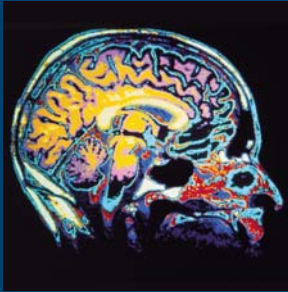




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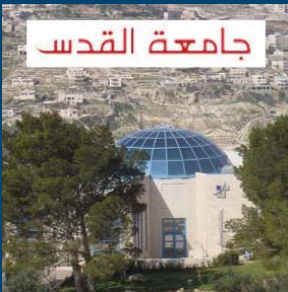
VOL. LX, NO. 3



Page 4

Is There Science Underlying Truth Detection?

Symposium organized by Emilio Bizzi and Steven Hyman



Page 6

Politics and Knowledge in the Middle East

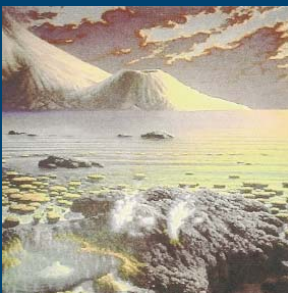
Philip S. Khoury, Sari Nusseibeh, Itamar Rabinovich, and John Waterbury



Page 13

Handel's Portraits of Italy in the Early Chamber Cantatas

Ellen T. Harris



Page 26

The Birth of Oxygen

John Abelson

INSIDE:

Hundreds Convene for The Public Good Meeting in Washington, *Page 1*

New Archival Facility at the House of the Academy, *Page 2*

War and Peace in the Operas of Giuseppe Verdi

by Philip Gossett, *Page 20*

Surveillance, Exposure, Privacy, and New Technologies

by Michael Traynor, Nancy Van House, and Deirdre Mulligan, *Page 32*



Calendar of Events

Contents

News

<i>Washington, D.C., Gathering Celebrates Knowledge as the Foundation for a Democratic Society</i>	1
<i>New Archive Facility</i>	2

Symposium

<i>Is There Science Underlying Truth Detection?</i>	4
---	---

Communications

<i>Politics and Knowledge in the Middle East</i> Sari Nusseibeh, Itamar Rabinovich, and John Waterbury	6
--	---

<i>Handel's Portraits of Italy in the Early Chamber Cantatas</i> Ellen T. Harris	13
---	----

<i>War and Peace in the Operas of Giuseppe Verdi</i> Philip Gossett	20
--	----

<i>The Birth of Oxygen</i> John Abelson	26
--	----

<i>Who's Watching Me Now? Surveillance, Exposure, Privacy, and New Technologies</i> Nancy Van House and Deirdre Mulligan	32
--	----

Noteworthy	38
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AMERICAN ACADEMY
OF ARTS & SCIENCES

**Saturday,
October 6, 2007**

Stated Meeting and Induction Ceremony –
Cambridge

Location: Sanders Theatre, Harvard
University

**Saturday,
November 10, 2007**

Stated Meeting – Chicago

Location: The Field Museum, Chicago, IL

**Wednesday,
November 14, 2007**

Stated Meeting – Cambridge

Location: House of the Academy

**Wednesday,
December 12, 2007**

Stated Meeting – Cambridge

Location: House of the Academy

*For information and reservations, contact the
Events Office (phone: 617-576-5032; email:
mevents@amacad.org).*

Washington, D.C., Gathering Celebrates Knowledge as the Foundation for a Democratic Society

Nearly one thousand of the foremost scientists, humanists, and leaders in business and public affairs gathered in Washington, D.C., from April 27–29 for the first joint meeting of the nation’s two oldest learned societies – the American Academy of Arts and Sciences and the American Philosophical Society. Both organizations predate the birth of the nation and include among their founding members Benjamin Franklin, John Adams, James Bowdoin, and John Hancock. Members of the congressionally chartered National Academies (the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine) joined the Academy and the Philosophical Society for the historic two-and-a-half-day meeting.

The Public Good: Knowledge as the Foundation for a Democratic Society was organized by Academy Chief Executive Officer Leslie Berlowitz and Philosophical Society Co-Executive Officer Mary Maples Dunn. It brought together academics and practitioners for a series of panel discussions, conversations, and dinner programs that focused on some of the most pressing issues facing the nation: *The Independence of the Courts; Religion and the Enlightenment; The United States and the Global Economy; The Media and Society; Science, Health, and*



Front: Mary Maples Dunn (American Philosophical Society) and Leslie Berlowitz (American Academy of Arts and Sciences); Back: William Friend (National Academy of Engineering), Ralph Cicerone (National Academy of Sciences), Emilio Bizzi (American Academy of Arts and Sciences), Baruch Blumberg (American Philosophical Society), and Harvey Fineberg (Institute of Medicine)

an Aging Society; and Energy Choices and Global Warming.

The more than forty featured presenters at the meeting included Pedro Aspe (Evercore Partners); Tom Brokaw (NBC News); Ralph Cicerone (National Academy of Sciences); E. L. Doctorow (NYU); Harvey Fineberg (Institute of Medicine); Linda Greenhouse (*New York Times*); Charles Holliday, Jr. (DuPont); Gwen Ifill (*Washington Week* and *The NewsHour with Jim Lehrer*); Kathleen Hall Jamieson (University of Pennsylvania); Judith Kaye (New York State Court of Appeals); Edward Lazear (President’s Council of Economic Advisors); Martin Marty (University of Chicago); Richard Meserve (Carnegie Institution of Washington); Peter Nicholas (Boston Scientific Corporation); Don Michael Randel (Andrew W. Mellon Foundation); John Reed (Citigroup, Inc.); John Rowe (Columbia University); Robert Solow (MIT); Rosanna Warren (Boston University); and Janet Yellen (Federal Reserve Bank of San Francisco).

At a ceremony at the Library of Congress on April 28, the Academy and the Philosophical Society paid tribute to three distinguished Americans. Librarian of Congress James H. Billington, historian and scholar John Hope Franklin, and former Supreme Court Justice Sandra Day O’Connor received *Public Good Awards* in recognition of their dedicated public service and their significant contributions to the advancement of learning.

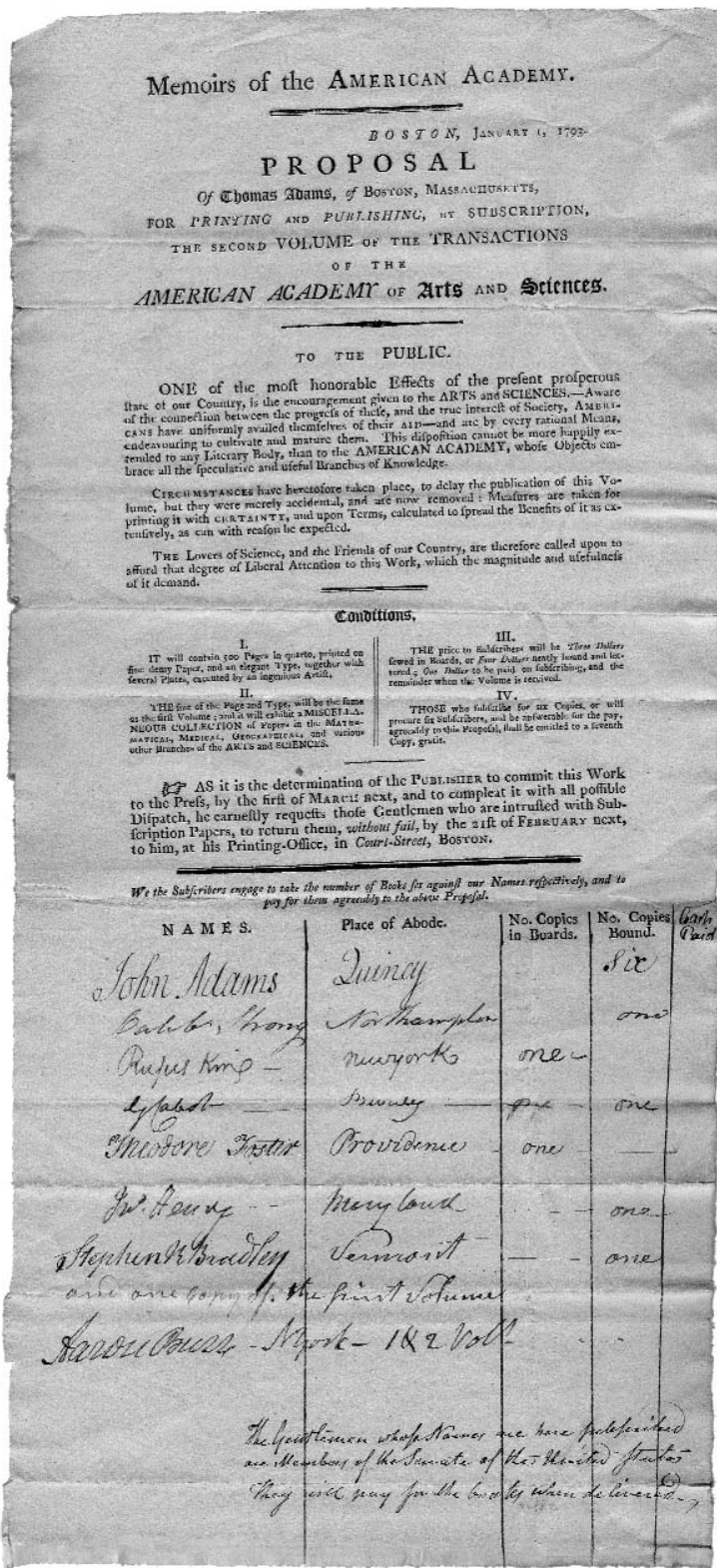
The Academy will publish the panel discussions, keynote addresses, and *Public Good Award* citations in a forthcoming publication. The audio of the program is available for downloading from the Academy’s website at <http://www.amacad.org/audio/publicgood>.

The Academy and the Philosophical Society express their deep appreciation to Ambassador Leonore Annenberg, a member of both societies, and to the Annenberg Foundation Trust at Sunnylands for generously supporting this joint meeting. ■



Don Michael Randel (Andrew W. Mellon Foundation)

New Archive Facility



Through the generous support of an anonymous donor, the Academy now has a state-of-the-art archival facility at its Cambridge headquarters. For the first time in its 227-year history, the Academy will be able to house all of its archival resources in a space designed specifically for the cataloging and storage of historic materials. Documents, publications, and works of art, placed on deposit at other institutions when the Academy was unable to store its own collections, will be brought together in a single repository.

The Academy's archive project has three closely related goals: to create an appropriate, climate controlled archive facility, which has been accomplished; to organize, catalog, and preserve the Academy's records in accordance with current archival practices; and to provide scholars and the wider public with access to the archives through guides to the collections posted on the Academy's website, the digitization of selected documents, and exhibits, both online and at the House in Cambridge. Funds to expand and sustain these activities are being sought.

The oldest materials date back to the founding of the Academy in 1780. Copies of the original charter and statutes, signatures of the founding members, and minutes of the first Stated Meeting held on May 30, 1780, appear in the earliest handwritten manuscripts. In succeeding decades, the holdings chronicle the Academy's transition from a Boston society of learned citizens in the eighteenth century; to an increasingly specialized body of researchers in the nineteenth; to a national and international research center, comprised of distinguished individuals from all fields and professions, in the twentieth. They provide a unique window on the historic, scientific, and civic development of the nation from the perspective of scientists and scholars, writers and artists, and political and corporate leaders.

The Academy's archive project benefits from the advice provided by the Archive Committee, which includes Joyce Appleby (University of California, Los Angeles), Bernard Bailyn (Harvard University), Ellen Dunlap (American Antiquarian Society), Brenda Lawson (Massachusetts Historical Society), Bernard Margolis (Boston Public Library), Robert C. Post (Yale Law School), Megan Sniffin-Marinoff (Harvard University Archives), and Patricia Meyer Spacks (University of Virginia). ■

Subscription list for the second volume of the *Memoirs of the American Academy*, issued by Boston printer and publisher Thomas Adams, January 1, 1793. The Academy sent blank subscription forms to members so they could gather signatures of people who pledged to buy a stated number of copies. This particular subscription form was signed by Vice President (and Academy founder) John Adams, Academy founding member Caleb Strong (U.S. Senator from Massachusetts), and six other senators: Rufus King of New York; George Cabot of Beverly, Massachusetts; Theodore Foster of Providence, Rhode Island; John Henry of Maryland; Stephen Bradley of Vermont; and Aaron Burr of New York.



Spring 2006: basement storage area before the start of renovations.



Academy's archivist Beth Carroll-Horrocks sorting material.



Spring 2007: newly installed compact shelving for archives.

The newly renovated 1,225-square-foot archive facility includes:

- Compact storage units and appropriate shelving
- Storage for artwork, textiles, oversized documents, and artifacts
- An alarm system to monitor for intrusion and for environmental emergencies
- An independent heating, ventilation, and air conditioning system to ensure maintenance of appropriate temperature and humidity
- Fire and water alarms
- A new work area

Academy Symposium

Is There Science Underlying Truth Detection?



Emilio Bizzi (MIT)

What is the state of the science underlying the use of functional magnetic resonance imaging (fMRI) technology to detect deception? What are the implications of using brain imaging as evidence in law enforcement and trial proceedings? These questions were put before two panels of experts on February 2, 2007, at the American Academy. MIT Institute Professor and Academy President Emilio Bizzi and Harvard Provost Steven Hyman presided over the symposium, which was co-sponsored by the McGovern Institute for Brain Research at MIT and Harvard University. Over 250 people, from universities, law enforcement agencies, and business, registered for the conference.

Marcus Raichle (Washington University in St. Louis School of Medicine) explained the fundamentals of fMRI technology, its use in brain imaging, and its value as a tool for understanding brain function. He noted the worldwide explosion of research using a technology “that peeks inside people’s brains and looks at what’s going on.”

“Like it or not,” Raichle said, “it’s here, and we’re going to need to know how to think about it, and how to deal with it.” The potential application is very broad. For example, the federal government conducts over 40,000 polygraph tests each year for employee screening and pre-screening, despite the documented shortcomings of the device. Raichle warned that much more research was necessary to

assess the value of using fMRI machines to detect deception.

Nancy Kanwisher (MIT) and Elizabeth Phelps (NYU) each examined current research on MRI-based lie detection. In the few published experiments where measurements have been attempted, success rates for detecting lies are very high. As Kanwisher noted, however, the methods used to generate these conclusions contain significant problems.

When a subject in a laboratory experiment complies with instructions and makes a false response, it is not the same as real-world deception. To cite one example, for criminals, the risks associated with lying are entirely different from those in the laboratory. The anxiety of the subject tested will be far greater outside of the laboratory, regardless of the person’s innocence or guilt. Finally, there are numerous countermeasures criminals might employ to evade detection, such as moving their tongue while undergoing a test or performing mental arithmetic. Kanwisher concluded that there is “no compelling evidence that functional MRI will work for lie detection in the real world.”

Phelps presented another perspective on this question. The feelings of suspects or witnesses who lie in criminal investigations are likely to be very strong. How do the neural mechanisms related to deception, such as those of memory and conflict, differ when an individual is highly emotional? On the basis of her research, Phelps suggested that “when we look at the brain’s circuitry of memory, we may not be able to differentiate those things that we imagined, rehearsed, and thought were plausible events, from those things that actually happened. Our memories contain things that happened in our minds and things that happened in the world.” Phelps has found, however, that emotion modifies the signatures of memory. Those attempting to develop fMRI techniques for lie detection will need to understand how emotion and memory interact if they are to produce results that would be useful in a legal context.

A second panel of experts considered the legal and ethical implications of imaging. Stephen Morse (University of Pennsylvania Law School) reminded the audience that all legal criteria are behavioral: they are based on what people do rather than what they think or intend. “Brains don’t kill people, people kill people,” said Morse. If neuroscience is to be legally relevant, it must help to identify the actual brain correlates of particular kinds of behavior when other evidence of behavior is ambiguous. For Morse, the answer to whether neuroimaging should be admitted as evidence of lying in a court of law comes down to first, whether the evidence is relevant, and second, whether the science behind the imaging is sound.

However, as Walter Sinnott-Armstrong (Dartmouth College) pointed out, these two criteria are difficult to apply because scientists and lawyers treat evidence very differently.



Steven Hyman (Harvard University)

Legal decisions require clear dichotomies – guilty or not guilty; admissible as evidence or not admissible. By contrast, scientists discover continuous probabilities on multiple dimensions. Lawyers and judges can recognize the scientific dimensions and continua, but they still need to draw lines in order to serve their own purposes in reaching decisions.

