chancellor Robert Berdahl with Sung-Hou Kim and Daniel Koshland (all, UC Berkeley)
4. Erich Gruen and Anthony Long (both, UC Berkeley)



5



6

## Stanford

5. Walter B. Hewlett (William and Flora Hewlett Foundation) and Louis W. Cabot (Cabot-Wellington, LLC)
6. President John Hennessy (Stanford University) and Jack W. Peltason (UC Irvine)



7



8

## New York City

7. Richard Avedon (New York, New York) and Thomas P. Sakmar (Rockefeller University)
8. Executive Officer Leslie C. Berlowitz, William T. Golden (New York, New York), and Jean E. Taylor (Courant Institute of Mathematical Sciences)



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## Environmental Change and the Human Condition

*John P. Holdren*

*Introduction by Carl Kaysen*

This presentation was given at the 1864th Stated Meeting, held at the House of the Academy on November 13, 2002.

*John P. Holdren, a Fellow of the American Academy since 1983, is Teresa and John Heinz Professor of Environmental Policy and Director of the Program in Science, Technology, and Public Policy at Harvard University's Kennedy School.*

*Carl Kaysen, a Fellow of the American Academy since 1954, is David W. Skinner Professor of Political Economy Emeritus at MIT.*

### Carl Kaysen

John Holdren has been a colleague of mine for many years. He is the Teresa and John Heinz Professor of Environmental Policy and director of the Program in Science, Technology, and Public Policy at Harvard University's Kennedy School, as well as professor of environmental science and public policy in the department of earth and planetary science at Harvard University.

Since receiving his B.S. and M.S. in aeronautics and astronautics at MIT and his Ph.D. in aeronautics/astronautics and plasma physics from Stanford, he has had two extraordinary careers, one as an academic and one as a public figure. After brief stints at the Lockheed Corporation, the Lawrence Livermore Laboratory, and Caltech, he went to UC Berkeley in 1973. There he cofounded and codirected a campuswide interdisciplinary program in energy and resources for twenty-three years, before assuming his position at Harvard in 1996. His bibliography includes some three hundred articles and reports, and he has edited, coedited, written, and contributed to fourteen books on energy, environmental problems, nuclear weapons, and arms control.

In 1981, John was one of the earliest recipients of the MacArthur Prize Fellowship. He is chair of the Committee on International Security

and Arms Control of the National Academy of Sciences and was a member of President Clinton's Committee of Advisors on Science and Technology (PCAST), where he led studies for the White House on protection of nuclear bomb materials, the U.S. fusion-energy R&D program, and energy R&D strategies for meeting the climate change challenge.

I've worked with John on the Academy's Committee on International Security Studies and in the Pugwash movement for many years, so I can add a few personal observations to his long public record. When Pugwash won the Nobel Peace Prize in 1995, jointly with Joseph Rotblat, John, as chair of the Pugwash Executive Committee, addressed the Norwegian Nobel Committee in Oslo. His combination of great energy, intellectual acuity, focus on the task at hand, a calm and easy manner, and a smile often hidden in the thickets of his facial



adornments make him an invaluable colleague in any joint enterprise. The speed with which he can put together a comprehensive and balanced record of long and complicated discussions never ceases to astonish all who work with him.

## John P. Holdren

### Environment and Well-Being

I think it is useful to consider the determinants of human well-being as falling into three broad categories: economic conditions and processes (such as markets, productive technologies, employment, income, wealth, and so on); sociopolitical conditions and processes (such as self-determination, governance, personal and national security, justice, education, health care, science, culture, and so on); and environmental conditions and processes (such as soils, the biota, nutrient cycles, mineral resources, climate, and so on).

A key understanding in relation to these three categories is that major failures in any one may undermine the human enterprise. The conditions and processes in each of the three categories are indispensable to human well-being. While some trade-offs around the edges are inevitable, it is a mistake to imagine that one or the other of the categories is primary and the others secondary. Human activities need to be managed in a way that preserves and enhances the ingredients of well-being under all three headings. A second important point is that the threats to human well-being arising from the environmental category remain less well understood (by publics, policymakers, and professors alike) and therefore less comprehensively addressed in politics and policy than are the threats in the other two categories.

What are the threats in the environmental category? As shown in Table 1, they can be divided into two groups: those arising from human activities and those generated by natural processes. Of course, there is an interaction between natural hazards and human activities: human indirection and inattention often lead to the magnification of natural hazards and to the general lack of priority we give to protecting ourselves and our property from these natural hazards.

The problems we know best and fear most may not be the most dangerous ones. Direct health impacts from pollution – dirty air, toxic contamination of ground and surface water, carcinogens in food, radioactivity from nuclear

## *The problems we know best and fear most may not be the most dangerous ones.*

accidents, and mismanagement of nuclear wastes – have historically received most of the attention, for reasons of the measurability and visibility of harm, and the ready understandability of the mechanism. The “indirect” threats – impacts of climate change, stratospheric ozone depletion, biodiversity loss, and alteration of geographic distribution and of population dynamics between beneficial and destructive organisms – are harder to predict and quantify, but they may prove to be more dangerous and less easily remedied.

An important reason for the persistent underestimation of threats in this “indirect” category is the widespread misimpression about the extent to which modern technology and medicine have reduced the dependence of human well-being on environmental conditions and processes – above all on climate, which affects all the others. Notwithstanding the remarkable accomplishments of biomedical, agricultural, and environmental engineering tech-

nologies, the fact is that civilization remains dependent on nature for most of the cycling of nutrients on which food production depends, for most of the regulation of crop pests and agents and vectors of human disease, for most of the detoxification and disposal of wastes, and for the maintenance of climatic conditions within limits conducive to all these other environmental services and to the human enterprise more generally.

### Environment and Development

Different types of environmental problems are associated with different phases of the societal trajectory between poverty and wealth. In the poorest developing countries, where infrastructure is largely absent and rapidly growing populations using primitive technologies must meet their basic needs with renewable resources in their immediate surroundings, the biggest problems are (a) degradation of those resources (e.g., deforestation, desertification, erosion); (b) bacterial contamination of waste-saturated water supplies; and (c) acute indoor air pollution from inefficiently burning biomass fuels in badly ventilated dwellings.

In the high-growth phase of economic development – with medium rates of population growth and rapid growth of gross domestic product (GDP) per capita, fed by a rapidly rising use of energy and materials in manufacturing, transport, and construction of buildings and infrastructure, with a low priority given to efficiency and the environment – the characteristic environmental problems include (a) massive urban and regional air pollution; (b) acid precipitation; (c) industrial pollution of surface and ground water with hydrocarbons and metals; and (d) filling and pollution of estuaries by ports, freight terminals, and oil refineries.

The richest countries – where population growth rates are low, per capita economic growth is moderate, and substantial investments in pollution control have begun to curb emissions to air, water, and soil of some of the more easily captured pollutants – are responsible for (a) continuing high emissions to the atmosphere of pollutants resistant to control (notably greenhouse gases, nitrogen oxides, very fine particles, and some toxic metals) resulting from high levels of material consumption and personal mobility; (b) clean-up challenges of daunting magnitude from the accumulated burden of past pollution of ground water, soil, and riverine and estuarine

**Table 1.**  
**Classification of Environmental Threats**

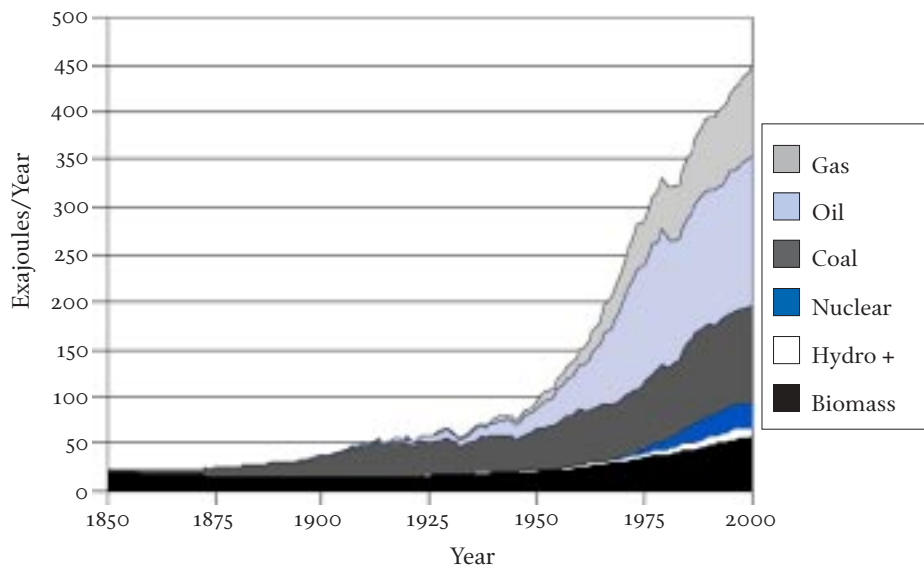
#### *Environmental threats from human activities*

- Direct loss of life, health, property, or income from routine, accidental, or malicious emissions:
  - toxic
  - carcinogenic
  - mutagenic
  - teratogenic
  - corrosive
- Loss of life, health, property, income, pleasure, or security as a result of a disruption of biological or geophysical resources or processes, including those of:
  - soils
  - vegetation
  - nutrient cycles
  - hydrology
  - climate
  - the stratospheric ozone shield
  - population dynamics of valued or destructive organisms

#### *Natural hazards*

- Weather/climate: storms, floods, droughts, avalanches, ice ages
- Geology: earthquakes, landslides, tsunamis, volcanoes
- Biology: die-offs, outbreaks of valued or destructive organisms

Figure 1. World Primary Energy Supply, 1850 – 2000



sediments; (c) luxury levels of consumption of meat, fish and shellfish, and tropical fruits and hardwoods, leading to deforestation by lumbering, grazing, and plantation operations; to overharvesting of estuarine, open-ocean, and coral reef environments; and to conversion of mangrove swamps into aquaculture ponds (mostly beyond the borders of the consuming countries).

Finally, the kinds of environmental problems that persist and grow at the highest levels of economic development – where population growth rates are low, per capita economic growth is moderate, and substantial investments in pollution control have begun to curb emissions to air, water, and soil of some of the more easily captured pollutants – tend to be those that (a) arise from renewable resource demands driven beyond thresholds of sustainability by the growth of prosperity itself (e.g., decimation of ocean fisheries and overharvesting of tropical hardwoods for high-income diets, homes, and furniture); or (b) are legacies of past carelessness in forms that are very costly to ameliorate after the fact and for which the “polluter pays” principle fails because the polluters have disappeared (e.g., toxic contamination of groundwater); or (c) arise from widely used, hard-to-replace productive technologies in ways that are resistant to inexpensive technological fixes (e.g., CO<sub>2</sub> emissions from fossil-fuel combustion); or (d) tend to export their environmental costs and risks in space and time to an extent that makes difficult their assessment and internalization through price or policy (e.g., CO<sub>2</sub>, biodiversity loss, nuclear proliferation and nuclear terrorism risks from nuclear energy).

