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A Celebration of the Arts and Sciences



A Philosophical Approach to Anger and Fear

Martha C. Nussbaum



On Sex and Death

Barbara J. Meyer



Morton L. Mandel Public Lecture How to Make Citizens

Eric Liu

ALSO: Songs of Love and Death—Jessie Ann Owens
Combatting Corruption: *Dædalus* Examines How to Halt Political
and Corporate Graft
Remembering Francis M. Bator, Steven Marcus, and Jerrold Meinwald

Upcoming Events

SEPTEMBER

6th

Emory University
Atlanta, GA

Morton L. Mandel Public Lecture

The Study of Writing by African American Women

Featuring: **Frances Smith Foster** (Emory University), **Beverly Guy Sheftall** (Spelman College), **Pellom McDaniels III** (Emory University), **Michelle M. Wright** (Emory University). Welcome by **Dwight A. McBride** (Emory University)

12th

American Academy
Cambridge, MA

Social Reception

hosted by the Boston-Cambridge Planning Committee

20th

University of Pennsylvania
Philadelphia, PA

Understanding Public Attitudes and Engagement with Science

Roundtable Discussion hosted by the Philadelphia Planning Committee

28th

Stanford University
Stanford, CA

A Discussion about Technology and the Self

Featuring **Peter Galison** (Harvard University)

OCTOBER

5th – 7th

Cambridge, MA

Induction Weekend

5th

MIT Samberg Conference Center
Cambridge, MA

A Celebration of the Arts and Humanities

Featuring: **Tania León** (Brooklyn College and The Graduate Center, City University of New York), **Viet Thanh Nguyen** (University of Southern California), **Richard J. Powell** (Duke University), **Jacqueline Stewart** (University of Chicago), **Damian Woetzel** (The Juilliard School)

6th

Sanders Theatre
Harvard University
Cambridge, MA

Induction Ceremony

7th

American Academy
Cambridge, MA

Annual David M. Rubenstein Lecture

15th

American Academy
Cambridge, MA

in collaboration with the Massachusetts Historical Society

“All Legislative Powers . . .” Article 1 of the U.S. Constitution, Then and Now

Featuring: **Jack Rakove** (Stanford University) and **Margaret Marshall** (Choate Hall & Stewart LLP; formerly, Massachusetts Supreme Judicial Court)

16th

American Academy
Cambridge, MA

The Challenge for Business and Society: From Risk to Reward

Featuring: **Stanley Litow** (Columbia University; Duke University; IBM; IBM Foundation)

30th

American Academy
Cambridge, MA

2018 Distinguished Morton L. Mandel Annual Public Lecture

The Implications of the 2020 Census

Featuring: **Kenneth Prewitt** (Columbia University)

From the President



Jonathan F. Fanton

The Academy's larger projects, like the Commission on the Future of Undergraduate Education and The Public Face of Science, are designed to help influence the intellectual life of the country – by providing new ideas, recommending new ways to address challenges, and calling attention to new knowledge. Often, these projects produce written documents – reports, occasional papers, or issues of *Dædalus* – that express the findings of their multidisciplinary committees. Increasingly, these projects also rely on the extraordinary convening capacity of the Academy – its ability to bring together experts from a range of fields and disciplines – to extend the influence of their work. Many of our projects continue long after their planned activities have concluded, by facilitating new collaborative efforts and establishing partnerships with the organizations and institutions most likely to benefit from our work.

Two projects, in particular, have been very successful in establishing these partnerships. The Academy's project on Civil Wars, Violence, and International Responses produced two volumes of *Dædalus* (Fall 2017 and Winter 2018) that explored the current state of civil wars around the world, the threats associated with intrastate violence and state disorder, and the policy options for the United States and the international community to respond to widespread violence and mitigate the global risks associated with it.

The project hosted conferences, private briefings, public events, and workshops with UN representatives, government officials, academics, policy-makers, and practitioners in the United States and internationally. Following the release of the second volume of *Dædalus*, selected project participants met with military and civilian personnel from the office of the U.S. Secretary of Defense, the office of the Chairman of the Joint Chiefs of Staff, and other Department of Defense offices to discuss the U.S. evolving strategy on counter-terrorism, including the role of international humanitarian law in counter-terrorism practices.

Several project participants also met with members of the National Security Council. The group participated in a briefing with more than ten NSC staff and region-specific directors. The project experts offered short- and long-term recommendations for preventing, mitigating, and helping countries recover from civil violence.

Along with collaborating with domestic institutions, the project team also engaged with international organizations, including the United Nations Department of Peacekeeping Operations, the United Nations Department of Political Affairs, and the office of the United Nations High Commissioner for Refugees. The meetings focused on how best to improve the internal capacities of the UN to respond to widespread violence around the world. The project's experts discussed how emerging and evolving technologies – when duly regulated – could help enhance UN capacities to intervene in conflicts, protect civilians, and monitor more accurately displacements and dislocations.

Similar to the Civil Wars project, the Commission on Language Learning produced several publications, including a final report on *America's Languages: Investing in Language Education for the 21st Century*. The report has helped to shape new legislative proposals at the federal level, including the World Languages Advancement and Readiness Act, which, if passed, would fund a grant program within the U.S. Department of Defense to foster innovative language instruction in K-12 education. It has also inspired new conversations about global education curricula

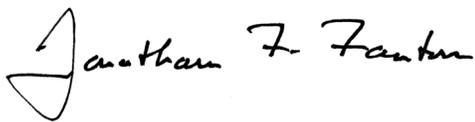
at schools and colleges like Northwestern University and Indiana University, and a range of out-reach activities around the country.

Since the report was released in 2017, the Academy has convened a working group to coordinate additional follow-up efforts. The America's Languages Working Group includes Commission members as well as other representatives from the language profession, academia, government, business, NGOs, and heritage and indigenous communities. On May 30, 2018, it published its first joint statement, "Bridging America's Language Gap," a call-to-action urging increased support for language education and improved access for students at every level. Thirty-eight individual business, government, and cultural leaders and over 150 organizations, including academic associations, businesses, colleges and universities, cultural and international organizations, language education associations, professional associations, school systems, and state humanities councils, have signed the call-to-action. The Academy will continue to add endorsements over time. The Working Group plans to use the call-to-action and a future online resource highlighting successful practices to help advance the Language Commission's recommendations around the country.

The project on Civil Wars, Violence, and International Responses and the Language Commission were both initiated by committees of distinguished Members and experts who worked together to formulate practical recommendations. Once these committees completed their work, the projects shifted focus to the people and organizations in the best position to advance their recommendations, fostering collaboration, building consensus, and encouraging further activity. This is an important strategy for many Academy projects, and one that the Academy has pursued more frequently in recent years to great success.

To help identify potential partners and receptive audiences for our work, the Academy – with generous support from Morton Mandel and the Jack, Joseph & Morton Mandel Foundation – has also created a new position: Director of Strategic Implementation. Our first director, Peter Robinson, is already working with Members and others to ensure that our projects have their intended effects.

We welcome your thoughts and suggestions about other ways to enhance the impact of our work.

A handwritten signature in black ink that reads "Jonathan F. Fantau". The signature is written in a cursive style with a large, stylized initial "J".

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Combating Corruption: New *Daedalus* Issue Examines How to Halt Political & Corporate Graft

Corruption can be ruinous, destroying nations, institutions, communities, individuals, the environment, and the very notion of public trust. Corruption self-reinforces, respects no law or border, and reproduces like disease. Most important, though, is that corruption is a systemic malady. It originates from the top and permeates downward; misconduct at one level seemingly authorizes it at the next. In his introduction to the Summer 2018 issue of *Daedalus*, guest editor and Academy Member **Robert I. Rotberg** (Harvard Kennedy School) asserts that “integrity or its absence . . . seeps into the collective societal consciousness: either to make corruption an ongoing social practice and an essential (even if de jure forbidden) component of a governing political culture; or more rarely, to accomplish the reverse, creating legal and normative barriers to wholesale approval of corrupt practices.” Corruption is so pervasive that it accounts for a loss of an estimated \$1 trillion annually – roughly 2 percent of global GDP – and disproportionately harms the countries and people that can least afford it. Yet there is room for optimism: corruption is not inevitable, and it is not unstoppable; the battle against pervasive and engrained corruption can be won.

“Anticorruption: How to Beat Back Political & Corporate Graft” explores the nature of modern global corruption – and how to defeat it. Highlighting examples from the United States, Brazil, Canada, China, Hong Kong, Nigeria, and Singapore, the authors in this issue – including both academics and law-makers – offer innovative, strategic, and practical recommendations to target public and private corruption. The authors recognize the enormity of their challenge, but focus on what is possible and what must be done: anticorruption successes are hard-won and difficult to sustain, but are essential for economic and social growth and political accountability.

Inside the Issue

Corruption is not only persistent and pervasive, but it is also difficult to solve, despite the multitude of anticorruption campaigns across the globe. Indeed, most countries have failed to move the needle on corruption over the last few decades. Yet **Robert I. Rotberg** (Harvard Kennedy School) begins the issue optimistically: the anticorruption effort is well-informed and there is a great deal of research on how countries have successfully beaten back corruption, including by establishing anticorruption agencies, increasing transparency, and creating merit-based bureaucracies. Although corruption is a tenacious problem, Rotberg notes that this collection of essays highlights a variety of anticorruption strategies – both successful and unsuccessful – and calls for innovative approaches to refine best practices.

In “Seven Steps to Control of Corruption: The Road Map,” **Alina Mungiu-Pippidi** (Hertie School of Governance, Germany)



Demonstrators protesting against South African President Jacob Zuma and calling for his resignation hold placards and shout slogans outside the Gupta Family compound in Johannesburg on April 7, 2017. © 2018 by Gulshan Khan/AFP/Getty Images.

rethinks international development’s standard tools for reducing corruption. While aid conditioned on good governance seemed like a potentially useful component of the anticorruption toolkit from the perspective of international development agencies, recent decades have shown that most of the top recipients of conditional international aid have not progressed on indicators of corruption. This disappointment propels Mungiu-Pippidi to offer a new road map toward establishing standards of “ethical universalism” in governance, which includes diagnosing the norm of resource allocation in a particular country and identifying the human agency with the most to gain from spearheading anticorruption efforts.

In “Fighting Systemic Corruption: The Indirect Strategy,” **Bo Rothstein** (University of Gothenburg, Sweden) highlights the need to rethink unsuccessful “best practices” in fighting corruption. The principal-agent theory – based on the idea that corruption can be remedied if the honest “principal” changes the incentives for its corrupt “agents,” who will find that it suits their own best interest to avoid corrupt actions – is often used as a model for explaining corruption. But it does not work well as a guideline for reducing corruption, as it depends on the will of an uncorrupted leader at the top of states or organizations, a leader who does not exist in practice. Rather, Rothstein suggests thinking about corruption as a “collective action problem” or “social trap”: namely, the idea that people are willing to do the right thing as long as they believe others will do the same. The reverse also applies: when corruption is understood as a widespread, even sanctioned, phenomenon, people are more likely to engage with it. Thus, Rothstein finds promise in military theorist Basil Liddell Hart’s “indirect attack” approach: rather than a direct attack against corrupt leaders, an indirect attack (such as universal public education) finds and attacks the “Achilles heel” of corruption, better upsetting the social equilibrium that allows corrupt actors to act with impunity.

In “Reforming Reform: Revising the Anticorruption Playbook,” **Michael Johnston** (Colgate University; International Anti-Corruption Academy) takes a bird’s-eye view of the last thirty years of international anticorruption efforts, observing that although increased attention to corruption can only be a positive sign, standard practices for fighting corruption have yielded lackluster results. He questions a number of common suppositions espoused by anticorruption experts, including claims that increasing transparency and creating large anticorruption agencies will always ameliorate the problem. Johnston argues that corruption is best combated indirectly, by developing relationships of accountability between citizens and the government, such as through education and civil society. Johnston thus advocates for what he calls “deep democratization”: a holistic development of citizen engagement in which “citizens have a voice . . . and can defend themselves against official abuses.” Indeed, he opines, “integrating citizens and their needs and wishes into governing lends new meaning to the notion of integrity, evoking honesty and transparency but also wholeness.”

In “Getting to Accountability: A Framework for Planning & Implementing Anticorruption Strategies,” **Matthew M. Taylor**

(American University) argues that anticorruption policies fail to translate to lasting success unless they are accompanied by a shift toward lasting accountability in state institutions. He identifies the need to standardize the process of institutionalization, presenting an “accountability equation”: namely, accountability is the outcome of transparency, oversight, and sanction, moderated by the degree of institutional effectiveness, and tempered by the degree of political dominance. This equation can be used to identify “trans-

Corruption is so pervasive that it accounts for a loss of an estimated \$1 trillion annually – roughly 2 percent of global GDP – and disproportionately harms the countries and people that can least afford it. Yet there is room for optimism: the battle against pervasive and engrained corruption can be won.

parency bottlenecks” and areas for institutional improvement in a number of sectors and contexts. He emphasizes the importance of generating societal trust and conducting ongoing, iterative evaluations of viable solutions.

In “Combating Corruption in the Twenty-First Century: New Approaches,” **Paul M. Heywood** (University of Nottingham, United Kingdom) identifies the lack of substantial progress on corruption in recent decades and questions anticorruption literature’s tendency to generalize, pointing instead to the fact that new technologies, forms of political organization, and economic trends have opened up opportunities for corruption that must be treated as unique and context-dependent. Heywood argues that, rather than focusing on unrealistic aspirations of defeating or eliminating corruption, anticorruption advocates must focus instead on promoting integrity: that is, values that encourage noncorrupt behavior. However, he notes that simply ensuring officials do not act corruptly is insufficient: “the absence of corruption does not imply the presence of integrity.” Thus, in order to build and promote a formal framework based on integrity, he calls for a better conceptual understanding of integrity in public life and its relationship to corruption.

In “Corruption & Purity,” **Susan Rose-Ackerman** (Yale University) explores corruption through a legal framework. Troubled by the prevalence of definitions that frame any violation of a person’s ideals as corruption, Rose-Ackerman defines corruption as any circumstance in which a steward of a public program operates in his or her own private interest in such a way that undermines the goals



Demonstrators protest along Paulista Avenue in São Paulo, Brazil, on December 4, 2016, against corruption and in support of the *Lava Jato* anticorruption operation. © 2018 by Miguel Schincariol/AFP/Getty Images.

of the program. From this definition, she analyzes clear-cut cases of corruption, including petty corruption (bribery of officials) and election fraud, which can be remedied by changing certain private actors' relationships to the state; as well as more ambiguous cases such as campaign finance, for which more nuanced policy solutions are necessary.

In "The Problem of Monopolies & Corporate Public Corruption," Zephyr Teachout (Fordham University School of Law) turns the focus away from corrupt elected or appointed officials and toward private actors who selfishly exercise public power. She argues that when corporations exercise public power selfishly, putting profit above public interest, they are engaging in corrupt behavior. Her approach is prophylactic, centered not on targeting monopolies like Google, but on preventing future consolidation of corporate power and private corruption. As a remedy, Teachout focus-

es on opportunities for new antimonopoly and campaign finance laws. As she concludes, the problem is not with the existence of the corporation, the "problem is with concentrated power: a handful of actors who are *sui generis*; so large and powerful they can bend public power. The modern anticorruption movement chooses not to address these large actors, using formalism or legalism as an excuse, at all of our peril."

In "Corruption & Illicit Trade," Louise I. Shelley (George Mason University) details how illicit trade – including of drugs, endangered species, and people – represents a significant sector of the global economy and compromises the integrity of financial, ecological, and political systems. These transactions would be impossible without corrupt actors, from border officials to high-level politicians to entrepreneurs on the Darknet. The relationship between corruption and illegal trade is mutually enforcing. However, while the phenomenon she describes is "decidedly transnational . . . most strategies and legal frameworks to combat corruption are state-based and thus are woefully inadequate to the task." She thus identifies potential strategies for disrupting this cycle, including increasing transparency in international financial institutions and supply chains.

In "The World Needs an International Anti-Corruption Court," Mark L. Wolf (United States District Court for the State of Massachusetts) argues that part of the difficulty in addressing corruption lies in the fact that corrupt high-level leaders often do not have the incentive to hold themselves or their colleagues legally responsible for malfeasance. This problem also arose in another context: that of massive human rights violations perpetrated or sanctioned by state-level leaders. In response, we created the International Criminal Court, which has successfully prosecuted human rights cases following genocides and civil wars. Judge Wolf advocates for an International Anti-Corruption Court (IACC) and argues that certain incentives, such as making IACC membership a condition of World Trade Organization membership and a requirement of being a party to the United Nations Convention against Corruption and to major trade agreements, would improve participation in the court. Such a court, Wolf suggests, would make strides in repatriating stolen wealth and making corruption an exception, rather than the rule, in governance.

In "Preventing Systemic Corruption in Brazil," Sérgio Fernando Moro (Thirteenth Federal Criminal Court of Brazil) details the ongoing anticorruption investigation known as *Operação Lava Jato* ("Operation Car Wash") from the perspective of the federal judge overseeing its prosecution. Beginning as an isolated instance of corruption in the Brazilian oil company Petrobras, Lava Jato has grown into the largest anticorruption effort in Brazilian history, leading to,

so far, more than sixty criminal cases brought against nearly three hundred defendants in Brazilian federal courts. Judge Moro shows how independent investigators and judges can follow due process to convict high-ranking corrupt politicians and business executives who were previously thought to be untouchable. Indeed, “the Lava Jato cases . . . represent a clear break with a past of impunity and with tolerance for systemic corruption” in Brazil. Moro highlights the fundamental parts of the investigation to offer lessons for anti-corruption efforts elsewhere.

In “Corruption & State Capture: What Can Citizens Do?” Sarah Bracking (King’s College London) offers an account of the impunity with which South Africa’s leading cadre, led by former President Jacob Zuma, came to “capture” key sites of control in the country’s government and corporate sector and prey upon public coffers. Bracking details how Zuma’s clique defended its corrupt practices by taking advantage of lax international finance laws, capitalizing on the racial tensions of a postapartheid nation, and intimidating state workers and citizens alike with violence. Unfortunately, “the Machiavellian behavior of political elites in modern Africa, as else-

where, often attracts little prosecutorial response due to the widespread practice of granting immunity to current and former officeholders.” However, Bracking identifies several reasons to hope that the situation can improve: South Africa still possesses a relatively independent private sector, media, and political opposition, all of which can close ranks to refuse to cooperate with corrupt cadres.

In “Strategies for Advancing Anticorruption Reform in Nigeria,” Rotimi T. Suberu (Bennington College) details how Nigeria’s severe political corruption has led to massive misuse of public funds; eroded public services such as education, water supply, and transportation infrastructure; and contributed to the rise of terrorism from groups such as Boko Haram. And while Nigerian President Muhammadu Buhari has promised a comprehensive disruption of corruption, he has not delivered. Suberu offers an in-depth analysis of the institutional failings, policy gaps, and structural challenges that created an environment for corruption to thrive, while also detailing some of the less-publicized successes of the Nigerian anticorruption movement. Ultimately, he suggests five innovative solutions: 1) creating a political anticorruption and oversight agen-

“Anticorruption: How to Beat Back Political & Corporate Graft”

Summer 2018 issue of *Dædalus*

Accomplishing Anticorruption: Propositions & Methods by Robert I. Rotberg (Harvard Kennedy School)

Seven Steps to Control of Corruption: The Road Map by Alina Mungiu-Pippidi (Hertie School of Governance, Germany)

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Combating Corruption in Asian Countries: Learning from Success & Failure by Jon S.T. Quah (National University of Singapore)

How Not to Fight Corruption: Lessons from China by Minxin Pei (Claremont McKenna College)

As Zephyr Teachout notes, the problem is not with the existence of the corporation, the “problem is with concentrated power: a handful of actors who are *sui generis*; so large and powerful they can bend public power. The modern anticorruption movement chooses not to address these large actors, using formalism or legalism as an excuse, at all of our peril.”

cies; 2) curbing the discretionary power of political executives; 3) restructuring the Nigerian system of unconditional federal revenue distribution into a conditional grants scheme; 4) strengthening transparency laws; and 5) mobilizing extensive public participation in constitutional change.

In “Combating Corruption in Asian Countries: Learning from Success & Failure,” Jon S.T. Quah (National University of Singapore) highlights the successful anticorruption campaigns of Singapore and Hong Kong, despite widespread corruption among Asian countries. Quah mines lessons from these stories, pointing to political will as a major factor in the effectiveness of those countries’ anticorruption agencies (as indicated by public funding and staff-population ratios in those countries). He also points to the need to address context-specific root causes of corruption rather than curbing corruption in public displays; and to the critical importance of independence on the part of anticorruption agencies. He concludes with four lessons for policy-makers: 1) political will is essential for success in combating corruption; 2) policy-makers must initiate appropriate reforms to tackle corruption by addressing its root causes; 3) policy-makers must establish Type A anticorruption agencies (agencies tasked only with fighting corruption) rather than relying on Type B anticorruption agencies (agencies tasked with multiple responsibilities, including fighting corruption) or multiple, com-

peting anticorruption agencies; and 4) ensure that Type A anticorruption agencies function as independent watchdogs.

In “How Not to Fight Corruption: Lessons from China,” Minxin Pei (Claremont McKenna College) uses China to explain how *not* to fight corruption. Judging by the numbers, General Secretary Xi Jinping’s ferocious anticorruption campaign can only impress: From late 2012 to July 2017, the drive has investigated and sanctioned or imprisoned tens of thousands of Communist Party and military and police officials, including vice ministers, generals, and deputy provincial governors, and other high-ranking officials. Yet this enforcement-centered strategy, Pei argues, is fundamentally a political purge of Xi’s rivals, and is neither sustainable nor durable. Pei recommends that China rebalance its enforcement drive with corruption prevention, passing mandatory rules of wealth disclosure and spending transparency, and relinquishing Party control of the economy. Although Pei believes that the Chinese Communist Party will not tolerate the political risks of such reforms, he creates a model for states that do possess the political will to build a successful long-term anticorruption program.