Sinnott-Armstrong cautioned that using fMRI as a test for lie detection would require a much better understanding of its predictive value. How high is the rate of false-positive errors – an indication that someone is lying

when in fact they are not? Only after the validity of the test is clearly established, and the error rates are known and understood, should neural lie detection be admissible in court.

Jed Rakoff, United States District Judge for the Southern District of New York, brought to the discussion a perspective from within the courtroom. “Witnesses lie,” confided Rakoff. “Some just embroider a little bit, some exaggerate, and some tell great big whoppers.” In his view, the Anglo-American legal system has dealt effectively with this problem by using the tool of cross-examination: “Practiced liars don’t tell falsehoods, they just omit key facts. Cross-examination, if it’s good, and it isn’t always, will bring that out. Brain imaging would not even be relevant to this situation because everything the witness said would

be the truth, just not all the facts.” Drawing on the studies and use of the polygraph, Rakoff maintains that, at present, brain imaging as a technique for lie detection is much more likely to cause mischief than to be of real help.

In a concluding presentation, Henry Greely (Stanford Law School) proposed that fMRI technology for lie detection should be banned, “unless or until it has been proven safe and effective to the satisfaction of a competent government agency, with public disclosure and discussion of the information on which the decision was based.” Greely suggested that the use of fMRI for lie detection should be tested in a comparable manner to medical devices that are subject to FDA approval. Testing should be done on diverse sets of people: children, the elderly, the mentally ill, people

who have had a drink, people who take blood pressure or other medications. This new technology may hold great promise for use in law enforcement and intelligence, said Greely, but only after it has been sufficiently tested to determine its accuracy.

Participating as an audience member, a chief executive of one of the firms seeking to market fMRI machines to detect deception indicated that despite the underdeveloped state of this technology, interest in its use is very strong. He has received calls from prospective clients in governmental agencies and the private sector, both inside and outside the United States. The Academy plans to publish the panelists’ presentations in its Occasional Paper series this summer. ■



Stephen Morse (University of Pennsylvania Law School), Jed Rakoff (U.S. District Court, Southern District of New York), Walter Sinnott-Armstrong (Dartmouth College), and Henry Greely (Stanford Law School)

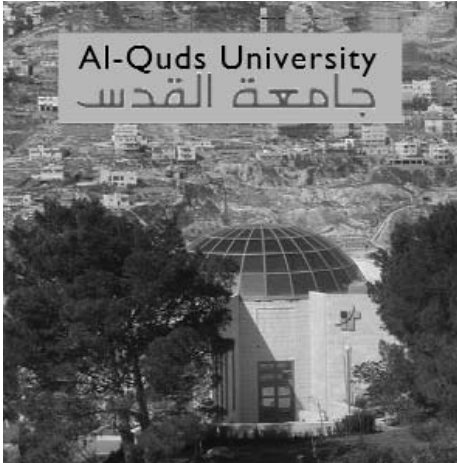


Marcus Raichle (Washington University in St. Louis School of Medicine)

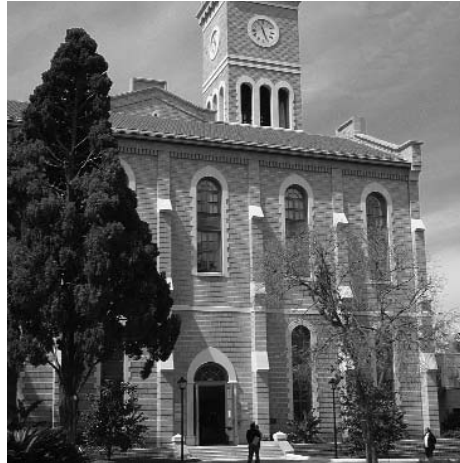


Nancy Kanwisher (MIT) and Elizabeth Phelps (NYU)

Cambridge Meetings



Main campus of Al-Quds University



College Hall on the American University of Beirut campus



Tel Aviv University campus

Politics and Knowledge in the Middle East

Sari Nusseibeh, Itamar Rabinovich, and John Waterbury

Introduction by Philip S. Khoury

This presentation was given at the 1905th Stated Meeting, held at the House of the Academy on November 13, 2006.

Sari Nusseibeh is President and Professor of Islamic Philosophy at Al-Quds University.

Itamar Rabinovich is President and Yona & Dina Ettinger Chair in Contemporary History of the Middle East at Tel Aviv University.

John Waterbury is President and Professor of Political Studies at the American University of Beirut.

Philip S. Khoury is Associate Provost and Ford International Professor of History at the Massachusetts Institute of Technology. He has been a Fellow of the American Academy since 2002.



Philip S. Khoury

Last summer, in the midst of the war involving Lebanon and Israel, I was asked what the Academy might do to provide an explanatory framework for understanding that war and its aftermath. My immediate response was to suggest that we invite these three university presidents from the Middle East to speak. They are, in their own right, distinguished experts on the region and have very interesting perches from which to observe the events surrounding them. I might add that each has had a long-standing commit-

ment to determine how to reconcile the seemingly irreconcilable.

I have known Dr. Sari Nusseibeh of Al-Quds University (University of Jerusalem) since our graduate school days here in Cambridge in the 1970s. I have known Dr. Itamar Rabinovich of Tel Aviv University almost as long, owing to our mutual interest in modern Arab history and especially in Syria and Lebanon. And as a trustee of the American University of Beirut, I have worked closely with Dr. John Waterbury for nearly a decade now, although I have known him, through his scholarship on the Middle East, for much longer.

Sari Nusseibeh has been President of Al-Quds University and Professor of Islamic Philosophy since 1995. He received his undergraduate education at Oxford and his Ph.D. from Harvard and has been a fellow at the Woodrow Wilson International Center for Scholars, the Radcliffe Institute for Advanced Study, and most recently, the Baker Institute for Public Policy at Rice University. In the 1970s and 1980s, he taught at Birzeit University in the West Bank and became increasingly involved in Palestinian politics, staking out positions that were bold, controversial, and ahead of

their time for both the Palestinians and the Israelis. A courageous and farsighted individual, he has written on Islamic philosopher Avicenna (Ibn Sina), and, more generally, on epistemology and on the theory of just and unjust wars. His best-known publication is *No Trumpets, No Drums: A Two-State Settlement of the Israeli-Palestinian Conflict*, published in 1991 with Mark Heller, a leading Israeli political scientist. Their book presaged by a full two years the Oslo Accords, on which we placed so much hope for a lasting solution to the Israeli-Palestinian conflict.

Al-Quds University is the youngest of the institutions represented here this evening. Established in Jerusalem in 1984 and officially decreed in 1993, it is an amalgamation of a number of older Arab educational institutions in Jerusalem and was born in the cauldron of the Israeli-Palestinian conflict. Today, it has more than 7,000 undergraduate and graduate students. Al-Quds has had to overcome numerous obstacles to reach the level of achievement it has attained, and Sari's leadership has been a crucial ingredient in its survival and success.

Itamar Rabinovich has had a long and distinguished career as a historian and university leader. The recipient of a Ph.D. from UCLA, he is about to step down as President of Tel Aviv University, a position he has held for the past eight years. Before becoming President, he served as Director of the Moshe Dayan Center for Middle Eastern and African Studies and Dean of the Entin Faculty of Humanities. He will continue to serve as the Yona & Dina Ettinger Chair in Contemporary History of the Middle East. In addition to his career in academia, he has had extensive experience in world politics and diplomacy. He served as Israel's chief negotiator with Syria under the late Prime Minister Yitzhak Rabin and as Israel's ambassador in Washington from 1993 to 1996, when many of us got to know him again in this country.

Founded in 1956, Tel Aviv University is the largest university in Israel with some 29,000 students; it is truly a major center of teaching and research, consisting of 9 faculties, 106 departments, and 90 research institutes. Itamar's gifted stewardship over the years has contributed tremendously to making Tel Aviv University one of the top research universities in Israel today.

John Waterbury became the fourteenth President of the American University of Beirut (AUB) in 1998, where he is also Professor of Political Studies. Before joining AUB, he was a member of the Princeton University faculty for almost 20 years, serving as the William Stewart Tod Professor of Politics and International Affairs and director of the Center for International Studies. He was also editor of the journal *World Politics* from 1992–1998. In the 1970s, John was the representative in Cairo of the American Universities Field Staff – a consortium of American universities. He received his undergraduate education from Princeton and his Ph.D. from Columbia. One of the leading political scientists writing about the Middle East, he has published widely on such topics as the political economy of public enterprise and the development of international river basins.

AUB was established by American Protestant missionaries in 1866 and is the most prominent American university beyond our shores, with some 7,000 students. It is a nonsectarian institution, registered in New York State, accredited by the Middle States Commission on Higher Education, and probably best known for its outstanding medical school. As many of you know, AUB went through an extremely difficult period during the long war for Lebanon between 1975 and 1990: its president was assassinated on campus, deans were murdered, and faculty were kidnapped and taken hostage. Before that war, it was the leading university serving the Arab world. There is no question in my mind, and in the minds of all who know the situation in Beirut, that John is the individual most responsible for rebuilding AUB and restoring its reputation.

We have asked our speakers to address several questions: First, how would you characterize the current political situation in the Middle East, with specific reference to Israel, Palestine, and Lebanon? Second, which aspects or relationships do you feel are most salient to understanding and improving the situation? Third, how does the current political situation affect life in your university? Fourth, what roles have your universities played, and what roles can they play, in helping to make the Middle East more peaceful, prosperous, and stable?



Sari Nusseibeh

I believe we have a situation in the Middle East that actually demands – requires – that people like you, that countries like the United States, do something about it. It's quite possible for the situation simply to continue in the way that it has been going, quite possible for us – the Israelis and the Palestinians – to continue fighting. In any case, it has become clear that the Israelis and the Palestinians are unable to extricate themselves from the conflict they created. We must look elsewhere, to the United States in particular, to help us address the issues we face. I know that this country has many other things on its mind, and I know that the Israeli-Palestinian conflict is

It has become clear that the Israelis and the Palestinians are unable to extricate themselves from the conflict they created. We must look elsewhere, to the United States in particular, to help us address the issues we face.

not necessarily the most important thing in life for most people. But I believe that, at this moment, only the United States can effectively bring the conflict to an end.

It is possible to bring the conflict to an end because I believe that most Israelis and Palestinians want a resolution. Polls and studies

clearly indicate that people would accept a peace settlement if it were initiated by a country like the United States. But if the United States does not take the initiative to bring about a settlement, then it is likely that the Israelis and the Palestinians will simply continue fighting each other, with neither side able to achieve its objective.

Having said this, let me address the role of education, with particular reference to my university and the challenges it faces. My university is in East Jerusalem; part of it lies within the municipal border of Jerusalem, and part of it lies outside. Given our location, the Israeli authorities have questioned whether we are, in fact, a legitimate entity. Over the past ten years – the years in which we have been growing as an institution – we’ve had legal problems with the Israeli authorities concerning our accreditation. In recent years, the discussion has gone something like this:

Because we exist both inside and outside the municipal border, it has been proposed that we split ourselves into two entities. Following the split, we could then apply for accreditation from outside the municipal line as a foreign or non-Israeli institution and request permission to run our operations within the municipal borders. Or, alternatively, we could apply as an Israeli institution from within the municipal border, in which case we would get accreditation for our operations within there, and the Israeli authorities will have nothing to say about whatever operations we run outside of the municipal borders.

Splitting oneself in two is quite a task. I’ve asked lawyers how one does this, but I haven’t gone to psychologists – yet. The lawyers assure me that it can be done, but for the last two or three years, I’ve been trying to work out, in my mind, how to divide oneself logically into two entities, and then, continue existing as one entity – legally, financially – and as an “organism.” This is one of our problems.

The other problem centers on the access of students and professors. My university has one of the leading medical programs in Palestinian institutions: the only medical school in Palestine with other health sciences associated with it. We’ve been trying to draw individuals of Palestinian origin who are working in the United States to teach with us and help us further develop the medical school. Recently, a professor from Yale University,

who had offered to come, was denied entry by Israel for the second time. You might ask yourselves how a professor of Palestinian origin, holding a U.S. passport and coming to a Palestinian territory, could be denied entry by Israeli authorities. The answer is simply that any Palestinian – anybody at all – coming into what is called the Palestinian area or “Authority” area has to pass through the Israeli doorway system, which includes Israeli immigration and security authorities. The Israeli authorities, consequently, can easily deny that person entry. In fact, that is what the Israeli authorities have been doing to many professors of Palestinian origin, with U.S. citizenship or European passports, who have wanted to teach at Palestinian institutions, particularly in the West Bank.

It is through scientific cooperation that bridges can be created between parties that are otherwise fighting each other, and that peace can be made.

More recently, Israeli authorities have issued a ban against all Palestinians from the West Bank and from Gaza who wish to continue their studies in Israeli institutions. There was the case of a female graduate of my university who wanted to take her Ph.D. in chemistry at the Hebrew University. For some time, Israeli security prevented her from entering Jerusalem. In the past several years, there have been calls by European and American academics to boycott Israeli academic institutions based on the fact that Israeli authorities are not allowing Palestinian academics to pursue their academic operations or activities freely. However, in my mind, it doesn’t stand to reason to support a boycott. My institution opposed the calls and has, in fact, been very active in trying to develop cooperative projects with Israeli institutions over the past ten years. We need to stand against the boycott; to emphasize that science does not have, nor does it recognize, borders: it is through scientific cooperation that bridges can be created between parties that are otherwise fighting each other, and that peace can be made.

In this context, I was very happy, last week, to see that the rectors of six universities in Israel, including Tel Aviv, issued a statement opposing the security ban against Palestinian students – a very significant position for them to take. More recently, I believe, the Israeli Academy of Arts and Sciences also issued a clear statement against the ban.

In the case of this particular Palestinian student, an Israeli human rights organization took the case to court; happily, the Israeli court ruled in her favor, and she is now pursuing her doctorate at the Hebrew University. Recently, I was touched to read an interview with her in an Israeli newspaper. She said that as a female, she was very conscious of how few female Ph.D.’s are represented in Palestinian universities. She saw no conflict with the Israelis; she wanted to study in Israel to improve herself and eventually to become involved in advancing the institutions of her own nation. This is the kind of situation that I hope we will be able to overcome through cooperation between Israeli and Palestinian academic institutions.

Today universities and academics on both sides of the border can perform a much more effective role in addressing the Israeli-Palestinian conflict than they have done in the past. And perhaps we should involve universities from the Arab world in our effort to bring peace to the region. But all of this isn’t going to replace the need that I mentioned at the beginning – the urgent need for the United States as a nation to stand up and extricate the Israelis and the Palestinians from the quagmire in which we live. I believe that it is your duty to do it, simply because nobody else can do it at this moment in time, and you can.



Itamar Rabinovich

Let me begin with a brief comment following Sari Nusseibeh's remarks. In my experience, Palestinian students from the West Bank and Gaza do not tend to study at Israeli universities; they generally go abroad or enroll in West Bank universities. However, we would like to encourage them to come to Israel, and I am personally involved in the effort to gain more permits.

I agree with Nusseibeh that a strong American stand is needed, not only in the Arab-Israeli context, but in the larger, regional context. There are signs of change in Washington and in the administration. The report to be submitted by the Baker-Hamilton team is important. It will urge a more pro-active U.S. policy, which we all want, but I'm not sure that, given its makeup, the Bush administration will be in a position to appoint an individual who could play a role in effecting a major breakthrough in the Middle East associated with the names Kissinger, Carter, and Baker. That requires personal talent, diplomatic skill, and the very strong support of an effective president.

Let me examine this from an Israeli perspective. In 1991, we began an ambitious effort to resolve the Arab-Israeli conflict. In the aftermath of the first Gulf War, what was known as the Madrid Process led to the Oslo Accords, which, in turn, led to Israeli-Jordanian peace and a great deal of Arab-Israeli normalization to the point that we have semi-diplomatic relations with countries in the Gulf and in North Africa. Following the mutual recognition between Israel and the PLO in 1993, the whole give-and-take between Israelis and Arabs changed dramatically.

But the process, as you know, failed. The year 2000 was the watershed in which both the Israeli-Syrian and the Israeli-Palestinian tracks of the peace process collapsed. It was not a total failure in that many positive consequences of that process are still with us. They offer the groundwork for a new beginning that I believe will come, if not within the next two years, then following the next American election.

For Israel, the policy choice based on the collapse of the peace process and the outbreak of the second Intifada was unilateralism. From the Israeli perspective, there was "nobody to talk to on the other side." Remaining in the West Bank and Gaza would eventually lead to the destruction of Israeli democracy and if we cannot negotiate a solution, let's disengage unilaterally. Hence, the Barak disengagement from Lebanon in 2000, and Sharon's disengagement from Gaza.