## Energy and the Environment

Many of the most difficult and dangerous environmental problems at each of these levels of economic development – from the damage that the very poor do to the immediate environment, and thus to themselves, to the damage that the very rich do to the global environment, and thus to everybody – arise from the harvesting, transport, processing, and conversion of energy. Energy supply is the source of most indoor and outdoor air pollution, most radioactive waste, and much of the hydrocarbon and trace metal pollution of soil and groundwater. And energy-related operations account for essentially all of the oil that humans have put into the oceans as well as for most of the human-produced gases that are altering the global climate.

But, of course, energy is also an indispensable ingredient of material well-being and of eco-

nommic development. We cannot do without it. And because the environmental characteristics of the energy resources and technologies on which society depends today can generally be changed only slowly, and at considerable cost, the dilemma embedded in energy’s dual roles in economic prosperity and environmental disruption cannot be easily resolved. In light of all of this, it has become increasingly clear that energy is the core of the environment problem; environment is the core of the energy problem; and the energy-environment intersection is the core of the sustainable development problem.

Let me try to clarify the energy situation in quantitative terms. Figure 1 shows world primary energy supply for the period 1850 – 2000, distributed according to fuel source. Note that 150 years ago, in 1850, about 88 percent of the world’s energy was coming from the biomass sources – mostly fuelwood and charcoal, augmented by crop waste and dung. The remaining 12 percent came from coal. In the ensuing century, from 1850 to 1950, world use of primary energy grew by a factor of 4.3, and this growth was supported mostly by a tremendous expansion in the use of coal. The growth of oil and natural gas became important only in the latter part of this period; by 1950, oil was supplying just over half as much energy as coal, and natural gas was supplying only a sixth as much as coal.

In the most recent half century, from 1950 to 2000, world energy use grew at a little more than twice the rate that had characterized its growth during the previous one hundred years. The increase in the last half of the twentieth century was 4.7-fold, making the increase over the one hundred fifty years from 1850 to 2000 a factor of 4.3 x 4.7, or 20-fold. As is clear from Figure 1, the great bulk of the growth of world energy in the last half century came from the

Table 2. World, U.S., and Chinese Energy Supply in 2000

	World	United States	China
Primary energy (exajoules)	450	105	146
of which ...			
oil	35%	38%	22%
natural gas	21%	25%	2%
coal	23%	25%	49%
nuclear energy	6%	8%	0.4%
biomass	13%	4%	25%
hydropower and other	2%	1%	2%
Electricity (billion kilowatt-hours, net)	14,700	3,800	1,300
derived from ...			
fossil fuels	64%	71%	82%
nuclear energy	17%	20%	1.2%
hydropower	18%	7%	17%
wind, geothermal, solar, and biomass	1.6%	2.2%	0.1%

Note: 1 exajoule = 10<sup>18</sup> joules = 1 billion gigajoules; hydropower is counted as energy content, not as fossil fuel equivalent; net electricity excludes the part of generated electricity that is used within the power plant.

**Table 3. World Energy and Economy by GDP per Person, 2000**

	Poor Economy	Transition Economy	Rich Economy
Population (billions)	4.1	1.2	0.8
GDP (trillion ppp-corrected 2000 US\$)	11	11	23
Industrial energy (terawatts)	2.9	3.2	6.3
Biomass energy (terawatts)	1.4	0.2	0.2
Fossil carbon (billion metric tons of C per year)	1.6	1.7	3.1
<i>per person</i>			
GDP (thousand ppp-corrected 2000 US\$)	2.7	9.2	29
Energy – industrial and biomass (kilowatts)	1.0	2.8	8.1
Fossil carbon (metric tons of C per year)	0.4	1.4	3.9

Notes: 1 terawatt = 1 trillion watts = 1 billion kilowatts = 31.5 exajoules per year. 1 metric ton = 1,000 kilograms = 2205 pounds = about 1.1 American tons. One ton of carbon in CO<sub>2</sub> corresponds to 3.67 tons of CO<sub>2</sub>. Purchasing-power-parity corrections are from the World Bank.

tremendous expansion in the use of oil and, most recently, natural gas. By 2000, world oil use was 1.6 times greater than coal use, and the energy coming from natural gas was about equal to that coming from coal. Altogether, fossil fuels were accounting for 78 percent of world energy use in 2000, with the remainder coming from biomass fuels (13 percent), nuclear energy (6 percent), and hydropower, geothermal, solar, and wind energy combined (3 percent). (The share attributed to biomass fuels is smaller than this in nearly all official tabulations, because these tabulations leave out the biomass energy forms – gathered fuelwood, crop wastes, and dung – that are not exchanged in organized markets but that constitute the principal energy sources for the poorest third of the world’s population.)

Table 2 shows the energy picture in the year 2000 in a bit more detail, comparing sources and magnitudes for the United States and China as well as the world as a whole, and showing electricity generation as well as primary energy. (Electricity is a “secondary” energy form, which, like other secondary energy forms such as gasoline, charcoal, biogas, and hydrogen, comes from one or more of the primary forms.) What is most striking in Table 2 is the high dependence on fossil fuels not only of the whole world but of countries as diverse in their stage of development as the United States and China. What is also striking are the modest percentages of primary energy and electricity supply that are accounted for by nuclear energy and by renewable energy forms other than biomass, notwithstanding the high prominence of these options in national and international energy debates.

In Table 3 the world energy picture in the year 2000 is portrayed in another way – namely, in relation to allocation of energy, economic activity, and emissions of fossil carbon to the atmosphere among poor, transition, and rich

economies. The country categories are based on GDP per capita corrected for purchasing power parity (ppp), where countries averaging below US \$5,000 ppp per year in 2000 are classified as poor, those between \$5,000 and \$20,000 as transition, and those above \$20,000 as rich. With these definitions, Table 3 shows that the rich countries, with only 13 percent of the world’s population in 2000, accounted for 51 percent of the world economic product, 46 percent of the world’s energy, and 48 percent of the carbon being added to the atmosphere in CO<sub>2</sub> from fossil fuel combustion. Looking at the per capita numbers underlines the magnitude of the gap: GDP per person in the rich countries is about eleven times higher than in the poor countries, energy use per person is eight times higher, and carbon emissions per person are about ten times higher.

### The Business-as-Usual Energy Future

Given these understandings of where we are and where we have been in relation to world energy supply, let us look at where we are going. Table 4 summarizes a middle-of-the-road

trajectory through the twenty-first century of the sort often described as a business-as-usual scenario. This means not that nothing changes, but rather that things change in roughly the patterns that have recently been prevailing, with adjustments for demographic and economic shifts that are more or less expected. Thus, in the scenario portrayed in Table 4, population growth rates continue to fall, but the population nonetheless grows until it stabilizes by 2100 at about eleven billion people. Aggregate economic growth averages 2.8 percent per year from 2000 to 2030, but only 2.3 percent per year for the whole century. The energy intensity of the world economy (energy use divided by real GDP) falls throughout the century at the long-term average of 1.0 percent per year, and the carbon intensity of energy supply (carbon emissions divided by primary energy) falls at 0.2 percent per year.

In a simpler division than that of the snapshot for the year 2000, this scenario considers only two country groups: industrialized and developing. One sees from the table that in this business-as-usual energy scenario (a) nearly all of the population growth and most of the energy growth will occur in the developing countries; (b) the industrialized-developing gap in GDP per person will not disappear even by the end of the century, although it will fall from a factor of 6.6 in 2000 to 3.8 in 2050 to 2.4 in 2100; (c) world economic product will increase nearly tenfold over the century, while energy use will quadruple; and (d) carbon emissions from fossil fuel combustion will more than double by 2050, and more than triple by 2100.

### What, Us Worry?

The question then arises, is there anything problematic about this? Should we worry about proceeding along the business-as-usual trajectory?

**Table 4. A Business-as-Usual Economic and Energy Scenario, 2000 – 2100**

	2000	2030	2050	2100
Population (billions)				
industrialized countries	1.3	1.4	1.4	1.4
developing countries	4.8	7.1	8.4	9.7
GDP (1,000 ppp-corrected 2000 US\$)				
industrialized countries	2.7	9.2	29	29
developing countries	1.0	2.8	8.1	8.1
Energy/person (kilowatts)				
industrialized countries	6.3	7.5	8.0	8.3
developing countries	1.3	2.2	2.9	4.7
GWP (trillion ppp-corrected 2000 US\$)	45	105	171	438
Carbon emissions (billion metric tons of C per year)	6.4	10.9	14.3	20.8

Notes: GWP = gross world product. The carbon emissions listed are projected from fossil fuel burning only.



The first concern that most people raise when they are shown a scenario in which energy use quadruples in the twenty-first century is whether the world's energy resources will suffice to support such an increase. Will we simply run out of energy? Table 5, which presents rough estimates for the Earth's endowments of nonrenewable and renewable energy resources, indicates that the answer to this question is no. Particular energy forms may be, or become, scarce in particular places, but the world is far from running out of energy in any absolute sense. The energy for business-as-usual growth throughout this century, and for quite some time beyond that, could be supplied by fossil fuels alone – if we are willing to pay the monetary, environmental, and perhaps also political costs – even without turning in any significant degree to nuclear and renewable energy.

But, while civilization is not running out of energy resources per se, it is running out of a number of things related to energy that ought to concern us.

We are, for example, running out of *cheap oil* much more rapidly than we are running out of energy as a whole. As the world has already learned, spikes in the oil price can be very disruptive economically, and armed conflict over access to the cheap oil that remains may be even more disruptive.

We are running out of *environment*, in the sense that the environment's capacity to absorb, without intolerable consequences, the

impacts of energy use and transformation is being severely depleted.

We are running out of *tolerance for inequity* in the energy-economic system – the inequity depicted in Table 3 and destined, according to Table 4, to disappear only slowly under business as usual. It is not just the economic division that is problematic, moreover; it is that the poor are more at risk from the environmental problems than the rich are.

We are running out of *money for better energy options* in two different respects. In the poor countries, the question is where the money will be found to deploy energy systems that are cleaner and more efficient than the less costly ones that are deployed now. In the rich countries, there is more than enough money to pay for these options, but we seem to have run out of the willingness to pay: we are refusing to make respectable investments in energy research and development for better technologies, and we refuse to tolerate even the mention of a carbon tax or other measures to internalize into the cost of energy the environmental damage that is being done.

And we are running out of *time* for a smooth transition to an energy system that is both sufficient to our needs and sustainable in the environmental sense. This matter of timing is perhaps the least-understood dimension of the energy problem. The problem is that energy systems – power plants, oil refineries, pipelines, and so on – tend to last thirty to fifty years. If you want the energy system in 2050

to look very different from today's, you had better start changing now, because the power plants we build over the next decade are still going to be running in 2050. Another way of looking at it is that the capital investment in the world energy system – the amount of money it would take to replace it – is about ten trillion dollars. This huge investment cannot be turned over quickly. If people suddenly decide ten years from now that we've got the wrong energy system, it won't be possible to have a different one ten years after that.

## The Climate Change Core of the Energy-Environment Dilemma

The essence of the energy problem is the question of how to meet society's energy needs without undermining the environmental foundations of well-being. And, within the constellation of environmental problems associated with energy, climate change will likely prove to be the most dangerous and intractable in the long run.