Academy Members may access an electronic copy of this *Dædalus* issue by logging into the Academy’s website and visiting the Members page. For more information about *Dædalus*, please visit <http://www.amacad.org/daedalus> or contact daedalus@amacad.org. ■

New Humanities Indicators on Career Outcomes for Recipients of Advanced Degrees

In a series of recent reports, leaders in the sciences, humanities, and higher education have called for additional data on the career outcomes of recipients of graduate degrees.¹ Drawing on national surveys of college graduates, the American Academy’s Humanities Indicators (www.HumanitiesIndicators.org) offers a fresh perspective on the outcomes of recipients of advanced degrees, providing a snapshot of their earnings, occupations, and job satisfaction.

The Trends for Ph.D.s

Employment trends among doctoral students are a subject of particular concern, as recent data show a substantial shift in the job market after the recession. In new findings about the employment commitments of Ph.D.s at the time they earn their degrees, the Indicators report a sharp decline in the share with jobs or commitments for postdoctoral study. Among new Ph.D. recipients in 2016 (the most recent year with data), almost 62 percent of doctoral degree recipients had a commitment for employment or postdoctoral study after earning their degree, which marked a substantial decline in just ten years and the lowest point on record.

Doctoral degree recipients in the humanities appeared to be the hardest hit, as barely half of new humanities Ph.D. recipients reported a firm commitment for employment or postdoctoral study. The humanities have traditionally lagged behind other fields on this measure, but the share reporting a job or postdoctoral study commitment after graduation fell 22 percent from 2006 to 2016. While the humanities experienced the largest decline, every field except for the behavioral and social sciences saw their shares of doctoral students with a definite job commitment fall by more than 15 percent.

These trends, combined with growing difficulties in the academic job market, have raised renewed questions about the purpose of doctoral study and the preparation of students for future careers. The leading scholarly societies in the humanities have focused considerable effort over the past five years on promoting “career diversity” in doctoral training, and a new report by the National Acade-

Degree Holders Indicating They Are “Very” or “Somewhat” Satisfied with Their Job, by Field of Degree, 2015

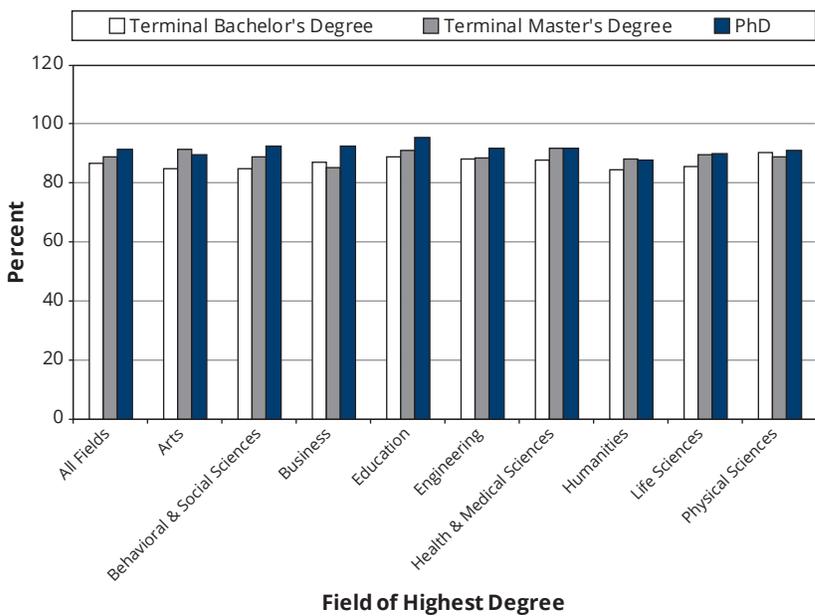


Figure 1

Source: National Science Foundation, *2015 National Survey of College Graduates*. Data analyzed and presented by the American Academy’s Humanities Indicators (www.humanitiesindicators.org).

1. See, for instance, National Academies of Sciences, Engineering, and Medicine, 2018. *Graduate STEM Education for the 21st Century* (Washington, D.C.: The National Academies Press, 2018); Rita Karam et al., *Managing the Expansion of Graduate Education in Texas* (Santa Monica, Calif.: RAND Corporation, 2017); and Jeffrey Allum et al., *Understanding PhD Career Pathways for Program Improvement* (Washington, D.C.: Council of Graduate Schools, 2015).

Median Annual Earnings of Full-Time Workers, by Highest Degree and Field of Degree, 2015

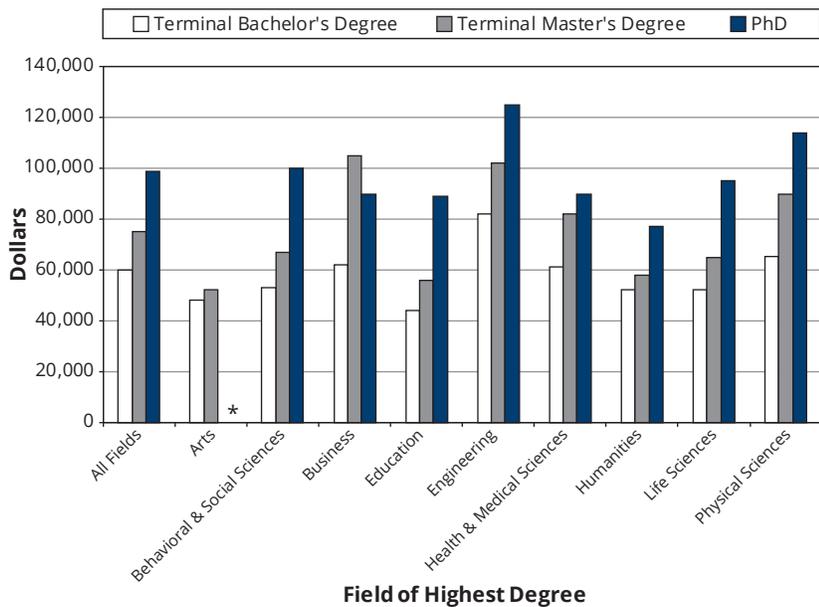


Figure 2

Source: National Science Foundation, 2015 National Survey of College Graduates. Data analyzed and presented by the American Academy’s Humanities Indicators. *Sample size for doctoral degree recipients in the arts was too small for an accurate estimate of earnings.

mies calls on the STEM fields to focus on training their students for diverse “professional contexts.”²

A separate set of Indicators, highlighting the wide occupational differences among recipients of doctoral degrees, suggests why the humanities arrived at the career diversity issue before the STEM fields. Ph.D. recipients in the humanities appear much more likely to take employment in postsecondary teaching in comparison to other fields. As of 2015, 56 percent of employed humanities Ph.D.s

2. For the humanities, see Anthony T. Grafton and Jim Grossman, “No More Plan B,” *Chronicle of Higher Education*, October 9, 2011; and Vimal Patel, “Grants Seek to Foster a Culture Change in Humanities Graduate Education,” *Chronicle of Higher Education*, August 9, 2016. For the STEM fields, see *Graduate STEM Education for the 21st Century*.

were teaching at the postsecondary level as their principal occupation, as compared to 29 percent of employed doctoral degree recipients in all fields combined.

Even in the 2016 cohort of Ph.D.s with job commitments, the humanities graduates appeared much more likely to look to colleges and universities for employment. Despite the recent decline in employment commitments at graduation, and a sharp drop in jobs advertised with scholarly societies in the field, 76 percent of humanities doctoral degree recipients with an employment commitment in the United States indicated they would be taking a job in the academic sector (including full- and part-time faculty and administrative appointments). Among doctoral degree recipients from all fields, the share was less than 45 percent.³

Despite the challenges for recent Ph.D.s on the job market, overall, doctoral degree recipients seem satisfied with their jobs. The Indicators report that 91 percent of Ph.D. recipients were “very” or “somewhat” satisfied with their employment in 2015 (Figure 1). Once again, however, doctoral degree recipients in the humanities were the notable exception. The share of humanities Ph.D.s employed outside academia who reported they were satisfied with their jobs was more than 11 percentage points below that of humanities Ph.D.s in academia (80 percent as compared to 91 percent). In contrast to the humanities Ph.D.s, doctoral degree recipients from all fields with employment outside of academia reported a high level of job satisfaction (92 percent), again underscoring the unusual focus of humanities Ph.D.s on college and university employment.

The disproportionate share of humanities Ph.D.s employed in academia also has another effect, as the relatively low salaries for college and university faculty – particularly for faculty in the humanities – lead to below-average earnings relative to other fields. The

3. For recent trends in jobs advertised with scholarly societies in the humanities, see “A Path Forward as Academic Job Market in Humanities Fal- ters,” Academy Data Forum (August 28, 2017), available online at www.amacad.org/content/research/dataForumEssay.aspx?i=22902.

Indicators reports median earnings of \$99,000 for doctoral degree recipients in all fields (see Figure 2). The median earnings range from a low of \$77,000 for humanities Ph.D.s to a high of \$125,000 for doctorate recipients in engineering.

Careers with Master's Degrees

While the career outcomes of Ph.D.s tend to receive the most attention, due to their role in academia and the extended time it takes to earn the degree, a substantially larger number of students earn master's degrees each year. The Indicators also provides new information on the career outcomes of those whose highest degree is a terminal master's degree. While there is no comparable data about the recent trends in their job outcomes as they earn their degrees, new reports from the Indicators find that they also have high levels of job satisfaction, have higher median earnings than those who lack a graduate degree, and are more likely to be in higher-level jobs.

Almost 90 percent of employed graduates with a terminal master's degree were in a management or professional position in 2015, as compared to 62 percent of graduates with just a bachelor's degree. And that difference shows up in their median earnings, as terminal master's degree recipients had median earnings of \$77,000, as compared to \$60,000 for those working with only a bachelor's degree. Among recipients of terminal master's degrees, graduates from the arts and education had the lowest median earnings (at \$52,000 and \$56,000, respectively), while graduates from business and engineering programs had the highest median earnings (\$105,000 and \$102,000, respectively).

Overall, 89 percent of the recipients of terminal master's degrees reported they were "very" or "somewhat" satisfied with their employment in 2015, and graduates working with a terminal master's degree reported high levels of satisfaction with most aspects of their jobs. Across all fields, terminal master's degree holders expressed the least satisfaction with their opportunities for advancement (less than 66 percent reported satisfaction on this measure) and their salaries (77 percent). On other, less tangible measures, however, such as their contribution to society and the intellectual challenge of their work, the shares reporting satisfaction were generally 84 percent or higher.

There were interesting variations between graduates from particular fields on these measures. For instance, recipients of terminal master's degrees in education had the highest levels of satisfaction on most aspects of their jobs (especially in their perceived contribution to society, at nearly 94 percent), but reported the lowest shares of satisfaction with their salaries (71.5 percent). Graduates from the health and medical sciences had similarly high levels of satisfaction

with their contribution to society, but also had one of the highest shares of satisfaction with their salaries (82 percent). Master's degree recipients from engineering and business, on the other hand, reported relatively low levels of satisfaction with their contribution to society (at below 83 percent) while also having the highest shares of satisfaction with their salaries (above 80 percent).

All these studies represent snapshots of degree recipients at particular moments. In future studies, the Indicators hopes to provide better tracking of degree recipients over time, in order to measure how recipients of advanced degrees fare from the start of a profession with one of these degrees to the end of their careers.

For more information about the Humanities Indicators, please visit www.humanitiesindicators.org or contact the Indicators staff at humanitiesindicators@amacad.org. ■

Don M. Randel Award for Humanistic Studies: Acceptance Remarks

A Philosophical Approach to Anger and Fear

On April 12, 2018, the American Academy of Arts and Sciences presented the Don M. Randel Award for Humanistic Studies to Martha C. Nussbaum (University of Chicago). An introduction by Paul Guyer (Brown University) and acceptance remarks from Martha Nussbaum appear below.



Paul Guyer

Paul Guyer is the Jonathan Nelson Professor of Humanities and Philosophy at Brown University. He was elected a Fellow of the American Academy in 1999.

Introduction

It is a pleasure and an honor for me to introduce the sixth winner of the Don M. Randel Award for Humanistic Studies in its forty-year history: Martha C. Nussbaum, the Ernst Freund Distinguished Service Professor of Law and Ethics in the Law School and Department of Philosophy of the University of Chicago, where she also teaches in the Classics Department, the Political Science Department, and in the Divinity School. It is a pleasure for me because I have known Martha since we began graduate school together almost half a century ago, and it is a pleasure to see a friend suc-

ceed beyond the wildest dreams that anyone could have had at the age of twenty-one.

It is an honor for me because Martha has been for almost that many years one of the most insightful and productive philosophers and scholars on our scene, and without question the most significant public intellectual that philosophy in America has produced in decades. Indeed, I do not think we have seen a public philosopher like her since John Dewey or before him our former neighbors William James and Josiah Royce. Martha would be just as fitting a winner for any award in public service as for our distinguished award in humanistic studies.

Martha Nussbaum's academic career has been exceptional. After earning her Ph.D. in classics and philosophy at Harvard, she was a Junior Fellow of the Society of Fellows and Assistant Professor of Classics and Philosophy there before moving to tenured positions at Brown, where she is still remembered fondly and is a welcome annual visitor, and then the University of Chicago. From her first book, a scholarly work on Aristotle's biology published just a few years after she finished her Ph.D., she has gone on to publish more than twenty further books, including such indispensable works as *The Fragility of Goodness*, *Women and Human Development*, *Upheavals of Thought: The Intelligence of Emotions*, *Frontiers of Justice*, *Liberty of Conscience: In Defense of America's Tradition of Religious Equality*, *Political Emotions*, *Anger and Forgiveness*, and most recently, with her Chicago colleague Saul Levmore, *Aging Thoughtfully*.

Nussbaum has also edited or co-edited another two dozen multi-author volumes. She has received at last count the extraordi-

nary total of fifty-six honorary degrees, and many other distinguished awards, including most recently the Kyoto Prize in Arts and Philosophy.

For what? Two of Martha's titles suggest the unifying threads of an extraordinarily diverse body of work, the "intelligence of emotions" on the one hand and the "frontiers of justice" on the other. In the preface to the book she is currently working on, some of which she presented at Brown a few weeks ago, she describes these as two separate sides of her work, but I think they are deeply connected.

On the topic of justice, Martha has pushed beyond the path-breaking work of John Rawls, whose *Theory of Justice* appeared while we were in graduate school and has been such an enduring influence on so many of our generation and since. Rawls himself pushed beyond Kant by accepting as his own first principle of justice Kant's definition of justice as the greatest freedom for each compatible with equal freedom for all, but adding as his second principle equal opportunity for positions and offices and the requirement that differential rewards be to the advantage of the least well-off. Martha has in turn pushed beyond Rawls by arguing for equal opportunity not just for offices and income but for the full range of what she calls human capabilities, and not just for those individuals in an historical position to bargain over a social contract, but for the full range of human beings, including women, the disabled or infirm, all those who in one society or another have been classified as minorities, and even beyond that for animals. And it is Martha's stress that justice requires opportunity for the full develop-

ment of human capabilities that links the one side of her work to the other.

Among human capabilities she recognizes the development of emotions, the basis of love, attachment, gratitude, grief, and much more, as well as more obvious bodily and intellectual capacities, practical reason, control over one's environment, and the like. For her, human beings must have the opportunity to develop and express their emotions but also to learn how to control them. Justice is the sum of the conditions that allows human beings to be fully human, and itself can arise only with both the expression and the control of human emotions. This is the ideal that underlies all of Martha Nussbaum's work.



Martha C. Nussbaum

Martha C. Nussbaum is the Ernst Freund Distinguished Service Professor of Law and Ethics at the University of Chicago, with appointments in the Law School and the Philosophy Department. In addition, she is an Associate in the Classics Department, the Divinity School, and the Political Science Department. She was elected a Fellow of the American Academy in 1988.

It is a delight to be introduced by Paul Guyer, not just an old friend but a philosopher whom I deeply admire and who exemplifies a rigor, insight, and dedication that show our profession at its best. I am extremely grateful to the Academy for the honor of this award, and especially honored that it is named for Don Randel, who has been such a paragon of commitment to the humanities throughout his distinguished career. And of course I have been so happy to have worked under Don's leadership at the University of Chicago, where we shared so many commitments, not least including a deep love of music. Don's commitment to the humanities and also, as it happens, his love of music find fitting continuation in the Humanities Deanship of Anne Robertson,

Does democracy really ask people to put anger aside? . . . And if democracy does ask people to give up anger, how would we protest against egregious injustice?

who is here. In general, I could not do my work without that great university, both its law school and its philosophy department, which have created an ideal environment for work, serious criticism, and teaching.

As Paul said, my career has focused on two areas: normative theorizing about justice and investigation of the nature and role of the emotions. Increasingly I have been bringing the two together and thinking of the role emotions play in moving us toward or, as the case may be, away from a just and decent society. All of this work has been continually nourished by my long study of the history of Greek and Roman philosophy, very much including the philosophical elements of literature. In the process, I have also made an attempt to address a wider public and to play the role of what people call a "public philosopher," something quite difficult to do in this country. But I have tried to do it always in a way that upholds philosophical standards and honors the work of other thinkers, past and present.

Let me, then, give you just a small example here, showing how a philosophical approach to the emotion of anger and the fear that so often underlies it can help us come to grips with the challenges of our political moment – the theme of my Jefferson Lecture in 2017, so this is but a sketch of a much fuller argument.

I start with poetry, with the ancient Greek playwright Aeschylus' depiction of the birth of democracy and the rule of the law in *Eumenides*, the third play of the *Oresteia*. The protagonists of this drama are some rather unpleasant characters. Called Furies or Erinyes, they help wronged individuals wreak vengeance on those who have killed a member of their family. The Furies are said to be ugly and foul, more like rabid dogs than like human beings. Their eyes drip a hideous liquid; they are even said to vomit up clots of blood that they have ingested from their prey. This is Aeschylus' way of imagining the obsessiveness and ugliness of retributive anger. Unreformed, these Furies could not be helpful in Athena's project to found a democracy involving legal trials and, more generally, the rule of law.

The idea of retributive payback, though ubiquitous and deeply human, is empty and quite unhelpful, if what we want is to change the future, which is the only thing we can change.

The end of the drama, however, shows the Furies not just accepting legal constraints but also fundamentally shifting their sentiments. They get a place of honor in the city, but the exchange is that they now want different things. They agree to foster the welfare of all the citizens, describing their new mood as "looking to the future with gentle intent" and also as "a mindset of common love." Perhaps most important, they agree to listen to the voice of persuasion. They are transformed physically in related ways: they stand up, they are given robes to wear, and they also get a new name: the "Eumenides," or "kindly ones," rather than Furies. So, what is the drama saying about anger? Does democ-

racy really ask people to put anger aside? (The Greeks and Romans didn't think very well of anger or associate it with masculinity, but Americans certainly do!) And if democracy does ask people to give up anger, how would we protest against egregious injustice?

To go further, however, we need a philosophical analysis, and in the Western tradition the definition of anger that influences all subsequent thinkers is Aristotle's. (It's actually similar to definitions in Indian philosophy, the only non-Western tradition I know anything about. We should remember always that philosophical thinking has roots in many cultures. And, it also has been validated by modern psychology: philosophers have to be attuned to the insights of other disciplines.)

Aristotle says that anger is a painful response to a significant damage, to something or someone that the angry person cares a lot about – and a damage this person believes to have been wrongfully inflicted, not just accidental. So far, so uncontroversial, and anger so defined seems not bad or destructive, but an ingredient of a good society's confrontation with wrongdoing.

But then the Furies enter. Aristotle claims that a wish for retribution or payback, some sort of pain for pain, is an essential part of anger as commonly experienced. This needs a long discussion, but if we cut to the chase I think Aristotle is correct: when we are angry we do want the wrongdoer to suffer, if only through legal punishment or even di-

vine intervention. (Gandhi agrees.) Or, even more subtly, we find ourselves wishing that the person who wronged us will simply have a miserable life in the future, that the second marriage of your betraying spouse is a dismal failure.

But (I then argue) the idea of retributive payback, though ubiquitous and deeply human, is empty and quite unhelpful, if what we want is to change the future, which is the only thing we can change. Capital punishment does not bring back the life that was lost; punitive litigation does not make a new future after a broken marriage. So, I then investigate the futility of anger at greater length, and show how this kind of empty thinking is often closely linked to fear and insecurity, to an underlying sense of powerlessness that reaches back to infantile experience, but that is exacerbated in times of personal or social unrest. Feeling powerless, we want control in an uncertain world, and anger gives an illusion of control: inflicting pain on someone feels powerful, and distracts us from the messy and difficult task of making a productive life.

In politics this is true in spades. Our nation right now has many real political and economic problems to solve: outsourcing, automation, the claims of immigrants and asylum-seekers, the demands of long-marginalized people and groups. It is human to feel helpless in the face of such problems. How easy, then, to turn instead to anger and scapegoating, imagining that inflicting pain on an opponent will fix the problem. (And note that this way of reacting is bad whether the opponent has actually wronged you or not: even real wrongs need to be addressed in a constructive and cooperative spirit, not in the spirit of the Furies.)

A great part of my new book is occupied by tracing the complex interrelationships between fear and anger, showing how fear turns anger toxic, turning people toward retributive fantasy and away from the hard

We should recognize the serious wrongs that occur in our society, name them, and protest against them. This part of Aristotelian anger, however, is separate from the payback part. . . . We can demand justice without wishing for painful retribution for our opponents.

constructive work that must be done to solve social problems.

But my Aristotelian analysis of anger also shows us where Athena's mediation digs in and offers hope: If we return to his definition, there is one part that seems productive: the recognition that a serious wrong has been done. When the facts are correct, this part of anger, the protest part so to speak, is socially productive. We should recognize the serious wrongs that occur in our society, name them, and protest against them. This part of Aristotelian anger, however, is separate from the payback part. Even if ordinary anger typically contains both elements, there is a conceptual separation between protest and payback. We can demand justice without wishing for painful retribution for our opponents, and indeed, as in the play, while joining in a common enterprise pointed toward future welfare for all.