For Israel, the policy choice based on the collapse of the peace process and the outbreak of the second Intifada was unilateralism.

Now, in the last two years, confidence, fence building, separation, and unilateralism all came crashing down. The Hamas victory and rockets fired from Gaza, followed by the missile attacks from Lebanon last summer, demonstrated that fences were of very limited value and that unilateralism didn't work. Clearly, Israel needs to think through what it wants to do next.

I would like to remind you that our current prime minister, Ehud Olmert, Sharon's successor, was elected on a platform of continuing the unilateral disengagement from Gaza and West Bank. But he has lost his personal standing, has no political base, and is preoccupied with political and personal survival. Unilateralism is practically and politically dead, and Olmert is in no position to think through a major new policy approach.

On the Palestinian side, we have a Hamas government. In Lebanon, Hezbollah just

The Middle East is not North Korea. It's more urgent and more crucial. Last summer's war demonstrates we have to continue to seek peace and that an overall approach needs to be adopted.

staged a government crisis by walking out of the senior cabinet and threatening to push the country back to civil war. There's not much hope in the region itself and there's not much hope coming from Washington. But clearly, this is a part of the world that cannot tolerate dead ends and vacuums, and something will need to be done about it.

I want to turn to the Iranian issue. Iran is casting a very large shadow over the whole region. It is powerful, populous, and rich. It's a country with an imperial heritage, and today it is a society composed of sophisticated elitists with huge ambitions. It went through a genuine revolution, and like many other revolutionary states, it wants hegemony. It reminds me of what Abdul Nasser and Pan-Arabism represented in the 1950s and 1960s.

What does hegemony mean in this case? It means that Iran will not control the whole region, but it would like to be a mediator between the region and the world. It is effective in several countries in the area, particularly in Lebanon and Syria; its Shiite constituencies are linked with those in Iraq; and it has resources in other countries in the Gulf. I support the Baker approach, which says that the United States needs to think seriously about entering a dialogue with Iran. Iran has ways of obstructing efforts to make peace with the Palestinians or the Lebanese. It has direct access to Hamas and to Islamic jihad, and these organizations have their headquarters in Damascus, directly under Syrian and Iranian influence. It cannot be ignored, and it can undo much of what we will try to do. But the United States must also develop a policy to deal with the repercussions of a failure to reach an understanding with Iran.

In practice, there is a competition between what we call the Palestinian track and the Syrian-Lebanese track. Israeli prime ministers sometimes feel that, politically, they can only do one thing at a time. Barak tried to do both and failed abysmally. Other prime ministers created a sequence and said, I'll deal first with the Palestinian issue, and then with the Syrian-Lebanese issue – or the reverse. In the 1990s, four Israeli prime ministers and Mr. Clinton preferred to deal first with the Syrian issue, and then move on to Palestine. It didn't work. After 2000, President Bush developed a healthy hatred for Bashar al-Assad, and he does not want to deal with Syria, while Sharon and his disciple, Olmert, want to focus on the Palestinian issue, not on Syria and Lebanon. The Middle East is not North Korea. It's more urgent and more crucial. Last summer's war demonstrates we have to continue to seek peace and that an overall approach needs to be adopted.

Finally, some words about university education in the region. When you go through the gates of Tel Aviv University or the Hebrew University by foot or by car, you pass through a security check. Although it has become routine, we should never forget that this is not what a university should be about. A university should be open and accessible to the larger community, without fences and gates.

I listened carefully to Leslie Berlowitz speak about the purpose of the American Academy, and I thought to myself that, actually, this could be our own mission statement. A civil society is a requisite for a democratic society. Israel is still building a civil society. Nearly half of the ninety institutes at Tel Aviv University are in public-policy areas. We believe that it is part of the mission of our university to eliminate government monopoly over thinking and speaking about public-policy issues and to create another voice that will be heard. Today, Tel Aviv and several other universities in Israel have institutes that provide alternative thinking and discourse to that of the government. We also believe that education should not be limited to only those who are privileged to attend an elite university; we consciously reach out to students from poorer neighborhoods as well as the Arab population of Israel and provide them with opportunities to train for a career in our country. So, in addition to teaching and research, our effort to help create a civil society is critical to our purpose.



John Waterbury

In my nine years as President of the American University in Beirut, I have been so consumed by the predictable routine of university administration that I think my academic and intellectual side has become pretty dormant. Looking at the contemporary situation in the Middle East – in Lebanon, Israel, and Syria – I am very much in the trees and losing sight of the forest. I welcome this opportunity to stand back and reflect on the current situation.

Looking over the time in which I have studied and lived in the Middle East – now over forty-five years – I believe that we are currently experiencing the worst period in U.S.-Arab relations, certainly in my memory. When I say something as extreme as that, I really question myself. Am I merely responding to immediate crises – the war last summer? Or can I assure myself that I have more objective reasons for coming to that conclusion?

A predecessor – not my immediate predecessor by any means, but the president of AUB in the early 1950s, the late Stephen Penrose – wrote an article for *Reader's Digest* with the title "Why Do the Arabs Hate Us?" I look back at that article and wonder whether I can claim that this is, in fact, the worst period. We can think of 1967, the June war, after which most Arab countries broke diplomatic relations with the United States. It was a time when only Iran and Saudi Arabia seemed to identify publicly with U.S. interests in the region. I remember now, almost fondly, Habib Bourguiba, the President of Tunisia, who in the mid-1960s advocated essentially for what Sari and Itamar and many others have worked for subsequently – something like Camp David. He was denounced as a traitor, as a lackey.

What's different? What's changed? In my view, in the 1950s and 1960s, we saw the ascendancy and the near-dominance in the Arab world of self-proclaimed socialist regimes, very much on the side of the Soviet Union in the cold war, and, at least at the elite level, ideologically committed to Third World revolution. Remember, this was the time when real revolution was going on in Algeria and in Vietnam. I lived in the Arab world at that time, and it struck me that there was something theatrical about the hostility toward the United States. It was very much at the level of state propaganda and state elites and seemed to have very little resonance among the peoples of the region itself. In addition, the socialism that was proclaimed as the dominant ideology never ran very deep in popular sentiment.

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I have two answers to why the Middle East is different today. First, I remember, as we all do, when Sam Huntington came forth with his "clash of civilizations." My reaction was that it's not a clash of civilizations; it's a clash of cousins. The problems in my part of the world clearly demonstrate that it's the guy down the street that you have to worry about, and he may, or may not, be related to you. But, having said that, I have to concede that, in recent years, there has been a sense of a clash, if not of civilizations, then of something very profound. I don't want to say value systems, because I'm not sure how many sides invoke the same values. But there's no question in my mind that what we might call political Islam has a resonance in Arab society and beyond, and that is unlike anything the socialist, populist regimes of the 1950s, 1960s, and 1970s were able to invoke. Whether or not

there's an objective truth to this, the protagonists of political Islam see themselves in a kind of mortal conflict with the West or the United States, without defining, too much, what the nature of that conflict is. A kind of ideological framework has penetrated Arab society to a greater extent than we have seen in previous periods of tension between America and the Arab world.

The second factor – and this brings me much closer to my institution – is the role of a generation of educated Arabs, who emerged either during the cold war period in the midst of highly repressive regimes, or subsequent to the loosening up of those regimes, at least economically, in the early 1970s. Egypt, under Anwar Sadat, can be regarded as the paradigm here. After 1973, there was a period known as *Infatah* – the opening to the non-Soviet world – that has really endured almost until the present. It led to the formation of a very different kind of middle-class intelligentsia than existed in the 1950s, 1960s, and 1970s. These people identified with the West. After years of studying in Eastern Europe and the Soviet Union, their children were allowed to come to the United States to be educated. Over the last five or six years, this very substantial group of Arabs has come to feel betrayed. Whether they are right or wrong doesn't make any difference. They believe that the United States has let them down, if not abandoned them. At the same time that they feel the hot breath of the Islamists, they have never really experienced the warm embrace of the United States.

What might that warm embrace be? I come back to Sari Nusseibeh's remarks. The warm embrace might have been, and occasionally and briefly was, efforts on the part of the United States to move Israel in directions that I don't think the Israelis, or at least Israeli governments, would willingly have gone. This group of Arabs hoped that America would maintain this policy, but under the Bush administration in particular, they have seen quite the reverse.

I'm not saying this with any personal sentiment. In many ways, I might agree more than even I would be willing to acknowledge with certain parts of the Bush policies. But I can simply tell you, from my own experience, how the Arabs I know – they tend to be Western educated – see the situation. I don't look forward to reading a new book on the imminent

demise of the moderate Arab middle class written by Marwan Muasher, an AUB alumnus, former Jordanian ambassador to both Israel and the United States, and former foreign minister and deputy prime minister of Jordan.

As a result of the combat in Lebanon last summer, I think that a number of voices and groups have once again focused their attention on the Arab-Israeli theater, and I believe – but I may be mistaken – they have tried to separate it to some degree from a global issue that is confronting us in the form of the war on terrorism. But to have divorced the Arab-Israeli problem, festering for all these decades, from this larger question has probably led us down, if not a blind alley, certainly the wrong road. We have heard a number of respected voices who have called, once again, for a com-

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prehensive look at this long-standing conflict. And as Sari said, there is widespread feeling in the Middle East that Palestinians and Israelis cannot extricate themselves from their conflict alone, and without the concerted intervention – over a long period of time, not just a single administration – of the United States.

In many ways, a light bulb went on this summer, and we'll see how long it continues to burn. I join Itamar in a sense that the constellation of forces may not be right for U.S. engagement in this crucial issue. In the remaining two years of the Bush administration, I doubt that we will see any meaningful engagement. It's a losing game more often than it's a winning game, and it may require more political stamina than anyone in Washington is really able to exhibit at the present time.

Let me turn, finally, to my university. Phil Khoury asked us what role our universities play in the current crisis. What AUB is doing in the current situation is essentially what it

has always done for 140 years. The university was founded in the wake of a savage civil war between Druze and Christians. It lived through the declining and often violent years of the Ottoman Empire. It lived through two World Wars as well as two fairly brutal civil wars in Lebanon, and, since 1982, a kind of endless and quiet war with Israel, which became very violent last summer.

Our guiding MO is to stay open at all costs. Since our founding and our first graduating class in 1866, AUB has never failed to graduate our seniors and our graduate students. Close it and you lose it. "Strive for excellence" sounds familiar, I'm sure, to all of you in education here. Extol and practice the values of openness in all forms is what we try to do. We do succeed, I think, in creating a completely nonsectarian atmosphere at AUB. The students may not always walk the walk, but they all talk the talk. They feel that one of the great luxuries of AUB is that, for a while, they can escape the highly sectarian nature of their own political system. We fight fiercely for academic freedom at AUB. I'm happy to say that the Lebanese government, in my experience and, I think, in my predecessors' experience, has rarely interfered in university affairs, rarely tried to influence how our professors teach, what opinions they hold, what books they use. That is indeed very rare in the Middle East.

At AUB, our goal is to contribute to the body of human knowledge. We wish to be a respected and prestigious research university. It is indicative of our independence that, despite the fact that five Shiite ministers have resigned from the Lebanese government and that Hezbollah threatens to go to the street to force the resignation of the current government, we will hold our student elections on Wednesday. My dean of students, who is also the acting president in my absence, assured me today that he thinks we're going to be able to carry these off without incident. What really worries me, of course, is where our students will go. We have been educating students to go abroad, and many, particularly our male graduates, do tend to go abroad. We hope – and there's good evidence that we're right – that they will return eventually. But it's not a great feeling to see your kids mentally packing up in their senior year and trying to figure out where they're going to go.

Cambridge Meetings

My final remark is that the mood in Lebanon is not very upbeat at present. The political tension is high, and the future is very uncertain. Let me tell you about a sign that was photographed in the back of an automobile parked on a Beirut street about three weeks ago. Reference is made to General Michel Aoun, a Christian Maronite and former military officer and general in the Lebanese armed forces, who opposed the Syrians violently in 1989 and was eventually forced into exile in Paris. After some eighteen years in exile, he returned to Lebanon in the spring of 2005. The second character in the sign is Samir Geagea, a former militia leader during the Lebanese civil war, one of the rare individuals who was convicted of crime, mayhem, and murder; thrown in jail; and then released in the spring of 2005. His wife is now a Member of Parliament, and he is now a prominent political leader. President Émile Lahoud, who may be a more familiar name to you, is the source of the great controversy on the three-year extension of his presidency at the behest of the Syrians. These are the three characters mentioned in this sign in the back of the car. The sign read as follows: "Aoun is back. Geagea is out. Lahoud is staying. I'm leaving. The car is for sale." ■

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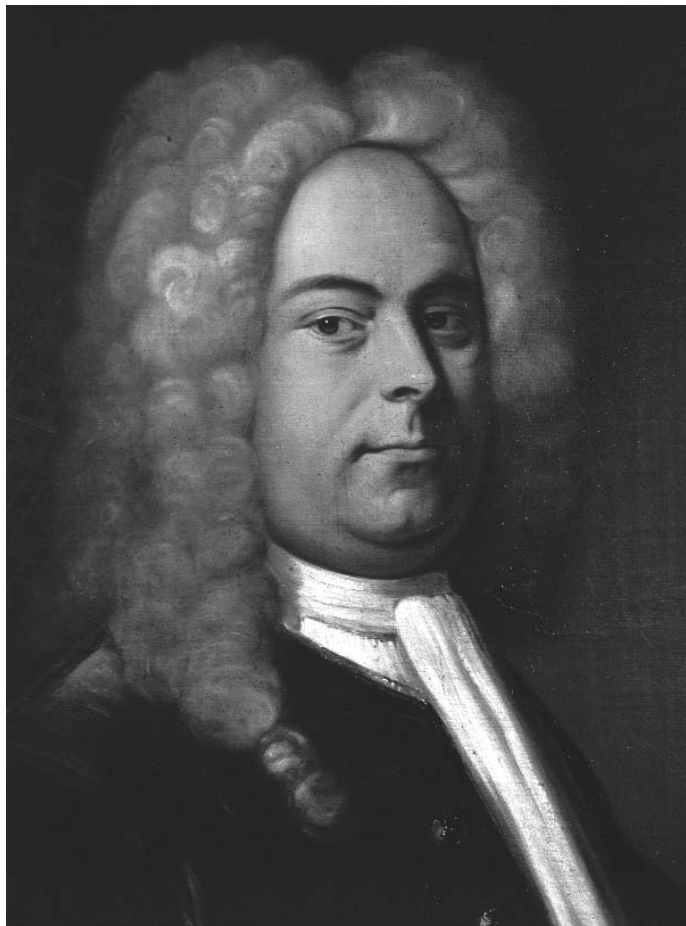
Michal Safdie and Moshe Safdie (Moshe Safdie and Associates)



Itamar Rabinovich (Tel Aviv University) and Joseph Nye (Harvard University)



Philip Khoury (MIT), Rami Khouri (The Daily Star), Sari Nusseibeh (Al-Quds University), and Roger Owen (Harvard University)



Handel's Portraits of Italy in the Early Chamber Cantatas

Ellen T. Harris

Introduction by Jane A. Bernstein

This presentation was given at the 1909th Stated Meeting, held at the House of the Academy on December 13, 2006. It was followed by a musical performance by Pamela Dellal, mezzo-soprano; Daniel Ryan, cello; and Michael Beattie, harpsichord.

Ellen T. Harris is the Class of 1949 Professor of Music at the Massachusetts Institute of Technology. She has been a Fellow of the American Academy since 1998.

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

Portrait of G. F. Handel. Civico Museo Bibliografico Musicale, Bologna, Italy. © Bridgeman-Giraudon/Art Resource, NY.



Jane A. Bernstein

It is a great pleasure to introduce my dear friend and colleague, Ellen T. Harris, one of the most distinguished musicologists of our generation. She is the Class of 1949 Professor at the Massachusetts Institute of Technology. Before coming to MIT, Harris taught at Columbia University and at the University of Chicago, where she served as Chair of the

Department of Music. An outstanding scholar of Baroque music, she is considered one of the foremost experts on the music of George Frideric Handel.