It is not the most dangerous today in terms of the number of premature deaths it is causing: indoor air pollution, outdoor air pollution, and bacterial contamination of surface water are killing far more people. But climate change will become the most dangerous over time, because climate profoundly influences all other environmental conditions and processes; it is the envelope within which all other environmental conditions and processes must function. If climate is sufficiently disrupted, therefore, everything else environmental will be disrupted too: the productivity of farms, forests, and fisheries; the geography of disease; the livability of the world's cities in summer; the damages to be expected from storms, droughts, floods, wildfires, and a rising sea level; and much more. And climate change is the most intractable environmental problem because it is so deeply rooted in the characteristics of the world energy supply system that can be changed only slowly and with great difficulty.

There is no longer any serious doubt among informed scientists that the climate is changing, and that it is changing in a way that is unusual compared to the natural patterns of climatic fluctuation. Climate is naturally a fluctuating system. The climate has always changed for a whole variety of natural reasons, but it is now changing more rapidly, and in a pattern that matches what would be expected from the suspected human cause. Indeed, because of this matching "fingerprint," it is virtually certain that the emission of green-

Table 5. World Energy Resources

<i>Nonrenewable</i>		TWY
Conventional oil and gas		1,000
Unconventional oil and gas (excluding methane clathrates)		2,000
Coal		5,000
Methane clathrates		20,000
Oil shale		30,000
Geothermal	– steam and hot water	4,000
	– hot dry rock	1,000,000
Uranium	– in light-water reactors	3,000
	– in breeder reactors	3,000,000
Fusion	– deuterium-tritium, limited by lithium	140,000,000
	– deuterium-deuterium	250,000,000,000
<i>Renewable</i>		TWY/year
Hydropower potential		15
Global biomass production		100
Power in the wind		2,000
Sunlight reaching land surface		26,000
– reaching entire Earth surface		88,000

Note: Nonrenewable resource estimates are for remaining recoverable resources, are highly approximate, and are measured in terawatt-years (1 TWY = 31.5 exajoules). Renewable resources are measured in terawatts of total flow, where 1 TW = 1 TWY/year = 31.5 exajoules per year. Fractions of the renewable flows that could be practically harnessed depend on assumptions, but are generally in the range of 1 – 10 percent. Note that world energy use in 2000 was just under 15 TW or 15 TWY/year, and a quadrupling by 2100 would imply 60 TWY/year.

house gases from human activities – above all, the combustion of fossil fuels – has been responsible for a substantial share of the climatic change that has been experienced in the last hundred years.

There is also a scientific consensus about where we are headed in the way of further climate change under the business-as-usual future. The scientific consensus best estimates,

*If climate is sufficiently disrupted, everything else environmental will be disrupted too.*

which are those of the Intergovernmental Panel on Climate Change, are that continuation on the business-as-usual emissions trajectory as described in Table 4 will lead to increases in the mean global surface temperature of 2° to 4°C over the current century. By century's end, the Earth will be warmer than it has been at any time in the last one hundred sixty thousand years. The best estimate for the rise of sea level by 2100 is about fifty centimeters. This global average warming will not occur uniformly and will entail major changes in climatic patterns – storm tracks, ocean currents, distribution of precipitation and soil moisture, extremes of hot and cold. And, in part because of the pace of the changes in climatic patterns, the resulting effects on human well-being are far more likely to be negative than positive.

Although most of the detailed analysis and discussion of the impacts of anthropogenic climate change have focused on the consequences of the doubling of the preindustrial concentration of CO<sub>2</sub>, this is not because there is any current reason to think that the buildup of the atmospheric burden of CO<sub>2</sub> will stop at that level. It was just for convenience in comparing results that the scientific community settled on a CO<sub>2</sub> doubling as a principal focus of study. On a business-as-usual trajectory like that depicted in Table 4, the concentration of CO<sub>2</sub> would soar past a doubling by around 2060 and would be near a tripling by 2100. And if the trajectory were still the business-as-usual one by that point, it would be practically impossible to stop the further concentration buildup below a quadrupling of the preindustrial concentration. For decades after the concentration stabilized, the temperature would continue to rise, moreover, because of the lag time caused by the thermal inertia of the

oceans. And sea level would continue to increase for centuries.

The equilibrium annual average temperature increase in midcontinent North America under a doubling of the preindustrial CO<sub>2</sub> concentration would be around 10°F; under a quadrupling, it would be around 20°F. Now, it is possible to have an interesting argument about whether the climatic and associated ecological consequences of a CO<sub>2</sub> doubling would be manageable without intolerable damage to the human condition – there are enough uncertainties about the details of impacts and adaptation to leave room for both optimistic and pessimistic assessments. But the situation is far less ambiguous for the case of the quadrupled-CO<sub>2</sub> world, which is where we will arrive if we don't do anything about it in the meantime. A quadrupled-CO<sub>2</sub> world would be a roasted world, with weather patterns and extremes of heat unlike anything yet experienced during the tenure of human beings on the planet. It would be a catastrophe for the human condition.

### **A Thought Experiment on the Magnitude of the Challenge**

There has been considerable study of the sizes and shapes of the deflections from the business-as-usual emissions trajectory that would be needed to stabilize the atmospheric concentration of CO<sub>2</sub> at various levels below a quadrupling. Assessing the implications of the results for the character of the energy system is instructive as to the magnitude of the challenge we face. Let me consider here the much-studied case of stabilization at twice the preindustrial concentration, hence at about 550 parts per million by volume (ppmv). While there is nothing magical about this target – and certainly no guarantee that achieving it would avoid severe damages from climate change – it is so difficult to meet (as we will see in a moment) that doing much better seems unlikely.

I note that a more rigorous consideration of the interaction of anthropogenic greenhouse gases with climate requires looking not only at CO<sub>2</sub> but also at non-CO<sub>2</sub> greenhouse gases, and at both energy-absorbing and energy-reflecting particles in the atmosphere. Coincidentally, however, the warming effects of the non-CO<sub>2</sub> greenhouse gases and absorbing particles are largely cancelled out by the cooling effects of reflective particles. This is likely to remain true during much of this century because increasing control over emissions of the non-CO<sub>2</sub> greenhouse gases and soot will be matched by increasing control over the

## *A quadrupled-CO<sub>2</sub> world would be a catastrophe for the human condition.*

sources of the reflective particles. Because of this and because, under business as usual, the CO<sub>2</sub> becomes increasingly the dominant factor as the century wears on, taking into account the effects of the CO<sub>2</sub> alone gives a decent approximation of the net effects to be expected.

The size of the CO<sub>2</sub> emissions reduction challenge becomes apparent when one recognizes that stabilizing the atmospheric concentration of CO<sub>2</sub> at 550 parts per million requires not just leveling off emissions at a level not too much higher than today's, but also subsequently bringing emissions down, over a period of many decades, to a fraction of today's. There is a variety of trajectories that could meet this goal – some featuring large early departures from business as usual but more gradual declines later, and others deferring early action but requiring very steep declines later. If one wanted to avoid the stabilization trajectories that place too much of the burden of reductions in the early decades of the century, as well as avoid those that involve extremely steep declines later, then one would want to level off emissions at about 11 billion tons of carbon around the year 2035 and then begin gradually to decline them to about 6 to 7 billion tons of carbon per year by 2100 and to 3 to 4 billion tons of carbon per year by 2200.

It is an easy matter to calculate, under some simplifying assumptions, how much the carbon-free part of the world energy supply would need to be expanded in the twenty-first century in order to get on and stay on a not-too-early/not-too-late trajectory for stabilizing CO<sub>2</sub> at 550 ppmv. The carbon-free options are (a) biomass, hydropower, wind, photovoltaics, and other renewable energy sources; (b) nuclear energy (currently nuclear fission and perhaps, after midcentury, nuclear fusion); and (c) advanced fossil fuel technologies that can capture the carbon and sequester it, rather than releasing it into the atmosphere. Assuming middle-of-the-road economic growth and continuation of the recent 1 percent/year world average rate of reduction of the energy intensity of economic activity, the carbon-free contribution would need to increase sixfold (to about 600 exajoules) by 2050 and fifteenfold (to about 1500 exajoules) by 2100 if the world were on the indicated 550-ppmv-stabilization trajectory. Only if the his-

torical world average rate of energy intensity reduction can be doubled to 2 percent per year over the whole world and the whole century can the requirement for carbon-free energy supply be held to a “mere” tripling in the twenty-first century.

To achieve such a rate of energy efficiency improvement worldwide for a century would be a fantastic challenge. Alas, there is as yet little sign of the sorts of policies and commitments that could yield the needed energy intensity reductions and carbon-free energy increases in the years ahead in any combination consistent with stabilizing atmospheric CO<sub>2</sub> at 550 ppmv.

## What Should We Be Doing? A Six-Point Program

We should of course be expanding research and the scientific dimensions of the problem. (No talk by a scientist is complete without this recommendation!) We should be doing more research on the science of climate change and its impacts; on the enhancement of terrestrial and oceanic sinks for carbon; on geotechnical engineering to offset the effects of greenhouse gases on the climate; and on adaptation to climate change. And we should be making increasing investments to exploit the opportunities that this research uncovers.

Second, we should have increased national and international support for the education, development, social welfare, and family planning measures known to be most effective in reducing population growth. If the world has, say, eight billion people in 2100 instead of eleven billion, the energy-climate problem will be easier to solve – still not easy, but easier – and so will many other problems.

Third, we should have incentives and other help for firms and consumers to make low-CO<sub>2</sub> and no-CO<sub>2</sub> choices from the menu of energy-supply and energy-end-use-efficiency options available at any given time. These incentives could be as simple as tax breaks for investments in options with the desired characteristics, but it seems unlikely that enough will be done without the stronger medicine of either a carbon tax or an emissions cap enforced through tradable emissions allowances.

Fourth, there should be accelerated research, development, and demonstration to improve the menu of low-CO<sub>2</sub> and no-CO<sub>2</sub> energy options from which incentivized producers and consumers can choose – better solar, wind,

## *The fates of the industrialized and less-developed countries are more interconnected than most people think.*

and biomass technologies; better nuclear technologies (advanced fission and, I hope, fusion); and very advanced fossil fuel technologies that can capture the carbon and sequester it away from the atmosphere.

Fifth, we should have increased international cooperation to facilitate applying the results of climate research, low-CO<sub>2</sub> and no-CO<sub>2</sub> energy research, and innovations in the ways of implementing these insights and options in the South as well as the North. The problem of global climate change from CO<sub>2</sub> emissions has been mainly caused up until now by the industrialized countries, which have contributed about three-fourths of the fossil fuel carbon added to the atmosphere over the past one hundred fifty years. Now fossil fuel use is growing faster in the developing countries than in the industrialized ones, however, and by 2025 or 2030 these countries will pass the industrialized countries in total emissions (but not in per capita emissions). In this situation, it is perfectly appropriate for the industrialized countries to take the first steps to address the problem, and to pay a large fraction of the costs of action – but there is no solution in the long run unless the developing countries participate in moving off of the business-as-usual trajectory.