Interestingly, this idea was used by Martin Luther King, Jr. in his movement. In all the welcome outpouring of work on King, I would like to mention the contributions of philosophers in a first-rate recent collection edited by Tommie Shelby and Brandon Terry, *To Shape a New World: Essay on the Political Philosophy of Martin Luther King, Jr.*, just published by Harvard, to which I'm honored to contribute, on the topic of King's thoughts about anger. King read so widely in both literature and philosophy that it is hard to know whether he was influenced by this or that particular source. But in any

case, he said the same thing: ordinary anger brings people to a protest movement, and when they arrive they typically want to inflict retributive pain. But once they get into his movement, he continually stressed, that anger has to be, as he put it, "channeled" or "purified," losing its retributive element and taking on new sentiments of love and hope. In 1959, he wrote that obstacles to the goals of a protest movement can be met in two ways:

One is the development of a wholesome social organization to resist with effective, firm measures any efforts to impede progress. The other is a confused, anger-motivated drive to strike back violently, to inflict damage. Primarily, it seeks to cause injury to retaliate for wrongful suffering It is punitive – not radical or constructive.¹

Studying his speeches, we can see King exemplifying repeatedly a determination to name and vigorously protest the heinous wrongs of racism and Jim Crow, often at great risk – while heading off the thought of retribution and replacing that thought with ideas of constructive work, love, and faith.

1. Martin Luther King Jr., "The Social Organization of Violence," in *The Papers of Martin Luther King, Jr., Volume V: Threshold of a New Decade, January 1959 – December 1960*, ed. Clayborne Carson, Tenisha Armstrong, Susan Carson, Adrienne Clay, and Kieran Taylor (Berkeley: University of California Press, 2005).

Philosophical analysis, animated by literary imagination, does not solve our political problems. For that we need sound economic planning, historical and scientific knowledge, and multidisciplinary cooperation. And we also need an open-minded and well-educated electorate and politicians interested in communicating economic, historical, and scientific knowledge to them, rather than just playing on their anger for their own advantage. But philosophy can help us understand ourselves and see where the problems lie, and it can also help us to identify some not-so-productive way to respond to them.

Furthermore, the contribution of philosophy lies in its methods as well as its content. It can actually help to build the sort of citizenry and the sort of politician that I have just imagined. Following Socrates, philosophy approaches people gently, respectfully, asking them to listen to persuasion rather than to make a lot of noisy boasts. So philosophy also embodies part of the solution we so badly need: a decent, respectful, rational, and imaginatively engaged way of relating to other people.

In these two related ways, philosophy contributes to the task that is always before us, in Aeschylus' time and in our own – since we always must face forward, wherever we are – of building a constructive, loving, reasonable, and non-retributive society that pursues human welfare. ■

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To view or listen to the presentations, visit <https://www.amacad.org/awards-2018>.

Francis Amory Prize Acceptance Remarks

On Sex and Death

On April 12, 2018, the American Academy of Arts and Sciences presented the Francis Amory Prize to Barbara J. Meyer (University of California, Berkeley). An introduction by David C. Page (Whitehead Institute; Massachusetts Institute of Technology) and acceptance remarks from Barbara Meyer appear below.



David C. Page

David C. Page is the Director of the Whitehead Institute, Professor of Biology at the Massachusetts Institute of Technology, and a Howard Hughes Medical Institute Investigator. He was elected a Fellow of the American Academy in 2011.

Introduction

Let me start by asking a question. Is anyone interested in sex? That may be too hard a question. How about is anyone interested in the differences between the sexes? I have had the pleasure of being a colleague of our Francis Amory Prize recipient, Barbara Meyer, since the early 1980s. Barbara and I—as well as her husband Tom Cline—share a passion for using the toolkits of genetics and molecular biology to understand the differences between the sexes.

I explore differences between males and females in our own species. This is sometimes a complicated matter. Barbara wisely explores differences between males, who are makers of sperm, and hermaphrodites, who are makers of both eggs and sperm. Barbara studies these differences in a very sexy species that modern biologists refer to simply as *the worm*. This is, of course, the nematode *Caenorhabditis elegans*. As the song goes, sex is a many splendored thing, and it presents scholars with an infinite array of nuances, distractions, and sideshows. Researchers are attracted to study sex in our own species, in the worm, and elsewhere.

Why has Barbara's work had such impact? The answer is actually very simple: Barbara has never been distracted by the many sideshows. Instead, she has consistently pursued the most central, the most fundamental questions about males, females, and hermaphrodites. And she has framed her findings in a manner that resonates far beyond the community of what we, biologists, affectionately refer to as worm people.

The ability to frame the fundamental question and to connect the answer to all of life is what sets Barbara's mind and her inquiry apart. And that is what we honor tonight.

It has been said that if we understand the worm, we understand life. Through your pioneering research using the amazing nematode worm *C. elegans*, you have shown the interplay between chromosome structure and function in sex determination. You have made groundbreaking discoveries with respect to how X chromosomes are counted to determine sexual fate, and how the

related process of dosage compensation is achieved. And you have identified the master control gene involved in sex determination. Your research into the mechanisms underlying dosage compensation produced many key insights into gene regulation, influencing the work on all higher eukaryotes, including humans. And because of you, we truly have a better understanding of life.

You are a mentor to many. And your work has been praised for its elegant genetic analysis followed by beautiful molecular and cellular studies, which have continued to yield a deep and fascinating picture of these processes. You are a true inspiration to your colleagues and those who will follow.

As the citation for the Francis Amory Prize reads: "With relentless dedication, determination, and passion, you have delivered on science's promise to provide a more expansive sense of who we are, how we fit with life on earth, and how we may improve the human condition."



Barbara J. Meyer

Barbara J. Meyer is Professor of Genetics, Genomics, and Development in the Department of Molecular and Cell Biology at the University of California, Berkeley, and a Howard Hughes Medical Institute Investigator. She was elected a Fellow of the American Academy in 1995.

It is a great honor and pleasure to be amongst some of my best friends on the planet, and to be able to be in Cambridge, a place I love, to receive this honor and to share it with people I admire so much. I am really grateful for this opportunity to see you all.

Tonight's lecture is a brief presentation about the fundamentals of sex and death. They are related in some interesting and in some boring ways. I will touch on both.

As David mentioned, we have taken our studies of sex and death all the way from the genetic underpinnings to in-depth molecular and biochemical studies. I will try to give you a flavor of the different approaches and conclusions.

The year 1921 was a landmark time when Calvin Bridges, a developmental geneticist, launched a series of experiments and publications on the topic of "Sex in Relation to

The choice of sexual fate is one of the most fundamental, binary developmental decisions in biology, and one that most organisms, from bacteria to man, must make.

Chromosomes and Genes." He realized and became famous for understanding that a chromosomal signal determines sex in fruit flies. The idea of a chromosomal sex signal fascinated me. When I entered the worm field, I wanted to understand the basis of such sex signals.

Many mechanisms of sex determination exist. Although not all mechanisms are chromosomal, many are based on chromosome counting (Figure 1a). In humans, the Y chromosome, as David Page knows well, determines sex. In worms, as in fruit flies, sex is determined by the number of X chromosomes. These animals count sex chromosomes, and they count them against the background of other non-sex chromosomes called autosomes, which I will describe in a moment.

A virtue of studying sex determination is that it is an exquisitely sensitive developmental switch that is highly tractable when one thinks deeply about genetics and molecular mechanisms. The choice of sexual fate is one of the most fundamental, binary developmental decisions in biology, and one that most organisms, from bacteria to man, must make. The switch results in an obvious choice between two developmental fates: male/hermaphrodite in the case of the worm.

The worm is unusual in that it is adept at calculating fractions (Figure 1b). This worm not only understands how to count the number of X chromosomes, but it can count them with great accuracy and fidelity. You and I have two sets of non-sex chromosomes. We are diploid, and a worm in the wild is also diploid most of the time. A diploid worm that has one X chromosome is a

male (1X to 2 sets of autosomes is an X:A ratio of 0.5). A diploid worm that has two X chromosomes is a hermaphrodite (2Xs to 2 sets of autosomes is an X:A ratio of 1). Impressively, this worm is more skillful than simply being able to count to two. It can calculate fractions. We can generate worms in the lab with unusual combinations of chromosomes, and remarkably, the worm can figure out the tiny differences in these ratios and commit, reproducibly, to becoming a fertile male or hermaphrodite. The worm translates ratios between 0.5 and 0.67 into the male fate, and ratios between 0.75 and 1 into the hermaphrodite fate.

That ability fascinated me. My desire to understand the mechanism launched my studies. What enabled us to figure out part of the answer is that we discovered the genetic and molecular target of this specific chromosome-counting mechanism (Figure 1c). We found a gene we named *xol-1* for XO-lethal (male lethal). This is where the death part comes in. I will explain the cause of death shortly.

When an animal is programmed genetically to be a male, the level of *xol-1* is high. When an animal is programmed genetically to be a hermaphrodite, the level of *xol-1* is low. I wanted to understand what this switch did and how it knew what to do.

A pan balance shows the answer in simple form (Figure 1d). If a diploid organism (AA, two sets of autosomes) has two X chromosomes (XX), it becomes a hermaphrodite. If this diploid organism (AA) has only one X chromosome, it becomes a male. We were able to discover the features of the X chromosomes and autosomes that are count-

ed. We found that specific genes encoded on X chromosomes, called X-signal elements (XSE), act as repressors of *xol-1*, and genes encoded on autosomes called autosomal-signal elements (ASE) act as activators of *xol-1*. The XSE repressor genes outcompete the ASE activator genes to repress *xol-1* when present in two copies, due to two X chromosomes. Or they allow *xol-1* to remain active when present in one copy. In that case, the ASE activators win. It is a simple switch. The complication is that the switch controls both sex and death.

Although we discovered the molecular basis of the sex signal and its direct target, the master sex-determination-switch gene *xol-1*, a fundamental question remained:

How is the signal interpreted reproducibly in an “all or none” manner to elicit either male or hermaphrodite development, never intersexual development? We have pioneered new approaches to answer these questions by developing methods with single-molecule and single-cell resolution. These methods enable us to count the number of molecules made from individual sex-determination genes – *xol-1*, XSE, and ASE – in every cell of an embryo and compare them across hundreds of embryos with different numbers of chromosomes.

The innovation that makes this analysis possible is a new network architecture for machine learning we are developing with James Sethian, a mathematics professor at

the University of California, Berkeley. It automatically renders every cell in an embryo in 3 dimensions (3D) so that the total number of specifically labeled molecules in each cell can be counted. The network is trained by comparing a 3D stack of hundreds of high-resolution images of an embryo having all of its cell membranes lit up with a green fluorescent protein to a second 3D stack of training images made from the same embryo having all cell boundaries manually outlined to model intact membrane structure. The training set takes weeks of labor to prepare per embryo – an arduous task! Then, applying the newly trained neural network to a new 3D stack of images from a different embryo automatically segments the cell boundaries with stunning accuracy and speed (a few seconds). Once the cell boundaries are defined, quantification of all the labeled molecules in a cell can be automated.

Now we return to the connection between sex and death. This relationship is best understood in the context of some well-known human genetic disorders. I am sure you are all familiar with the condition called Down syndrome, in which three copies of chromosome 21 are present instead of two (Figure 2a). The elevated levels of gene products from the extra chromosome 21 cause numerous abnormalities, creating problems in development. Down syndrome is one of the few examples in which three copies of a human chromosome is even compatible with life. Three copies of almost any other chromosomes would cause a developing fetus to die.

In a similar vein, males and hermaphrodites in worm species require equivalent levels of X-chromosome products, despite the fact that males have only one X and hermaphrodites have two. As the nematode sex-determination mechanism evolved, a dosage compensation process co-evolved to equalize X expression between the sexes. We found that *xol-1* controls not only sex

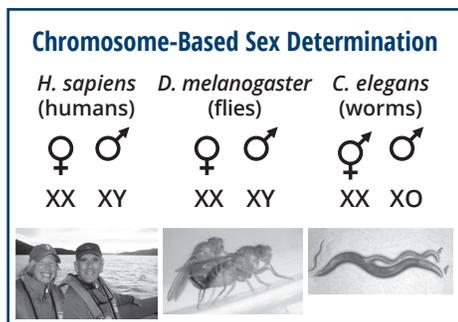


Figure 1a

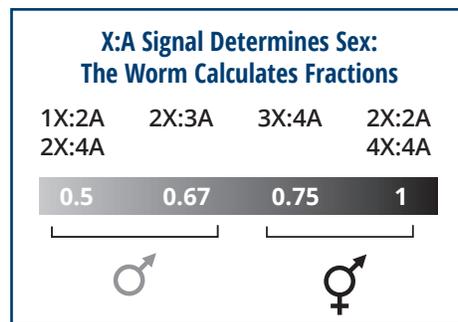


Figure 1b

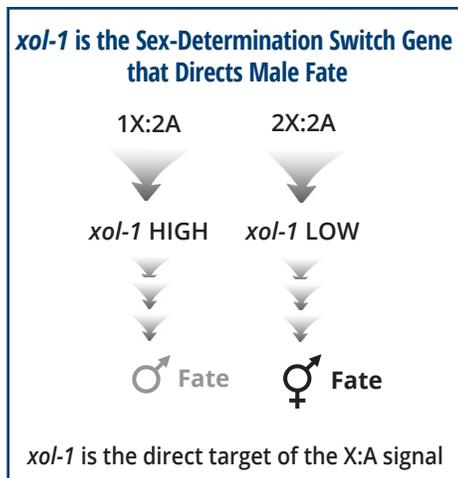


Figure 1c

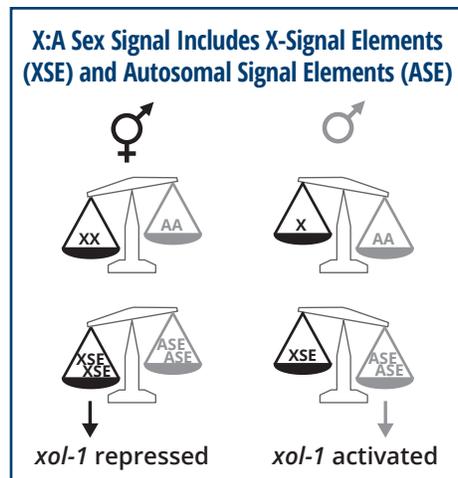


Figure 1d

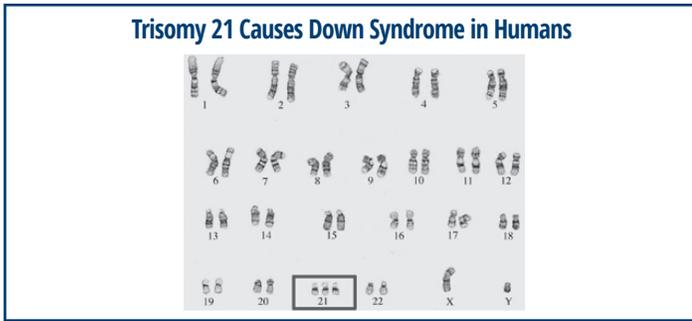


Figure 2a

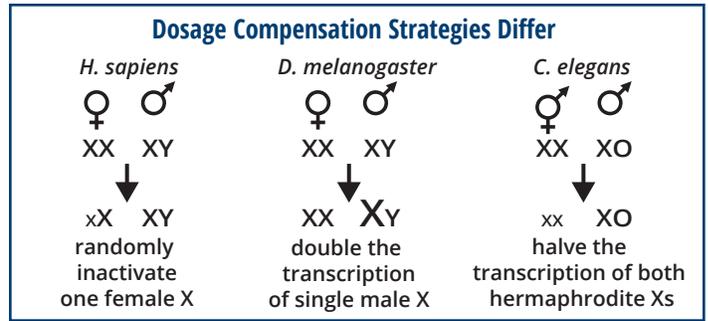


Figure 2b

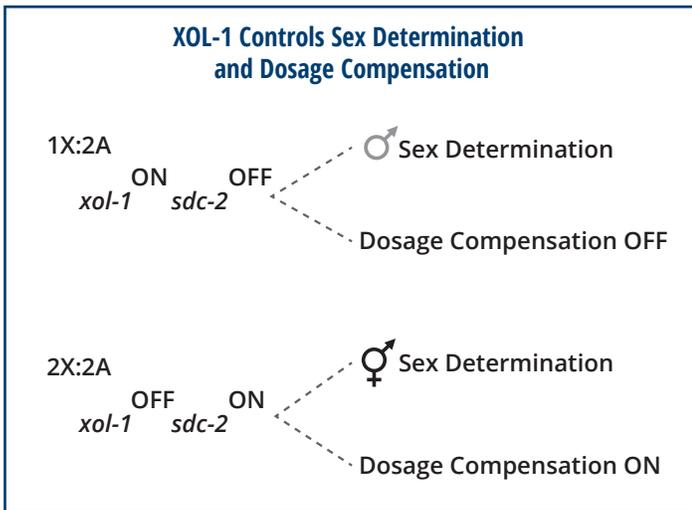


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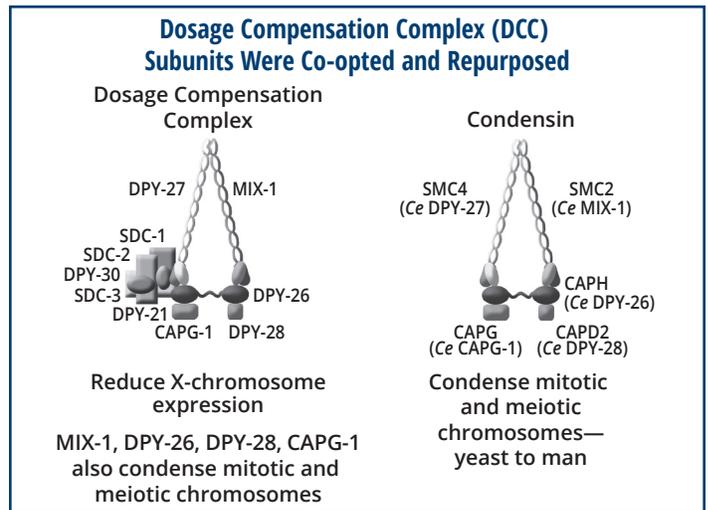


Figure 2d

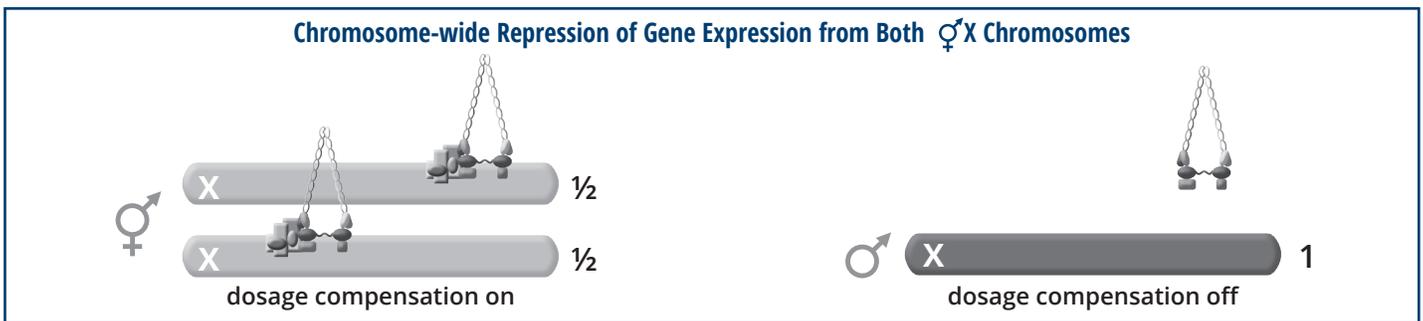


Figure 2e

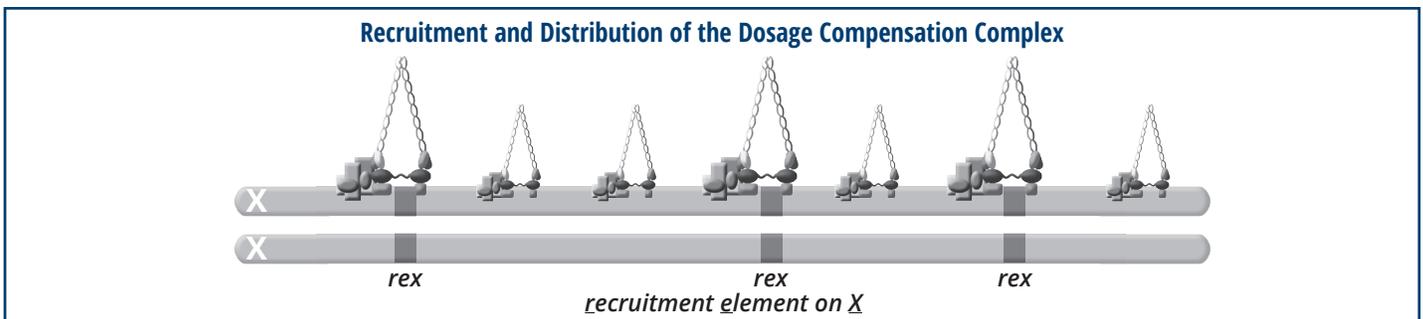


Figure 2f

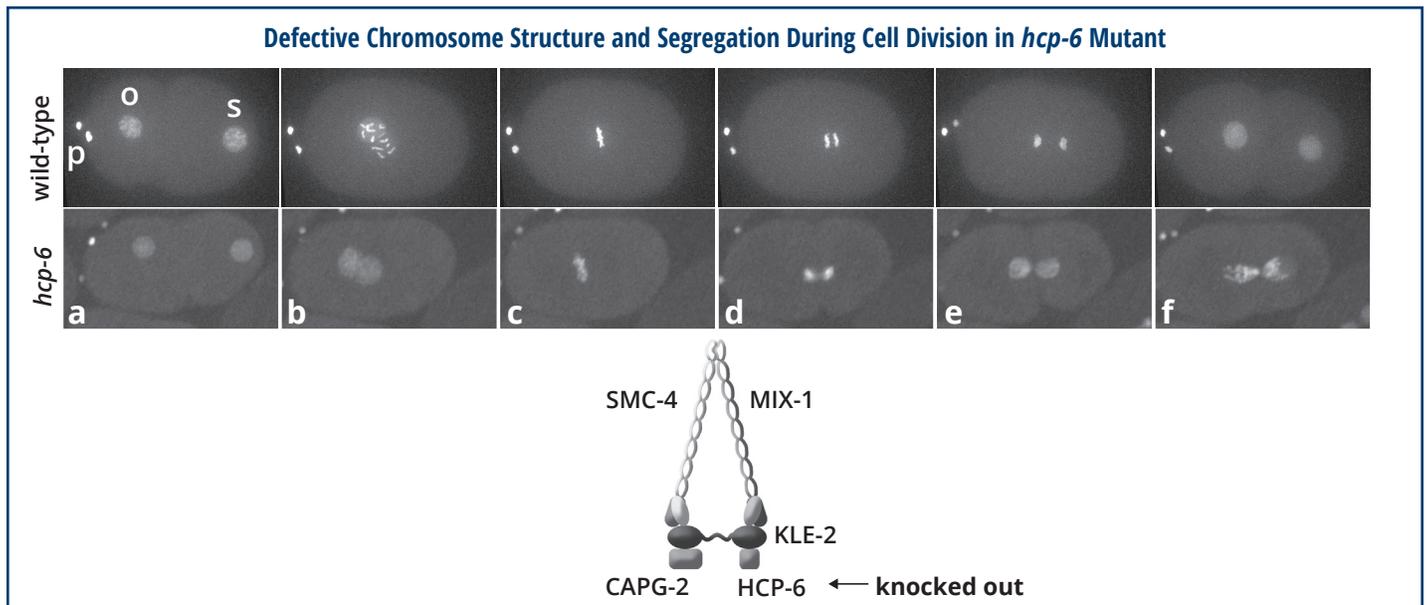


Figure 3a-f

determination, but also dosage compensation. If *xol-1* is turned off accidentally in a male, he will die from an incorrect level of X-chromosome gene expression. Thus, sex and death are indeed linked.