Harris's interest in musicology began during her undergraduate years at Brown University. Her teacher Ivan Waldbauer recognized her talents and urged her to pursue graduate studies at the University of Chicago. The late 1960s were not an easy time for women in the academic world. There were no role models for us, and social expectations at that time went against women pursuing a career in higher education. During her first year as a graduate student, she sought the advice of the eminent musicologist, Edward Lowinsky. Now, Lowinsky was not generally known for his kind mentorship of students. But he realized Ellen's brilliant potential and encouraged her – indeed, he insisted that she continue her studies in musicology. Her other teachers at Chicago included such luminaries as Howard Mayer Brown, Leonard Meyer, Philip Gossett, and her thesis advisor, Robert Marshall.

Her dissertation on the pastoral genre in Handel was an interdisciplinary study on national styles in seventeenth- and early-eighteenth-century literature and music drama in Italy, Germany, and England. Soon published as *Handel and the Pastoral Tradition*, it became the definitive monograph on the subject, one that would resonate in her later works.

Both scholarship and performance have always played an important role in Professor Harris's oeuvre. In 1987, she simultaneously brought out her second book on Henry Purcell's *Dido and Aeneas* along with a new critical edition of the musical score. Her volume was the first full-length study of Purcell's masterpiece. It delved into the opera's historical and cultural background, considered the libretto from the perspective of prevailing literary conventions, and discussed eighteenth- and late-nineteenth-century performance practices. Only two years later, she oversaw a thirteen-volume critical facsimile edition of seventy-one librettos documenting Handel's operatic career.

Over the years, numerous articles and reviews by Professor Harris concerning opera, performance practice of vocal music after 1600, and the English Baroque have appeared in many journals and newspapers. One of my favorites, “Handel the Investor,” which won the prestigious Jack Westrup Prize, moves from the musical to the economic world as it elucidates Handel’s financial expertise through an investigation of the accounts he held at the Bank of England.

Of all her publications, the jewel in the crown is her latest book, *Handel as Orpheus: Voice and Desire in the Chamber Cantatas*. A milestone in Handel research, it not only explores the Italian cantata – a hitherto neglected yet important genre in the Handelian repertory – but also places these chamber works in their social and cultural context, and in so doing opens a window onto the life of a very private composer. For this publication, Harris was honored with the two top book awards in her field: the Louis Gottschalk Prize from the Society for Eighteenth-Century Studies and the Otto Kinkeldey Award from the American Musicological Society.

I would be remiss if I didn’t mention Professor Harris’s extraordinary accomplishments as an administrator. Upon her arrival at MIT she served as Associate Provost for the Arts. In that capacity, she published articles on censorship in the arts and arts education that appeared in *The Chronicle of Higher Education* and *The Aspen Institute Quarterly*. Last year she was honored with the Gyorgy Kepes Prize for her contributions to the arts at MIT.

Finally – and I’m saving the best for last – Ellen Harris is also a very talented musician. Many of us have had the pleasure of hearing her live musical demonstrations during her presentations, but few know that she could have pursued a career as an opera singer. During her years as a graduate student, she trained at the American Conservatory and became an active member of the Repertory Opera Theater in Chicago. She continued to study voice privately while an Assistant Professor at Columbia and was about to audition for the New York City Opera when she was offered a position at the University of Chicago. At that point she chose to follow the path that led to the academy. Nonetheless, she has performed as a soprano soloist at two of Boston’s great landmarks: Fenway Park, where in 1991 she sang the National An-

them, and Symphony Hall, when she made her 1997 Boston Pops debut under the baton of John Williams.

George Frideric Handel, famous for his English oratorios and, of course, his masterpiece *Messiah*, is one of the most illustrious composers of all time to write for the voice. And, as we will hear tonight, given Ellen Harris’s exceptional talents as a scholar and singer, she is the preeminent person to talk about this great composer’s life and music.



Ellen T. Harris

The confluence of Handel and the month of December has traditionally meant a performance of *Messiah*. Nowadays, as a result of the ever-expanding Handel opera revival, it could also mean the opening of an opera production, as with the Metropolitan Opera production of *Rodelinda* in 2004. My topic tonight, however, is neither opera nor oratorio, but rather the musically rich cache of Italian chamber cantatas that Handel wrote before his composition of either opera or oratorio had reached full maturity. Because some of these survive in fragmentary form and others in multiple versions, it is difficult to say exactly how many cantatas Handel composed – in the same way that we are comfortable declaring, for example, that he wrote forty-two operas – but one hundred is about right.

In late 1705 or early 1706, when Handel was twenty, he crossed the Alps – or possibly just took the sea route from Hamburg – to Italy. In Germany, his experiences as a professional musician had been exclusively in the public arena. In 1702, while studying law at the university in his hometown of Halle, he took a

position as a church organist; but in 1703 he left his studies and his job, possibly under the influence of his friend Georg Philipp Telemann at Leipzig, and traveled to Hamburg to try his hand at opera. At the public opera house, he was hired first as a freelance orchestral musician, but quickly took on composing and conducting responsibilities after his talent was discovered. Over three years, he composed four operas for Hamburg; the music survives for only one.

Once in Italy, Handel moved away from composing and performing in the public sphere and into the world of private patronage. His Italian compositions, with the exception of

Handel’s Italian compositions, with the exception of his opera Agrippina for the public opera of Venice, were written for private performance in the apartments, chapels, or theaters of his private patrons.

his opera *Agrippina* for the public opera of Venice, were written for private performance in the apartments, chapels, or theaters of his private patrons, including the Medici in Florence; the Cardinals Pamphili, Ottoboni, and Colonna, as well as the Marchese (later Prince) Ruspoli in Rome; and the Duke Gaetani d’Aragona and his wife Aurora Sanseverino in Naples.

Handel did not secure long-term employment at any of these houses, where many musicians were regularly engaged, perhaps because of his nationality and Lutheran religion. It may also be that Handel deliberately avoided accepting this kind of commitment. Like his father, a surgeon who held court appointments but also maintained a large city practice, Handel never accepted a position like the one held later by Haydn at Esterhazy, which involved specific daily duties in service of an employer. While in Italy, he largely maintained his independence, working without salary as a guest of his hosts and returning music for hospitality.

After leaving Italy in 1710, Handel took a position at the court of Hanover, and the employment was such that it gave him, or required him to take, extensive entrepreneurial opportunities. Although the Elector of Hanover, Georg Ludwig, was second in line to the throne of England after his mother Sophie, the dowager electress, Queen Anne, the last of the Stuart monarchs, wanted none of the electoral family in England during her reign. As a result, the Hanoverians were dependent on political envoys in London for delivering communications from Hanover and gathering information to send back. Handel's strong desire to try his hand at public opera in London therefore served the Elector's interests. He was allowed to travel, or was sent, to that city with the freedom to

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make independent professional explorations but also, undoubtedly, with the task of ingratiating himself at the highest levels of society and returning information. In his first year in London (from late 1710 to the summer of 1711), Handel quickly made his way into the inner circles of Anne's court and also scored a huge hit with his first Italian opera for London, *Rinaldo*. He wrote not one note for Hanover, but on his return there a year later, was duly paid for his services.

Handel traveled again to London late in 1712, but this time he ran into difficulties with his German employer. Queen Anne, having negotiated a peace agreement with France in the War of Spanish Succession, requested that Handel compose a Te Deum for the national day of celebration. As the queen's separate peacemaking was strongly opposed by her German and Dutch allies, her choice of Handel to compose the celebratory music was at least partly a political move, for the participation of the Hanoverian court composer on such a public occasion would suggest a wider international agreement than existed. The Elector, adamantly refusing to

be implicated in Britain's unilateral peace, resolved the issue by firing Handel. The Hanoverian envoy in London then strove to calm tempers all around. In the end, Handel's dismissal stood, and as is well-known, he composed the Utrecht Te Deum and Jubilate for Queen Anne. When the dust settled, however, the envoy wrote in numeric code to the Elector that Handel "will continue to tell me all he knows." Georg Ludwig, of course, became king of England in 1714.

The 1710s were a tumultuous time for England and for Handel, and at many points the composer may not have been sure of his future. His personal goal was clearly to write opera, and with the establishment of the Royal Academy of Music in 1719 this dream became reality. Before this time, however, Handel had sought out alternate means of support, including the kind of private patronage he had experienced in Italy. Although the vast bulk of his cantatas were written in Italy, one or two can be associated with Hanover, and a handful come from these years in London as a result of the patronage of Lord Burlington, the Earl of Carnarvon (later the Duke of Chandos), and perhaps others. When Handel acquired his own house in 1723, he finally became independent of the hospitality of patrons. Freed from the necessity to write private music, he chose never again to write a chamber cantata.

Between 1600 and 1750, the Italian chamber cantata was arguably the most pervasive form of vocal music. Unlike the Protestant church cantata, the chamber cantata was typically for one singer with a *continuo* accompaniment consisting of harpsichord and cello (or one or the other of these instruments). Sometimes the cantata took on a more expansive and often more dramatic form with the inclusion of additional singers and instrumental forces, but by far the most common type was a succession of two arias preceded by recitative for solo voice and *continuo*. The texts were generally secular and in a pastoral idiom. Although the majority of the cantata shepherds pine for lost or unrequited love, a few, in reference to the War of Spanish Succession, talk of putting down their pipes and taking up arms, while others represent spiritual shepherds pursuing lost souls.

Given its diminutive size, the chamber cantata was typically written for private performance, either for an aristocratic patron or for meetings of elite intellectual societies, such

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as the Arcadian Academy in Rome, a city in which there was a good deal of overlap between the private *conversazione*, or salons, of individual patrons and the meetings of the Academy. Although most of the cantata texts remain anonymous, some can be attributed to the patrons themselves or other Academy members. Giovanni Maria Crescimbeni, one of the founders of the Arcadian Academy, describes the cantata as a literary genre invented in the seventeenth century specifically for the purpose of musical composition. It uses long and short line lengths (typically mixed seven- and eleven-syllable lines, or *versi sciolti*, in the recitative; and eight-syllable lines in the arias) without a regular rhyme scheme. By and large, Handel's cantatas adhere to all of these norms.

Although Handel wrote most of his cantatas in Italy, a group of about ten new cantatas and ten revised cantatas originate later in England, and the popularity of the genre in both countries led to the publication of many books of cantatas, making these works available for home performance even to those who did not, or could not, commission cantatas themselves. Alessandro Marcello published a book of twelve cantatas in Venice, in 1708, when Handel was in Italy. Albinoni's book of 1702 was dedicated to the Medici who were among Handel's patrons. Bononcini and Ariosti, Handel's operatic rivals in England, published books of Italian cantatas in London in 1721 and 1728, respectively. And the English composer Thomas Roseingrave published a set in 1735 with texts by Paolo Rolli, a member of the Arcadian Academy whose poems Handel also set in London. Handel, however, never published any of his cantatas, which is surprising not only because of the widespread popularity of cantata books, but also because he published in all the other genres in which he composed.

Handel knew the musical value of his cantatas and certainly did not withhold them because he felt them lacking in quality. Indeed, he frequently turned to the cantatas for inspiration in the composition of later works. Some of his early operas, such as *Agrippina* and *Rinaldo*, may be said to be largely based on borrowings from cantatas; but even in his last oratorio, *Jephtha*, of 1751, Handel dipped into the cantatas for musical material. Did Handel decline to publish his cantatas because he had made the decision to rely on them compositionally, or did he decide to reuse the glorious music they contained because he had made up his mind not to publish them as cantatas? The answer, of course, cannot be known, but the question is one we will want to think about in the course of the evening.

The sheer number of baroque cantatas, and their seeming lack of singularity, given the apparently repetitive pastoral imagery, has discouraged scholarly and musical attention.¹ It is difficult, therefore, to place Handel's cantatas fully into their musical context; however, I can say with assurance that his contributions to the genre are lacking in neither quality nor individuality. Handel's reuse of the music attests to this on the musical side, and the texts, once closely examined, begin to come alive with well-defined portraits of his patrons. That is, just as the classical pastorals of Theocritus and Virgil depict contemporary personalities and issues, so do the pastoral texts Handel set to music. In the large dramatic cantata *Oh, come chiare*, for example, Handel's patron is depicted in the character of the shepherd Olinto, who says he will exchange his pastoral bagpipe for the warlike trumpet; Olinto Arsenio was the pastoral name Ruspoli assumed in the Arcadian Academy. The other characters are the Tiber River and Glory. All three are led by a benevolent star (*astro clemente*), referring to Pope Clement XI. The cantata *Stelle, perfide stelle!* describes the pain of departure on leaving Rome and a lover behind, and its subtitle reads *Partenza di G. B.* I have argued that this work might be in the 'voice' of (Georg) von Binitz, who, according to Handel's friend, Johann Mattheson, traveled with Handel to

Italy; he may also be the companion of Handel mentioned in the Ruspoli documents.

All of the music Handel wrote for Naples can be associated with the wedding of Tolomeo Gallio, Duke of Alvito, and Beatrice Tocco on July 19, 1708. The serenata (that is, a large-scale cantata) *Acis, Galatea e Polifemo* is specifically tied to Alvito in Handel's manuscript where he signs the work "Napoli li 16 di Giugno, 1708 d'Alvito." The bride was the niece of Aurora Sanseverino, who appears, at least phonetically, as Handel's Neapolitan patron in the composer's biography published by John Mainwaring in 1760, one year after the composer's death. Mainwaring is a critical source, as he must have received his information about Handel's pre-London years direct-

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ly from the composer, either first- or second-hand. Given the Italian title of Donna, the patroness would have been called by Handel Donn' Aurora, which was duly transmitted by the Englishman as Donna Laura, creating a confusion that took years to unravel.

The story of *Acis, Galatea e Polifemo* tells of the love of Acis and Galatea and the death of Acis at the hands of the raging monster, Polyphemus. It may initially be difficult to understand why this tale would be appropriate for a wedding, but the answer lies in metaphor. At the very beginning of the serenata, Acis describes himself as a stream that rushes "among tree-roots and rocks until it at last arrives murmuring with silver steps to kiss the seashore"; after his death he undergoes a metamorphosis into just such a stream, rushing to the sea to be united perpetually with the sea nymph Galatea. The union of the rushing river with the bosom of the sea was an image commonly used to represent undying love.

In another cantata that Handel set in Naples at the same time as *Acis, Galatea e Polifemo*, and probably by the same author, Nicola Giuvo, the text explains the metaphor clearly. *Sento là che ristretto* begins with a description of a

brook in the "narrow confine of stumps and rocks," struggling through high banks to unite itself with the sea. After the first aria, in which the river yearns for the sea, the text continues: "Nice, I am the brook, and the beautiful sea is your soft breast." The singer in this cantata is surely that of the bridegroom, and his beloved Nice the bride, Beatrice. In the cantata *Nell'africane selve* the singer again addresses Nice, describing himself as a lion that has been captured by the beauty of her eyes. In *Nel dolce tempo* a shepherd relates how he saw and fell in love with a shepherdess; no names are given but the location is identified by the textual reference to the Volturno River that flows into the sea just north of Naples after passing Piedimonte d'Alife, the primary residence of Donna Aurora.

In Rome, the cantatas most closely identified with portraits of specific individuals are those associated with, and having texts by, Cardinal Pamphili, Handel's first Roman patron. During the first half of 1707, Handel set four cantatas and one oratorio with texts by Pamphili. At least three of these point specifically to Handel or Pamphili, and describe Pamphili's admiration for the young composer. We tend now to picture Handel exclusively as a stout, older man in a full-bottomed wig, but this is a false image of the younger man. He is described by the Dowager Electress of Hanover as "quite a handsome man," and a musician "who surpasses everyone who has ever been heard in harpsichord-playing and composition."² He was also highly educated and cultured. Prince Ferdinand de' Medici stresses his gentility, and not his musicianship, in a letter of recommendation stating that Handel had "honest sentiments, civility of manners, and full command of several languages."³

Pamphili's attraction to Handel raises the issue of homoeroticism in the cantata. The pastoral poetry of Theocritus and Virgil freely encompassed both same-sex and heterosex-

1. See Ellen T. Harris, *Handel as Orpheus: Voice and Desire in the Chamber Cantatas* (Cambridge, Mass.: Harvard University Press, 2001), for an in-depth study and for further references.

2. As quoted in Donald Burrows, "Handel and Hanover," in *Bach, Handel, Scarlatti: Tercentenary Essays*, ed. Peter Williams (Cambridge: Cambridge University Press, 1985), 39.

3. As quoted in Carlo Vitali, "Italy – political and musical contexts," in *The Cambridge Companion to Handel*, ed. Donald Burrows (Cambridge: Cambridge University Press, 1997), 43.