This leads finally to the sixth point: We need to construct a global framework of commitments to long-term restraints on greenhouse gas emissions – a framework designed for sufficiency, for equity, and for feasibility. This has not happened yet. The United Nations Framework Convention on Climate Change (which was ratified by the United States in 1992 and which is in force) and the Kyoto Protocol (which the United States has refused to ratify and which may well go into force without this country’s participation) were intended as initial steps in the needed direction, but they are not working yet and would not be enough if they were.

Of course, the private sector has a large role to play in the six-point agenda I have laid out here. But the nature of the problem – as one that involves externalities, common property resources, public benefits, and binding agree-

ments among states – dictates that government policy also has to play a major role. The government of the United States – a country with a quarter of the world’s fossil fuel use, a quarter of the world’s CO<sub>2</sub> emissions, the world’s strongest economy, and the world’s most capable scientific and technological establishment – ought to be leading and not following in this effort that is so crucial to the prospects for sustainable prosperity for everybody. But we are not leading – we are lagging.

## Why the Energy-Climate Problem Is Being Underrated

Why do we underrate this problem so much? I think there are six major reasons that the public, policymakers, and even most scientists continue to be complacent about it.

First, human well-being is more dependent on both energy and climate than most people think. Most people are not at all interested in energy – in BTUs and gigajoules and kilowatt-hours – and it’s hard to blame them. People are interested instead in energy *services* – comfortable rooms, cold beer, convenient transportation – and in a strong economy, a livable environment, and a peaceful world. But for the most part they don’t understand the connections between energy choices and these elements of personal and societal well-being. They certainly don’t understand the multiplicity of ways in which human well-being depends on climate.

Second, existing energy sources are more problematic, and climate change is further along, than most people think. Few people know that nearly 80 percent of the world’s energy still comes from fossil fuels. Fewer still know that the disruptions of climate being experienced today, which are already problematic in many respects, do not even reflect the equilibrium consequences of the CO<sub>2</sub> that has already been added to the atmosphere. That is, because of the time lag induced by the thermal inertia of the oceans, further changes in climate could not be avoided even if we could stop the growth of the atmospheric CO<sub>2</sub> concentration overnight.

Third, the energy-climate implications of the expected growth in population and energy use per person are bigger than most people think. Very few people have done the kinds of arithmetic I’ve presented here, looking at what population, economic activity, energy use, and carbon emissions are likely to be in 2030 or 2050 or 2100.



Fourth, scientific uncertainties are not proper grounds for complacency, as so many people seem to think. There are uncertainties in the climate change picture – big ones, when it comes to the timing and the pattern of impacts of climate change – but uncertainties tend to be symmetric. That is, while things might turn out to be better than your current best estimate, they might also turn out to be worse.

Fifth, the time lags associated with the appearance of the symptoms, diagnosis of the cause, prescription of the remedy, and implementation of the prescription are all longer than most people think. Such time lags make “steering” and “braking” in the energy-climate system very problematic.

Finally, the fates of the industrialized and less-developed countries are more interconnected than most people think. There is a tendency in the industrialized countries to suppose that if the climate change problem does turn out to be as bad as currently advertised, it will mostly be people in the less-developed countries who will suffer. Americans, Europeans, and Japanese think that because we in the North have lots of technology, lots of capital, and lots of infrastructure we will be able to adjust. This view is wrong, in part because the North’s assets will not be adequate to protect it against all of the consequences of severe climate change that are in store. But even more importantly, it is wrong because the North will not be able to insulate itself from the misery that climate change generates in the South.

The fact is that the people on this planet live under one global atmosphere, on the shores of one global ocean, our countries linked by flows of people, money, goods, ideas, images, diseases, drugs, weapons, and, perhaps ultimately, nuclear explosives. We cannot keep one end of the boat afloat while the other end sinks. ■

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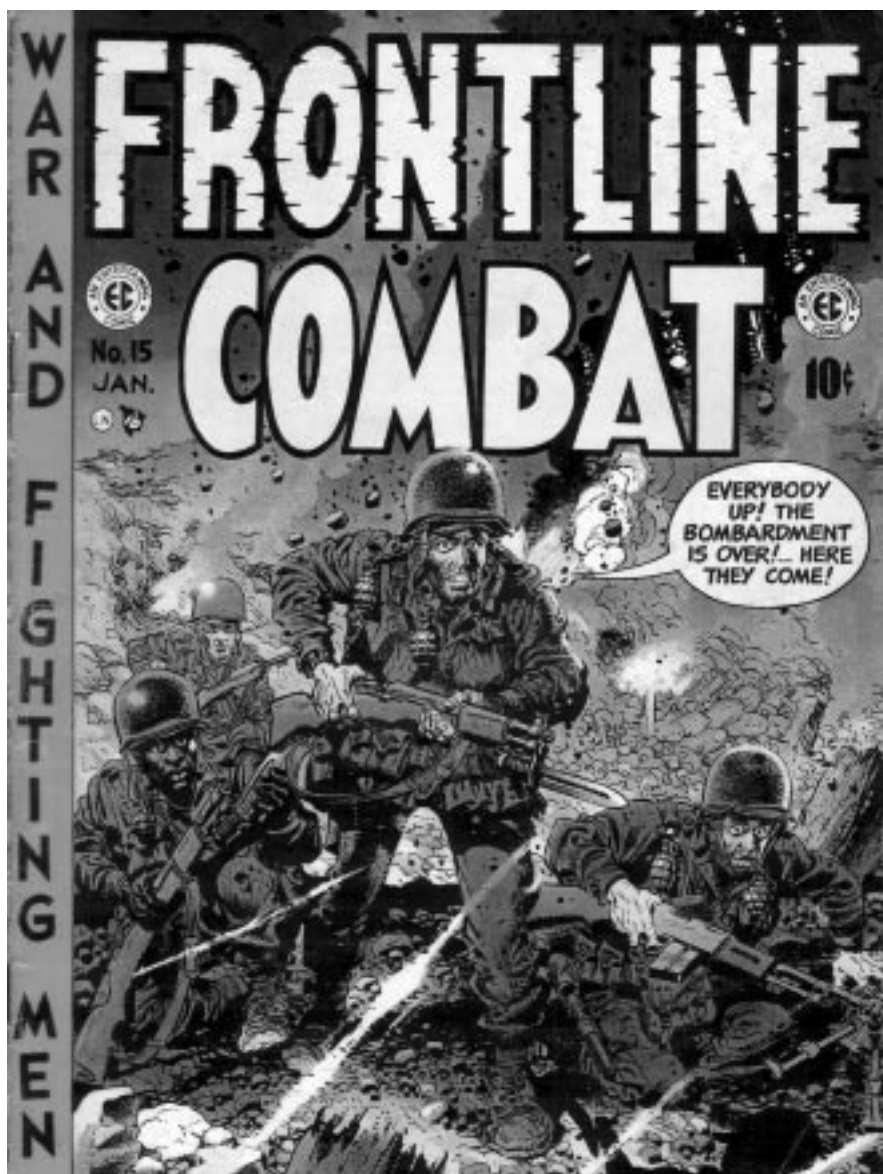


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## Race, Art, and Integration: The Image of the African American Soldier in Popular Culture During the Korean War

Gerald Early

Introduction by Alan Lightman

This presentation was given at the 1867th Stated Meeting, held at the House of the Academy on February 12, 2003.

Gerald Early, a Fellow of the American Academy since 1997, is the Merle Kling Professor of Modern Letters and the Director of The Center for the Humanities at Washington University in St. Louis.

Alan Lightman is Adjunct Professor of Humanities at MIT. A Fellow of the American Academy since 1996, he is the author of several books, and his most recent work of fiction is *Reunion*.

### Alan Lightman

There's a poignant moment in Gerald Early's essay "Life with Daughters: Watching the Miss America Pageant" – an essay that was included in Houghton Mifflin's *Best American Essays of the Century*. In that moment, Early catches his daughter looking at "her mother's very long and silken straight hair, the hair that the other black girls at school admire," and

asks her if she would like to have hers straightened as well.

"Not now," his daughter answers. "Maybe when I'm older. It'll be something different."

"Do you think you will like it?" Early asks.

"Maybe," his daughter answers.

"In that 'maybe,'" Early writes, "so calmly and evenly uttered, rest the complex contradictions, the uneasy tentative negotiations of that which cannot be compromised yet can never be realized in this flawed world as an ideal; there is, in that 'maybe,' the epistemology of race pride for black American women so paradoxically symbolized by their straightened hair." It seems to me that Early's writing encompasses all of the complex contradictions and uneasy negotiations of African American culture and of American culture in general.

Early studies jazz, boxing, baseball, beauty contests, and film for their deeply human meanings. As a writer, he is one of the great essayists of our time. But more than that, he is an explorer. He is a thinker. His trademarks are utter honesty, a powerful intellect, and fierce independence. The African American experience is the lens through which Early photographs the world, but he is not a separatist. While showing the richness and complexity of African American culture, he also shows it as an organic part of American culture. After reading Early, we feel provoked in the best sense of the word, and we also feel more whole.

One of Early's most appealing qualities, to me, is his modesty. He does not try to establish a persona. Rather, he wants to be measured by his thought – and that quiet thought has been widely recognized and honored. In 1988 he received a coveted Whiting Prize for promising writers near the beginning of their careers. In 1995 his essay collection *The Culture of Bruising: Essays on Prizefighting, Literature, and Modern American Culture* won a National Book Critics Circle Award. Other of his books include *Tuxedo Junction: Essays on American Culture, Daughters: On Family and Fatherhood*, and *One Nation Under a Groove: Motown and American Culture*. He is the editor of many volumes, including *The Sammy Davis, Jr., Reader*, *The Muhammad Ali Reader*, and *Body Language: Writers on Sport*. His edited volume *Lure and Loathing: Essays on Race, Identity, and the Ambivalence of Assimilation* was named an Outstanding Book by the Gustavus Myers Center for the Study of Bigotry and Human Rights in 1993. He has been a commentator for National Public Radio, and



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## Gerald Early

### Integration in America Before the Brown Decision

Between 1945, which marked the end of World War II, and 1954, the year of the Brown decision, which outlawed racial segregation in the nation's public schools, the United States experienced integration in several symbolic and potentially powerful ways that challenged institutionally the ideology of white supremacy. The fact that World War II was fought, in part, against the racist ideology of Nazism; that increasingly race was being challenged in academic circles as a legitimate scientific concept; that sociological studies such as the pathbreaking *American Dilemma*, compiled by Gunnar Myrdal, described America as a society suffering from a disjunction between its democratic creed and its practice of segregation and racial oppression; that African Americans had become more deeply restive about their situation and more militant about social change – all partly explain the shift that was beginning to accelerate during those postwar years. Furthermore, the rise of communism as a world power, through both the expansion of the Soviet Union and the establishment of the People's Republic of China in 1949, had put more pressure on the United States to change its racial practices in order to influence non-white third-world countries in Africa and Asia.