Most organisms that determine sex by a chromosomal mechanism have co-evolved an X-chromosome dosage compensation process. The strategies differ (Figure 2b). For example, for every female in this room, a process called X-inactivation occurs. We have two X chromosomes, and one is inactivated randomly in every cell throughout our lifetimes. If X inactivation fails to occur in the fetus, she will die. In the fruit fly, the dosage compensation mechanism turns up expression from the single male X. Failure to turn up expression of the male X will cause the male to die. In the worm, we showed that a dosage compensation mechanism turns down expression of both hermaphrodite X chromosomes by half. A hermaphrodite that fails to turn on dosage compensation will arrest development as an embryo and die. Understanding how the worm dos-

age compensation process occurs is a daunting problem to solve, and we have been able to tackle it through the combination of multiple different approaches.

Genetically, we learned that when *xol-1* is activated in a male, it turns off a hermaphrodite-specific gene called *sdc-2* (sex determination and dosage compensation) (Figure 2c). In so doing, it turns on the pathway of male sexual differentiation and prevents the dosage compensation process from turning down expression of the single male X. When *xol-1* is turned off in the hermaphrodite by the XSEs, *sdc-2* is active; *sdc-2* then turns on the pathway of hermaphrodite sexual differentiation and triggers the process of dosage compensation to turn down gene expression from both hermaphrodite X chromosomes.

Through genetics and biochemistry, we discovered a huge complex of proteins (including SDC-2) that binds to both hermaphrodite X and turns down expression of genes by half (Figure 2d). The worm cleverly co-opted and repurposed several proteins

used in other essential biological processes from yeast to man. The co-opted proteins were originally required to compact and resolve replicated chromosomes in preparation for their segregation into daughter cells during somatic cell division (mitosis) or into sperm or eggs to make fertile gametes (meiosis). The worm co-opted the proteins for the entirely new purpose of regulating gene expression. We were able to find all the genes encoding these proteins by powerful genetic screens in which we searched for mutations that prevented *xol-1* mutant males from dying. Not only did the worm steal many proteins for a new role, it continued to use these proteins in their old roles of compacting chromosomes in preparation for their segregation. The worm co-opted the ancient proteins for new roles via the evolution of worm-specific proteins that associate with the conserved chromosome compaction proteins and recruit them to X chromosomes at the appropriate time in embryogenesis, giving them two roles in the same cell (Figure 2d).

We showed that these promiscuous dosage compensation complex (DCC) proteins are recruited specifically to hermaphrodite X chromosomes by the XX-specific protein SDC-2, which triggers binding to *cis*-acting regulatory elements on X called *rex* sites (recruitment elements on X) to reduce gene expression by half (Figures 2e and f). The strongest of these sites have DNA sequence motifs that are highly enriched on X and confer specificity for SDC-2 binding to X. The complex then spreads along the entire X chromosome to sites that lack the X-enriched sequences (Figure 2f). XOL-1 prevents the DCC from binding to the single X chromosome of males by turning off SDC-2. If XOL-1 is defective, SDC-2 recruits the DCC to the male X, reduces gene expression, and kills all males, showing the connection between sex and death.

To help conceptualize the molecular function of the dosage compensation complex, the individual images in Figure 3 compare chromosome structure and segregation in wild-type embryos and embryos that are defective in one of the ancient chromosome segregation proteins from which the DCC was derived. (HCP-6 is related to DPY-28.) A green fluorescent histone protein that binds along the lengths of all chromosomes was used to visualize the chromosomes. The first images show a one-cell embryo just after a sperm (s) fertilized the oocyte (o), and the oocyte chromosome number was reduced to one copy (Figure 3a) by segregation of the extra copies into discarded structures called polar bodies (p). In the wild-type embryo, individual chromosomes condensed into distinct rod-shaped bodies as the sperm and oocyte chromosomes migrated toward each other (Figure 6b). In mutants, individual chromosomes remained disorganized and stringy during migration, but eventually achieved compaction somewhat similar to wild-type chromosomes as they aligned before for their segregation into daughter cells

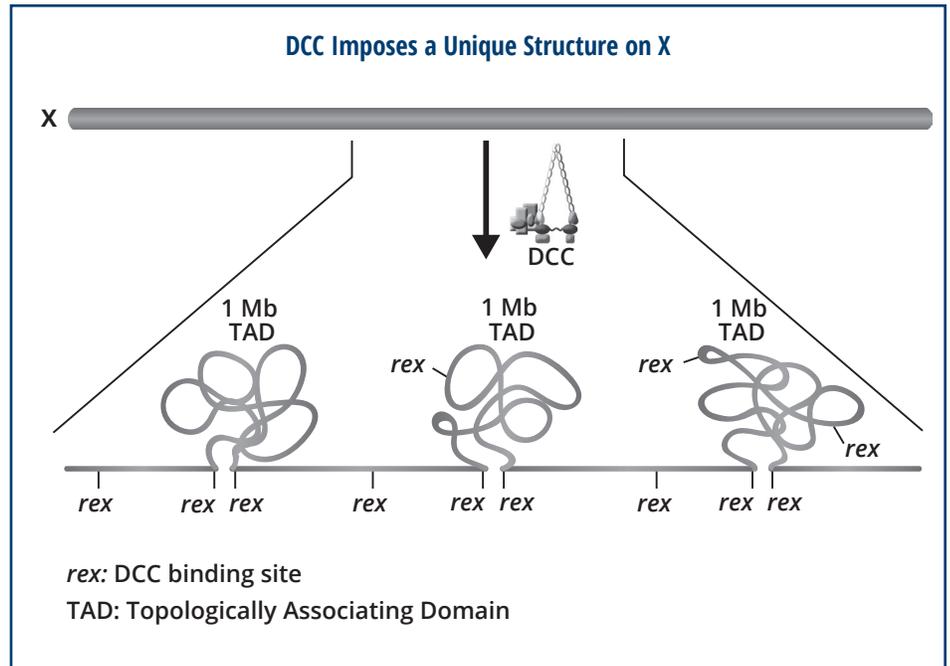


Figure 4a

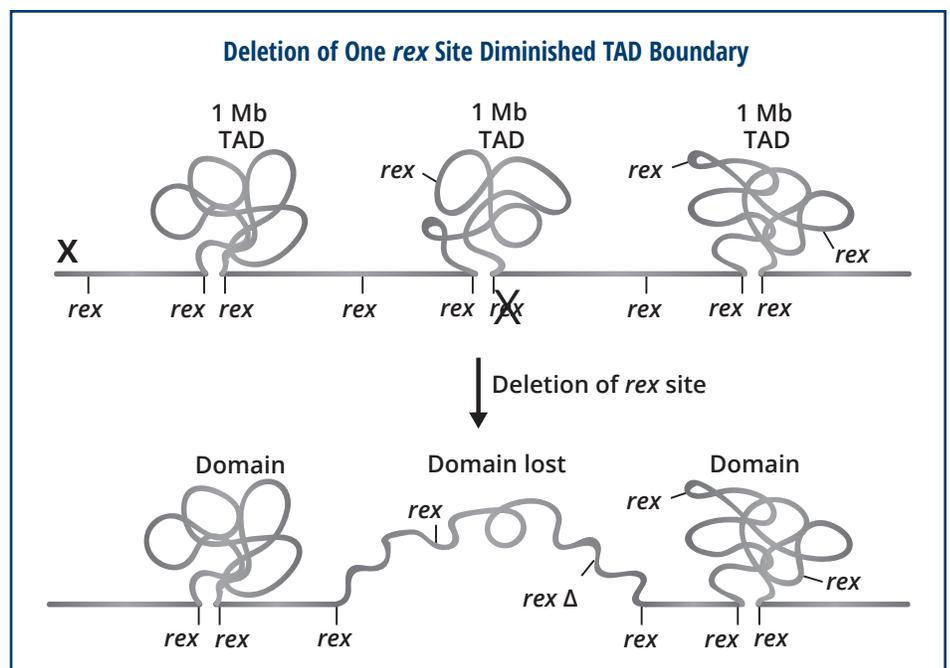


Figure 4b

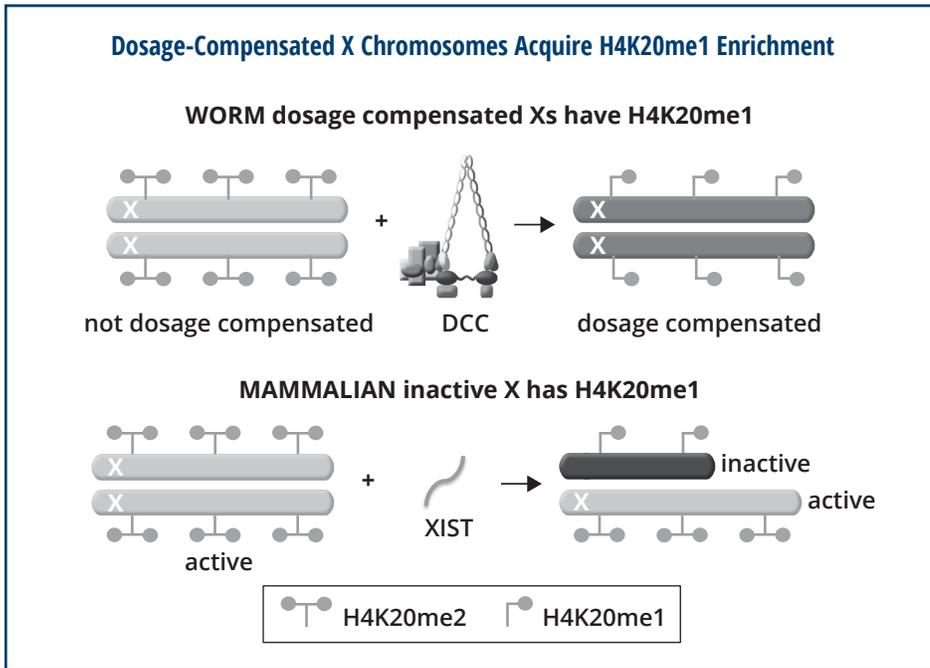


Figure 5a

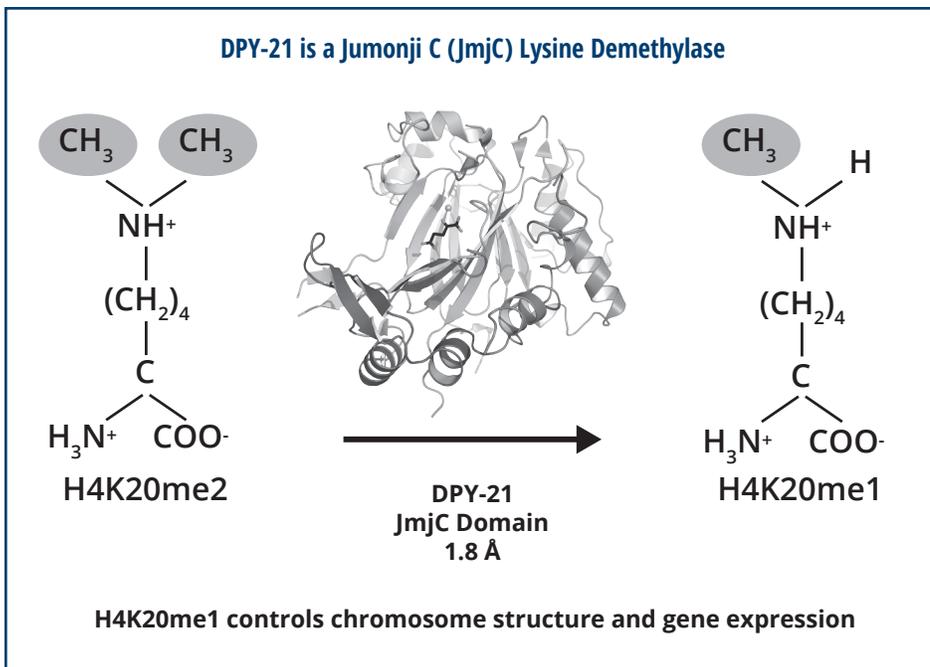


Figure 5b

(Figure 3c). Chromosomes from wild-type embryos separated suddenly and completely during this first cell division, but mutant chromosomes failed to resolve their connections and remained attached by chromosome bridges (Figures 3d and e). Ultimately, segregated wild-type chromosomes partitioned equally into the two daughter cells and then decondensed. In contrast, mutant chromosomes never fully separated but instead remained strongly interconnected such that the two daughter cells received different chromosomal contents, neither of which had the correct number or type of chromosomes (Figure 3f). Mutant embryos eventually died from improper chromosome content due to chromosome segregation problems. Clearly, these ancient proteins are essential for proper chromosome compaction, resolution, segregation, and thus embryo viability.

Both the similarity between DCC proteins and ancient chromosome segregation proteins, and the participation of DCC proteins in chromosome compaction, resolution, and segregation suggested that the DCC might influence X-chromosome gene expression by regulating the structure of X chromosomes.

We performed a series of experiments to determine whether the DCC reshapes the structure of X chromosomes and found that it does (Figure 4a). The DCC remodels hermaphrodite X chromosomes into a unique, sex-specific spatial conformation, distinct from that of autosomes or male X chromosomes, by using its strongest binding sites (*rex* sites) to facilitate long-range interactions among regions of DNA across X. The dosage-compensated X chromosomes have self-interacting domains called topologically associating domains (TADs) (Figure 4a). Sites on the DNA within each domain can interact, but a region of DNA in one domain cannot interact with a region in the other. In mammals, this type of structure restricts the

genes and regulatory DNA that can associate with each other. In so doing, the structure facilitates proper development of an animal's body plan and prevents inappropriate gene activation that causes defective development.

We found that most of the TAD boundaries on X coincide with a strong *rex* site (Figure 4a) and that disrupting the SDC-2 component of the DCC prevented the structure from forming. Importantly, we were able to use the modern techniques of genome editing to delete a *rex* site at a boundary and discovered that the TAD boundary was lost completely (Figure 4b). Thus, the *rex* site is essential for the formation of the boundary. Moreover, when we simultaneously deleted all of the *rex* sites at the DCC-dependent TAD boundaries (eight in total), the unique structure of X was destroyed. The X changed from a highly ordered structure into a more random structure. I have drawn these results as a cartoon, but you can trust me that we have large data sets that underlie this conclusion!

We were surprised to find that the hermaphrodites were still alive, even though the structure of their X chromosomes was disrupted. However, further analysis revealed that the lifespan of the mutant worms was not normal: the mutant worms died prematurely. They had progeria. Their lifespans were reduced by 20 percent. Moreover, the mutant worms were more sensitive to heat and other stresses than wild-type worms. The reduced tolerance to heat caused 40 percent more of the mutant animals to die than wild-type animals. Thus, the special structure of X seems to be important to enable the worm to have a normal life. Without the structure, the worms undergo premature death and are less tolerant to heat and other stresses.

We also found that the DCC modifies X chromosomes in other important ways that are critical for proper X expression. We discovered that the DCC modifies the chemi-

cal composition of histone proteins on the X chromosome (Figure 5a). Dosage-compensated X chromosomes have a unique signature: the amino acid lysine 20 in the histone H4 protein carries one methyl group. The male X chromosome and dosage-compensation-defective hermaphrodite X chromosomes are different. Their lysine 20 in histone H4 carries two methyl groups. We discovered through X-ray crystallography, biochemistry, and imaging that the DPY-21 subunit of the DCC has an enzymatic activity that specifically removes one of the methyl groups on lysine 20 of histone H4. DPY-21 has a Jumonji C lysine demethylase activity that converts H4K20me2 to H4K20me1 (Figure 5b). Using genome engineering to change a single amino acid in DPY-21 that is important for this catalytic activity eliminated the enrichment of H4K20me1 on X. It also caused elevated X-chromosome gene expression, a hallmark of defective dosage compensation, reduced X-chromosome compaction, and disrupted X-chromosome conformation by diminishing the formation of TADs.

These studies are directly related to the development of mammals. As I mentioned previously, human females have one active X chromosome and one inactive X. The inactive mammalian X has the same chemical modification as the dosage-compensated worm X chromosomes. The inactive X has H4K20me1, but the active one has H4K20me2 (Figure 5a). We discovered that mammals have a protein that is very similar to DPY-21 and demonstrated *in vitro* that the mammalian protein has the same enzymatic activity as DPY-21. It converts H4K20me2 to H4K20me1, just as in worms, making it likely that the mammalian protein influences the composition and activity of the inactive X. Our findings emphasize the important concept that for many aspects of biology, understanding a process in humans relies on lessons learned via complementary studies in model organisms.



Figure 6a

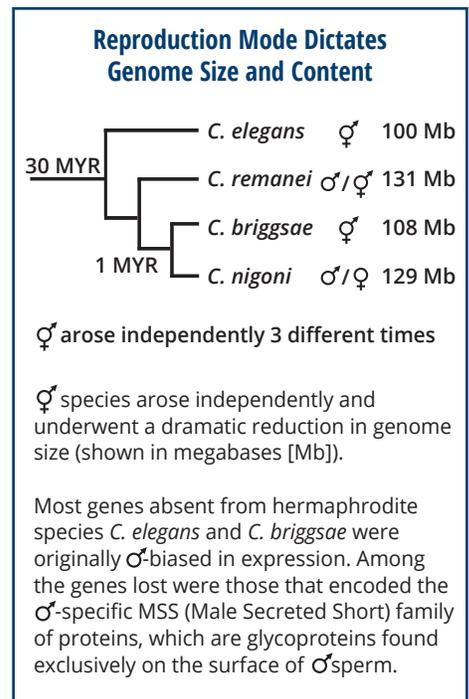


Figure 6b

In isolated environments where food is limited and males are scarce, reproduction and survival are more successful if all progeny can be produced by a single parent.

Analysis of nematode sex is also invaluable for understanding other aspects of biology, particularly evolution. My final remarks will then be about evolution. Thus far I have discussed how chromosome content dictates sexual fate and X-chromosome gene expression. But let me now describe surprising results about the converse: The mode of sexual reproduction (hermaphrodite vs. male/female) dictates genome size and content. This work, in collaboration with Eric Haag's lab (University of Maryland), Asher Cutter's lab (University of Toronto), and Erich Schwarz (Cornell University), was featured recently in *The New York Times* Science Trilobites section (Figure 6a). In the nematode genus *Caenorhabditis*, most species are male/female, but self-fertile hermaphroditic species like *C. elegans* have arisen independently at least three times. These hermaphroditic species are able to produce males but rarely do so in the wild. Uniparental reproduction via self-fertilizing hermaphrodites is thought to have been more adaptive than biparental reproduction via mating for survival in isolated habitats in which males and food were scarce, at least over the relatively short term.

We found that loss of virile males in the species was accompanied by the rapid shrinkage of the genome and loss of genes biased for expression in males (Figure 6b). At least 25 percent of the genome was lost from hermaphrodite species compared to closely related male/female species. Among the genes lost were those that encoded the family of MSS (Male Secreted Short) sperm proteins. They are glycoproteins found on the surface of male sperm. None of the hermaphrodite species has these genes, al-

though small, inactive remnants of the genes were found. All the male/female species have these genes. Why are these genes important?

The MSS sperm-specific proteins are essential for enabling sperm to compete with other sperm, win the fight, and fertilize the oocyte. Remarkably, removing this *mss* gene family from the male/female species *C. remanei* by genome editing rendered the mutant male sperm unable to compete with normal sperm from the wild-type species, even though the mutant sperm could successfully fertilize oocytes in the absence of the normal sperm. A series of competitive mating experiments showed this phenomenon. If the wild-type male was allowed to mate first and the mutant male second, the wild-type male sired the progeny. Even if the mutant male mated first and the wild-type male mated second, the wild-type male sired the progeny. If the mutant male was the only male allowed to mate, he sired a normal number of progeny.