Did Handel decline to publish his cantatas because he had made the decision to rely on them compositionally, or did he decide to reuse the glorious music they contained because he had made up his mind not to publish them as cantatas?

ual love and treated both as beautiful to gain and painful to lose, and the Italian cantata followed this model. Further, Roman aristocratic (and Arcadian) society honored same-sex love in this classical tradition despite draconian legal prohibitions against sexual relationships between men. I hope in my lifetime it will become unnecessary to point out that, like heterosexuality, homosexual relationships span a wide range of human emotion, from admiration and longing to passionate love and sex. That Pamphili's texts seem to cover a goodly part of this range tells us nothing about either Handel's reaction to Pamphili or his feelings upon being given these texts to set. Nor can we glean anything definitive from the reports that later in life Handel referred to Pamphili as an "old fool"⁴ or that he is rumored to have had an affair with a prima donna while in Italy.⁵ Even if true, neither anecdote would close the possibility of a reciprocal relationship of some kind between the composer and the cardinal.

In Pamphili's text for the oratorio *Il trionfo del tempo ed il disinganno*, which Handel set in May of 1707, Pleasure, on the one side, and Time and Undeception, or Truth, on the other, compete for the soul of Beauty. Music exists in Pleasure's kingdom, and when Beauty hears the sound of an organ, she immediately asks for the origin of the heavenly tone. Pleasure then indicates the living "youth," specifically the twenty-two-year-old Handel who would

have been at the keyboard playing the Organ Concerto that occurs at this point. In response to the concerto, Pleasure comments that "the graceful youth awakens sweet delight with enticing tones, and with new allurements gives listening its own pleasure," and Beauty replies that "his hand has wings, or rather his hand makes music more than mortal." Pleasure's allures, apparently including Handel as an object of desire, are significant, and Beauty (perhaps Pamphili himself?) is torn. Before making the correct choice, she expresses her desire "to have two hearts in my breast, so as to give one to repentance; the other I would give to pleasure."

In the cantata *Tra le fiamme*, which Handel set in July, Pamphili identifies himself more closely. The text compares the deadly flight of Icarus with the fatal attraction of moths to a flame, none of which can rise, like the phoenix, from its own ashes. The phoenix (*fenice*) was Pamphili's Arcadian name, and while the cantata warns against allowing unregulated passion to take wing and cautions man to take only imaginative flights of fancy, the text of the first and last aria contains the confession that the author/singer's heart is already playing dangerously among the flames (*tra le fiamme*).

In what is probably the last text by Pamphili set by Handel, the cardinal mentions Handel by name, describing him as superior to Orpheus. The text of *Hendel, non può mia musa* states that while Orpheus could stop birds in flight and beasts in their tracks, and make trees and rocks move, he couldn't make any of these things sing. How much greater then is Handel, who, Pamphili continues, "forced my muse into song, just when it had hung the plectrum on a dry tree and was lying motionless." The musical conceit, implying that Handel's arrival in Rome had awakened Pamphili's poetic muse, barely conceals a sexual reading – and, in point of fact, the cardinal's muse had not been slumbering. Furthermore, the three texts by Pamphili that were set by Handel describe a clear trajectory, from Handel's music arousing "delight" in *Il trionfo*, to inspiring a dangerous attraction that only a phoenix (Pamphili's Arcadian identity) could survive in *Tra le fiamme*, to affecting a (sexual) reawakening in *Hendel, non può*. Let me reiterate, we have no way of knowing whether the cardinal acted on any of these feelings, nor can we determine Handel's response. We will, however, come

back to Handel's rather wry setting of the cantata comparing him to Orpheus a little later.

Although a number of Handel's cantatas have taken on new life with the recognition that they offer individual portraits, most lack this kind of specificity. It seems likely, however, that cantatas frequently contained personal allusions, even when these are now lost to us. A manuscript of cantatas owned by the castrato Andrea Adami, a favorite of the Cardinal Ottoboni, includes watercolor miniatures, tentatively attributed to Pier Leone Ghezzi, at the beginning of each work. These do not depict simple shepherds and shepherdesses in pastoral surroundings, but rather aristocratic characters in recognizable Roman surroundings, providing yet another "glimpse behind that curtain of stylisation which the cantatas were supposed to weave."⁶

In many cantatas, it is impossible to establish the sex of either the singing voice or the beloved. Tightly controlled by artifice, the chamber cantata permitted the intimate expression of intense emotion through concealment.

The conventions governing both the texts and the performance of the cantatas made disguise easy. For example, even though cantatas are written from a male perspective, the vast majority are set in the treble range. That is, as occurs frequently in baroque opera as well, the gender of the performer did not necessarily relate to the character depicted. The character of Ruspoli in Handel's cantata *Oh, come chiare* was sung by a woman. The distraught nymph in *Delirio amoroso*, the first cantata Pamphili wrote for Handel, was sung by a male castrato (and may represent Pamphili himself). Men were often cast as women

4. As quoted in Winton Dean, "Charles Jennens's Marginalia to Mainwaring's Life of Handel," *Music & Letters* 53 (1972): 164.

5. As reported by the Dowager Electress of Hanover: see Burrows, "Handel and Hanover," 39.

6. Reinhard Strohm, "Scarlattiana at Yale," in *Händel e gli Scarlatti a Roma*, ed. Nino Pirrotta and Agostino Ziino (Florence: Leo S. Olschki, 1987), 131.

or, at least, represented with feminine imagery. In religious works, for example, the soul is always gendered female, as is the character of Beauty, who represents the soul (and also Pamphili?) in *Il trionfo*. In Handel's oratorio *La resurrezione*, written for Ruspoli, the role of Mary Magdalen was premiered by a woman; but after the Pope objected to the presence of a woman on the stage, even in a private villa, the role was taken over by a castrato. It is conjectured that at the premiere of *Acis, Galatea e Polifemo* in Naples, Acis was sung by a woman and Galatea by a castrato; at a later performance both roles were taken by castrati.

In addition to the nonspecific gender tradition of performance, the cantata texts themselves frequently obscure the sex of the beloved, as the Italian language makes it easy to hide sexual gender behind linguistic gender: by using metonymy to refer to the beloved as "the beautiful eyes" or "the charming lips"; by using words that have no sexual gender, such as "il mio tesoro" (my treasure); or by using elision to hide the sexual identification, as in "l'amo," where the pronoun could be either "him" or "her" (*lo* or *la*) – that is, "l'amo" could mean either "I love him" or "I love her." In many cantatas, therefore, it is impossible to establish the sex of either the singing voice or the beloved. Tightly controlled by artifice, the chamber cantata permitted the intimate expression of intense emotion through concealment.

Lungi n'andò Fileno, one of Handel's cantatas copied for Ruspoli in August 1708, offers this kind of intense experience. It provides a rare example of a cantata that specifies a male beloved. The singer bewails the absence of this loved one, named Fileno, who has departed for parts unknown. At first the singer's eyes dissolve in tears, and the sounds of weeping and sighs resound in neighboring caves and caverns. However, the singer realizes that tears will not bring pity and welcomes death instead.

Is the character represented by this singer male or female? Our actual singer today, as in Ruspoli's household, is a woman – Pamela Dellal. In two of the cantatas she will perform, she must take on the character of a man: the Neapolitan bridegroom in one and Cardinal Pamphili in the other. In *Lungi n'andò Fileno*, however, there is a question. I wonder if on hearing the cantata sung by a woman you will

automatically give the voice a female sexual identity, and if so, whether you would hear it differently were it to be sung by a counter-tenor. There would, however, be no historical validity in such an experiment.

In my view, *Lungi n'andò*, like most of the cantatas without a specific referent, is best understood in its full ambiguity. Although in this case the beloved's name is identified as male, the text can be understood to represent non-gendered human emotion and passion. Its intentional nonspecificity allows multiple interpretations, permitting each auditor to place him- or herself into the role and to experience with the singer the pain of unrequited love. This is, in fact, what ultimately distinguishes Handel's music for me: its ability always to place the listener inside the emo-

What ultimately distinguishes Handel's music for me is its ability always to place the listener inside the emotion, to make the emotion not something that is viewed in another, but something that is personally experienced.

tion, to make the emotion not something that is viewed in another, but something that is personally experienced. That is, whether or not Handel depicts a specific individual known to us today, he offers portraits of human emotion. All three of our cantatas tonight accomplish this in different ways.

The Neapolitan cantata, *Nel dolce tempo*, which tells, unusually, of a happy, requited love, savors the pleasure and delight. In the first aria, the bass line is created out of a descending chain that continually collides against a neighboring note before releasing into consonance. The effect is a kind of *frisson*, as if the shepherd is feeling little sparks of joy. Certainly, he relishes the word "pastorella," lingering over it with a sense of expansion and emphasis by doubling the sense of measure (by hemiola). In the last aria, he

abandons himself completely to joy, joining the birds trilling in the harpsichord with a long melisma on the word "sing" (*cantar*).

One struggles to imagine the twenty-two-year-old composer's initial reaction to being given the text of *Handel, non può mia musa* to set: was it horror, embarrassment, amusement? Whatever his first reaction, he took a humorous, somewhat ironic, approach to the text in his setting. Where the text states that Orpheus stopped birds in flight and beasts in their tracks, Handel uses an awkward short-long, long-short rhythm that depicts a kind of creeping paralysis, leading up to repeated silences in the music following the word "stop" (*fermar*), so that the musicians themselves act out the reaction of the beasts. The second aria focuses on the "harmony of the new Orpheus." At these words, Handel ironically halts all harmonic motion; by sustaining a single note in the bass for eight measures, he wryly depicts the "new harmony" as a monotone. The music historian Charles Burney, who knew Handel personally, wrote that "his natural propensity to wit and humour, and happy manner of relating common occurrences, in an uncommon way, enabled him to throw persons and things into very ridiculous attitudes." His setting of *Handel, non può* may be taken as a musical example of this side of his character.

Lungi n'andò, in contrast to both of the preceding cantatas, is riven with despair and dissonance. The first aria, depicting endless weeping, is set in a *largo* (very slow) tempo with a complex combination of triple and duple time, not just consecutively but concurrently. Here, the flowing tears offer no release; rather, the rhythmic disjunctions create a sense of the suffering and sorrow mentioned in the text. Further, as opposed to *Handel, non può*, the harmonies are constantly shifting underfoot (from E minor to A minor, to D minor, to G minor, back through A minor to B minor, to G major, etc.), as if the bereft lover has lost his bearings with no secure resting place. The second aria depicts the wish for death to end the cruel pain. Its bass and melody both unwind inexorably, as if this ultimate destination is inescapable, the widely disjunct intervals depicting the ever-present ache of longing for the absent loved one.

These three cantatas offer a glimpse into the musical riches that have lain undiscovered

among Handel's works. *Nel dolce tempo* has been recorded twice, but only one is still available. The other two cantatas have never been recorded, and I myself have never heard them performed. In my view, Handel kept his cantatas private because he considered them personal. As we revel with him in *Nel dolce tempo*, chuckle with him in *Hendel, non può mia musa*, and weep with him in *Lungi n'andò Fileno*, some delight can surely be taken, as the Arcadian Academy members certainly did, in thinking about the pastoral portrait of the Duke of Alvito and his bride, the way Handel's self-portrait makes fun of Pamphili's panegyric, or what unidentified aristocrat lurks behind the façade of the beloved Fileno. You may find, however, also like the members of that older Academy, that if you have ever loved, laughed, or wept, the strongest portrait of all in these works is of your own emotion. ■

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Ellen Harris (MIT) and Kay Kaufman Shelemay (Harvard University)



Werner Sollors and Nathan Glazer (both, Harvard University)



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Midwest Meeting



War and Peace in the Operas of Giuseppe Verdi

Philip Gossett

This presentation was given in collaboration with the Chicago Humanities Festival at the Academy's 1904th Stated Meeting, held on November 11, 2006, at the Gleacher Center at the University of Chicago. It included musical performances by Quinn Kelsey, baritone; Marjorie Owens, soprano; and the University of Chicago Motet Choir under the direction of James Kallembach.

Philip Gossett, a Fellow of the American Academy since 1989, is Robert W. Reneker Distinguished Service Professor of Music at the University of Chicago.



Philip Gossett

Modern audiences are always somewhat embarrassed when, toward the beginning of the second act of *La forza del destino* – the opera Verdi first presented in St. Petersburg on November 10, 1862 – the camp-follower/gypsy, Preziosilla, sings of the glories of war (see Example 1).

Everyone in this “Osteria,” in the Spanish village of Hornachuelos, repeats the refrain, “War is lovely, long live war.” Their words are not idle: we will meet these characters again in the third act, engaged in a fierce battle in Italy.

Francesco Maria Piave’s libretto for Verdi, of course, is not proclaiming the beauty of *all* wars. Preziosilla is inviting the visitors at the Osteria to participate in a particular kind of war against the Germans, “eternal enemies of

Italy and its children,” to which the chorus responds: “Morte ai Tedeschi” [“Death to the Germans”]. These phrases were frequently modified in the nineteenth century, with “Tedeschi” [“Germans”] changed to “straniero” [“foreigner”] in order to soften the message – but the message was nonetheless communicated.

Indeed, the connection to Italian culture and politics was very strong, as has recently been demonstrated anew by the distinguished

A musical score snippet for the opera 'La Forza del Destino'. It shows two staves of music in G major and 2/4 time. The lyrics are: 'È bel - la la guer - ra, ev - vi - va la guer - ra, ev - vi - va la guer - ra, ev - vi - va!'. The first staff ends with a fermata over the final note. The second staff begins with a fermata over the first note, followed by a triplet of eighth notes.

Example 1

Verdi sought to place the story of his characters within a specific social and political context.

Italian historian Alfredo Banti in his masterful book *La nazione del Risorgimento* (2000). At the premiere of Verdi's *Nabucco* in 1842, the Austrian censors tolerated the priest Zaccaria's invocation to the captive Hebrews to fight against the God of the Egyptians in the name of the God of Abraham, with the words "che sia morte allo stranier" ["may the foreigner die"]. In the wake of the failed revolutionary movements of 1848, however, renewed and strengthened censorship cracked down on even those phrases it had permitted earlier in the decade. So, various theaters modified the final phrase from Zaccaria's text to "che ci additi il tuo voler" ["may you show us your will"], "contro il barbaro guerrier" ["against the barbarian warrior"], or "che dia morte all'oppressore" ["may the oppressor be killed"].

The entire third act of *Forza* takes place in a military camp near Velletri, just south of Rome. Heavily influenced at this point in his career by French grand opera, particularly the works of Meyerbeer, Verdi sought to place the story of his characters within a specific social and political context. His presentation of life in a military camp was derived from his reading of a scene from Friedrich Schiller's *Wallenstein*. In fact, one section, the preaching of the quasi-comic friar, Melitone, is a setting of text taken directly from Schiller and translated into Italian by Verdi's friend Andrea Maffei. In the "Accampamento," too, there are choruses proclaiming the virtues of war, "Gioja e vita al militar" ["Joy and life for a soldier"], and a rousing, largely unaccompanied "Rataplan" (imitating the sound of snare drums) for Preziosilla and the chorus. The piece was so well received that, in his 1869 revision of the opera, Verdi concluded the act with it. Not everything is presented in such optimistic tones, however. The "Accampamento" also features a chorus of peasants whose fields have been destroyed by the war and who are reduced to begging for bread, as well as a group of new recruits

who have been forcibly separated from their weeping families.

While Verdi takes evident pleasure in building this complex and varied scene, he never loses sight of his principal characters: the baritone Don Carlo, son of the Marchese accidentally killed in the first act, and the tenor Don Alvaro, son of an executed Indian ruler (hence, to the Spaniards, a barbarian). Previously, Alvaro's attempt to run off with Don Carlo's sister, Leonora, resulted in the confrontation that occasioned the death of their father. Now, both Carlo and Alvaro are fighting in the Italian wars against the Germans, but both have assumed fictitious names. The struggles for national sovereignty in Italy allow Verdi ample opportunity for these two proud antagonists – who have not previously met – to show their bravery in the face of death, to form a friendship in which each saves the life of the other, and to have that friendship dissolve into murderous hatred when their identities are revealed.

Thus, the extreme conditions of war provide a backdrop for scenes of heroism and passion on which the composer lavishes some of his finest music, including an aria for Don Carlo. The wounded Don Alvaro, who is about to undergo surgery and may not survive, has consigned to his "friend" a box of personal effects to be burned should he die. But Carlo is suspicious: who is this man? He begins to open a secret compartment in the box with the key the wounded man has given him, but then he hesitates: he has sworn his faith and honor to follow the wishes of his friend. In the cantabile of his aria, "Urna fatale," Don Carlo rejects the dishonorable path. Yet, there is a portrait in the box, not under lock and key, and hence not subject to the oath. When he sees that it is a portrait of his sister, Leonora, he knows who the wounded soldier must be. After the surgeon returns to say that he has saved the life of the soldier, Don Carlo bursts into the final section of his aria, its cabaletta, where he expresses his joy at the survival of Don Alvaro, whom he now intends to strike down for having killed his father.