However, there was still much uncertainty and nervousness about drastic racial change in the United States at the time. It must be remembered that while World War II was, in a way, a war against racism, the United States was intensely racist in its pursuit of victory against the Japanese, spewing forth virulently racist propaganda against them and placing Japanese Americans in internment camps during the war. With the advent of the cold war in the late 1940s, conservatives tended to see agi-

*But probably nothing was held in lower regard or seen as more dangerous by many adults of the period than comic books.*

tation by African Americans as being instigated by communists. The repressive political atmosphere in the United States during the early 1950s tended to make any expression of liberal perspectives suspect, even condemned, as if bourgeois liberal reform were interchangeable with socialism or communism. An extraordinary example of this – especially relevant in this instance, as it relates to the loyalty of African Americans and their willingness to fight for the United States against a foreign power – is Jackie Robinson's testimony before the House Un-American Activities Committee on July 18, 1949, spurred by Paul Robeson's comment a month earlier that he thought African Americans should fight against lynching in the United States and not against the Soviet Union.\*

Nonetheless, important acts of integration, of crossing over, occurred during that time, particularly in the cultural realm – including the integration of major-league baseball when Jackie Robinson joined the Brooklyn Dodgers as a rookie in 1947; the awarding of the National Book Award in 1953 to Ralph Ellison for his novel *Invisible Man*, published in 1952; and the awarding of the 1950 Pulitzer Prize for poetry to Gwendolyn Brooks for her collection *Annie Allen*, published in 1949. Indeed, in some respects racial integration had become, as these instances indicate, something of a mainstream act in American culture by the early 1950s. Yet integration had not gained casual acceptance; it was still seen in many circles as something unusual, radical, associated with the Left. After all, a good portion of the American public did not trust popular culture, within which several noted examples of integration were

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\* For more on this, see Roger Kahn, *The Era 1947–1957: When the Yankees, the Giants, and the Dodgers Ruled the World* (New York: Ticknor & Fields, 1993), 198–207; Martin Duberman, *Paul Robeson: A Biography* (New York: Knopf, 1989), 360–362; and Arnold Rampersad, *Jackie Robinson: A Biography* (New York: Knopf, 1997), 210–216. Robinson also discusses his testimony in his autobiography, *I Never Had It Made* (Hopewell, N.J.: Ecco Press, 1995).

occurring at the time. People in the film industry, for example, were under attack for their alleged affiliation with communists (and had adopted a policy of self-regulation back in the 1930s after first being attacked). Many people had mixed feelings about American popular music – especially jazz and the new rhythm-and-blues music of the late 1940s – and the people who played it. But probably nothing was held in lower regard or seen as more dangerous by many adults of the period than comic books.

So integration did not resolve racial tension in the American society of the early 1950s. Rather, in the various ways it was depicted, integration reflected the complex depths of a profound contradiction Americans felt deeply – not only about race but also about the strength of their institutions and the influential reach of popular culture. Nowhere was this complex welter of tensions more richly expressed than in the cultural representations of the most important act of institutional integration to occur before the Brown decision – that is, the 1948 decision to integrate the American military. And nothing dramatized the integration of the military, or accelerated it, more than the Korean War – the most significant political event for the United States between the end of World War II and the Brown decision.

### Integration in the Mainstream

The cover of the January 1954 issue of EC Comics's *Frontline Combat* showed a black soldier (along with three white soldiers) in combat. This was highly unusual. Blacks were almost never seen on the covers of comic books in the 1940s and 1950s – the heyday of comics – unless they were depicted as jungle natives or as comic caricatures. Comic books were a highly racialized and intensely racist art form during this period of the early cold war. The exceptions to this were some special-edition sports comics that featured on their covers noncaricatural images of such popular black athletes as Jackie Robinson, Larry Doby, Roy Campanella, Willie Mays, and Joe Louis. Published in the late 1940s and early 1950s, these comics reflect the positive, if limited, impact that the integration of sports – particularly team sports – had on the United States and on how whites in this country saw African Americans.

How many young people read comics during that era? According to Bradford W. Wright, author of *Comic Book Nation: The Transforma-*



tion of *Youth Culture in America*, the comic book industry grew to unprecedented heights during the years of the Korean War (1950 – 1953). In 1950, 300 comic book titles were published, producing annual sales of \$41 million. In 1953, 650 titles were published, producing sales of over \$90 million. Circulation in 1953 averaged about 70 million a month. Ninety percent of boys and girls under eighteen read them, as did most American GIs. Twenty-five percent of high-school graduates admitted to reading them as well. Comic books were, without question, the most popular art form, and the most popular form of literature, for the young in America.

The fact that blacks were generally not to be found on the covers of war comics or inside them is hardly surprising, considering how American society generally saw African Americans at the time of World War II and the Korean War, and particularly how it saw African American soldiers. Most Americans at the time still found it hard to imagine blacks in combat. In World War II, which had ended only five years before the Korean War began, the vast majority of African American men in the service were employed in service units. They were thought by most whites who were in command in the armed services to be unfit for combat. Whites thought blacks lacked courage and leadership skills and were not intelligent enough to be in the infantry or anywhere near the front line.

The decidedly mixed reports on the performance of all-black units in combat during World War II – particularly the 92nd Division's unimpressive performance in Italy in June 1944 – only suggested to many whites in command that blacks were indeed unfit and that the practice of segregating troops by race and tracking them into certain occupations was a sound one that should be continued. As army brass were wont to say when pressed about the issue of integration during World War II, the armed forces were no place for social experimentation or social engineering.

I have interviewed Truman K. Gibson, who in 1943 followed a thoroughly frustrated and thwarted William Hastie as the civilian aide to the secretary of war, and who wrote the report on the performance of the 92nd Division. Gibson said that he told the armed services high command that what they had with a segregated army was social engineering and a politicized army – because, after all, racism is a political idea, and segregation is a political and social arrangement. What he was advocating, by urging integration, was the depoliticization

of American military life by acknowledging and exposing racism – not as a truth or a self-evident reflection of a natural law, which it professed itself to be, but as the political idea that it was. After all, Gibson argued, how could black units be expected to function well when they had such a high percentage of men who had performed poorly on the army's aptitude test, mostly because of their poor education and impoverished backgrounds? Black units had a higher percentage of such men than white units, and a far higher percentage than the armed forces recommended for a good regiment. The good black soldier was weighed down by being surrounded by too many men

*During the era of segregated armed forces, depicting black soldiers in pulp art would essentially have meant drawing a largely black comic book.*

who were unfit through no fault of their own. The unfitness in the segregated units was intensified by being concentrated; white unfitness was spread around. The very segregation that whites said was necessary and unavoidable was actually making it impossible for black men to perform well, no matter how much they wanted to; thus, segregation was nothing but a self-fulfilling prophecy that ensured a status of inferiority for blacks by creating it in the first place.

This in turn ensured that in the age of integration, which the United States was entering, nothing positive was to be found in racial segregation or in the ways that blacks had adjusted to it. In effect, for African Americans, all segregation translated into inferiority and powerlessness. Clearly, in regard to an institution like the military, there is hardly a place or a reason for the idea that segregation may have had some positive aspects, but there may be important reasons to consider that idea in regard to the development of a vibrant African American cultural identity and its expression. Of course, it must be understood that at the time, most black leaders who endorsed integration felt that any assertion that could be interpreted as the least bit supportive of segregation would undercut any possibility of changing the American political and social arrangement, as most whites were unable or

unwilling to examine African American life in their society in any sort of sophisticated or nuanced way.

Gibson, of course, couched this in terms that the military could understand: namely, that segregated armed forces were an inefficient use of manpower and demoralizing for blacks, who consequently became a hindrance rather than a help in any war effort. That argument, compelling as it was, was not terribly persuasive at the time. African Americans' compromised citizenship status, which was reflected in their use in the armed forces and which intensified their lack of morale, was something that the military thought, perhaps rightly so, that it should not challenge unless other major institutions in the United States were willing to do so as well. In the game of social change, no one ever really wants to be first.

During the era of segregated armed forces, depicting black soldiers in pulp art would essentially have meant drawing a largely black comic book. The officer in charge of the black unit could be white, but he would be the only white, and the characters could not be in combat. This would have violated two important selling points of war comics – or any comics, for that matter: first, by depicting a large number of blacks as anything other than a jungle tribe, and second, by showing soldiers in wartime doing something other than engaging in combat, when precisely what attracted adolescent readers to depictions of war were images of carnage and heroism. Black service units would not have interested readers of war comics, even if the men who drew comics had been interested in dramatizing such aspects of military life.

How the public saw service units and the politics of convincing the public of the value of an integrated military probably explain the United States military's support of the production of the film *Red Ball Express*, shot in November and December 1951 and released in May 1952, during the height of the Korean War. Although the film is about World War II, its true subject, its real cultural moment, is Korea – in much the same way that while Robert Altman's 1970 film *M\*A\*S\*H* is about the Korean War, its true subject, its actual cultural moment, is Vietnam. *Red Ball Express*, which stars Jeff Chandler and features prominently a young Sidney Poitier, is about the trucking detail – the 371st Quartermaster Truck Company – that supplied the 1944 Allied European invasion. It was over 70 percent African American, and some of its men later volunteered for, and were accepted into, combat

units in the European theater that were suffering from shortages. These men acquitted themselves well when placed in combat. But the film wishes to tell us that these black men also were heroes in service, and that integration does indeed work: the white and black men of the trucking outfit learn to get along with one another, after a couple of tense racist moments early on.

The Department of Defense, which at the time was very interested in the movie business, helped in the making of the film. Indeed, location scenes were shot at Fort Eustis, Virginia, the headquarters of the Army Transportation Corps. It had apparently become, by 1951, important army propaganda to show a successfully integrated army and to puff the role of blacks in it. This was a significant change from 1948, when President Truman issued Executive Order 9981, which in effect integrated the armed forces. In 1948 the army was strenuously opposed to this order.

*Red Ball Express* celebrated the idea of an integrated army, as did the *Saturday Evening Post* in an article entitled “How Do Our Negro Troops Measure Up?” (June 16, 1951). The piece essentially told the story of the demise of the last all-black army unit, the 24th Infantry Regiment, which entered Korea in July 1950 – just one month after the war started, when things were going poorly for unprepared and outnumbered American troops. The performance of the 24th was so poor, according to the article, that the members of the unit made up a derisive song about themselves, called “Bugout Boogie.” “Bugging out” – abandoning one’s position in battle, running away, tossing aside one’s weapon, refusing to fight – was common among both black and white soldiers during the early days of the Korean War, when the North Koreans made incredible advances in their invasion of the South, and American troops were ill equipped to stop them. Blacks were singled out more for this behavior than whites and were more severely punished for it.

The most famous case was that of Lieutenant Leon Gilbert, who was sentenced to death for refusing to take his men on what he thought amounted to a suicide mission on July 31, 1950. Because of an outcry by the black press and the national black community, Gilbert’s sentence was eventually reduced to twenty years in prison. Indeed, so vigorously were blacks court-martialed in the early days of the Korean War, before the all-black 24th Infantry Regiment was integrated, that the National Association for the Advancement of Colored People sent Thurgood Marshall to Japan in

## Most comic books about the Korean War that were published during that war took a decidedly grim, world-weary view of it . . .