An even more compelling experiment was to take the *mss* gene family from the male/female species *C. nigoni* and add it to its closely related hermaphrodite species *C. briggsae* (diverged by only about one million years) and ask if the MSS-containing sperm became more potent and thus more competitive. The MSS-containing sperm always won the competition! *C. briggsae* males with the MSS sperm protein outcompeted *C. briggsae* males lacking the MSS sperm protein no matter if the MSS-containing males mated first or second. Finally, a mating between wild-type *C. briggsae* males and hermaphrodites yielded 50 percent cross-progeny males in the first generation,

as expected. If their progeny was allowed to propagate continuously until the twelfth generation, no males persisted in the population: the hermaphrodite mode of replication won out. In contrast, while a mating between *mss* mutant *C. briggsae* males and hermaphrodites also yielded 50 percent cross-progeny males in the first generation, by the twelfth generation, 30 percent of the offspring was still male, demonstrating a marked increase in the effectiveness of these males versus hermaphrodites.

These experiments demonstrate that the MSS protein family is key for sperm fitness and competitiveness, and hence male virility. Why would a species give up males? What is the advantage of being a self-fertile hermaphrodite species? In isolated environments where food is limited and males are scarce, reproduction and survival are more successful if all progeny can be produced by a single parent. To reach that state, genes important for efficient reproduction through mating must be eliminated. The dramatic transition in mode of reproduction is a compelling evolutionary adaptation for survival.

I'll end with that thought. I thank my lab members and funding sources throughout the decades for conducting and enabling this exciting research. Thank you for listening and thank you for this award. ■

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Songs of Love and Death: *I madrigali a cinque voci* (Venice, 1542) by Cipriano de Rore (1515/16–1565)

In 2015, the American Musicological Society gave the Noah Greenberg Award to musicologist Jessie Ann Owens and the vocal ensemble Blue Heron, directed by Scott Metcalfe, for their project to produce the world premiere recording of Cipriano de Rore's landmark *I madrigali a cinque voci* (Venice, 1542). The award, named for the founder of the New York Pro Musica Antiqua, encourages cooperation between scholars and performers and recognizes outstanding contributions to historical performing practices.

On May 3, 2018, Owens spoke at the Academy about Cipriano's music; following her presentation, Blue Heron performed a selection of madrigals drawn from his 1542 publication. The program, which served as the Academy's 2067th Stated Meeting, included a welcome from Jonathan F. Fanton (President of the American Academy) and an introduction by Jane A. Bernstein (Austin Fletcher Professor of Music Emerita at Tufts University). The following is an edited version of Jane Bernstein's introduction and Jessie Ann Owens's presentation.



Jane A. Bernstein

Jane A. Bernstein is the Austin Fletcher Professor of Music Emerita at Tufts University. She was elected a Fellow of the American Academy in 2005.

Introduction

It is a great honor for me to introduce this evening's program: "Songs of Love and Death: Selections from Cipriano de Rore's *I madrigali a cinque voci* of 1542." I am particularly excited to do so because this event exemplifies a true collaboration between mu-

sic scholarship and performance presented by my dear friend and colleague, Professor Jessie Ann Owens, and Boston's premiere early music ensemble, Blue Heron.

Jessie Ann Owens is one of the foremost scholars of Renaissance music. She is Distinguished Professor Emeritus of Music and former Dean of the Humanities, Arts, and Cultural Studies at the University of California, Davis. She has had a long and outstanding career as a teacher, scholar, and administrator. Before coming to UC Davis, she taught at the Eastman School of Music and then at Brandeis University, where she served first as Dean of the College and then as Dean of Arts and Sciences. She also holds the distinction of serving as president of two scholarly societies: the American Musicological Society and the Renaissance Society of America.

Her research in the Renaissance has centered on the Este Court in mid sixteenth-century Ferrara, compositional process, the Italian madrigal, Elizabethan and Jacobean music treatises, and the music of Cipriano de Rore. Not known to shy away from challenging projects, Professor Owens served as editor of the monumental thirty-volume series *The Sixteenth-Century Madrigal*, which for the first time made available to performers literally thousands of Italian madrigals in modern score. She is also acclaimed for her

pathbreaking book, *Composers at Work: The Craft of Musical Composition 1450–1600*, published by Oxford University Press, which received the 1998 ASCAP-Deems Taylor Award. In this highly original study, Owens tackles the question of how Renaissance musicians wrote their music, offering for the first time a systematic examination of composers' autograph manuscripts before 1600. But it is her long and continuous work on the Flemish composer Cipriano de Rore and the madrigal that has led to her remarkable collaboration with Blue Heron.

The Italian madrigal is a unique musical/poetical genre, where, as the composer Mazzone de Miglionico in his 1569 First Book of Madrigals put it, "the notes are the body of music, but the words are the soul." The vocal ensemble Blue Heron is the ideal partner for this important project, since under the leadership of Scott Metcalfe, the Boston-based group has been widely admired for its highly sensitive performances and its commitment to the understanding of the texts. Blue Heron has been praised by both music critics and scholars alike as one of the finest early music ensembles specializing in the Renaissance musical repertory.

Professor Owens's and Blue Heron's mission has been to bring to life again one of the most important works of the sixteenth century by creating the first recording of

Cipriano de Rore's first book of madrigals from 1542. For this exciting project, they have received the coveted Noah Greenberg Award from the American Musicological Society. Some of you may have heard of Noah Greenberg, who, in 1952, founded the New York Pro Musica, one of the first early music ensembles in North America, most famous for its revival of the great medieval masterpiece, *The Play of Daniel*. The Award, established by the Trustees of the New York Pro Musica Antiqua in memory of their first director, is intended as a grant-in-aid to stimulate active cooperation between scholars and performers by recognizing and fostering outstanding contributions to historical performing practices. What could be a more perfect project than this collaboration to produce a world premiere recording of Rore's landmark madrigal edition.



Jessie Ann Owens

Jessie Ann Owens is Distinguished Professor Emeritus of Music at the University of California, Davis. She was elected a Fellow of the American Academy of Arts and Sciences in 2003.

It is becoming clear, thanks in part to the collaboration with Blue Heron, that Cipriano de Rore's first book of madrigals is remarkable both for its unprecedented scale and for the intensity of its emotional journey. My thanks to the American Academy for giving me the opportunity to present these findings and to Blue Heron for their inspired and revelatory performances.

In 1542, a Flemish immigrant to Italy with no steady job that we know of burst onto the musical scene with a remarkable publication. Cupriaen De Rore, or Cipriano de Rore, as he signed his name in his letters, was twenty-seven years old, or possibly twenty-eight, and had never published any of his music when he brought out *I madrigali a cinque voci* with a leading Venetian music printer, Girolamo Scotto.

The title page of his 1542 publication is remarkably spare (see Figure 1). We learn

nothing about the composer beyond his name – Cipriano Rore. We now think he may have been working as a freelance composer and living in Brescia, not far from Venice, when this book was published. Just a few years later, in 1546, he would secure the most prestigious post in Italy, chapelmaster for the Duke of Ferrara, so maybe this book functioned like a dissertation or a first book to advertise the composer's skills to potential employers. He later served as chapelmaster at the Farnese court in Parma and then at San Marco in Venice. He returned to Parma and died there in 1565, at the age of forty-nine or fifty. The portrait in Figure 2, in a luxurious manuscript commissioned by Duke Albrecht V of Bavaria in 1559 and painted by court painter Hans Mielich, shows him at the height of his fame as a composer.

But there is more to be gleaned from the title page. "CANTUS" tells us that this is one of five separate volumes, or partbooks, one for each of the five voices. The singer with the highest voice sings the cantus, the top line. Each singer saw only his or her own part, much like the members of a string quartet today.

Then comes Cipriano's name, "CIPRIANO RORE," followed by a very brief title: "I madrigali a cinque voci," the madrigals for five voices. Most prints that contain madrigals – musical settings of Italian poetry – were part of a series, with titles such as "first book of madrigals for four voices," "second book," etc. By calling it "the madrigals," it is almost as though this would be his only book of madrigals. He would in fact go on to publish five books for five voices and two books for four voices. The title page ends with the conventional "nuovamente posti in luce," newly published, and information about the publication: the printer's mark, the printer, and place and year of publication.

Equally interesting is what is not present. The book lacks a privilege, a form of copyright protection granted by the Venetian

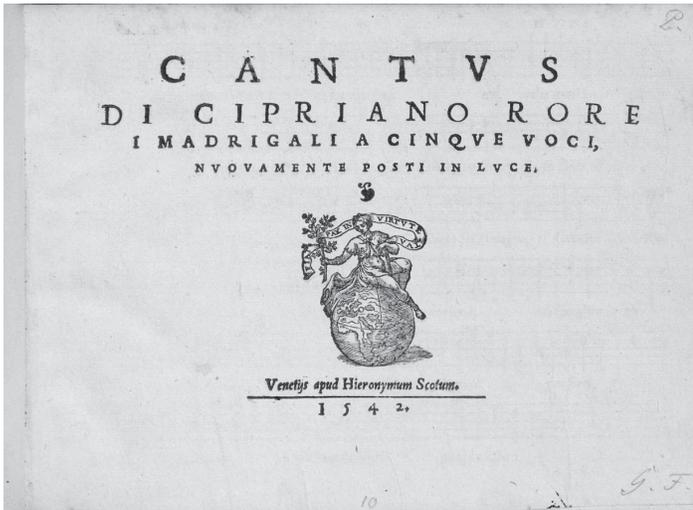


Figure 1. Title page, *Di Cipriano Rore i madrigali a cinque voci* (Venice, 1542), Wien, Österreichische Nationalbibliothek, Musiksammlung, SA.77.D.5/1-5 (used by permission).



Figure 3. Title page, *Cypriani Rore motetta nunc primum summa diligentia in lucem prodita. Quinque vocem* (Venice, 1545), Wien, Österreichische Nationalbibliothek, Musiksammlung, SA.77.D.32/1-5. Harald Fischer Verlag Online Collection "Die Musikdrucke der Staats- und Stadtbibliothek Augsburg 1488–1630" (used by permission).



Figure 2. Hans Mielich, portrait of Cipriano de Rore, 1559, Munich, Bavarian State Library, Mus.ms. B, p. 304 (used by permission). Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0).

government that is typically printed on the title page: "cum gratia et privilegio." The image in Figure 3 shows the title page of his 1545 book of motets, for which he did obtain a privilege. Did he not understand in 1542 the value of a privilege for protecting his intellectual property and creative work? Or did he lack the means for filing an application? The 1542 book became a best-seller, and four different printers brought out nearly a dozen editions over the course of the century.

Most striking is the absence of a dedication, the customary way of thanking a patron for financial support. The verso of the title page, where a dedication would typically be placed, has been left blank. Does this mean that Cipriano paid for the first edition of the book himself? Or was there possibly a patron who preferred to remain unnamed? Cipriano, unlike many composers, would never play the dedication game (trading a dedication for a subvention), and he never dedicated any of his prints to a patron.

At the very end of the 1542 *I madrigali a cinque voci* is the table of contents (see Fig-

ure 4), a simple list of the twenty pieces in alphabetical order, most with the notation "con la seconda parte" (indicating a madrigal divided into two sections). Nothing draws attention to the special character of the contents. In fact, this print marked a significant change in the kinds of Italian texts composers were setting, away from lighter and shorter texts to serious texts drawn above all from the *Rerum vulgarium fragmenta*, or *Canzoniere*, the collection of 366 lyric poems by Francesco Petrarca (1304–1374), known in English as Petrarch (see Table 1). Sixteen of the twenty madrigals in the 1542 book are sonnets, the first time the sonnet would so dominate a publication, and twelve of them are by Petrarch. This publication marked a decisive turn toward the unparalleled popularity of Petrarch among composers in the middle decades of the sixteenth century.

Stylistically, the music made a comparable shift: from the relatively simple chanson-like style of the early madrigal, typically for four voices, to a highly wrought setting

TAVOLA			
Altiero fesso	6	Per mezzo i boschi, con la seconda parte	
Amor che vedi, con la seconda parte	17	te	11
Ben si conuien a voi	18	Persequendomi amor, con la seconda parte	
Cantai	1	te	13
Cbi vol veder, con la seconda parte	14	Quand'io son tutto volto, con la seconda parte	
Da qui bei lumi	20	Quanto piu m'auicino, con la seconda parte	4
Far potesse io vendetta, con la seconda parte	16	te.	12
Hor che'l ciel e la terra, con la seconda parte	2	Quel sempre acerbo, con la seconda parte	
Hor che l'aria et la terra, con la seconda parte	19	te	15
Il mal mi preme, con la seconda parte	10	Solta lontana, con la seconda parte	5
La vita fugge, con la seconda parte	8	Stroue rupi, con la seconda parte	7
Pogian' al ciel, con la seconda parte	3	Tu piangi, con la seconda parte.	9
		FINIS.	

Figure 4. Table of contents, *Di Cipriano Rore i madrigali a cinque voci* (Venice, 1542), Wien, Österreichische Nationalbibliothek, Musiksammlung, SA.77.D.5/1-5 (used by permission).



Figure 5. Giovanni Brevio, coat of arms, Arqua Petrarca (photo: Owens).

that used imitative polyphony of the sort more commonly found in motets, usually for five voices. These are long pieces, mostly in two sections (usually with the first eight lines of the sonnet in the first, the last six in the second), written in the new “black note” rhythmic notation. It is no exaggeration to say that with this print De Rore established the madrigal as a genre that would celebrate the fusion of music and poetry.

Other features of this publication have revealed themselves only gradually. Cipriano chose to compose and organize the music in the order of the modes, a kind of predecessor of keys in later music, from mode 1 to mode 8 (see Table 1). Only the final three pieces in the book do not adhere to this scheme. He distinguished between the pairs of modes – 1 and 2, 3 and 4, and so forth – through range: the contrast between high and low shown by the choice of clefs (the high g_2 versus the low c_1).

This is the earliest collection of polyphonic music to use modal order, first recognized by Bernhard Meier in 1963 and remarked on by many scholars since then. In fact, Cipriano seems to have been among the first composers to understand how to translate the concepts associated with modality, devised originally for monophonic chant, for polyphonic music. The models he established would be followed by composers such as Palestrina and Lasso for the rest of the century.

Until now, however, no one has asked the why question: *why* would Cipriano decide to compose and organize this collection according to the eight modes? The answer gets at the heart of why this is such an important print. I believe that the texts form a previously unrecognized cycle of sixteen sonnets, a sequence that tells a story through words and – this is the crucial point – also through music by using modes to bring out the affect of the text.

The print divides into four large groups, with pieces ending on G, then E, then F, and then G again (the final three pieces stand outside this scheme). These groups can be seen as an orderly and logical series of moves through four scale types or sounds, each with a distinctive ordering of whole and half steps:

G with a flat (D transposed up a fourth)
E
F with a flat
G

We can rearrange these four scale types or characteristic sounds along a continuum from the most minor sound, E phrygian, with its distinctive half-step opening, to the very bright F major, a continuum from darker to lighter:

Darker (E)
Dark (G with a flat)
Light (G)
Lighter (F with a flat)

Table 1: Contents of Cipriano de Rore, *I madrigali a cinque voci* (1542)

No. First line	Poet	Form	Mode	Type (Key)
1 Cantai, mentre ch'i arsi del mio foco	Brevio	14-line ballata	1 tr.	b g2c2c3c3F3 G
2 Or che'l ciel et la terra e'l vento tace	Petrarch 164	sonnet	1 tr.	b g2c2c3c3F3 G
3 Poggiand'al ciel coll'ali del desio	anon	sonnet	1 tr.	b g2c2c3c3F3 G
4 Quand'io son tutto volto in quella parte	Petrarch 18	sonnet	2 tr.	b c1c3c4c4F4 GG
5 Solea lontana, in sonno consolarne	Petrarch 250	sonnet	2 tr.	b c1c3c4c4F4 GG
6 Altiero sasso, lo cui gioco spira	Molza	sonnet	3	- c1c3c4c4F4 E
7 Strane rupi, aspri monti, alte tremanti	Amanio	sonnet	3	- c1c3c4c4F4 E
8 La vita fugge et non s'arresta un'ora	Petrarch 272	sonnet	3	- c1c3c4c4F4 E
9 Tu piangi et quella per chi fai tal pianto	Tebaldeo	sonnet	4	- c2c4c4F3F4 EE
10 Il mal mi preme et mi spaventa il peggio	Petrarch 244	sonnet	5	b g2c2c3c3F3 F
11 Per mezz'i boschi inospiti e selvaggi	Petrarch 176	sonnet	5	b g2c2c3c3F3 F
12 Quanto più m'avvicino al giorno estremo	Petrarch 32	sonnet	6	b c1c3c4c4F4 FF
13 Perseguendomi amor al luogo usato	Petrarch 110	sonnet	6	b c1c3c4c4F4 FF
14 Chi vol veder quantunque pò natura	Petrarch 248	sonnet	7	- g2c2c3c3F3 G
15 Quel sempre acerbo et onorato giorno	Petrarch 157	sonnet	7	- g2c2c3c3F3 G
16 Far potess'io vendetta di colei	Petrarch 256	sonnet	8	- c1c3c4c4F4 GG
17 Amor, che vedi ogni pensiero aperto	Petrarch 163	sonnet	8	- c1c3c4c4F4 GG
18 Ben si conviene a voi	anon	9-line madrigal	[1]	b g2c2c3c3F3 D
19 Or che l'aria et la terra	anon	11-line madrigal	[2 tr.]	b c1c3c4c4F4 GG
20 Da quei bei lumi ond'io sempre sospiro	Brevio	13-line ballata	[3]	- c1c3c4c4F4 E

Note: b/- indicates the presence or absence of a flat in the signature; g2c2, etc., refers to the kind of clef and its placement on the staff; and the capital letter refers to the sonority of the final chord (a double letter refers to the lower octave).

If we then arrange the groups as they appear in the print, we see the audible effect of this grouping:

Dark (G with a flat)
 Darker (E)
 Lighter (F with a flat)
 Light (G)

The first half is in the minor modes (using the dorian and phrygian scales on D [transposed to G with a flat] and E), and the second in the major modes (using the lydian and mixolydian scales on F and G). This large-scale tonal structure reflects the narrative

arc of the cycle, which moves from the darkness of love's pain and loss in the first half to resignation and acceptance in the second.

At the very center is *Tu piangi et quella per chi fai tal pianto*, the only piece to end on low E (EE), which serves as a pivot between the two halves:

Il viver nostro è un fior colto de spina;
 però piangi la tua, non la sua morte,
 ché morte è quella che se chiama vita.
 (Tebaldeo, 1989 ed.)

Our life is a flower grown from a thorn;
 so weep for your death, not for hers,

for death is that which is called life.
 (trans. Lloyd/rev. Owens)

Death and life are juxtaposed.

The book opens with a *ballata* by an unnamed poet that functions like a proem or introduction to the sonnet sequence, highlighting themes that would recur throughout the cycle. From the 1545 publication *Rime et prose volgari di M. Giovanni Brevio* we learn that the poet was Giovanni Brevio (ca. 1480–ca. 1560), a Venetian priest and novelist. He wrote both the opening *ballata* and the one that closes the book. His pres-

ence in these important positions in *I madrigali* could well function as a poetic signature. We know little about his life: nephew of a cardinal (by adoption), he spent time during the 1510s in Rome and again in the 1540s, and held ecclesiastical benefices in the Veneto. He lived in Padua and Venice and was friends with many of Italy's leading writers. Although no portrait has survived, we do have his coat of arms, showing crossed lion's paws (see Figure 5).

We will never know for sure, but it seems very likely that Brevio collaborated with De Rore to assemble this set of texts, mostly by Petrarch but also by contemporary imitators of Petrarch, and to organize them in such a way as to create a narrative that can be expressed through the affects of the modes. I do not have time to make a detailed case for reading these texts as a cycle, but I can draw attention, by way of example, to links among the four darkest texts, those set to the E mode. *Altiero sasso* and *Strane rupi* both con-

prints of Petrarch's *Canzoniere*, one of which survives today in Florence. It is a heavily annotated copy, in which he traces Petrarch's quotations and allusions. Brevio knew his Petrarch inside and out. He also shared with his friend Pietro Bembo (1470–1547), cardinal, poet, and influential literary critic, a fascination with fourteenth- and fifteenth-century manuscripts of the *tre corone* – Dante, Boccaccio, and Petrarch – and owned a now-lost manuscript copy of the *Raccolta Bartoliana*, a collection of medieval lyric poetry.

Antonio Tebaldeo (1463–1537) was a well-known poet and courtier, associated with the courts in Mantua and Ferrara. He then moved to Rome, and as a member of the circle around Pope Leo X could well have known Brevio. Brevio copied and annotated Tebaldeo's poetry in a manuscript anthology that I believe he compiled, which is preserved today in Venice. Tebaldeo's sonnet *Tu piangi*, the oldest poem in the 1542 collec-

only did they overlap in Rome, where Molza lived for most of his life in the entourage of Medici prelates (Pope Leo X, Pope Clement VII, Cardinal Ippolito de' Medici), but they certainly knew one another. A wonderful letter from the Florentine historian and *letterato* Benedetto Varchi to Molza describes his visit to Catajo in 1536, the villa south of Padua where the Italian noblewoman Beatrice Pia degli Obizzi held a literary salon. Varchi had a *canzone* by Molza that he recited by heart to Bembo and then brought with him in written form to Catajo. Beatrice was not there but Brevio was. Varchi writes:

La mattina seguente, vedete che particolari io conto perché vostra signoria intenda ogni cosa, andando presso ad Arquà per visitare la Cavagliera de gli Obizi [Beatrice Pia degli Obizzi], gliela presentai scritta, sendovi solamente monsignor Brevio, ed egli or forte, e or piano, e or cantando, la lesse tutta più di vinti volte sempre lodandola; all'ultimo mi disse alcune cose di non molta importanza, come vedrà vostra signoria, e io, dubitando di non tenerle a mente e per non errare, gliela riportai a casa, perché egli umanissimamente, presa la penna, scrisse di sua mano quello che vedrà vostra signoria. Quelli segni o fregghi sono dove sua signoria vorrebbe si mutasse, né allora gli sovveniva come; né m'accade dire altro circa la canzone, salvo che ringraziar vostra signoria da sua parte d'aver mandato a mostrargliela, che certo intende e parla di vostra signoria come ella merita e mostra amarla cordialissimamente . . . (ed. Bramanti, 2008)

The translation of the passage in bold is as follows: "I [Varchi] presented it to him [Brevio] in writing, and he read it more than twenty times, now loudly, now softly, and now singing it, always praising it." Brevio then took the poem home with him and

The revelation of Cipriano's 1542 publication – the novelty that must have come as a shock to listeners accustomed to simple settings of amorous texts – is the power of music to portray human emotion.

cern the natural world (words for rocks and cliffs – *rupi, sassi, pietre* – recur several times). In *Strane rupi*, *La vita fugge*, and *Tu piangi* there are repeated references to sadness – the sad heart (twice), the sad fate – and no fewer than six references to weeping. Similar kinds of connections run throughout the cycle.