[At this point, Quinn Kelsey, a recent graduate of the Lyric Opera of Chicago Center for Young American Artists, sang Don Carlo's Aria, "Urna fatale," from *La forza del destino*.]

There are many pages in the earlier operas of Verdi, those written during the years in which the Italian dream of Risorgimento was still to be achieved, where arias or choruses convey a message of hope and the conviction that armed struggle would be necessary to give birth to a new country. The texts are explicit, and the musical settings strong and uplifting. In the Prologue of the 1846 *Attila*, for example, the barbarian ruler and his hordes of Huns and Ostrogoths are found in the central square of the conquered Aquileia. A group of warrior women is paraded before Attila. He asks one of them, "What has inspired such valor in you?" Odabella responds, "Santo di patria indefinito amor!" ["Holy

The extreme conditions of war provide a backdrop for scenes of heroism and passion on which the composer lavishes some of his finest music.

and infinite love for my country!"] While your women hold back, she continues, "no, donne italiche, cinte di ferro il seno, sul fumido terreno sempre vedrai pagnar" ["we, Italian women, armed with steel, will always be seen fighting on the smoke-filled earth"] (see Example 2).

Even more intense is Verdi's reaction after the Milanese uprising of March 1848, known as the Cinque Giornate, which soon spread to much of Italy. Having been in Paris at the beginning of the Cinque Giornate, Verdi wrote to his publisher, Giovanni Ricordi, on March 25: "I hear great news from Milan, but nothing certain, nobody has letters directly [. . .] I am in a state of great anxiety, and most annoyed that I am here." He did not remain in Paris for long. His most famous letter from this period is to Piave, written in Milan on April 21, 1848:

You can imagine whether I wanted to remain in Paris, after hearing there was a revolution in Milan. I left the moment I heard the news; but I could see nothing

ma noi don - ne i - ta - li - che,
cin - te di fer - ro il se - no, di fer - ro il sen,

Example 2

but these stupendous barricades. Honor to these heroes! Honor to all Italy, which in this moment is truly great!

The hour of her liberation has sounded, you may be convinced of that. It is the people who want it: and when the people want something there is no absolute power that can resist them. [. . .]

You speak to me of music!! What's got into you? . . . Do you believe I want to concern myself now with notes, with sounds? . . . There is and must be only one music welcome to the ears of the Italians in 1848. The music of the cannon! . . . I would not write a note for all the gold in the world: I would feel immense remorse in using music-paper, which is good for making cartridges.

There are many pages in the earlier operas of Verdi... where arias or choruses convey a message of hope and the conviction that armed struggle would be necessary to give birth to a new country.

That Verdi soon wished to celebrate the new political situation through his music, however, becomes clear in his correspondence with the librettist Salvatore Cammarano. In an April 20 letter to Verdi, Cammarano excuses his previous silence because "in this era of political confusion, anxiety, and hopes, civic thoughts took precedence in me over

artistic thoughts." Now that Cammarano is seeking a subject for a projected new opera with Verdi, the changed political situation has "opened up an ample terrain for our choice," and he suggests several subjects that would previously have been impossible, before turning to the subject he really wishes to develop: "And if within you burns, as it does within me, the desire to treat the most glorious epoch of Italian history, let us bring ourselves back to that of the Lombard League." After summarizing the subject of *La battaglia di Legnano*, in which the Italians in 1176 successfully fought against the German barbarians under the leadership of Federico Barbarossa, he concludes: "By God, a subject of this kind must stir every man who has an Italian soul in his heart!" In the poetry of the first act, which Cammarano sent on June 26, the opening words are assigned to the chorus:

Viva Italia! un sacro patto
Tutti stringe i figli suoi:
Esso alfin di tanti ha fatto
Un sol popolo d'Eroi!

[Long live Italy! A sacred pact binds together all your children. It has finally made from the many a single people of heroes!]

Verdi set this text as a simple, unaccompanied choral hymn (see Example 3).

Vi - va I - ta - lia! Sa - cro un pat - to tut - ti strin - ge i fi - gli suoi! —

Example 3

In a letter of October 24 about Cammarano's third act, Verdi requested only one change: the introduction of a short scene for Lida and Rolando, so as to give the *prima donna* an expanded presence. Cammarano obliged the composer with the scene that includes this strophe, in which Rolando tells his wife what to say to their son should he die in battle (see Example 4):

Digli ch'è sangue italico,
Digli ch'è sangue mio,
Che dei mortali è giudice
La terra, no, ma Dio!
E dopo Dio la Patria
Gli apprenda a rispettar.

[Tell him that he is of Italian blood, tell him that he is of my blood, that God judges men, not the earth! And after God teach him to respect the homeland.]

As of January 1849, of course, these texts were still possible in Rome, where Papal forces had not yet overturned the Roman Republic, but they were no longer acceptable in Milan, where the Austrians were again firmly in control. Although Ricordi published *La battaglia di Legnano* in its original form, the Austrians forced the publishers to destroy the plates. Instead, Verdi and Cammarano's opera became *L'assedio d'Arlem*, with changes in the text to make it acceptable to the Austrian rulers.

Yet not all armed conflict, not all actions of war, even in the name of Italy and Christianity, could be considered just in the eyes of either God or man. Meyerbeer's 1836 work for the Paris Opéra, *Les Huguenots*, had put on stage one of the worst incidents of religious intolerance in the history of Europe, the massacre of Protestants by the Catholic majority on St. Bartholomew's Eve of 1572. As always, the historical event served as a backdrop for personal tragedy, in this case the love of Valentine, daughter of one of the leaders of the

Di - gli ch'è san - gue i - ta - li - co, di - gli ch'è san - gue mi - o,

Example 4

Catholic faction, for Raoul, a Protestant soldier. Before the opera concludes, Valentine embraces the faith of Raoul and both are murdered, as they sing the tune of the Lutheran chorale, “Ein feste Burg ist unser Gott,” while the Catholic soldiers chant, “Dieu le veut, Dieu veut le sang” [“God wants it, God wants blood”] and Valentine’s father looks on, helpless, at his dying daughter.

The effect of war on those caught up in its throes despite themselves is a theme Verdi would explore several times, not always with complete honesty.

The most frightening scene of the drama, though, comes in the fourth act, where a secret visit by Raoul to Valentine is interrupted by the arrival of the Catholic faction, who are plotting the massacre. Three monks bless the daggers and swords of the “holy cause,” the will of God and the King. All rush forward on the stage, their swords and daggers drawn, and sing (see Example 5): “Dieu le veut, Dieu l’ordonne, non! non! grâce à personne. A ce prix il pardonne au pêcheur repentant.” [“God

wants it, God orders it, no! no! mercy for no one. At this price he pardons the repentant sinner.”]

By the early 1840s, there could have been few lovers of opera in Europe who did not know this opera (although often with modified texts or even changed historical frameworks), either from seeing it or from studying it through a vocal score. But the phrase “Dieu le veut” had a long history: it is the cry (“Al sangue! Iddio lo vuole! Iddio lo vuole!”) that accompanies the Crusaders in Tomasso Grossi’s 1826 poem, *I lombardi alla prima crociata*, the source for Temistocle Solera’s 1843 libretto for Verdi’s opera of the same name.

For all its Risorgimento aura, Verdi’s *I lombardi* is by no means a work that looks approvingly on the bloody history of the Crusades. The opera takes place in Milan, Antioch, and the outskirts of Jerusalem, as it follows a Milanese contingent on the First Crusade to Jerusalem in 1096–1097. I will spare you details of the familial history that is played out in the drama. Suffice it to say that Giselda, the daughter of Arvino, a Milanese nobleman, has been captured by the Muslim tyrant of Antioch, Acciano, and has fallen in love with Acciano’s son, Oronte. Oronte, in turn, following the lead of his mother, Sofia, has vowed to become a Christian.

In the cantabile of Giselda’s aria at the end of the second act, “Se vano è il pregare,” she

prays for peace to her dead mother. But in an elaborate *tempo di mezzo*, Giselda learns that her father and the Crusaders have attacked Acciano’s palace, killing the sultan and his son. (It turns out that Oronte still lives, although he suffers wounds that ultimately will cause his death.) When her father, bathed in blood, presents himself to his daughter, she recoils in horror and sings, “No! giusta causa non è d’Iddio / La terra spargere di sangue umano” [“No! God does not consider it a just cause to spill human blood”], and concludes, “Queste del cielo non fûr parole . . . no, Dio nol vuole!” [“These are not the words of heaven . . . no, God does not wish it!”]. And she predicts that the vanquished will arise again and seek horrible revenge: they will surge forward in torrents and threaten all of Europe. In the repetition of her cabaletta theme she asserts again: “No, Dio non vuole. Ei sol di pace scese a parlar.” [“No, God does not wish it. He descended to earth only to speak of peace.”] And as the curtain falls, she offers her breast to her father and urges him to strike her dead.

Let me emphasize that, although the situation is similar in Grossi’s narrative poem, his Giselda does not pronounce any of these words; in particular she does not say “Dio nol vuole.” This intervention is the work of Solera and Verdi.

[Marjorie Owens, from the Lyric Opera of Chicago Center for Young American Artists, sang Giselda’s Aria, “Se vano è il pregare,” from *I lombardi alla prima crociata*.]

The “Dio non vuole” of Giselda, of course, must be read as a direct response both to the traditional cry of the Crusaders and to the “Dieu le veut” of the Catholic faction in *Les Huguenots*. Even with this intertextual connection, however, it is striking to see how Verdi emphasizes this rejection of the spilling of innocent blood, of the vengeful spirit of the Crusades. In *I lombardi*, Verdi and Solera stress the moral ambiguity of the Crusades. Preziosilla’s “è bella la guerra” does not carry over into a war that seeks to impose the will of one people on another of different customs and a different religion. It is, unfortunately, a lesson we have still not fully grasped.

Dieu le veut, Dieu l'or - don - ne, non! non! grâce à per - son - ne!

Example 5

* * *

The effect of war on those caught up in its throes despite themselves is a theme Verdi would explore several times, not always with complete honesty. There is something too beautiful about the hymn in *Aida*, sung by Amonasro and the Ethiopian prisoners during the course of the finale to the second act, “Ma tu Re, tu signore possente” (see Example 6). The opera ultimately makes clear that their true feelings are anything but innocent:



Ma tu Re, tu si-gno-re pos-sen-te, a co - sto-ro ti vol-gi cle-men-te...

Example 6

it is revenge the Ethiopians want – not peace. In Verdi’s *Macbeth*, however, the composer’s first opera on a Shakespearian subject, he writes a chorus for the refugees, victims of the usurper’s efforts to preserve his corrupt power. “Patria oppressa,” they sing: “Oppressed homeland, we can no longer call you our mother, because your children inhabit a tomb. No one can speak out for those who suffer and die.” A text of this kind, in the words of Alfredo Banti, acquires meaning as “the anticipation of an event that remains to realize itself, the ransom of the nation, of whose story they nonetheless offer testimony.”

By the mid-1840s, Verdi and his librettists were cognizant, in the words of the music historian Roger Parker, “of a ‘genre’ of choruses, a successful style with which Verdi was already identified and, perhaps, which he might be encouraged to exploit again.” What is being invoked is a series of operatic choruses: “Va pensiero sull’ali dorate” from *Nabucco* (1842), “O Signore, dal tetto natio” from *I lombardi* (1843), and “Si ridesti il leon di Castiglia” from *Ernani* (1844). All are constructed on similar poetry: four quatrains of *decasillabi*. Later, when writing *Macbeth*, Verdi asked his librettist, Piave, to write a chorus with four quatrains of *ottonari* verse, with which he hoped to “make a chorus of the importance of that of *Nabucco*,” but without “adopting the same meter.” Piave obliged him with a chorus whose rhythm is different (“Patria oppressa! il dolce nome”) but which enters the same discourse of loss, desire, and rebellion found in the other choruses.

It is not only Piave’s words that join this chorus to the discourse of national feeling and desire, but also Verdi’s original musical setting of 1847. All these choruses are marked by a preponderance of singing in unison or at the octave, as if intended for mass performance. They are highly tuneful, with easily remembered melodies and simple harmonies – another sign of their popular provenance. And frequently the choruses break into simple but glorious chords in the third of the

four quatrains. In *Macbeth*, “Patria oppressa” opens the final act, the act that will continue with an aria for the disconsolate Macduff, whose wife and children Macbeth has slaughtered; Lady Macbeth’s sleepwalking scene; and finally the battle and defeat of Macbeth.

[The University of Chicago Motet Choir, under the direction of James Kallembach, sang the 1847 version of “Patria oppressa.”]

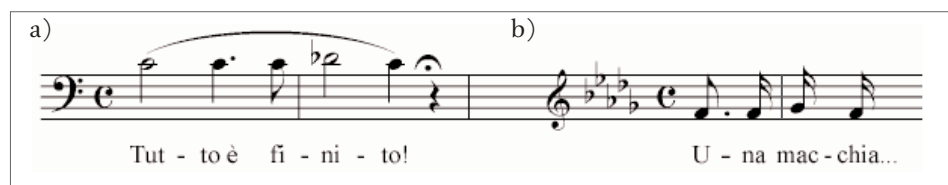
Despite its modified verse pattern (*ottonari* instead of *decasillabi*), this 1847 version of the chorus shares its basic musical shape and style with the earlier Verdian Risorgimento opera choruses. It sends multiple messages: those pertaining to the opera in which it is embedded, as a chorus for the refugees; and those pertaining to the audiences that are receiving the opera, as yet another reference to the “patria oppressa” under foreign domination – that is, to the Italian political situation. It should come as no surprise that even before the 1848 revolutionary movements, “patria oppressa” became “patria amata” [“beloved,” rather than “oppressed,” homeland] in Naples. But after the revolution failed, the text was completely replaced with different poetry (in the same rhythm) for a

Verdi was neither a conscientious objector to war... nor a propagandist for his government’s bellicose policies.

revival of *Macbeth* in Milan in 1849: according to David Lawton, editor of the critical edition of *Macbeth* in both its versions, the sense of the piece is transformed “from an anguished outcry against the barbaric tyranny of Macbeth to a lament (two acts too late!) for King Duncan.”

After the unity of Italy was achieved in 1860 (although Rome would not come on board for another decade), the Risorgimento style no longer had the same significance for Verdi or for his audiences as it did in 1847. Thus, in the major revision of *Macbeth* he undertook in 1865 (the first performance of the new version was in Paris, but the work was all done in Italian), Verdi left the text unaltered but completely changed his musical setting. There is no easy lyricism, but a series of melodic fragments – set in a harmonically bitter framework – that reflects not the aspirations of a people, but their suffering. Notice particularly his use of a figure “come un lamento” [“like a lamentation”], a descending minor second that constantly produces dissonances with the melody. This figuration dominates a great deal of the opera, from Macbeth’s fateful pronouncement after murdering Duncan, “Tutto è finito” [Example 7a, “I have done the deed”], to Lady Macbeth’s sleepwalking scene, where – played by the English horn – it is like the insistent voice of her conscience, an interval she duplicates in her first words “Una macchia” [Example 7b, “Yet, here’s a spot”].

Freed from the underlying political agenda of the 1847 version, Verdi concentrates on the dramatic and musical situation, producing a setting that may have carried a less potent



Tut - to è fi - ni - to! U - na mac - chia...

Example 7

political message, but brought out instead the horrors of war and its innocent victims.

[The University of Chicago Motet Choir, under the direction of James Kallembach, sang the 1865 version of “Patria oppressa.”]

We are far from Preziosilla’s “war is lovely, long live war.”

* * *

Verdi was neither a conscientious objector to war, such as Benjamin Britten, nor a propagandist for his government’s bellicose policies, as some would charge Dmitri Shostakovich with having been for at least part of

his life (although the matter is contested). On one level, of course, it could be argued that a successful opera composer does not need to *believe* in what he sets to music: he only needs to produce a musical setting that is in and of itself convincing. As literary theorists have long understood, the narrator of a novel is *not* its author.