January 1951 to investigate. Eventually, Douglas MacArthur, Supreme Allied Commander of the United Nations forces in Korea, was forced “to concede that these courts-martial may have been excessive” (*Pittsburgh Courier*, June 9, 1951, pp. 1, 4). At a conference recently held at Morgan State University about black soldiers’ participation in the Korean War, all the surviving men of the 24th said emphatically that they did not “bug out,” that racist whites said this about them to smear the reputation of black men. Some were nearly in tears discussing this, and the audience was deeply moved.

Truman Gibson made the same allegation about black performance in combat when he reported on the 92nd Division during World War II, and he was attacked in the black press for it. He responded by saying, in effect, that if racism and segregation are horrible, how can their products and results be construed as good? The 1951 *Post* article strongly endorsed the integration of combat units, citing considerable evidence (a significant portion of which was anecdotal) that blacks perform better in integrated units. With both *Red Ball Express* and the *Post* article, racial integration in the military had become acceptable mainstream opinion in America. Yet racial integration remained an uneasy topic.

### Integration as Subversive Art

The black man on the cover of the January 1954 issue of *Frontline Combat* is, indeed, an American GI in combat – one of a group of four soldiers – and provides a complex point of departure as rich as a film like *Red Ball Express*. This character is in an integrated unit; the other soldiers on the cover are white. He is not a comic caricature; he is drawn as realistically as the other men. And he is the subject of that issue’s lead story, entitled “Perimeter!” This startling moment in American comics signals a change in how war stories can be depicted in pulp art.

The story is set in Korea, appropriately enough, as the war there had just ended five months

earlier, in July 1953, and as that war was our first with officially integrated armed forces and integrated combat units. The story opens with a harsh perspective on the war itself. Most comic books about the Korean War that were published during that war took a decidedly grim, world-weary view of it, as William W. Savage, Jr., points out in his book *Comnies, Cowboys, and Jungle Queens*. This was a departure from the comic books of World War II, which were considerably more jingoistic and tended to see war in strictly heroic terms. A good deal of this might be ascribed to the fact that the Korean War was more difficult to understand politically, even though its ideological distinctions were fairly clear in the popular mind. It was essentially a civil war being played out on a world stage and as a sort of proxy for the jousting taking place among the United States, the Soviet Union, and the newly arrived Communist China. It was also militarily indecisive; indeed, some saw the stalemate as a defeat for the United States.

Considering the censorship movement – or, put another way, the content-regulation movement – that was threatening the comic industry in the early 1950s, as well as the tense restriction of political opinion in America during the McCarthy era, it is clear that comics took a view of the war that generally mirrored the view of the general public: We hate communists, but this war seems strange and pointless. Few comics were willing to probe the public’s limits on cultural and political matters, other than on how much sex and violence would be tolerated.

“Perimeter!” tells us at the start that the cast of war is diverse, representing many nations and many races. And so we get the story of Matthews, a black man who constantly reads the Bible. When one of the white soldiers refers to the Koreans as “gooks,” Matthews corrects him, noting that the ROK (Republic of Korea) soldiers would be insulted if they overheard that slur, and insists that they be called Koreans. One of the white soldiers, Miller, is prejudiced and thinks he has an ally in Tex, the Southerner. The story is fairly blunt in its portrayal of racial dislike, a subject that was virtually never broached in this way in comic books of the period or even in later ones.

The Americans are attacked several times by the Chinese – routed by them, in fact – and Tex is separated from the other men in his platoon. At night, after one battle, Tex hears a wounded soldier crying for help. He helps the soldier, carrying him back to his foxhole and protecting him the entire night. The wounded



soldier turns out to be Matthews, the black man. When the racist Miller chastises Tex for saving Matthews, Tex gives him Matthews's Bible to read. It is unclear in the story whether, during the night, Tex actually knew he had saved Matthews. The fact that the white Southerner risks himself to save the black is the ironic point of the story.

William Gaines was the publisher of EC Comics, a company he inherited from his father. He started a new trend in comics by developing unusual horror titles like *Haunt of Fear*, *Crypt of Terror*, and *Vault of Horror*, as well as two war publications that were considered pathbreaking: *Frontline Combat* and *Two-Fisted Tales*. His publications were always somewhat above the usual comic book fare, and they spawned imitators – particularly the horror comics. He effectively combined pulp

## *The Steel Helmet, shot in ten days in October 1950 on a budget of \$104,000 and released in February 1951, was the first American movie about the Korean War.*

with liberal politics, and he offered a more challenging moral vision than usually directed toward adolescents. When excessive gore, violence, and sexual innuendo began to plague comic books, including some of Gaines's own titles, a movement was mounted in the early 1950s to censor comics, as they were thought by some to be a cause of juvenile delinquency. Gaines, because he so vigorously resisted the censorship movement, became the most visible target of it. Fredric Wertham, a noted psychiatrist who testified about the baleful effects of segregation on black schoolchildren in a 1951 case in Delaware, published the anti-comic book treatise *The Seduction of the Innocent* in 1954. This intensified the debate, eventually leading Gaines to testify before a Senate subcommittee on crime. By November 1954, not too long after the issue of *Frontline Combat* that contained "Perimeter!" was published, the comic industry, under mounting pressure, established a comic code that ended virtually all of Gaines's publications – with the exception of *Mad*, which he changed from a comic book to a magazine, with great success. Among

other things, the 1954 code banned the words *terror*, *weird*, and *horror* from comics. "Those were my three big words," Gaines said (quoted in Amy Kiste Nyberg, *Seal of Approval: The History of the Comics Code*, University Press of Mississippi, 1998, p. 109).

### Hardboiled Integration, or Integration as Noir Art

Filmmaker Sam Fuller was another artist of the period who had to explain his art to authorities. In his autobiography, *A Third Face*, Fuller says that after the release of the film *The Steel Helmet*, which he wrote, produced, and directed, "The Pentagon asked me to come to Washington to be questioned about the movie" (p. 262). *The Steel Helmet*, shot in ten days in October 1950 on a budget of \$104,000 and released in February 1951, was the first American movie about the Korean War. Fuller admits that the topicality of that conflict made it attractive for him as a film subject. Before the credits roll, an on-screen tribute appears: "This story is dedicated to the United States Infantry."

Fuller had fought in the infantry in World War II – had, in fact, been a member of the Allied invasion force on D-Day. He was certainly not unpatriotic, and in many respects he seemed to love the military, particularly the infantry. Many former servicemen were attracted to the film, but the military brass felt uneasy about it. Whether the general public felt that way did not affect the film's success at the box office. As Fuller writes in *A Third Face*, "Maybe *The Steel Helmet* cast a stone at the façade of intolerance and simple-mindedness. Maybe it didn't. In any case, the picture was an unexpected box-office smash. Unbelievably, my share of the profits was a couple of million bucks after taxes" (p. 264).

In 1949, when the War Department was reorganized as the Department of Defense under James Forrestal, the Motion Picture Production Office was established. It was meant to regulate the armed forces' "zealous pursuit of film roles," as military historian Lawrence H. Suid notes in *Guts and Glory: The Making of the American Military Image in Film* (pp. 136 – 137). But the Office never succeeded in regulating and controlling how the armed services interacted with Hollywood. As early as the Korean War in 1950, each service decided for itself the extent of the help it was willing to provide a filmmaker, in accordance with its best interests.

The preoccupation with Hollywood on the part of the Defense Department and the various branches of the military indicated that

they saw film as an important propaganda tool and were very concerned about how the armed services were depicted. The Defense Department did not officially approve *The Steel Helmet*, but it did provide some stock military footage. Despite the Pentagon's distrust and dislike of the film, according to a February 1951 *Variety* news item, *The Steel Helmet* was shown, uncensored, to the entire circuit of army and air force camps in the United States.

"What kind of outfit is this?" asks a soldier when the remnants of the company whose story we have followed emerge from a Buddhist temple at the end of *The Steel Helmet*. The camera pans the faces of the four survivors of the enemy attack on the temple: Zack, the unbalanced hero of the film; Thompson, the black medic; Tanaka, the Japanese American sergeant; and Driscoll, the bald-headed young white private. What kind of outfit is this, indeed. And what kind of story was Sam Fuller trying to tell about race and war?

*The Steel Helmet* does something that had become a cliché in war movies: it shows war through the personalities in a small company of men who are on an odyssey. But Fuller changes things by introducing fresh social and political elements: one of the central characters of this company is African American, another is Japanese American, and race is a dramatic issue in the film.

Fuller was driven to make a different sort of war movie. In an interview published in Lee Server's study *Sam Fuller: Film Is a Battleground*, Fuller expands on his views about war and film: "In the movies it is almost impossible to show a real war, to photograph battle. There is smoke everywhere. And the average moviegoer does not want to see real war. Not real war! Men afraid, men vomiting, men shitting in their pants, men shooting men on their own team. And before battle, there's no movie there. Before an invasion the soldier is sleeping. He's trying to sleep as much as he can because afterward he doesn't know when he'll get another chance" (p. 20). In *A Third Face*, Fuller writes, "I wanted an opportunity to show audiences that war was more complex than front-page newspaper articles. You never saw the genuine hardship of soldiers, not ours nor the enemy's, in movies. The confusion and brutality of war, not phony heroism, needed to be depicted. The people who chanted 'We are right, and they are wrong' needed to be debunked. . . . One of the major studios heard about the picture and offered to produce it, with John Wayne playing Zack. That would



have taken all the reality out of the film. This wasn't a gung-ho war movie. I was determined to make it look real, my soldiers human and deeply flawed. War brings out the best and worst in you. With Wayne, I'd end up with a simplistic morality tale" (p. 256).

At the beginning of *The Steel Helmet*, Zack, whose company was bound and killed by North Koreans, is freed from his bonds by an orphan South Korean boy who happens upon him. After an exchange in which Zack calls the boy a gook and is emphatically corrected by the boy, who says he is a Korean, Zack dubs the orphan "Short Round" and tells him to outfit himself with the boots and steel helmet of a dead soldier. The two travel together, eventually meeting Corporal Thompson, a medic (played by African American actor James Edwards, who had opened new doors for black actors when he played the main character in Stanley Kramer's pathbreaking war drama *Home of the Brave*, set during World War II).

Thompson, too, is something of an archetype. He served in the last war as a driver for the Red Ball Express, as well as on the front lines. He is, in fact, in miniature, the history of the black soldier in American wars since 1941. He volunteered to fight; in this way, black loyalty is not questioned. He went to school on the GI Bill and learned surgery (this seems to suggest subtly that the GI Bill might do a great deal to advance black men socially and economically). The viewer is meant to see Thompson as a grizzled veteran as well. He is clearly cast in a different light from the black soldiers of *Red Ball Express*. The viewer is meant to respect him as a soldier, and the film does not depend on the assumption that he must prove himself.