I will be the first to admit that the evidence of a collaboration is circumstantial. But it is significant that I can tie Brevio, directly or indirectly, to all of the poets whose texts make up the 1542 print. Pride of place, of course, goes to Petrarch. Brevio is known to have owned two early sixteenth-century

tion, apart from Petrarch's, was published in 1498 and many times thereafter.

Niccolò Amanio (ca. 1468–ca. 1528), a lawyer and administrator as well as a poet, died without publishing his *rime*. They circulated in manuscript and then, from 1545, began to appear in printed anthologies published by the Venetian printer Gabriel Giolito di Ferrari. Brevio knew Giolito and could have been involved in that venture, which also included some of his own poems.

Perhaps the best documented connection is between Brevio and the poet and *bon vivant* Francesco Maria Molza (1489–1544). Not



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Figure 6. Jacopino del Conte, portrait of Vittoria Farnese (1550–1560, Image date: 1930), Galleria Borghese, Roma, http://library.artstor.org/asset/AZERIIG_10312611818. Web. 2 Jul 2018. Artstor.

annotated it with editorial advice for Molza, whom he professed “to love most cordially.”

Molza’s sonnet in the 1542 print, *Altiero sasso*, is a strange text that has resisted interpretation:

Proud rock whose yoke breathes the ancient honor of the great people of Mars; river that breaks this way and that, now quiet and still, now full of rage and fury; slopes that all the world still loves and desires; eternal memories consecrated by so many and such writings; and you, scattered relics, on which every good soul gazes with devotion—I seem to hear fleeing around you the waves sighing, and the branches, and the flowers, and the breeze lamenting, and the stones breaking from grief, be-

cause already the day of weeping draws near when the beautiful face that all of Italy honors, will leave you, wrapped in horror at her departure. (trans. Feldman/rev. Owens)

The first section is clearly a reference to Rome, to the Capitoline and the Tiber. The natural world laments “because the day of weeping draws near when the beautiful face that all of Italy honors will leave you,” i.e., Rome, “wrapped in horror at her departure.” Who is this “bel viso,” the lady whose departure all of Italy mourns? A recent publication by Franco Pignatti has identified the context: the sonnet was written by Molza when it seemed that the “bel viso,” namely, Vittoria Farnese (shown in Figure 6 in a portrait by Jacopino del Conte), the niece of Pope Paul III and a very valuable property in the marriage diplomacy that was a constant in European politics, was set to depart for France to marry a member of the French royal family, François, duc d’Aumale. The negotiations failed, however; he would go on to marry Anna d’Este and she Guidubaldo della Rovere. The sonnet thus has a firm terminus ante quem of Spring 1541, after which it lost its original purpose and was in effect useless, except perhaps to Giovanni Brevio, who could imagine putting it into the group of sad texts that De Rore could set in the mournful phrygian mode. We have to imagine a manuscript circulation of the sonnet, perhaps between Molza and Brevio. Cipriano likely encountered the text after Spring 1541, possibly in 1542, setting it as part of the cycle.

But how did De Rore and Brevio connect? My best guess is through Count Fortunato Martinengo, who Bonnie Blackburn argues may have been De Rore’s patron in the early 1540s. The count can be documented in Padua, as part of the circle around the newly formed *Accademia degli Infiammati*. A letter from 1540 suggests that Brevio would be invited to join; he was living in Padua, just

down the street from Sperone Speroni, who in 1541 would become Prince of the academy.

Unfortunately, we have no evidence of performances of the 1542 madrigals during the sixteenth century, and so we do not know whether they were intended to be sung as a set or in smaller groups or individually, or in all of these different ways. The scale is monumental by Renaissance standards, in which most pieces lasted only a few minutes. The scale is also monumental by today’s standards, which is why Blue Heron is focusing this year on half of the pieces, and next year on the other half. (The two-CD set will be issued in 2019.)

Let me close by considering one of the pieces Blue Heron will perform: *Amor, che vedi*, the Petrarch sonnet that closes the cycle. The cycle had opened with the poet-narrator setting forth two protagonists: Madonna, his lady, and Amor, the vengeful god who drove his pain:

Cantai, mentre ch’i’ arsi del mio foco
la viva fiamma ov’io morendo vissi,
ben che quant’io cantai e quant’io scrissi
di madonna e d’amor, fu nulla o poco.

I sang, while I burned from the living
flame of my fire where I dying lived,
although what I sang and wrote about
my Lady and about Amor was nothing
or little. (trans. Owens)

Amor, or Cupid, makes periodic appearances over the course of the cycle, and in the closing poem is addressed directly:

Amor, che vedi ogni pensiero aperto
e i duri passi onde tu sol mi scorgi,
nel fondo del mio cor gli occhi tuoi porgi
a te palese, a tutt’altri coverto.

Sai quel che per seguirte ò già sofferto,
et tu pur via di poggio in poggio sorgi
di giorno in giorno, et di me non t’accorgi.
che son sì stanco, e ’l sentier m’è
troppo erto.

Ben veggio io di lontano il dolce lume
ove per aspre vie mi sproni et giri,
ma non ò come tu da volar piume.

Assai contenti lasci i miei desiri
pur che ben desiando i' mi consume
né le dispiaccia che per lei sospiri.
(Petrarch, RVF 163, ed. Durling)

Love, you who see openly my every
thought and the harsh steps where you
alone guide me, reach your eyes to the
depths of my heart, which appears to
you but is hidden from all others.

You know what I have suffered in fol-
lowing you; and still day by day you
climb from mountain to mountain,
and pay no attention to me who am so
weary, and the path is too steep for me.

I do see from afar the sweet light to-
ward which you spur and turn me
through these hard ways; but I do not
have wings, as you do, to be able to fly.

You leave my desires content as long as
I am consumed with a high love [desir-
ing well] and it does not displease her
that I sigh for her. (trans. Durling)

The overall affect of the text reflects accep-
tance, and the eighth mode can readily re-
flect that affect. The poet/narrator tells Cu-
pid that he is tired, that Cupid knows how
much he has suffered on the journey. The
closing lines explain that he is content be-
cause he is consumed by loving and because
his sighs are not displeasing to his lady. His
beloved takes pleasure in his misery.

While working within the overall affect,
Cipriano also brought out specific images
(highlighted in bold) by means of vivid mu-
sical gestures. He set “i duri passi,” the harsh
steps, as a descending tetrachord at differ-
ent pitch levels or steps. At the lover’s utter
exhaustion (“che son sì stanco”), he intro-
duced a B flat, which sounds like a lowering

of the key, a graphic illustration of the lov-
er beaten down by his journey. At the end of
the first part he represented the text, “and
the path is too steep for me,” by employing
a deliberate violation of the expectations
for mode 8: he ends on D rather than on the
more typical C, a subtle reference to the text;
D is literally too steep or high for a plagal or
low-range piece. In the second part, the lover
continues to talk about “aspre vie,” the hard
way or path, and now De Rore introduced
sharps that are foreign to the mode to denote
harshness. At the very end, he illustrated the
lover’s sighs (“sospiri”) with rests. This ges-
ture would become so common that there
is scarcely a madrigal that does not depict
“sospiri” with rests. These kinds of musical
strategies invite the listener to savor the text
and to be alert to specific musical responses.

The revelation of Cipriano’s 1542 publica-
tion – the novelty that must have come as a
shock to listeners accustomed to simple set-
tings of amorous texts – is the power of mu-
sic to portray human emotion. These mad-
rigals, each one a world unto itself, when
taken together tell a story about the many
faces of love. Quite an achievement for a
first book.

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Owens, respectively

Morton L. Mandel Public Lecture

How to Make Citizens

On May 30, 2018, Eric Liu (CEO of Citizen University, Executive Director of the Aspen Institute's Citizenship and American Identity Program, and Cochair of the American Academy's Commission on the Practice of Democratic Citizenship) spoke at a gathering of Academy Members and guests about preparing citizens in a democracy. The program, which served as the Morton L. Mandel Public Lecture and the 2068th Stated Meeting of the Academy, featured welcoming remarks from Jonathan F. Fanton (President of the American Academy of Arts and Sciences). The following is an edited transcript of Eric Liu's presentation.

**Eric Liu**

Eric Liu is an author, educator, and civic entrepreneur. He is the founder and CEO of Citizen University, the Executive Director of the Aspen Institute's Citizenship and American Identity Program, and Cochair of the American Academy's Commission on the Practice of Democratic Citizenship.

Iwould like to begin by saying a few words about the Academy's Commission on the Practice of Democratic Citizenship, which I cochair with Danielle Allen (Harvard University) and Stephen Heintz (Rockefeller Brothers Fund). The Academy recently launched this commission. We plan to host gatherings around the country that feature talks and presentations like this evening's but also to convene meetings where the

We live in an age right now when so much of our conversation about democracy is dominated by national politics and by what is going on in Washington, D.C.

flow of the conversation is reversed: where we are listening to people from all walks of life and from all parts of the political spectrum about what the future of democratic practice is going to look like in this country technologically, ethically, and in terms of the values, knowledge, systems, and skills that are needed to make change in this ever evolving republic of ours.

And so we are extending to you an open-ended invitation to send your thoughts and ideas as we do our work. Our aim is not only to produce a report that will capture some of the most promising and innovative ideas around the country for how to revitalize and revivify democratic practice, but also to think about ways in which people who are in different pockets and regions of the United States can and should be learning from one another. We live in an age right now when so much of our conversation about democracy is dominated by national politics and by what is going on in Washington, D.C., and in many ways that can be dispiriting. But we also live at a time that I would describe as an age of networked localism, when people are rediscovering the power of participation in local self-government and recognizing that the local ends up being an incredibly open and permeable arena for innovation and

new kinds of practice of power, new claims of voice, and new ways to shape norms as well as laws. But none of this can happen in parochial isolation.

What is happening in Seattle connects, affects, and infects what is happening in Akron, in Wichita, in Miami, in Tucson, and so on all around the country on issues of all kinds across the left and the right. Movements that arise from both the libertarian anti-establishment wing of the Republican Party and the socialist anti-establishment wing of the Democratic Party are pushing back against sectors that say you have to do things in a certain way. They are innovating in ways that are allowing them to experiment locally but then web up all around the United States. And it is in that spirit that we want to carry out and conduct the work of this commission.

Let me back up and tell you a little bit more about myself and about how I come to this work and to the topic of our program this evening.

I run a nonprofit organization called Citizen University, which is based in Seattle. We do work all around the United States to foster a culture of powerful citizenship by teaching the practice of power, hosting gatherings, and facilitating experiences that

strengthen rituals of democratic practice. In many ways, we are trying to rekindle a spirit of what you might think of as American civic religion: namely, the recognition that we are both blessed and burdened by an inheritance that is a creed of ideals established when the American Academy was formed in the 1780s and restated at various junctures of crisis throughout the history of this country. And it is this creed that has been challenging us over the generations to actually live up to it, challenging us to be greater than ourselves, challenging us in a way that people in other nations around the world – my forebears are from China – are not so blessed or burdened with. They go on with their lives individually and nationally, but they don't ask themselves the way we ask ourselves with earnest – and sometimes in anger – are we actually living up to or are we betraying our stated creed? And that is an exceptional thing to have.

We also live at a time when people are rediscovering the power of participation in local self-government and recognizing that the local ends up being an incredibly open and permeable arena for innovation and new kinds of practice of power, new claims of voice, and new ways to shape norms as well as laws.

In our work at Citizen University we are always trying to reinforce the ways in which that creed, that container of ideals and obligations, is what we work within. But we also take pains to note that when we say the word *citizen* we are not talking only or perhaps even primarily about documentation status under the immigration and naturalization laws of the United States. We are talking about a greater, broader, more ethical conception of citizenship that you might think of as essentially the art of be-

ing a prosocial contributor to a community, a non-sociopath, to put it in simplest terms. And it is this broader ethical conception of being a prosocial contributor to a community that we are trying to emphasize and elaborate upon and democratize in many ways in our work.

I come to this work not only because I have worked in government and in different areas of public service. I came to Seattle in 2000 at the end of the Clinton administration, and I have learned in the last eighteen years as a citizen of Seattle and of Washington state more about democratic practice and what it means to strengthen a culture of citizenship than I did in all my years working in the hallowed halls of power in the White House and on Capitol Hill. By serving on the board of the Seattle Public Library for a decade (I love the library and would still be serving if there were no terms limits) I learned about the life of the neigh-

borhoods of this city. When we were ready with a \$200 million bond measure to build and renovate twenty-eight branches across the city, we asked the residents in every neighborhood in the city about their hopes and dreams for their new library branches.

When you live in Seattle you take it for granted that this is just part of the culture here. People have pride in their community, they are rooted in their sense of place, and they expect to be asked what their hopes and dreams are for their corner of the city.

But I can tell you, because my work takes me to communities all around the United States, that the expectation that we have here in Seattle is exceptional. There are a lot of places in this country, in fact most places, that do not ask their citizens what their hopes and dreams are; they do not invite them to participate in the articulation of the physical structures and the intangible institutions that we are called to build together. I served on the State Board of Education in Washington as well and during my time on that board, the same thing happened.

When you serve on the Board of Education in Washington and are called, as we were, to revise high school graduation requirements for the state, you realize that you need to talk to people at the University of Washington, at the community and technical colleges in the state, as well as to people in the trades and in business about not only where our next wave of employees is going to come from, but where the next wave of citizens is going to come from. When you talk to people about these kinds of questions and about public education, you get a chance in a very hands-on way to recognize that the point of free compulsory public education is not in fact to make great workers or employees for our businesses, but rather to make citizens who are capable of self-government in a democratic republic.

Intellectually I knew this when I was working in D.C. and debating about education policy at the federal level. But being rooted in a place like Seattle helps me to understand the ways in which the future of our democracy depends on rooms like this one, where a group of people can see each other, look each other in the eye, and get a sense of how they are responding to ideas.

The other important piece for me is that I am the child of immigrants. My parents were born in mainland China. They fled to Taiwan during the Chinese Civil War. They came to the United States separately in the

1950s and met in upstate New York. As a second-generation American there was this unspoken sense that my parents had done the heavy lifting, and thanks to section one of the 14th Amendment of the Constitution of the United States, I was granted birthright citizenship. I was a citizen of the United States simply because I was born at Vassar Hospital in Poughkeepsie, New York, a status that could not be taken away from me if I crossed the border, if I migrated here or there, if I took a job somewhere else, or if I went on vacation somewhere.

But the message that I received from my family and from my community was with that opportunity of being blessed with birthright citizenship came an equal or greater obligation. And that simple idea has powered a lot of my adult waking life to contribute to the community, to push this country to live up to its stated creed and ideals. This obligation is deeply visceral and multi-generational. My grandfather, who I never met, was the son of a farmer in Hunan Province in China. In 1911, he joined the first military academy of the first Republic of China. He ended up becoming a pilot in the first air force of the Republic of China and fought and served during both the Sino-Japanese War and the war against the Communists in mainland China. Although I never met him, all my life I have essentially labored under the idea of him because his name in Chinese is Liu Guo-yun. Liu is the family name. For those of you who do not speak Mandarin Guo-yun basically translates into “deliverance of the nation.” No pressure! My grandfather was part of the deliverance of his nation, and so to be that person’s grandson and to be born here has instilled in me this sense that my job is to activate in everybody with whom I work and learn a sense that we all have to hurry up and help deliver this nation.

When talking about ideas like citizenship and democracy, it is important to remember

At Citizen University we do work all around the United States to foster a culture of powerful citizenship by teaching the practice of power, hosting gatherings, and facilitating experiences that strengthen rituals of democratic practice.

that all of this work and all of these notions are situated in stories and in our experiences. As the great pragmatists – the William Jameses, the Oliver Wendell Holmeses, and others, many of whom are American Academy Members – taught us, experience should be the measure of our ideals. When we are experiencing a democracy in upheaval; or a republic on a shaky foundation; or a country that is being pulled apart by polarization, apathy, and ignorance; or a country whose body politic is so ill and ill attended to that we are vulnerable to all kinds of viruses – such as literal viruses implanted by Russian hackers and others, or figurative viruses of authoritarianism, nativism, and scapegoating – that is when those viruses come to the fore and their symptoms become palpable and unavoidable. We are living now in such a time like that.

So on this question of what it means to make citizens I have a very simple formula, a quasi-scientific equation that I like to use that encapsulates not only the work that we do at Citizen University but the way that I think in general about this work of citizenship broadly defined. And the equation goes like this: $P + Ch = Ci$. That is, Power plus Character equals Citizenship. I want to unpack that equation for you. Let’s start with the P, power. One of my most recent books is entitled *You’re More Powerful Than You Think: A Citizen’s Guide to Making Change Happen*. It grew out of work that I have been doing for many years trying to democratize the understanding of how power works in civic life. The reason why I undertook this

body of work is that I think that so many Americans, I would say the great majority of Americans, are willfully ignorant about power.

When I say power in civic life I mean simply a capacity to ensure that others do as you would like them to do. Now, to many Americans that definition is distasteful, menacing, and domineering and not something they would want to comfortably talk about or own. But let’s get real. In every arena of our lives – in our personal relationships, in our families, in our neighborhoods, in our faith and civic organizations, and in public life – we as humans are wired to want to get others to do as we would like them to do. Because we labor in America under this mythology that we are all equal and we all have equal say and equal clout it seems impolite to point out the ways in which that is just not true. And so it seems impolite to talk about power. It seems a little dirty – like a combination of *House of Cards* and *Game of Thrones* with these dark arts of manipulation and backstabbing and the rest. But we live in a time in this country – an age of nearly unprecedented inequality and nearly unprecedented concentrations of wealth, voice, and opportunity – when if you choose to put your head in the sand about power, if you choose to be willfully ignorant about what power is, how it works, who has it or does not have it, where it flows, why it flows that way, why it has always flowed that way, what it would take to change that flow, then you are absolutely affirmatively ceding the field to those who are very happy to exploit your

The point of free compulsory public education is not in fact to make great workers or employees for our businesses, but rather to make citizens who are capable of self-government in a democratic republic.

ignorance, who are quite fluent in power, and who are perfectly happy to exercise their fluency to take your power in your name.

And this is the sensation that people have across the left and the right. Actually, I have stopped using the metaphor of the political spectrum since it is a bit more these days a political circle. When you start thinking about the folks who were the co-founders of the Tea Party, the folks who were the co-founders of the Occupy Wall Street movement, the folks who ended up gravitating toward Donald Trump as a presidential candidate or toward Bernie Sanders, they are actually closer in many ways to each other than they are to some of their fellow party members. They are closer in their resistance to and rejection of top-down establishments and their suspicion of concentrated power and their sense that the game has been rigged. They may differ on who is rigging the game, they may differ on the ways in which somebody is cutting in line ahead of them, but that motivation, that sense that the deck is stacked and the game is rigged, is something that they share.

We live in the age of the great push back. And that age is not just about the Trump presidency. It goes back at least to the Tea Party and the Occupy Wall Street movement. It is blossoming in all different kinds of cascading movements from Black Lives Matter to the Fight for \$15, from movements like the Dreamers who are pushing for a voice and a pathway to citizenship for undocumented immigrants to the #MeToo Movement that is now upending institu-

tions not only political but educational, corporate, and the rest. Across all of these movements is a sense of bottom-up citizen power. And so it behooves us to become literate in that power.

When I talk about literacy and power I often break down power in a very simple way, namely, there are three laws of power in civic life. It is useful to think about these three laws and how they play out throughout our history as a country, and particularly today in this time of great polarization and upheaval.

Law number one: power compounds and concentrates, which is fairly obvious in Seattle. If it took you longer to get here today because of the traffic, that was the result of an economic boom from Amazon and other big tech firms that have hired tens of thousands of new people over the last decade, adding nearly 120,000 new residents, most of whom are highly educated with skill, clout, and capital, and who are changing our traffic patterns, the equilibrium of our housing market, the norms and attitudes about homelessness, and what is acceptable and tolerable.

All of these things are happening right now in ways that make visible and palpable to us how power compounds. The rich get richer, the poor get poorer, those with some clout tend to get more clout, and those with some voice tend to get more voice. Social media amplifies this dynamic in which having a little bit accrues and accretes into having a lot more. This is not, of course, a feature only of the age of social media. It is a dynamic as old as human civilization, cer-

tainly as old as Scripture. We read in the Book of Matthew about how the nature of societies, when left to themselves, is not only for the rich to get richer but for the rich to get so rich and the poor to get so poor that the rich shall eventually extinguish the poor. It takes some affirmative commitment of spirit and action to undo that natural cycle.

So power compounds in ways that we feel not just economically but politically. There have been studies by political scientists from Princeton and elsewhere over the last several years that show that the United States Congress today is driven in its policy choices essentially by the preferences of the most wealthy. Now, if it happens that the preferences of the top 10 percent of Americans by income and wealth also align with the preferences of those in the middle class or the working class, then that's great: those of us not in the top 10 percent get to have our preferences expressed. But that is only by chance. What Congress listens to is the dollar and more precisely the organized dollar, meaning organized capital. One hundred fifty or so years ago people talked about slave power in a way that I think today we can talk about money power. The organized capital at the top – choose your demographic: 1 percent, 5 percent, or 10 percent of the United States – the top 1 percent has accrued over 90 percent of the gains of the so-called recovery in our economy since the 2008 crash. That kind of concentration of wealth leads to a concentration of voice, of who is heard and who decides.