Yet when one examines carefully the operas of Verdi, patterns do emerge in the choices he makes, the modifications he and his librettists impose upon their sources, the musical styles he adopts and rejects. The resulting picture of the composer, faced with our

theme of war and peace, is not unequivocal. He knew the dangers of accepting the idea of a “just” war, but he was also willing to risk much to change the political system under which Italy suffered before 1860. That very ambivalence is one of the things that has given his operas meaning for generation after generation of operagoers, and that will continue to do so as long as the human issues the operas explore remain with us. ■

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Philip Gossett (University of Chicago), on the left, with members of the Academy’s Midwest Council. Front: CEO Leslie Berlowitz, President Emilio Bizzi (MIT), Emiko Ohnuki-Tierney (University of Wisconsin-Madison), Robert Wald (University of Chicago); Back: Gerald Early (Washington University in St. Louis), Vice President Midwest John Katzenellenbogen (University of Illinois at Urbana-Champaign), and Bernard Agranoff (University of Michigan)



Accompanied by Philip Gossett on piano, Quinn Kelsey (baritone) sings Don Carlo’s Aria, “Urna fatale,” from *La forza del destino*.

California Meetings



An artist's rendering of what the Archean earth looked like at the time of the rise of oxygen.

The Birth of Oxygen

John Abelson

This presentation was given at a meeting of the American Academy, held at the University of California, San Diego, on November 17, 2006.

John Abelson is George Beadle Professor of Biology, Emeritus, at the California Institute of Technology, Adjunct Professor of Biochemistry at the University of California, San Francisco, and the President of the Agouron Institute. He has been a Fellow of the American Academy since 1985.

We take it for granted that our atmosphere contains oxygen, but we and most other animals would die within minutes if the oxygen was removed. It is not widely appreciated that for half of the earth's history there was virtually no oxygen in the atmosphere. Oxygen appeared 2.45 billion years ago, and it has been present ever since – though not always at its present level of 21 percent.

Photosynthesis produces more than 99 percent of the oxygen in the atmosphere. Arguably, the biological invention of photosyn-

thesis was, after the origin of life itself, the most important development in the history of our planet. About twelve times as much energy is derived from the aerobic metabolism of a molecule of glucose as the energy obtained from anaerobic metabolism. Without the invention of oxygenic photosynthesis, multicellular organisms could not have evolved. Furthermore, the presence of oxygen in the atmosphere leads to an ozone layer that protects life from the lethal effects of ionizing radiation.

The closely linked evolution of photosynthesis and the evolution of the atmosphere is perhaps the best example of the interdependence of biological and geological processes. In chronicling the rise of oxygen, I will first describe photosynthesis and its origins. Then I will turn to a discussion of the state of the earth and its atmosphere before and during the rise of oxygen. After the rise of oxygen, the atmosphere and the oceans went through some initially cataclysmic and then very slow changes. Finally, 540 million years ago – al-

most 2 billion years after the initial rise of oxygen – roughly the present levels of oxygen in the atmosphere and in the ocean were attained. It was only then that multicellular life began to flourish.

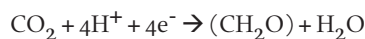
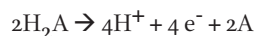
The story of oxygen and its effects takes place over a long period of time (see Figure 1).

One way to comprehend this vast expanse of time is to compare it to the time it took the continents to rearrange themselves completely via plate tectonics. Two hundred and twenty-five million years ago, all of the continents were together in the supercontinent Pangaea. Over 225 million years the continents separated and the Atlantic and Indian oceans were formed. This process represents about 5 percent of the earth's history and about one-tenth of the time period we chronicle here.

It is also useful to consider how much biological change can take place in 2 billion years. A heritable and selectable change – a mutation – can take place at every cellular division. The earth's oceans contain about 4×10^{24} ml of water. If we conservatively assume a steady state of 1000 cells/ml in the ocean and a division time of one week (during this period most cells are unicellular microorganisms), then in 2 billion years something like 10^{39} divisions could take place. Specific mutations in bacteria take place at a frequency of about 10^{-8} . Even more rapid changes can occur when genes are transferred between different organisms. In 2 billion years there is enormous potential for evolutionary change.

Photosynthesis

In photosynthesis, the energy of light is used to extract electrons and protons from a donor molecule H_2A , which are then used to reduce carbon dioxide:



The donor molecule H_2A can be a variety of reduced compounds, including H_2S , Fe^{++} , H_2 , various organic compounds, and H_2O . The use of the former group of donors probably predated the use of water in photosynthesis. The cellular machinery for oxygenic photosynthesis (in which water is used as the donor) is, in part, derived from its predecessors.

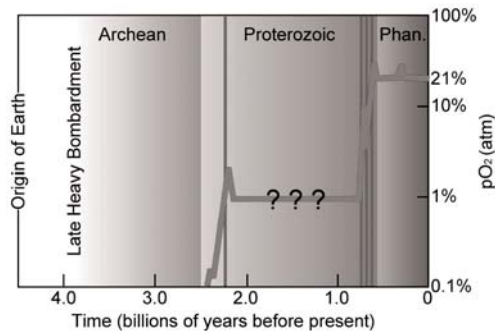
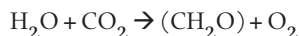
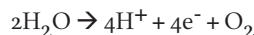


Figure 1

In oxygenic photosynthesis, the electrons from water are extracted and used to generate energy and to reduce carbon dioxide to a carbohydrate according to the equation:



Since the work of Martin Kamen and Samuel Ruben more than fifty years ago, we know the O_2 generated in photosynthesis is entirely derived from H_2O . Water is therefore dissociated in photosynthesis according to the equation:



It takes an enormous amount of energy to extract an electron from water because oxygen has a high affinity for electrons. One photon of light is required to extract each electron, making photosynthesis a four-electron process.

Oxygenic photosynthesis takes place in one class of bacteria, namely, cyanobacteria. It also takes place in a number of eukaryotic organisms, e.g., algae and plants. Photosynthesis is nearly identical in eukaryotes and cyanobacteria because photosynthetic eukaryotes came from a symbiotic event in which a primitive eukaryote captured a cyanobacterium.

In discussing photosynthesis and its origin, therefore, it is appropriate to focus on cyanobacteria.

The photosynthetic machinery in cyanobacterium is located in a system of layered *thylakoid* membranes. The membranes enclose an interior space, the *lumen*. The machinery consists of pigmented proteins, many of them extending across the thylakoid membrane to the exterior space, the *stroma*. Some of the proteins and pigments in the thylakoid membrane serve as antennae to funnel light energy into the reaction center.

The reaction center consists of two complex multiprotein assemblies, termed Photosystem I and Photosystem II (PSI and PSII). At the heart of both PSI and PSII is a cofactor chlorophyll molecule.

Figure 2 depicts the major multiprotein complexes involved in photosynthesis.

We don't have sufficient space here to discuss photosynthesis in depth, so I will focus on the mechanisms of oxygen synthesis. This reaction takes place in PSII. The active site for dioxygen synthesis, called the Oxygen Evolving Center (OEC), contains four manganese atoms and one calcium atom, coordinated mainly to one core PSII protein. The water-splitting mechanism is unique; so far, at least, a related metallo-protein has not been identified. The OEC allows for the integration of a one-electron process (the excitation of cytochrome P680) with a four-electron process (the splitting of H_2O to form O_2). A beautiful experiment done fifty years ago by Pierre Joliot and Bessel Kok proved that the OEC abstracts protons and electrons from water stepwise to evolve oxygen. Alternative models ruled out by this experiment include the cooperation of four reaction centers to cleave a single molecule of H_2O , and the accumulation by one center of four oxidizing equivalents prior to oxidizing water in a single concerted step.

The OEC can now be understood more clearly because J. Barber in London obtained a 3.5Å crystal structure of PSII, and K. Sauer, W. Saenger, and colleagues found a

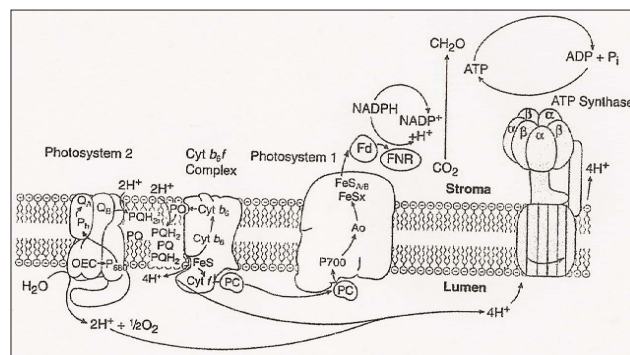


Figure 2. From Robert E. Blankenship, *Molecular Mechanisms of Photosynthesis*. Reprinted with permission from Blackwell Publishing.

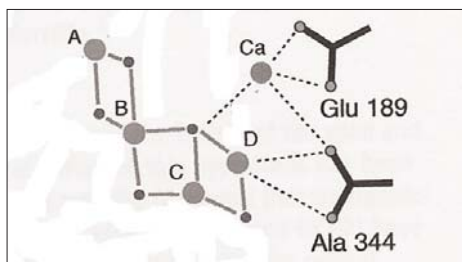


Figure 3. From Junko Yano et al., “Where Water is Oxidized to Dioxygen,” *Science* 314 (November 3, 2006): 821–825. Reprinted with permission from AAAS.

higher resolution structure of the OEC manganese-oxide core by X-ray absorption spectroscopy on single crystals of PSII.

In photosynthesis the manganese-oxide cluster binds two molecules of H_2O . The energy of one quanta of light abstracts one proton and one electron. This structure then integrates four electron-transfer reactions that result in the synthesis of one molecule of dioxygen from two molecules of water. The invention of this mechanism was a unique event in evolution. When did it happen?

A Date for the Evolution of Oxygenic Photosynthesis

When did oxygenic photosynthesis evolve? One piece of data suggests that it had evolved by 2.7 billion years ago, 250 million years before the appearance of oxygen in the atmosphere.

This piece of data was discovered using powerful analytical techniques (gas chromatography and mass spectrometry) developed by Roger Summons at MIT for detecting minute traces of biological compounds (biomarkers) in ancient rocks. Rocks formed billions of years ago have gone through cycles of heating (diagenesis). The preservation of organic chemicals in ancient rocks is rare, and when they are present they are limited to hydrocarbons.

A class of hydrocarbons called stearanes was found in samples taken from black shales deposited in northwestern Australia 2.7 billion years ago. Stearanes are derived diagenetically from steroids, e.g., cholesterol, now found almost exclusively in eukaryotic cells. Steroid synthesis involves a number of steps requiring molecular oxygen. For example, in the synthesis of cholesterol starting with squalene, eleven separate steps require molecular

oxygen. It seems very unlikely that all of these steps used some other oxidant and different enzymes prior to the advent of oxygen and then were somehow altered with the arrival of oxygen. Thus one could make the argument that the presence of stearanes in the Australian black shales indicates the presence of molecular oxygen in the ocean 2.7 billion years ago.

But even though the rocks from which these samples were extracted are correctly dated, it is more difficult to be sure that the biomarkers were deposited in the rocks at that date. They could have been the result of groundwater penetration from the surface or penetration of oils from younger rocks into the older rocks. Or they could have been contaminated by drilling fluid. Great precautions are now taken to avoid this type of contamination. Cores are obtained using only water as the drilling fluid. The exterior surface of the drill cores is shaved off, and the sample is taken from the interior of the core.

The biological invention of photosynthesis was, after the origin of life itself, the most important development in the history of our planet.

It is also important, insofar as it is feasible, to investigate biomarkers in yet older rocks. The possibility that oxygenic photosynthesis evolved 300 million years before the advent of oxygen in the atmosphere poses the obvious question of why it took so long for oxygen to appear in the atmosphere. To answer that question, we need to know what the earth was like before the appearance of oxygen in the ocean and what events might have triggered its rise in the atmosphere.

The Archean Earth and the Rise of Oxygen

In the Archean eon, more than 2.5 billion years ago, the major components in the atmosphere were N_2 , CO_2 , and perhaps CH_4 , methane. The argument for methane is that, at the origin of the earth, the sun was 30 percent fainter than it is now. Without a greenhouse gas, the earth would have been frozen until 2 billion years ago. The geological record, however, shows that liquid water was present

The closely linked evolution of photosynthesis and the evolution of the atmosphere is perhaps the best example of the interdependence of biological and geological processes.

during the Archean eon and that the temperature was likely warmer than it is now.

Certainly carbon dioxide would have provided a greenhouse effect, but without oxygen in the atmosphere, methane, likely produced by methanogenic bacteria, could have accumulated to 1000 ppm (it is present at about 2 ppm now). The composition of the Archean ocean is less certain, but geological evidence suggests that there was much less sulphate than there is now and very little dissolved oxygen because the dissolved iron Fe^{++} was abundant. In the Archean world, organisms only lived in the ocean, and the primary producers were likely the nonoxygenic photosynthesizers (although, remember, we do not know for certain how early oxygenic photosynthesis evolved).

Geologists have known for more than fifty years that oxygen appeared in the atmosphere about 2.3 billion years ago. Preston Cloud and Dick Holland were the first to make this observation. The Huronian Supergroup in southern Canada provides a good example of what they realized early on and could see at many places around the world.

In the Matinenda formation (formed 2.45 billion years ago) are conglomerates that contain uraninite and pyrite. These conglomerates are detrital deposits, meaning that they were washed into the sea by ancient rivers. Uraninite, UO_2 , is insoluble whereas the more oxidized form, UO_4 , is soluble. If oxygen had been present in the atmosphere, UO_2 would have been oxidized and solubilized. In addition, pyrite (FeS_2) is rapidly converted to hematite, Fe_2O_3 , in the presence of oxygen. Pyrites and uraninites are not seen in the sediments above the Matinenda formation in the Huronian, and they are generally not present anywhere in detrital deposits younger than 2.3 billion years.

When we reach the Lorraine formation (formed 2.2 billion years ago), we first encounter red beds. These are sandstone beds, deposited by rivers or windblown dust. Red crystals of hematite coat the sandstone grains. The presence of red beds is indicative of an oxidizing atmosphere. The earliest red beds were formed about 2.2 billion years ago. So oxygen must have appeared in the atmosphere after the deposition of the Matinenda formation, and before the deposition of the Lorraine formation.

A more recent result has firmly pegged the rise of oxygen at 2.45 billion years ago. In order to understand this result, we must briefly review the use of atomic isotopes in geochemistry. Four isotopes of sulfur occur naturally: ^{32}S (94.9 percent), ^{33}S (0.76 percent), ^{34}S (4.29 percent), and ^{36}S (0.02 percent). In biological processes, like SO_4 reduction to SO_2 , ^{32}S is the most popular isotope. ^{34}S is used about half as much as ^{33}S . Starting with the work of James Farquhar and Mark Thiemens of the Scripps Institution of Oceanography, the isotopic abundances of the sulfur isotopes in various rocks have been measured. All modern rocks contain the same ratio of ^{33}S to ^{34}S because in modern rocks the preferential use of ^{33}S to ^{34}S in biological processes has determined this ratio. A quantity $\Delta^{33}\text{S}$ is a measure of the deviation of the abundance of ^{33}S from that ratio. In all modern rocks $\Delta^{33}\text{S}$ is zero. Figure 4 shows a recent compilation of the data.

In rocks younger than 2.45 billion years, the value of $\Delta^{33}\text{S}$ is zero; in rocks older than 2.45 billion years the value is negative if the sulfur is derived from barite (BaSO_4) and positive if the sulfur is derived from pyrite (FeS_2).

The variation of $\Delta^{33}\text{S}$ from zero is called *mass independent fractionation*. We can conclude that nonbiological processes were at work on sulfur in rocks older than 2.45 billion years: these processes were photochemical. Because of the presence of oxygen in the atmosphere, however, the ozone shield formed 2.45 billion years ago. Ozone absorbs ultraviolet light, active in a number of photochemical processes in the atmosphere. For sulfur, these could include reduction or oxidation of SO_2 or H_2S , leading to elemental sulfur or H_2SO_4 , both of which can be incorporated into rocks. In the modern ocean all atmospheric sulfur is protected from photochemistry by the ozone layer and is subjected to *mass dependent frac-*

tionation. A level of oxygen in the atmosphere that is 1/100 the present level would lead to an effective ozone shield.