Thus, we have a war film built on the construction of this multiracial trio: the black, the Asian, and the white. Moving through the fog, they run into a company that seems to be wandering in circles. Zack is first greeted by Tanaka, the Japanese American sergeant. The company is under the command of Lieutenant Driscoll, who apparently does not listen to his far-more-experienced sergeant because he is Japanese ("His eyes are slanted the wrong way," as Zack says). It is Sergeant Tanaka who stops the lieutenant from calling the Korean boy a gook. Also, it is Zack and Tanaka who kill the North Korean snipers who attack the group. Subsequently, the trio finally joins the patrol company on its mission of finding and holding a Buddhist temple as an observation post. This is when the story of *The Steel Helmet* really begins.

## *This film has two major themes: first, the violation of the sacred, and second, learning how to see clearly.*

Hidden in the temple is a North Korean major, who kills one of the soldiers (here, the film takes on the quality of a science-fiction story about an alien hidden among a space crew). The North Korean is eventually captured. Short Round, the Korean boy attached to Zack, is killed by a North Korean sniper. In a fit of rage, Zack kills the North Korean prisoner for mocking the dead boy.

It was the latter act that got the film in trouble with the Pentagon, which did not appreciate depictions of American soldiers violating the Geneva Conventions. Fuller wrote about the reaction to this scene in *A Third Face*: "What really made the reactionaries go nuts was my scene in which Zack gets so mad that he kills the POW with a machine gun in cold blood. The Pentagon asked me to come to Washington to be questioned about the movie. . . . It turned out to be an inquisition" (p. 262). Later, Fuller said, "We all knew the Geneva Convention rules. But war's irrational. Order breaks down. A guy who's been trying to kill you sticks his hands in the air and says that he's your prisoner. Sometimes it doesn't fly, because he just shot your buddy. You kill him. It's shameful. It's against the convention. But it happens, damn it. I was only reporting it with a camera" (p. 264).

This film has two major themes: first, the violation of the sacred, and second, learning how to see clearly. Korea is presented to the viewer as a land of the sacred: Short Round, the Korean boy, wears a prayer on his back; he winds up becoming Zack's companion because, according to the rule of Buddha, he who saves someone's life "holds his heart in his hands" (and it is the boy who humanizes Zack). Zack and Short Round are attacked by two North Korean soldiers dressed as women praying at a Buddhist shrine. Most of the film takes place in a Buddhist temple. Short Round tries to attach a prayer to Zack's back (Zack removes it). The lieutenant tells his company not to harm anything in the temple – to leave it exactly as they found it. Ultimately, the temple is destroyed when the Americans must hold off a North Korean attack. Short Round continues to write prayers while in the temple. Indeed, ridiculing one of Short Round's prayers – a

wish to Buddha to make Zack like him – is what gets the North Korean prisoner of war killed. Just before he dies, his last words are a request for prayer – even though he had described himself, when captured, as a "North Korean communist." To be sure, Fuller's message is that war is a gross violation of the natural order of the sacred and the profane in life. Perhaps the worst crime that war commits is that it respects nothing, honors nothing, affirms nothing about life as we normally know it and live it. It is irrational. War is the great leveler of civilized life but, ironically, it is also a product of civilized life – and the technical sophistication with which modern war is conducted depends on civilization.

*The Steel Helmet* is also about seeing and perception: When Zack raises his head at the beginning of the film, we see his eyes, and we see the eyes of the Korean boy in a close-up when he saves Zack. According to Zack, Lieutenant Driscoll ignores Sergeant Tanaka because his eyes are slanted the wrong way. And the North Korean prisoner of war, when he talks to Sergeant Tanaka, says that the whites hate them because of their eyes. Two North Korean soldiers are disguised as women praying. Zack fears that a group of Korean peasants are North Koreans in disguise (a common tactic of North Korean soldiers). Fog, at one point in the film, obscures perception – an obvious reference to the metaphorical expression "the fog of war."

But the two most dramatic moments concerning perception in the film are about race and politics, and they occur when the North Korean prisoner of war talks to the black medic and the Japanese sergeant. The North Korean thinks that neither man sees himself as he truly is or for what he truly is. He strikes a nerve in Sergeant Tanaka by asking if his family had been interned in the prison camps during World War II; the sergeant replies yes. The North Korean presses, "Were you one of those idiots who fought in Europe for 'your' country?"

To this, Tanaka proudly responds that he did, with the 442nd Combat Team, and that over three thousand of them won Purple Hearts. He asserts that he is an American, and ultimately loses patience with the North Korean, warning, "Knock it off before I forget the Articles of War and slap those rabbit teeth of yours out, one at a time." It seems peculiar that the Japanese sergeant would use the term "rabbit teeth" with the Korean, given that he himself was subjected to the same sort of racial slur during World War II. It is difficult to know if

Fuller is being ironic about how assimilated the Japanese American is. The use of the term “gook” is clearly disapproved of by characters in the movie; is the slur against the Korean all right because Tanaka, a Japanese American, says it, or because Tanaka was provoked by being reminded that he himself is Asian, or because the North Korean is a communist?

Then there is the prisoner of war’s conversation with Thompson, the black medic. “I just don’t understand you,” the North Korean says to Thompson as his wounds are being dressed. “You can’t eat with them unless there’s a war. Even then, it’s difficult. Isn’t it so?”

“That’s right,” Thompson replies.

“You pay for a ticket. But you even have to sit in the back of a public bus. Isn’t it so?” the North Korean continues.

“That’s right. A hundred years ago I couldn’t even ride a bus,” Thompson says. “At least now I can sit in the back. Maybe in fifty years, sit in the middle. Someday, even up front. There are some things you just can’t rush.”

“You’re a stupid man,” the North Korean says. He spits in disgust. The medic responds by ripping some of the bandages from the prisoner’s chest.

Never had a war film raised such issues as the loyalty of black soldiers or what they had to fight for. This aspect of *The Steel Helmet* proba-

bly jarred many white viewers and perhaps made them think about racism in the United States. These same viewers were doubtless reassured by the gradualism that the black soldier seems to endorse in such a hardboiled way.

Certainly, in his interactions with both the black medic and the Asian sergeant, the North Korean gets the better of the argument – the logic of which suggests something about colored solidarity that was to become a political fact in the world with the 1955 Afro-Asian Unity Conference in Bandung, Indonesia, and something about how communists were going to use Americans’ racism against us to undermine our nation’s position in the world and to sow seeds of doubt and despair in the minds of minorities. To the North Korean, both Thompson and Tanaka misperceive themselves as Americans when in fact they are not. That is precisely the point Fuller wants to make in this rather crazed war film: the true American heroes are a collection of maladjusted misfits. The condition of being American, in Fuller’s multiracial vision of humanity, is the drama of people who are not seen as Americans by other Americans but who still identify themselves as such.

The film is a far darker story of the multiracial struggle for humanity than *Red Ball Express*, and also a more profound one. Unlike most films of its era that deal with integration, *The*

*Steel Helmet* does not sentimentalize the subject. The film’s message is not that the minority soldiers have to prove themselves but that all the men must bond, in the end, in a way that transcends their race. There is something almost unfeeling and repressive, not celebratory or liberating, about integration in this film – rather like the feeling one generally gets about American life in the standard film noir of the cold war period. Fuller seems to be skeptical not about integration itself but about claims that it would dramatically change the elements of American life that spiritually make Americans American. In this regard, *The Steel Helmet* is probably the most impressive, most mature film about race and war ever made. ■

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Quotes by Sam Fuller are from *A Third Face: My Tale of Writing, Fighting, and Filmmaking* by Sam Fuller, with Christa Lang Fuller and Jerome Henry Rudes (Knopf, 2002), and from *Sam Fuller: Film Is a Battleground: A Critical Study, with Interviews, a Filmography, and a Bibliography* by Lee Server (McFarland, 1994).

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Gerald Early (Washington University in St. Louis), James Carroll (author and Chair of the Visiting Scholars Program), and Alan Lightman (MIT)



Gerald Early, Mayor Michael A. Sullivan (Cambridge, Massachusetts), Vice President Louis W. Cabot (Cabot-Wellington, LLC), and Executive Officer Leslie C. Berlowitz (American Academy)

# Noteworthy

## Select Prizes and Awards

### Nobel Prizes, 2003

#### Economics

**Robert F. Engle** (NYU) and **Clive W. J. Granger** (Canterbury University).

#### Literature

**John Maxwell Coetzee** (University of Adelaide).

#### Chemistry

**Peter C. Agre** (Johns Hopkins University School of Medicine) with **Roderick MacKinnon** (Rockefeller University).

#### Physics

**Alexei Alexeyevich Abrikosov** (Argonne National Laboratory), **Vitaly Lazarevich Ginzburg** (P. N. Lebedev Physical Institute), and **Anthony J. Leggett** (University of Illinois at Urbana-Champaign).

### National Medals of Science, 2002

#### Engineering

**Leo L. Beranek**, former Academy President (BBN Technologies).

#### Chemistry

**John I. Brauman** (Stanford University).

#### Biological Sciences

**James E. Darnell, Jr.** (Rockefeller University).

#### Physical Sciences

**Richard L. Garwin** (Council on Foreign Relations; IBM Thomas J. Watson Research Center).

#### Mathematics

**James G. Glimm** (State University of New York, Stony Brook).

#### Biological Sciences

**Evelyn M. Witkin** (Rutgers University).

#### Physical Sciences

**Edward Witten** (Institute for Advanced Study).

### National Medals of Technology, 2002

**Nick Holonyak, Jr.** (University of Illinois at Urbana-Champaign), with **M. George Craford** (LumiLeds Lighting) and **Russell Dean Dupuis** (Georgia Institute of Technology).

**Carver A. Mead** (Caltech).

**David Gross** (UC Santa Barbara), **Frank Wilczek** (MIT), and **H. David Politzer** (Caltech) received the High Energy and Particle Physics Prize of the European Physical Society.

**Raymond S. Stata** (Analog Devices, Inc.) was named the 2003 recipient of the Institute of Electrical and Electronics Engineers Founders Medal.

**Robert Metcalfe** (Polaris Venture Partners) and **Robert Gallagher** (MIT) were selected to share the Marconi International Fellowship.

**William O. Baker** (Bell Laboratories, Lucent Technologies) received the Marconi International Fellowship Foundation's Lifetime Achievement Award.

**George Whitesides** (Harvard University) and **Eugene Newman Parker** (University of Chicago) were named laureates of the 19th annual Kyoto Prizes sponsored by the Inamori Foundation.

**Robert Nerem** (Georgia Institute of Technology) received the Pierre Galletti Award from the American Institute for Medical and Biological Engineering Board of Directors.

**Mary Ann Glendon** (Harvard University) was among the recipients of the 2003 Bradley Prize, presented by the Lynde and Harry Bradley Foundation.

**Owen Witte** (UCLA) has been honored with the deVilliers International Achievement Award of the Leukemia and Lymphoma Society.

**Stanley Hoffmann** (Harvard University) was awarded the 2003 Lifetime Contribution Award in EU Studies by the European Union Studies Association.

## New Appointments

Economist **Nicholas Stern** is the new second permanent secretary and managing director of Budget and Public Finance of HM Treasury in the United Kingdom.

The National Science Foundation has named astrophysicist **Michael S. Turner** (University of Chicago) as assistant director for mathematical and physical sciences.