Law number two: power justifies itself. At every turn, incumbent holders of power individually and institutionally will spin elaborate narratives about why that ought to be the way things are, about why that is in fact the natural order of things, about why that concentration and that compounding of power, clout, and wealth is nearly God-given. With white supremacy not just a norm practiced by a small minority but in fact

the official ideology of so much of our law and government, it has become one of these narratives of self-justification: that whites ought to be in positions of power because whites are by definition . . . you fill in the blank: more capable of self-government, have more self-control, have more grit, have more this, have more that, and that people who are not in this category are not expected to be leaders in our society and to have the same kinds of opportunities. We may think in a room like this that this sentiment is a very nineteenth-century or outmoded frame of thought, but all you need to do is turn on your Twitter feed to see that this narrative is alive and well.

Male supremacy is another narrative that we are experiencing and that is being challenged today because of #MeToo. Think about places like the University of Washington and how much tech talent is here in this university and in the tech companies of this region, but also in Silicon Valley and the tech world in the twenty-first century and how much of that world is driven implicitly by narratives of male supremacy. It is primarily men who run these new companies and new businesses in Silicon Valley. Men are more . . . fill in the blank: capable at math, capable at making hard decisions, less sentimental, more hardnosed and savvy in business. You hear these narratives every day at Google, Facebook, Amazon, Microsoft, and the other great big tech companies – narratives of self-justification.

One of the things that we have to recognize about these narratives is they are not only at the scale of great social forces like male or white supremacy; they are also woven into the ways in which at a micro level our power dynamics unfold. And so that consciousness of the ways in which power justifies itself is part of being awakened to the nature and the dynamics of power and society. If all we have are these first two laws, that power is always compounding

and concentrating and that power is always justifying itself, we would be stuck in a pretty grim doom loop in which fewer and fewer people were hoarding more and more of the resources, wealth, and voice in our society and telling the rest of us why we ought to be happy about that because it is the natural order of things. And there are many ways in which we experience that doom loop right now. One great example of this, which is a cross-partisan ideology embraced perhaps more by Republicans than Democrats but it has certainly been championed by both, is the ideology of trickle-down economics: the idea that the super wealthy are job creators, with a capital J and a capital C, who must be worshipped, who must be taken care of, who must be put on a pedestal because they are the true origins of prosperity. If we simply pay enough homage to them and don't burden them with too much in the way of taxation or regulation their prosperity will leak its way down to the rest of us.

On this question of what it means to make citizens I have a very simple formula, a quasi-scientific equation that I like to use that encapsulates not only the work that we do at Citizen University but the way that I think in general about this work of citizenship broadly defined. And the equation goes like this: Power plus Character equals Citizenship.

This ideology has powered economic agendas, both Republican and Democratic, for most of the last forty or fifty years. But it is actually just a fairytale and not founded on fact. Any record of the major tax cuts taken in this country will show that in fact the true origins of prosperity are not the few at the top but rather the many in the middle. When workers have more money, businesses have more customers, and that is the

true origin of a growing, increasing cycle of rising demand. We are all better off when we are all better off. The narrative of trickle-down economics is one of self-justification that both causes and affects the way in which power compounds and justifies itself. It is a very vivid example today of how people start behaving in a scarcity-minded way. Everybody is looking over his or her shoulder. Though you might be comfortable and affluent, you are not feeling very comfortable. You might own a single-family home in Seattle, but you are looking around and thinking who is coming after me? You might be scraping by and be full of resentment for those who are seizing unearned privileges in our society.

The scarcity mindset takes hold when you get into this doom loop, and it is something that we are feeling palpably in our politics right now. If all we have are those first two laws it would be a pretty grim situation. In many societies people get stuck right there,

but what breaks us out of that doom loop and what can save us potentially, particularly in a self-renewing country like ours, is law number three: power is infinite. This statement cuts against our intuitions that we draw from, among other things, physics and science. We think that physics teaches us that there is only so much heat or energy in a system and that nobody over here can get more of the energy without somebody

over there getting less of the energy. It is the law of thermodynamics, and our intuitions are by definition this very zero-sum thing: if someone is going to get more, then someone else is going to be suffering. But I am not talking about physics. I am talking about civics, in which it is possible to generate brand new power out of thin air and to add brand new power into a system in a positive sum way through the magic act of organizing, by inviting a few other humans to join you in some common endeavor that requires a common goal or common strategy, and navigating through difference and negotiating through different priorities. That magic act of organizing, which is not just community organizing in the sense that we think of today around issues and ballot measures and elections, is as old as Benjamin Franklin and the American Academy of Arts and Sciences. Start a club on anything – a philosophical club, a tradesmen’s club, a debate club, a business club – and you have created brand new power out of thin air.

We are living at a time right now when many Americans are rediscovering that it is in fact possible to generate brand new power out of thin air.

We are living at a time right now when many Americans are rediscovering this third law of power, that it is in fact possible to generate brand new power out of thin air. That is the very definition of each of these movements that has been surging seemingly out of nowhere over the last decade or more. At Citizen University we work with the full circle of ideological practitioners of citizen power. We work closely with different founders of different Tea Party organizations: the founder of the Tea Party Patriots, the former head of FreedomWorks. And on the left we work with co-founders and co-creators of the Black Lives Matter

movement, the leaders and orchestrators of the \$15 Now movement. What they have in common is that all of them are recognizing that with this third law it is possible to take what seems like a fixed system of unequal power and actually change that equation.

Each of these three laws comes with an imperative for action. And it is these imperatives for action that we need to reflect upon when we think about what it means to make citizens. If from the first law power is always concentrating or compounding into these winner take all games, then we have to change the game. If in the second law power is always justifying itself in these elaborate ideological narratives about why things are the way they are, then our second imperative is to change the story. And finally, if most people remain stuck in this zero-sum finite mindset about the nature of power in a complex adaptive system like a community, then our third imperative is to change the equation and remind them of the positive sum nature of power in civic life.

Now, let me be clear. When I say that power is infinite, when I say that it is possible to generate power out of thin air, I am not saying that you can just manifest wealth by imagining it. I am not saying that you can just make things change by wishing it so. And just because one group can generate new power by organizing doesn’t necessarily mean that that is the way things are going to stay. Incumbent holders of power have access to the third law as well and they will counter-organize and they will counter-mobilize and they will activate new forms of power to try to reckon with what has been generated. There is a simple word for the

dynamic of organizing and counter-organizing, of pushing over here and then getting pushback over there: politics, namely politics in a democracy. And that is what it means to show up in civic life – to start a club, to organize each other, and to vote, of course, but to do all the things that precede voting, that make voting simply the capstone and the final deposit and expression of a long set of habits of the heart, as Tocqueville put it – of what it means to claim membership in a community.

So literacy in power is the first part of this equation, $P + Ch = Ci$. But the second part is equally important, the idea of character. I am not talking about individual virtue necessarily, or individual traits like perseverance, diligence, grit, or honesty. Those things matter, of course. They are important in life and in civic life. But what I am talking about here in this context is what I think of as character in the collective, how we behave toward each other in the ways that we live together. Ethics and values like mutuality and a recognition that true self-interest is mutual interest. Ethics like reciprocity and knowing that what goes around comes around. Ethics of service and sacrifice, ethics of contribution before consumption, and ethics of responsibility.

What I am talking about is the notion that our fates are entwined, that in a city upon a hill people do not walk past each other without making eye contact. In a city upon a hill, people don’t stop seeing and ignoring the homeless in tents on a sidewalk under the overpass, that in a city upon a hill people don’t tolerate as acceptable voter turnout rates of 30 and 40 percent, maybe 50 percent in a big election. That in a city upon a hill people recognize that citizenship means showing up with our wallets, with our voices, with our feet, with our ideas, and with our hearts. That is what it means to live in a city upon a hill and that those ethics and those ideas of character are not high ideals.

They are the bread and butter of surviving in a world that is utterly indifferent to our experiment and utterly indifferent to our creed. It is only by cultivating character that we can actually make sure that the practice of power is tempered.

If all you are is super-literate in power and schooled and expert in the ways to get other people to do as you would like them to do, if all you are is highly skilled at understanding the machinery of decision-making in politics and government and understanding how you can rig that machine in a certain way or apply pressure on one part of the machine to yield a certain kind of outcome, if all you have is that, but you are untethered from any moral sense, to any sense of responsibility to a greater good, to any sense that you are a member of the body, then all you are in fact is a highly skilled sociopath. But the inverse is true as well. If all you are is deeply steeped in civic character and earnest about these values and ethics and really a big believer in mutuality and service and shared sacrifice, but you are at the same time completely clueless about how to get anything done in a community, completely unpracticed in organizing your neighbors, completely ignorant about who is making decisions on the city council, the county council, the state legislature, or the United States Congress about things that matter to you, if you are completely in the dark about who is deciding because that is the central question of all civic power, if all you have is that deep grounding in civic character but utter illiteracy in power, then you are merely amusing yourself in a philosophical debate. You are not participating in life as a citizen. And so it is the coupling of power and character that makes for citizenship.

Let me close with a note about what we have to teach each other. Citizen University – though university is in our name – is not a four-year degree-granting baccalaureate institution. We are a popular education

We have discovered that as broken as our national politics are, people in place, rooted in community, are being reminded that they are still capable of self-government and of healing our republic. People are still capable of practicing citizenship at the local level.

platform. We go into communities. We have gatherings, rituals, workshops, shared experiences, festivals, and summits where people from all walks of life come together and learn and practice and challenge each other in these ideas of what it means to get literate in power and what it means to push each other a little bit harder to live up to a notion of civic character. What we have discovered in that work is something very simple and very profound. There are different ways to put it, but I think candidate Barack Obama put it best back in 2007 and 2008 when he said, “We are the change we’ve been waiting for.” He said this during the 2008 campaign and the people who liked him cheered when he said it but they didn’t believe it. What they heard him say was, “I, Barack Obama, am the change you’ve been waiting for.” And they said to themselves, “Yeah, you’re the change I’ve been waiting for. Thank God this perfect kind of unicorn of a candidate has come along and he is going to save the republic and he is going to be awesome. He is this, he is that, he is a pioneer, he has all this great knowledge and heart. He will help our country solve race. Wow, that’s great, there he is.” And then guess what? He didn’t do it.

For those of us who liked Obama, this might surprise you, and for those of us who didn’t like him, it should come as no surprise. A few years later, we have Donald Trump and he essentially said the same thing but promised something else. He was

more honest. He said, “I alone can unrig the system. I alone can make the changes that we need in this country. I alone can drain the swamp of our sick corrupted democracy.” And to many Americans this sounded authentic. I trust this guy. He doesn’t play by any of the rules of the old establishment. He is willing to break all convention. I think this guy alone can actually do it. And the people who didn’t believe Barack Obama but did believe Donald Trump were operating from the same premise, which is that it is someone else’s job to save this country, to drain the swamp, to clean up the mess, to unrig the system.

Our work at Citizen University includes going to communities all around the country, having gatherings like this one, but also what we call Civic Saturday, which is essentially a gathering about American civic religion. It is a gathering that actually follows the arc of a faith gathering. We sing together. We turn to the strangers next to us and talk about a common question. We hear readings of American texts that challenge us and force us to think about whether we are living up to those ideals and words. There is a sermon. We sing again. There is an hour afterwards in which people are organizing and engaging in activism or education or just simply making friends. And it is through these rituals and experiences, which we started here in Seattle and now have taken all around the country, that we have discovered that as broken as our na-

All around this country right now in our towns people are revitalizing democracy and remaking the idea of citizenship.

tional politics are, as powerless as people feel in this rigged system right now, as much as people are inclined to want to hand their power over to a strong man – whether it is a strong man named Barack Obama or a strongman named Donald Trump – as much as that may be the case, people in place, rooted in community, are being reminded again and again when they see each other and look each other in the eye and invite each other to fix something and do something that they are still capable of self-government and of healing our republic. People are still capable of practicing citizenship at the local level.

The way that we make citizens now is to make sure that we are teaching power, that we are democratizing what we know and circulating what we know about how power works, about who decides, about how you make stuff happen, and that we at every turn, in every circle of institution here, are also cultivating character. And that when we do that we do that with a faith that we are not alone. We do that with the knowledge that people in Tacoma are doing that, that people in Ellensburg are doing that,

that people in Yakima are doing that. That people in Poughkeepsie are also doing that, as well as in Birmingham, Savannah, and Baton Rouge. All around this country right now in our towns people are revitalizing democracy and remaking the idea of citizenship. And so our commitment in coming together today and thinking about the work that we do as citizens, and certainly in taking seriously the invitation that I extended at the beginning of this evening for you to participate in the life and the work of this commission on the future of democratic practice, is that all of us have not just a say and not just an opportunity, but an obligation and a responsibility to be the authors of our new republic and to be the builders of our new democracy. When we do that we shall truly be, again, a city upon a hill. ■

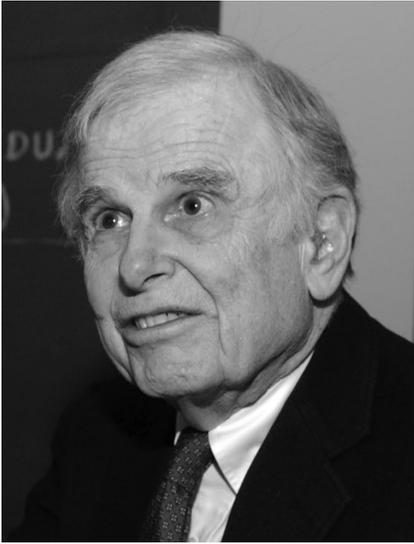
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To view or listen to the presentations, visit <https://www.amacad.org/citizens>.

In Memoriam: Francis M. Bator

Elected to the Academy in 1970



Francis M. Bator, elected to the American Academy of Arts and Sciences in 1970, died on March 15, 2018, at the age of 92. Bator was a professor at Harvard's John F. Kennedy School of Government and served as Deputy National Security Advisor to President Lyndon Johnson from 1965 to 1967.

Born in 1925 in Budapest, Hungary, at the age of fourteen he fled with his family to New York, where his father became a banker. Bator enrolled in Groton, after which he studied at the Massachusetts Institute of Technology, where he obtained both his Bachelor of Science and Ph.D. degrees in economics. About Bator, McGeorge Bundy observed, "He has the sophistication of the Central European, the good manners of the Grotonian, the intellectual acuteness of the Institute (MIT), and the splendid combination of human qualities for which all residents of Cambridge are noted."

As Deputy National Security Advisor on International Economic Policy and Europe first under Bundy and then under Walt Rostow, Bator served during President Johnson's fateful decision to Americanize the war in Vietnam. This experience shaped his understanding of policy-making and the agonizing choices presidents confront. In an insightful lecture initially presented at the American Academy of Arts and Sciences and later expanded into the article "No Good Choices: LBJ and the Vietnam/Great Society Connection," Bator wrestled with the dilemma President Johnson faced in seeking to pursue his Great Society program at home while escalating the U.S. war in Vietnam abroad.

About this Bator wrote, "The war deprived the Great Society reforms of some executive energy and money. But Johnson believed – and he knew how to count votes – that had he backed away in Vietnam in 1965, there would have been no Great Society to deprive. It would have been stillborn in Congress." That judgment led to a great debate between Bator and Fred Logevall, the leading historian of America's involvement in Vietnam. Logevall countered Bator with the argument, "In view of the constellation of forces in Congress and in the press, and Johnson's own dominant political position, there is

little reason to believe that a decision against war would have exacted an exorbitant political price, or cost Johnson the Great Society."

Bator's primary responsibility in government centered on Europe. He was called sometimes "Europe's assistant," a title he liked. As *The Economist* wrote when Bator left government, "He has had direct responsibility and direct access to the President, who has relied heavily on him on a wide range of subjects having both a technical and a political aspect: international monetary reform, the Kennedy Round of tariff negotiations, adapting the North Atlantic Treaty Organization to the existence of General de Gaulle, whistling up credits to support sterling, financing the forces in Germany and keeping the nuclear proliferation treaty alive." In sum, *The Economist* concluded, "On most of these matters most of the time, a thread of lucidity, consistency and balance has been traceable in the Administration's handling and Mr. Bator has had a lot to do with it."

President Johnson's admiration for Bator was captured in a note that read, "What I did want to say right now is how greatly I value your work, your mind, your independence, and your devotion to your country. I am proud to have you with me in these times."

Before going to Washington, Bator taught economics at MIT. There he wrote his most famous article, "The Simple Analytics of Welfare Maximization," which became a pillar in the teaching of microeconomics. His subsequent work, "The Anatomy of Market Failure," laid the cornerstone for our modern understanding of what markets do and – equally importantly – leave undone. It illustrated cases in which "perfect" markets fail to produce perfect (Pareto-efficient) outcomes. Thus in a perfectly efficient market firms produce "externalities" such as greenhouse gases that destroy a livable environment. His 1960 work, *The Question of Government Spend-*

ing, was identified by *The New York Times* as one of the seven books that informed John F. Kennedy's thinking on the presidency. Walter Lippmann's review of it in *The New York Herald Tribune* declared, "It is objective, scholarly, and highly analytical, and it will – I think – have a gradual and profound influence on American thinking in these manners."

Upon returning to Cambridge from Washington, Bator joined what was emerging to become Harvard's Kennedy School as Chairman of its Public Policy Program. With Richard Neustadt, Thomas Schelling, Howard Raiffa, and a handful of others, he became one of an illustrious group known as the school's "founding fathers." MIT professor and Nobel laureate Robert Solow called Bator a "pillar of eclectic American Keynesianism," who fought to clear a path from academic economics to public policy. He continued teaching at Harvard until his retirement in 1994.

Bator and his wife, the former Micheline Martin, separated in 1972. Besides her and their son, Christopher, he is survived by his daughter Nina Bator Moss, his partner Jae Roosevelt, and four grandchildren.

Graham Allison
Harvard University

In Memoriam: Steven Marcus

Elected to the Academy in 1974



I remember Steven Marcus as a wonderful talker: superb conversationalist, superb public speaker. In both roles, he often articulated unexpected truths. He could talk about anything, and he knew about everything, as a result of his constant, omnivorous, intense reading. He could – and frequently did – enliven and propel a dreary committee meeting by his pungent, cogent formulations of exactly what needed to be said. The American Academy profited from his verbal gifts and the sharp intelligence underlying them. Professor Marcus served on the Council and on the Committee on Studies and Publications and, for many years, as Editor of the Academy. After originating the idea of the Humanities Indicators, he participated eagerly in the program’s development and refinement. To all these activities he brought wisdom, clarity, and vast experience.

His experience included that of writing important books on diverse important subjects: Freud (*Freud and the Culture of Psychoanalysis: Studies in the Transition from Victorian Humanism to Modernity*, 1984); Dickens (*Dickens: From Pickwick to Dombey*, 1965); pornography (*The Other Victorians: A Study of Sexuality and Pornography in Mid-19th Century England*, 1966), and more, much more. On paper as well as in speech, he vividly explored his wide-ranging interests.

Although he taught briefly at City College in New York and at Indiana University, Steven Marcus spent most of his academic career at Columbia University, from which he had received his Ph.D. He thrilled generations of students by his demanding, exciting classroom presence and his capacity to reveal and elucidate unexpected intellectual connections. Men and women in mid-career, far beyond their graduate school days, would reminisce about the wonders of working with Professor Marcus as their dissertation advisor – the wonder of his kindness, as well as of his high standards and his perspicuity. To hear him reflect, in formal classroom settings or in personal exchange, on a passage in *Hard Times* or on a Wordsworth poem could guide a listener not only to the intricacy of literary achievement, but also to the thrill of discovering it.

Steven Marcus, a founder of the National Humanities Center in North Carolina, long served as vice chair of its board of trustees. For two terms of office, he chaired the department of English and comparative literature at Columbia; later, he was for two years Dean of Columbia College and Vice President for Arts and Sciences. Always, he used his gifts in the service of the humanities, employing his vigorous intellect to advance his passionate commitment to high causes.

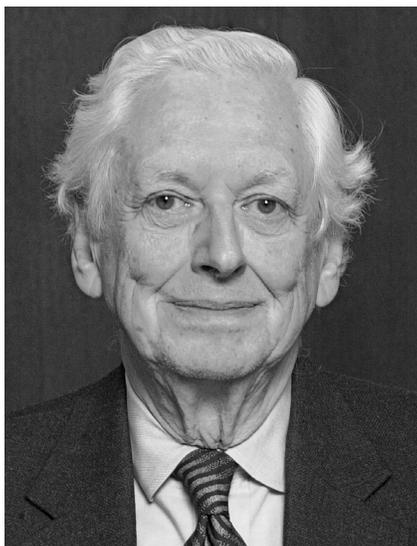
A former student described Marcus, accurately, as “a great scholar and a man of great integrity.” She might have added that he also had a great sense of humor and a wonderful capacity for pleasure: in many ways, a great man. Late in his life, Steven told me that he thought of the American Academy as “his community.” He certainly belonged in the company of the distinguished.

Steven Paul Marcus died in New York City on April 25, 2018. His wife, Gertrud Lenzer, survives him, along with his son, John Marcus, and a grandson, Asa.

Patricia Meyer Spacks
University of Virginia

In Memoriam: Jerrold Meinwald

Elected to the Academy in 1970



Jerrold Meinwald will long be remembered for his consummate curiosity, his infectious smile, his love of music, and his passion for all things wondrous. With his passing on April 23, 2018, we grieve the loss of this wonderful, kind, and generous man who made our lives much richer in so many ways.

Born in 1927 in New York City to Herman Meinwald and Sophie Baskin Meinwald, he graduated from Stuyvesant High School and attended Brooklyn College and Queens College. After serving in the United States Navy as an electronics technician (1945–1946), Jerry earned a Ph.B. (1947) and B.S. (1948) in Chemistry from the University of Chicago, and an M.A. (1950) and Ph.D. (1952) from Harvard University. While at Harvard he worked with renowned chemist and Nobel laureate R. B. Woodward.

Jerry's enthusiasm for discovery and chemistry emerged early in his life. With his childhood friend Michael Cava he produced homemade firework shows for neighbors and synthesized dyes in his home laboratory. Yet he was equally passionate about music of all kinds. Jerry played the flute and the recorder and studied with some of the outstanding teachers of the twentieth century. He loved to perform whenever the occasion arose. Often with his wife Charlotte at the piano, he played with (and for) colleagues, friends, and family members. Combining his love of science and music, he performed concerts of chamber music at meetings of the International Society for Chemical Ecology in Urbana, Illinois (2014), Stockholm, Sweden (2015), and Kyoto, Japan (2017).

Cornell University was the main benefactor of his talents in research and teaching from his first faculty appointment in 1952 and throughout most of his career. He trained generations of chemists and published more than four hundred journal articles with some two hundred collaborators. One of his early projects at Cornell was to determine the chemical compound in catnip that causes cats to go crazy when they smell it. This was the beginning of a long career deciphering the intricate chemical strategies that insects use when mating, locating food, protecting offspring, and defending against

attackers. He and entomologist Thomas Eisner, a colleague for fifty years, showed that insects and plants interact in countless ways, both synergistically and antagonistically, through chemical signals. That collaboration established a new field of science called "chemical ecology."

Jerry was elected to the National Academy of Sciences in 1969, to the American Academy of Arts and Sciences in 1970, and to the American Philosophical Society in 1987. He was an Alfred P. Sloan Foundation Fellow (1958–1962) and twice a John Simon Guggenheim Foundation Fellow (1960–1961 and 1976–1977). His many awards include the Tyler Prize in Environmental Achievement (1990), the Heyrovsky Medal of the Academy of Sciences of the Czech Republic (1996), the American Chemical Society's Roger Adams Award in Organic Chemistry (2005), the Grand Prix de la Fondation de la Maison de la Chimie (2006), the Benjamin Franklin Medal in Chemistry (2013), the Nakanishi Award of the Chemical Society of Japan (2014), the National Medal of Science (2014), and the American Academy's Distinguished Leadership Award (2016).

Jerry contributed in so many ways to the American Academy. In 1970, he joined a joint committee of the American Academy and National Academy of Sciences to establish an International Centre of Insect Physiology and Ecology (ICIPE) in Nairobi and served as its Research Director from 1970–1977. He was a member of the Academy's Council beginning in 1983. He held leadership roles in many Academy studies and publications, serving on the Academy's Committee on Publications and Public Relations and on the Academy's Committee on Studies, culminating in his service as co-chair in 2012 when these committees merged and became the Committee on Studies and Publications. In 2006, he began serving as a

Co-Principal Investigator of the Academy's project on Science in the Liberal Arts Curriculum and co-edited (with John Hildebrand) the project's final publication, *Science and the Educated American: A Core Component of Liberal Education*. He also served as a guest editor of two *Dædalus* issues: "Science in the 21st Century" (with May Berenbaum, Summer 2012) and "From Atoms to the Stars" (with Jeremiah Ostriker, Fall 2014).

Most visible to Academy Members was his role as Secretary, a position he held from 2005–2016, which included serving as Chair of the Committee on Membership. For many years, I had the pleasure of working closely with Jerry as I served as Chair of Class I, as Assistant Secretary for the Sciences, and now as Secretary of the Academy. As I follow in Jerry's footsteps, I know that I have learned much from this wise master in ensuring that the Academy's election process is fair and reflects the mission and values of our organization. I – along with his many friends, students, and colleagues – will miss Jerry's gentle nature, the way he listened to all voices, and his wonderful smile that reflected the joy that he had for living. Such memories are as rich and full as the music that he so loved.

Jerry is survived by Charlotte Greenspan, his wife of thirty-seven years; their daughter, Julia; and Constance and Pamela, daughters of his first marriage to Yvonne Chu.

Geraldine Richmond
University of Oregon

Select Prizes and Awards to Members

Chimamanda Ngozi Adichie (Lagos, Nigeria) was awarded the PEN Pinter Prize 2018.

Joseph Altonji (Yale University) was awarded the 2018 IZA Prize in Labor Economics.

David J. Anderson (California Institute of Technology) was awarded the 2018 Edward M. Scolnick Prize in Neuroscience, given by the McGovern Institute for Brain Research at MIT.

Martin Baron (*The Washington Post*) was awarded the Benton Medal for Distinguished Public Service, given by the University of Chicago.

Bonnie Bassler (Princeton University) was awarded the 2018 Dickson Prize in Medicine, given by the University of Pittsburgh School of Medicine.

Eavan Boland (Stanford University) was elected an honorary member of the Royal Irish Academy.

Luis Caffarelli (University of Texas at Austin) was awarded the 2018 Shaw Prize in Mathematical Sciences.

Hillary Clinton (Chappaqua, NY) received the Radcliffe Medal, given by the Radcliffe Institute for Advanced Study at Harvard University.

Michael Cook (Princeton University) was named an Honorary Fellow of King's College, Cambridge University.

Robert Crabtree (Yale University) was elected a Fellow of the Royal Society.

Carlo Croce (Ohio State University) was awarded a 2018 Dan David Prize.

Marcetta Darensbourg (Texas A&M University) was named the 2018 Southeastern Conference Professor of the Year.

Lorraine Daston (Max Planck Institute for the History of Science, Germany) was awarded a 2018 Dan David Prize.

Jenny Davidson (Columbia University; Visiting Scholar, 2005–2006) was awarded a fellowship to the Institute of Ideas and Imagination of Columbia University.

Elizabeth Diller (Diller Scofidio + Renfro; Princeton University) has been named one of *Time* magazine's 100 most influential people of 2018.

Jennifer Doudna (University of California, Berkeley) was awarded the 2018 Kavli Prize in Nanoscience. She shares the prize with Emmanuelle Charpentier (Max Plank Institute for Infection Biology, Germany) and Virginijus Šikšnys (Vilnius University, Lithuania).

Brian J. Druker (Oregon Health and Science University), **Tony Hunter** (Salk Institute for Biological Studies), and **John Mendelsohn** (University of Texas MD Anderson Cancer Center) were awarded the 2018 Tang Prize in Biopharmaceutical Science.

Herbert Edelsbrunner (Institute of Science and Technology Austria) was awarded the 2018 Wittgenstein Prize.

John Elliott (University of Oxford) is the inaugural recipient of the Premio de las Órdenes Españolas, given by the Spanish Orders of Santiago, Calatrava, Alcántara, and Montesa.

Ezekiel Emanuel (University of Pennsylvania) was awarded a 2018 Dan David Prize.

Drew Faust (Harvard University) was awarded the John W. Kluge Prize for Achievement in the Study of Humanity by the Library of Congress.

Robert Fettiplace (University of Wisconsin-Madison School of Medicine and Public Health) was awarded a 2018 Kavli Prize in Neuroscience. He shares the prize with **A. J. Hudspeth** (Rockefeller University) and Christine Petit (Pasteur Institute).

Gerald Fink (Massachusetts Institute of Technology) is the recipient of the 2018–2019 James R. Killian Jr. Faculty Achievement Award given by MIT.

Andrea Goldsmith (Stanford University) is the recipient of the 2018–2019 Athena Lecturer Award, given by the Association of Computing Machinery.

Jeffrey Gordon (Washington University School of Medicine) is the recipient of the 2018 Copley Medal from the Royal Society.

Ann Graybiel (Massachusetts Institute of Technology) was awarded the 2018 Gruber Neuroscience Prize.

Lenore A. Grenoble (University of Chicago) was awarded a John Simon Guggenheim Memorial Foundation Fellowship.

Angela Gronenborn (University of Pittsburgh) received the Mildred Cohn Award in Biological Chemistry from the American Society for Biochemistry and Molecular Biology.

Alma Guillermoprieto (Mexico City, Mexico) was awarded the Princess of Asturias Award for Communication and Humanities, 2018.

Rebecca Henderson (Harvard Business School) was awarded the Dr. Alfred N. and Lynn Manos Page Prize for Sustainability Issues in Business by the Darla Moore School of Business at the University of South Carolina. She shares the prize with George Serafeim (Harvard Business School).

A. J. Hudspeth (Rockefeller University) was awarded a 2018 Kavli Prize in Neuroscience. He shares the prize with **Robert Fettiplace** (University of Wisconsin-Madison School of Medicine and Public Health) and Christine Petit (Pasteur Institute).

Tony Hunter (Salk Institute for Biological Studies), **Brian J. Druker** (Oregon Health and Science University), and **John Mendelsohn** (University of Texas MD Anderson Cancer Center) were awarded the 2018 Tang Prize in Biopharmaceutical Science.

Evelyn Fox Keller (Massachusetts Institute of Technology) was awarded a 2018 Dan David Prize.

Mary-Claire King (University of Washington) was awarded the 2018 Shaw Prize in Life Science and Medicine. She was also awarded a 2018 Dan David Prize.

David M. Kreps (Stanford University) was awarded the 2018 Nemmers Prize in Economics.

Jennifer Lewis (Harvard University) was inducted into The American Institute for Medical and Biological Engineering College of Fellows.

Dahlia Lithwick (*Slate Magazine*) was awarded the 2018 Hillman Prize for Opinion and Analysis Journalism.

Jane Mansbridge (Harvard University) was awarded the 2018 Skytte Prize in Political Science by the Johan Skytte Foundation.

John R. McNeill (Georgetown University) was awarded the 2018 Dr A. H. Heineken Prize for History.

John Mendelsohn (University of Texas MD Anderson Cancer Center), **Tony Hunter** (Salk Institute for Biological Studies), and **Brian J. Druker** (Oregon Health and Science University) were awarded the 2018 Tang Prize in Biopharmaceutical Science.

Joel Mokyr (Northwestern University) has been named a Distinguished Fellow of the American Economic Association.

Paul Offit (Children's Hospital of Philadelphia) was awarded the 2018 Albert B. Sabin Gold Medal.

Hiroshi Ooguri (California Institute of Technology) was awarded the 2018 Hamburg Prize for Theoretical Physics.

Naomi Oreskes (Harvard University) was awarded a 2018 Guggenheim Memorial Fellowship.

Stuart H. Orkin (Boston Children's Hospital; Harvard Medical School) was awarded the 2018 Nemmers Prize in Medical Science.

Stephen Owen (Harvard University) was awarded the 2018 Tang Prize in Sinology. He shares the award with Yoshinobu Shiba (Toyo Bunko).

Svante Pääbo (Max Planck Institute for Evolutionary Anthropology, Germany) was awarded the Princess of Asturias Award for Technical and Scientific Research, 2018.

Annie Proulx (Port Townsend, WA) was awarded the 2018 Library of Congress Prize for American Fiction.

Veerabhadran Ramanathan (University of California, San Diego) was awarded the 2018 Tang Prize in Sustainable Development. He shares the prize with James E. Hansen (formerly, NASA).

Lisa Randall (Harvard University) was awarded a 2018 Guggenheim Memorial Fellowship.

Joseph Raz (Columbia Law School) was awarded the 2018 Tang Prize in Rule of Law.

Nicholas Rescher (University of Pittsburgh) was honored by the American Philosophical Association's inauguration of the Nicholas Rescher Prize that recognizes an awardee's lifetime contributions to systematic metaphysics.

Judith Resnik (Yale University) was awarded an Andrew Carnegie Fellowship.

Scott D. Sagan (Stanford University) was awarded an Andrew Carnegie Fellowship.

Robert J. Sampson (Harvard University) was awarded a 2018 Guggenheim Memorial Fellowship.

Michael J. Sandel (Harvard University) was awarded the Princess of Asturias Award for Social Sciences, 2018.

Helmut Schwarz (Technische Universität Berlin) was elected a Foreign Associate of the National Academy of Sciences.

Martin Scorsese (Sikelia Productions) was awarded the Princess of Asturias Award for Arts, 2018.

Beth Simmons (University of Pennsylvania) was awarded an Andrew Carnegie Fellowship.

Michelle Simmons (University of New South Wales) was elected a Fellow of the Royal Society.

Marcelo Suárez-Orozco (University of California, Los Angeles) has been recognized by Carnegie Corporation of New York as a "Great Immigrant" as part of its Great Immigrants Initiative.

Craig Thompson (Memorial Sloan Kettering Cancer Center) received the Bert and Natalie Vallee Award in Biomedical Science from the American Society for Biochemistry and Molecular Biology.

Jeremy Thorne (University of California, Berkeley) received the Herbert Tabor Research Award from the American Society for Biochemistry and Molecular Biology.

Mark Trahant (*Indian Country Today*) is the recipient of the 2018 NAJA Richard LaCourse Award, given by the Native American Journalists Association.

Ewine van Dishoeck (Leiden University, the Netherlands) was awarded the 2018 Kavli Prize in Astrophysics.

Bert Vogelstein (Johns Hopkins University School of Medicine) was awarded a 2018 Dan David Prize.

Sharon Weiner (American University; Visiting Scholar, 2005–2006) was awarded an Andrew Carnegie Fellowship.

New Appointments

Dennis Ausiello (Massachusetts General Hospital; Massachusetts Institute of Technology) has been elected to the Board of Directors of Rani Therapeutics.

Lisa Feldman Barrett (Northeastern University) has been named President-Elect of the Association of Psychological Science.

Bonnie Berger (Massachusetts Institute of Technology) was elected to the Brandeis University Board of Trustees.

Lord Browne of Madingley (Li Energy) has been appointed to the Advisory Board of Blue Bear Capital.

Francisco Cigarroa (University of Texas Health Science Center in San Antonio) was elected Chair of the Board of Trustees of the Ford Foundation.

Elazer R. Edelman (Massachusetts Institute of Technology; Harvard Medical School; Brigham & Women's Hospital) has been named Director of the Institute for Medical Engineering and Science at MIT.

Drew Gilpin Faust (Harvard University) was elected a member of the Board of Trustees of the J. Paul Getty Trust.

Pinelopi K. Goldberg (Yale University) has been named Chief Economist of the World Bank.

Jeffrey Immelt (formerly, General Electric Company) was appointed Executive Chairman of athenahealth.

Paula A. Johnson (Wellesley College) was elected to the Board of Directors of Eaton Vance Corp.

Carolyn A. "Biddy" Martin (Amherst College) was elected a member of the Harvard Corporation.

John R. McNeill (Georgetown University) was elected President of the American Historical Association for 2019–2020.

Mary Miller (Yale University) was appointed Director of the Getty Research Institute.

Joseph Neubauer (Aramark Corporation) was reelected as Chair of the University of Chicago Board of Trustees.

Nancy Knowlton (Smithsonian Institution) was appointed as a member of the Global Board of Directors of The Nature Conservancy.

Norman Pearlstine (Time Inc.) has been named Executive Editor of *The Los Angeles Times*.

Penny S. Pritzker (PSP Capital Partners) was elected a member of the Harvard Corporation.

Rebecca Richards-Kortum (Rice University) has been named a U.S. Science Envoy.

Crystal Sanders (Pennsylvania State University; Visiting Scholar, 2013–2014) has been named Director of the Africana Research Center of the Pennsylvania State University.

Debra Satz (Stanford University) has been named Dean of the School of Humanities and Sciences at Stanford University.

Select Publications

Poetry

Terrance Hayes (University of Pittsburgh). *American Sonnets for My Past and Future Assassin*. Penguin Books, June 2018

Fiction

Chris Abani (Northwestern University), ed. *Lagos Noir*. Akashic Books, June 2018

Bill Clinton (The Clinton Foundation) and **James Patterson** (Hachette Book Group). *The President Is Missing: A Novel*. Little, Brown and Company and Alfred A. Knopf, June 2018

Anne Tyler (Baltimore, MD). *Clock Dance: A Novel*. Alfred A. Knopf, July 2018

James Wood (Harvard University; *The New Yorker*). *Upstate: A Novel*. Farrar, Straus and Giroux, June 2018

Nonfiction

Kwame Anthony Appiah (New York University). *The Lies that Bind: Rethinking Identity*. Liveright, August 2018

Mary Beard (University of Cambridge). *How Do We Look: The Body, the Divine, and the Question of Civilization*. Liveright, September 2018

Henry E. Brady (University of California, Berkeley), **Kay Lehman Schlozman** (Boston College), and **Sidney Verba** (Harvard University). *Unequal and Unrepresented: Political Inequality and the People's Voice in the New Gilded Age*. Princeton University Press, June 2018

Mary Schmidt Campbell (Spelman College). *An American Odyssey: The Life and Work of Romare Bearden*. Oxford University Press, September 2018

James H. Cone† (Union Theological Seminary). *Said I Wasn't Gonna Tell Nobody*. Orbis Books, October 2018

Scott Cowen (Tulane University). *Winnebagos on Wednesdays: How Visionary Leadership Can Transform Higher Education*. Princeton University Press, February 2018

John Elliott (University of Oxford). *Scots and Catalans: Union and Disunion*. Yale University Press, July 2018

Doris Kearns Goodwin (Concord, MA). *Leadership: In Turbulent Times*. Simon & Schuster, September 2018

Temple Grandin (Colorado State University). *Calling All Minds: How to Think and Create Like an Inventor*. Philomel Books, May 2018

Patricia Hampl (University of Minnesota). *The Art of the Wasted Day*. Viking, April 2018

Terrance Hayes (University of Pittsburgh). *To Float in the Space Between*. Wave Books, September 2018

Elhanan Helpman (Harvard University). *Globalization and Inequality*. Harvard University Press, August 2018

John Kaag (University of Massachusetts, Lowell; Visiting Scholar, 2007–2008). *Hiking with Nietzsche: On Becoming Who You Are*. Farrar, Straus and Giroux, September 2018

Eric R. Kandel (Columbia University). *The Disordered Mind: What Unusual Brains Tell Us About Ourselves*. Farrar, Straus and Giroux, August 2018

Thomas E. Levy (University of California, San Diego) and Ian W. N. Jones (University of California, San Diego), eds. *Cyber-Archaeology and Grand Narratives*. Springer, March 2018

Errol Morris (Fourth Floor Productions). *The Ashtray (Or the Man Who Denied Reality)*. University of Chicago Press, May 2018

Laura Nader (University of California, Berkeley). *Contrarian Anthropology: The Unwritten Rules of Academia*. Berghahn Books, January 2018

Martha C. Nussbaum (University of Chicago). *The Monarchy of Fear: A Philosopher Looks at Our Political Crisis*. Simon & Schuster, July 2018

Paul A. Offit (Children's Hospital of Philadelphia; University of Pennsylvania Perelman School of Medicine). *Bad Advice: Or Why Celebrities, Politicians, and Activists Aren't Your Best Source of Health Information*. Columbia University Press, June 2018

Stephen Owen (Harvard University). *Just a Song: Chinese Lyrics from the Eleventh and Early Twelfth Centuries*. Harvard University Press, February 2019

Elizabeth J. Perry (Harvard University) and Prasenjit Duara (Duke University), eds. *Beyond Regimes: China and India Compared*. Harvard University Press, October 2018

Stanley Plumly (University of Maryland). *Elegy Landscapes: Constable and Turner and the Intimate Sublime*. W. W. Norton, August 2018

Joy Lisi Rankin (Michigan State University; Visiting Scholar, 2015–2016). *A People's History of Computing in the United States*. Harvard University Press, October 2018

Martin Rees (University of Cambridge). *On the Future: Prospects for Humanity*. Princeton University Press, October 2018

Condoleezza Rice (Stanford University) and Amy B. Zegart (Center for International Security and Cooperation, Stanford University). *Political Risk: How Businesses and Organizations Can Anticipate Global Insecurity*. Twelve Books, May 2018

Frances McCall Rosenbluth (Yale University) and **Ian Shapiro** (Yale University). *Responsible Parties: Saving Democracy From Itself*. Yale University Press, October 2018

Kay Lehman Schlozman (Boston College), **Henry E. Brady** (University of California, Berkeley), and **Sidney Verba** (Harvard University). *Unequal and Unrepresented: Political Inequality and the People's Voice in the New Gilded Age*. Princeton University Press, June 2018

Ian Shapiro (Yale University) and **Frances McCall Rosenbluth** (Yale University). *Responsible Parties: Saving Democracy From Itself*. Yale University Press, October 2018

Anna Marie Skalka (Fox Chase Cancer Center). *Discovering Retroviruses: Beacons in the Biosphere*. Harvard University Press, October 2018

Rosemary A. Stevens (Cornell University, Weill Cornell Medical College). *A Time of Scandal: Charles R. Forbes, Warren G. Harding, and the Making of the Veterans Bureau*. Johns Hopkins University Press, November 2016

Paul Theroux (East Sandwich, MA). *Figures in a Landscape: People and Places*. Houghton Mifflin Harcourt, May 2018

Michael Tomasello (Duke University). *Becoming Human: A Theory of Ontogeny*. Harvard University Press, January 2019

Sidney Verba (Harvard University), **Kay Lehman Schlozman** (Boston College), and **Henry E. Brady** (University of California, Berkeley). *Unequal and Unrepresented: Political Inequality and the People's Voice in the New Gilded Age*. Princeton University Press, June 2018

Steven Weinberg (University of Texas at Austin). *Third Thoughts*. Harvard University Press, August 2018

We invite all Fellows and International Honorary Members to send notices about their recent and forthcoming publications, scientific findings, exhibitions and performances, films and documentaries, and honors and prizes to bulletin@amacad.org. ■

† Deceased

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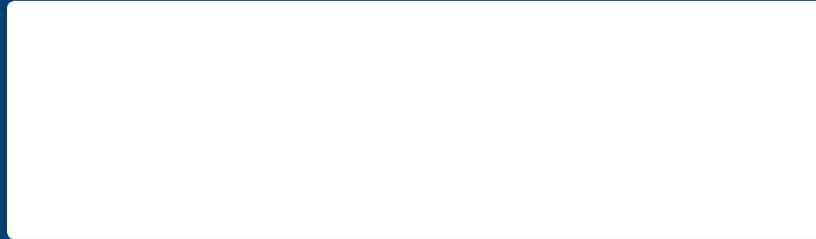
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