**David A. Kessler** has been selected as dean of the school of medicine and vice chancellor for medical affairs at UC San Francisco.

Amersham plc has appointed cell biologist **James E. Rothman** (Columbia University) to its newly created position of chief scientific adviser.

President of the University of Michigan and biological chemist **Mary Sue Coleman** has been elected to the board of directors of Johnson & Johnson.

**Roger M. Perlmutter** has been appointed chairman of the board of directors of The Institute for Systems Biology. He also serves as executive vice president for research and development at Amgen, Inc.

## Select Publications

### August 2003

Historian **James Carroll**'s new novel, *Secret Father*, is a story of espionage, self-discovery, and love set in Berlin at the height of cold war tensions. Houghton Mifflin

*Interesting Times: A Twentieth-Century Life*, a memoir by **Eric Hobsbawm** (University of London), details Hobsbawm's personal and intellectual life, including his writings on nineteenth- and twentieth-century history and his views of contemporary society. Pantheon Press

**Peter L. Galison**'s (Harvard University) *Einstein's Clocks, Poincaré's Maps: Empires of Time* illuminates our understanding of time at the beginning of the twentieth century through two related dimensions. W. W. Norton and Company

### September 2003

*End of the Earth: Voyages to the White Continent* is an account of **Peter Matthiessen**'s (Sagaponack, New York) travels to Antarctica. National Geographic Press

*Pieces of My Minds: Essays and Criticism, 1958 - 2002* by **Frank Kermode** (University of Cambridge) includes chapters from his books, lectures, and previously unpublished essays. Farrar, Straus & Giroux

*In Original Fire: Selected and New Poems*, **Louise Erdrich** (Minneapolis, Minnesota) has brought together several poems from her previous books, *Jacklight* and *Baptism of Desire*, with new verse on such themes as motherhood, family, death, and mourning. HarperCollins

**Robert H. Bork**'s (American Enterprise Institute) latest work, *Coercing Virtue: The Worldwide Rule of Judges*, compares judicial activism in the U.S., Canadian, and Israeli supreme courts. American Enterprise Institute Press

*The Great Unraveling: Losing Our Way in the New Century* by **Paul Krugman** (Princeton University; *The New York Times*) combines many of his most significant op-ed pieces from *The New York Times* with new commentary chronicling how the boom economy unraveled. W. W. Norton and Company

**Robert D. Putnam** (Harvard University) and **Lewis M. Feldstein** (New Hampshire Charitable Foundation) have co-authored *Better Together: Restoring the American Community*, a series of case studies demonstrating what groups of people of varying sizes have accomplished by cultivating mutual assistance networks. Simon & Schuster

*In Why Societies Need Dissent*, **Cass R. Sunstein** (University of Chicago) draws on his knowledge of economics, law, and psychology to argue that dissent is critical to the success of a democratic society. Harvard University Press

**Henry Petroski**'s (Duke University) book, *Small Things Considered: Why There Is No Perfect Design*, explores the history and design of everyday technologies, such as telephone keypads, toothbrushes, and cup holders, that are practically invisible in their ubiquity. Knopf

Newspaper columnist **Molly Ivins** (Austin, Texas) and co-author **Lou Dubose** (Austin, Texas) turn their sharp humor on the Bush administration's domestic and foreign policy in *Bushwhacked: Life in George W. Bush's America*. Random House

Following *Le Divorce* and *Le Mariage*, **Diane Johnson** (San Francisco, California) again pursues the cultural disconnections of Americans in France in her newest novel, *L'Affaire*. E. P. Dutton



**Robert Creeley's** (Brown University) latest collection of poems, *If I Were Writing This*, speaks to the precariousness of life as Creeley faces his own mortality and the increasing vulnerability of the world around him. New Directions Books

In her memoir, *Madam Secretary*, **Madeleine Albright** (Washington, D.C.), the highest-ranking woman in American government service, recalls her background as a child refugee from Czechoslovakia, her struggles as a working mother to break into the foreign policy establishment, and her service as U.N. ambassador and Secretary of State. Miramax

*The Fifth Book of Peace* by **Maxine Hong Kingston** (UC Berkeley) recounts her struggle to transform her personal suffering – the loss of her home and all her possessions in the 1991 Oakland fire – into a new understanding of the suffering of everyone who survives violent upheaval and tragedy, especially as a result of war. Knopf.

## October 2003

*Elizabeth Costello*, **John Maxwell Coetzee's** (University of Adelaide) latest work, is a novel about a distinguished and aging Australian novelist whose life as mother, sister, lover, and writer is revealed through a series of eight formal addresses. Viking Press

In *Fortune Favors the Bold: What We Must Do to Build a New and Lasting Global Prosperity*, **Lester Thurow** (MIT) considers the impact of globalization and offers solutions to problems ranging from the U.S. trade deficit to violations of intellectual property rights. Harper Business

*Eyeshot*, **Heather McHugh's** (University of Washington) new collection of poetry, criticism, and translation, focuses on how life and death balance on the smallest details, revealing the movement between anxiety and the human compulsion for order. Wesleyan University Press

*The Roaring Nineties: A New History of the World's Most Prosperous Decade* by **Joseph E. Stiglitz** (Columbia University) summarizes the last decade's market trends and argues that the principal players in one of the greatest economic expansions in history laid the groundwork for its own collapse. W. W. Norton and Company

**Shirley Hazzard's** (New York, New York) novel *The Great Fire* is the story of men and women struggling to reclaim their lives in the aftermath of World War II. Farrar, Straus, & Giroux

In *The Creative Habit: Learn It and Use It for Life*, choreographer **Twyla Tharp** (Twyla Tharp Dance Company) draws on the lessons learned in a thirty-five year career to illustrate that creativity is not a gift but rather the product of preparation and effort, applicable in any field or profession. Simon & Schuster

While organizing archives taken from the Nazis at the end of World War II, **Gerhard L. Weinberg** (University of North Carolina, Chapel Hill) discovered the manuscript of a second book written by Hitler. Accompanied by Weinberg's introduction and annotation, *Hitler's Second Book: The Unpublished Sequel to Mein Kampf* centers on Hitler's foreign policy and his anticipation of an inevitable clash with the United States. Enigma Books

**Toni Morrison's** (Princeton University) new novel, *Love*, is the story of a group of women obsessed by a wealthy owner of a resort hotel who shapes their lives as father, husband, lover, guardian, and friend. Knopf

In *Lightning Man: The Accursed Life of Samuel F. B. Morse*, **Kenneth Silverman** (NYU) reveals the complex man who was a gifted painter, pioneering photographer, republican idealist, and the inventor of the American electromagnetic telegraph, which earned him the name "Lightning Man." Knopf

*The Early Stories, 1953 – 1975* contains 102 short stories written by **John Updike** (Boston, Massachusetts) during this period, including "A&P," "Pigeon Feathers," and the long out-of-print Olinger stories. Knopf

In *Departure*, the first book of poetry by **Rosanna Warren** (Boston University) in a decade, Warren explores the concepts of intimacy and separation across the landscapes of Europe and New England. W. W. Norton

**Robert Coles** (Harvard University) turns his attention to popular music's Bruce Springsteen and the impact of his work on the lives of his audience and on this country's literary tradition in *Bruce Springsteen's America: The People Listening, a Poet Singing*. Random House

## November 2003

In his book, *In an Uncertain World: Tough Choices from Wall Street to Washington*, **Robert E. Rubin** (Citigroup), with Jacob Weisberg (*Slate*), offers an analysis of some of the most important events in recent American history and presents a clear, consistent approach to thinking about markets and dealing with the new risks of the global economy. Random House

In *Hegemony or Survival: America's Quest for Global Dominance*, **Noam Chomsky** (MIT) examines America's quest for global supremacy, tracking the U.S. government's pursuit of policies intended to achieve "full-spectrum dominance" at any cost. Henry Holt and Company

"We Are Lincoln Men": *Abraham Lincoln and His Friends* by **David Herbert Donald** (Lincoln, Massachusetts) presents a portrait of Abraham Lincoln's closest friends and advisers: Joshua Speed, William H. Herndon, Orville H. Browning, William H. Seward, John Nicolay, and John Hay. Simon & Schuster

Psychiatrist **Robert Jay Lifton's** (Cambridge Health Alliance) *Superpower Syndrome: America's Apocalyptic Confrontation with the World* explores what Lifton terms "a worldwide epidemic of violence" involving America and the religious fanaticism of Osama bin Laden and other Islamic extremists. Thunder's Mouth Press

In *Goya*, **Robert Hughes** (Shelter Island, New York) has interwoven his personal experiences with mortality into a richly-illustrated analysis of the artist whose life and work bridged the transition from the eighteenth-century reign of the old masters to the early days of the nineteenth-century moderns. Knopf

## Exhibitions

In summer and early fall 2003, national and international exhibitions featured the work of **Louise Bourgeois, Vija Celmins, John Chamberlain, Chuck Close, Eric Fischl, Jasper Johns, Ellsworth Kelly, R. B. Kitaj, Jack Levine, Agnes Martin, Elizabeth Murray, Bruce Nauman, Kenneth Noland, Claes Oldenburg, Jules Olitski, Philip Pearlstein, Robert Rauschenberg, Robert Ryman, Richard Serra, Cindy Sherman, Wayne Thiebaud, and Bill Viola**.

The National Gallery, London, is hosting a major exhibition of **Bill Viola's** work, continuing through January 4, 2004. Using actors shown in silence and extreme slow motion, *Bill Viola: The Passions* probes and reveals the nature of overwhelming emotions.

**Louise Bourgeois** and **Helen Frankenthaler** are among the female artists highlighted in the National Academy of Design Museum's *Challenging Tradition: Women of the Academy, 1826 – 2003*. The exhibit, which runs through January 4, 2004, examines the role of women in the history of the National Academy of Design in New York City and, by extension, in the American art world over the past two centuries.

Nearly 200 works by **James Rosenquist** including paintings, sculpture, drawings, prints, and source collages will be featured in *James Rosenquist: A Retrospective* at the Solomon R. Guggenheim Museum in New York through January 25, 2004. Items on display range from Rosenquist's pop canvases to his billboard-size collages and his recent use of abstract painting techniques.

*We invite all Fellows and Foreign Honorary Members to send notices about their recent and forthcoming publications, scientific findings, exhibitions and performances, and honors and prizes to [bulletin@amacad.org](mailto:bulletin@amacad.org). Please keep us informed of your work so that we may share it with the larger Academy community.* ■

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## Annual Fund Campaign

The Academy's Annual Fund launched its 2003 – 2004 campaign in October. The participation of all Fellows is critical to ensure a balanced budget in these uncertain economic times. Our goal this year is to surpass the \$1.1 million mark. "We are grateful to the Fellows and friends who have contributed in the past," says Vice President Louis Cabot. "The Academy relies on Annual Fund gifts to underwrite our projects, publications, and increasingly active programming across the country. We hope that all members will be generous in helping us to meet our goal this year."

For information about making a gift to the Academy, please contact the Development Office (email: [dev@amacad.org](mailto:dev@amacad.org); phone: 617-576-5057).

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