The sulfur-isotope data determine the time for the rise of oxygen at some level. But the biomarker data suggest that oxygenic photosynthesis originated at least 300 million years earlier. What prevented oxygen from appearing in the atmosphere earlier? Though this question has been frequently asked, we do not have a universally accepted answer yet. There could have been either geological or biological reasons for the delay, or both. Perhaps the level of reductants supplied to the atmosphere and the ocean by volcanic activity decreased because of altered chemistry in

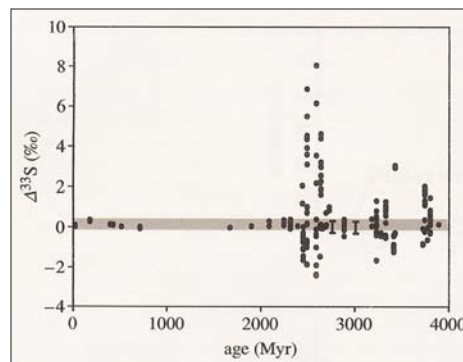


Figure 4. See J. Farquhar et al., *Science* 289 (August 4, 2000): 756; updated by S. Ohno.

the mantle. Or perhaps oxygenic photosynthesis, though it evolved earlier, had only become effective enough to alter the atmosphere 2.45 billion years ago.

Interestingly, the appearance of oxygen in the atmosphere had some relatively near-term effects on the geology of the earth but did not markedly influence the biology of the earth (at least as seen in the fossil record) for another 1.8 billion years.

The Proterozoic Earth after the Rise of Oxygen

In the Huronian Supergroup there is evidence of three separate glaciation events between the anoxygenic uraninite conglomerates (formed 2.45 billion years ago) and the oxygenic red bed deposits (formed 2.2 billion years ago). Large dropstones are seen, left behind in the sediment as the glacier recedes or as scratches in the bed rock made as the glacier moves over it. The earth evidently went through a pronounced cooling period between 2.45 and 2.2 billion years ago.

One piece of data suggests that oxygenic photosynthesis had evolved by 2.7 billion years ago, 250 million years before the appearance of oxygen in the atmosphere.

In South Africa, in the Makganyene formation, there is evidence of another glaciation event 2.2 billion years ago. Joe Kirschvink at Caltech has shown by paleomagnetism that the Makganyene glacial event took place when the Transvaal Craton was near the equator. This means that the entire earth was glaciated, a “snowball earth” event. The most plausible cause of the cooling is that the rise of oxygen in the atmosphere destroyed the methane, and thus the greenhouse effect, that was warming the earth. As the earth cooled and ice formed, more and more solar radiation was reflected (ice reflects eight times as much radiation as water). Once ice covered the poles to the thirtieth latitude north and south, a positive-feedback loop ensured that a sheet of ice about two kilometers deep would cover the earth.

Why did the earth not remain in a frozen state? How could life have survived? Vulcanism is the most probable answer. Life was most likely confined to heated regions near vents. Eventually, carbon dioxide escaping into the atmosphere would have accumulated because it could not have dissolved in the ocean and hence been lost in weathering processes, as it is normally. After 30 to 50 million years, a sufficient level (350 times the current level) of carbon dioxide probably accumulated, enough to create a greenhouse effect that would have melted the ice. Once that level had been attained, there would have been a reverse positive-feedback loop, and the ice would have melted in a few hundred years.

In the aftermath of snowball earth, the intense greenhouse effect is hypothesized to have raised the surface temperature to 50°C – a hot-house earth. Carbon dioxide dissolved in the ocean, and a massive precipitation of CaCO_3 and MgCO_3 (dolomite) occurred. These precipitates are called cap carbonates, and they can be as much as four hundred meters thick.

The post-snowball earth ocean was rich in nutrients; cyanobacteria therefore flourished, raising the level of oxygen in the ocean and in the atmosphere. Dissolved iron precipitated as hematite, and manganese as MnO_2 . South Africa thus possesses some of the richest manganese deposits in the world as a result of this event.

The Makganyene glaciation was the first snowball-earth event (there were earlier regional glaciations), but it was not the only one. Two more snowball-earth events took place between 800 million years and 600 million years ago. In the intervening billion years the earth was relatively quiet. Geologists call this period the “boring billion.”

The Boring Billion

Following a proposal made by Don Canfield in 1998, consensus is building among geologists that, except for the likely spike after the Makganyene glaciation, the level of oxygen in the atmosphere remained low for more than 1 billion years and did not rise to present levels until the end of the Proterozoic eon 540 million years ago (see Figure 1).

The modest levels of oxygen in the atmosphere could have led to an ocean weakly oxygenated at the surface, and an anoxic and sulfidic (like the Black Sea today) ocean below. It is not possible here to review all of the geological data supporting this conclusion, but one line of evidence from Ariel Anbar and Tim Lyons, involving the level of molybdenum in Proterozoic black shales, strongly supports this model. In an oxic atmosphere, molybdenum is washed into the ocean by rivers as the soluble MBO_4^{2-} anion. Molybdenum is thus abundant in today's oceans. A survey of molybdenum in black shales through time reveals that molybdenum is low during the Archean, slightly elevated in the mid-Proterozoic, and abundant in the Phanerozoic period.

The relatively anoxic ocean of the mid-Proterozoic could not have supported multicellular life and would have been a poor environment for eukaryotes. There is plenty of evidence for single-cell eukaryotes in the Proterozoic, but cyanobacteria would have dominated the shallow oceans and tidal flats. Beginning in the late Proterozoic, as oxygen levels rose, the multicellular eukaryotes make a modest appearance in the fossil record. This is the end of the boring billion.

The Rise of Multicellular Eukaryotes

Two snowball-earth events punctuated the end of the Proterozoic eon: one occurred 750 million years ago, the other 600 million years ago. These were not caused by oxidation of methane in the atmosphere but, more likely, by a fall in carbon-dioxide levels. At this time, all of the earth's land mass was near the equator, and so none of it would have been covered with ice as Antarctica is today. The entire land mass of the earth would have been available for removing CO_2 from the atmosphere by atmospheric weathering, leading to a gradual cooling of the planet. The rich aftermath of these snowball earth-events could have oxygenized the oceans and led to the initial rise of multicellular animals. We can see fossils from this period (called the Ediacaran or Vendian period) in many parts of the world. At the boundary between the Cambrian and the Precambrian eras, 542 million years ago, a mass extinction occurred. The Ediacaran animals disappeared, and the modern world followed.

The relatively anoxic ocean of the mid-Proterozoic could not have supported multicellular life.

However, we have to look at rocks deposited some 40 million years later to see the blossoming of animal life in the Cambrian period as seen in the Burgess shales. The Burgess shales record a wonderful zoo of animals that clearly had developed many of the body parts seen later in evolution as well as mind-boggling creatures that were never seen again. By the Cambrian period, oxygen was near its present level in the atmosphere and the ocean. Animal evolution was on its way.

Epilogue

The unique and powerful process of oxygenic photosynthesis nearly resulted in the extinction of all life in the Makganyene glaciation. The earth itself, with its molten core, came to the rescue in that instance. After a period of nearly 2 billion years, photosynthesis ultimately made the evolution of multicellular animal life possible, a process that continues today.

Photosynthesis ultimately made the evolution of multicellular animal life possible, a process that continues today.

Although it is in its infancy from a geological perspective, human intelligence may be as unique and potent a force for change on earth as photosynthesis was. Will human intelligence lead to a flowering of the earth, or will it lead to the extinction of life? It is too early to say. Geology tells us that we will have to wait 2 billion years to know.

Acknowledgments

I should say that I am not a geologist. I am a biochemist, but I have been a student of geobiology for the past five years and, as President of the Agouron Institute (see www.agi.org), I have been a patron of the field. For the past five years we have supported a course in geobiology, which has included a geology field trip led by John Grotzinger of Caltech and Andy Knoll of Harvard. I have been on all of the field trips. We have also carried out a drilling project in South Africa in which we obtained some 3000 meters of core that cover the period of about 2.5 billion years to 2.2 billion years. It was during that period that oxygen first appeared in the atmosphere. Last year we sponsored an interdisciplinary meeting on “Oxygen” in Santa Fe, New Mexico. About forty chemists, biochemists, geologists, and microbiologists discussed the problem of the origin of oxygenic photosynthesis. This report represents my attempt to synthesize the ideas that were expressed in this exciting meeting. I wish to thank my geobiology mentors, John Grotzinger and Andy Knoll, for helping me to appreciate what rocks can tell us about biology. I thank Andy Knoll, Robert Blankenship, Judith Klinman, Don Canfield (the organizers of the Oxygen meeting), and many of the participants for helping me to write this article. Thanks also to my longtime partner in science, Mel Simon, and to Joan Kobori, the Agouron Institute administrator who has made the execution of our programs possible.

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Andrew Benson (Scripps Institution of Oceanography) and Melvin I. Simon (California Institute of Technology)

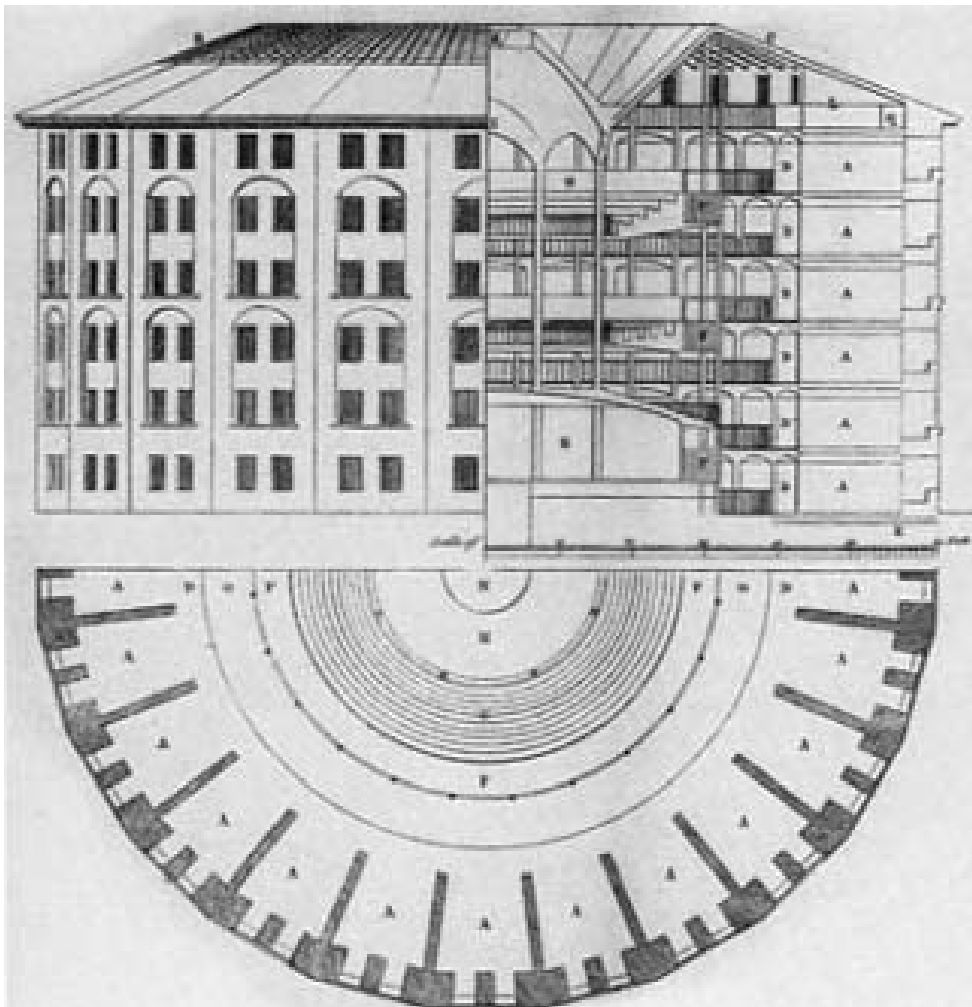


Marye Anne Fox (University of California, San Diego) and Leslie Berlowitz (American Academy)



Gordon Gill (University of California, San Diego) and John Abelson (University of California, San Francisco)

California Meetings



The Panopticon by Jeremy Bentham, 1791. The Panopticon became a blueprint for penal institutions, allowing round-the-clock surveillance of prisoners. Inmates never knew whether they were being watched; guards in the central tower could see everything without being seen.

Who's Watching Me Now? Surveillance, Exposure, Privacy, and New Technologies

Nancy Van House and Deirdre Mulligan

Michael Traynor, moderator

This presentation was given at a meeting of the American Academy, held at the University of California, Berkeley, on November 20, 2006.

Nancy Van House is Professor in the School of Information at the University of California, Berkeley.

Deirdre Mulligan is Clinical Professor of Law and Director of the Samuelson Law, Technology, and Public Policy Clinic at Boalt Hall School of Law at the University of California, Berkeley.

Michael Traynor is Senior Counsel at Cooley, Godward Krnoish, LLP, and President of the American Law Institute. He has been a Fellow of the American Academy since 2002.



Michael Traynor

I was a student at Berkeley from 1951 to 1955. It was a lighthearted and happy time in many ways, but it was also a time when this great university was in turmoil over a loyalty oath, which the Supreme Court of California even-

tually held invalid. We can remember surveillance going on at Sather Gate, and those of us whose next step after graduating was a hitch in the military had cause to wonder whether such surveillance might impact our prospective commissions adversely. We later learned that the FBI had wiretapped conversations between Dr. Robert Oppenheimer and his lawyer. So, when we read about such striking developments as the warrantless national surveillance that is going on now, we are reminded that this is not necessarily a new development. It is just a dramatic expression of the government's capacity for intrusion, including lawless intrusion.

The American Law Institute is beginning work on a new project that deals with the government's access to, and use of, personal information. As with all of our projects, one of the hardest tasks is to develop the initial framework for analysis. In this case, we must decide whether to look at the types of data involved; the purpose or context of the data; or perhaps, more likely, the method of accessing particular data. One of the principal issues here, too, is whether there are different standards – and what they are – for government and private surveillance. Can the government, by contracting with private agencies that are not necessarily bound by the Constitution, acquire information that it may be unable to gather under the constitutional exercise of its powers? A critical related question is whether limitations should be placed on the use of information that is gathered by the government, for example, allowing its use for counterintelligence purposes but not for criminal prosecutions.

In considering the issues raised today, it bears asking whether, and to what extent, the federal regulations governing human subjects apply or should apply to behavioral research of the kind that our speakers will mention. Moreover, our discussion today is relevant not only to surveillance within the United States but also to the gathering of information about terrorists, terrorism, and related research in foreign countries and the questions whether, and to what extent, social and ethical principles apply to such research, whether confidentiality can be assured, and whether special safeguards must or should be taken.

Our discussion tonight will be divided in two parts. Nancy Van House will talk about the private aspects of surveillance, exposure, privacy, and new technologies. Nancy is a professor in the Berkeley School of Information and is a specialist in the social uses of photography. Her research focuses on information creation and use, as well as on the uses of information systems and technology for knowledge work. She also considers the role of trust in, and the credibility of, the Internet and Internet-based information.

Our second speaker, Deirdre Mulligan, is Clinical Professor of Law and Director of the Samuelson Law, Technology, and Public Policy Clinic at Berkeley. She and I participated earlier this year in a workshop on the Academy's project, "The Internet as a Public Space." Deirdre has published articles about the risks and opportunities that technology poses to privacy, free expression, and access and use of information.



Nancy Van House

One of my primary interests is the interplay between the social and technology. I work within a research paradigm that assumes that neither the social nor technology drives the other, but, rather, they are mutually constituted, that there are complex interactions between them.

My colleagues and I have been examining the uses of new technologies. One important trend here is convergence, that is, various technologies that once might have been separate are coming together in the same devices, particularly in the Internet. Here I will fo-

One of the key issues surrounding images is that, once they are removed from their context, their meaning may be unclear or it may change.

cus on new photographic technologies, including those that link to the Internet, to explain the interaction of these kinds of technologies and to point out some of the things we need to be concerned about.

Photographs and photographic images are particularly interesting for a variety of reasons. In some ways, they're a lot like text, but in other ways, they're quite different. The field of visual studies (which is, itself, an interdisciplinary field of sociology, anthropology, art history, and cultural studies) is concerned with meaning-making practices around photographic images. Pictures can have many different meanings. They can be used in a variety of different contexts and in different ways. One of the key issues surrounding images is that, once they are removed from their context, their meaning may be unclear or it may change. Different people may use an image to say different things, or the images may be interpreted differently by the viewers than was intended.

Images also raise the issue of agency. Unlike text, photographic images are rarely of the photographer; they are frequently pictures of other people. Very often, the person represented has very little say about the image. Roland Barthes once spoke about the four images in his own photographic portrait: the person he thinks he is, the person he would like to present to the world, the person the photographer thinks he is, and the person the photographer is presenting to the world for the sake of his art. None, he says, is the person he is.

The new technologies with which I'm concerned include cameraphones. Current cameraphones take images of up to three megapixels, which, for most people, is at the level of a decent point-and-shoot camera. Because

they are mobile and tend to be always at hand, cameraphones are often used to take pictures that people might not take otherwise. They're seen as not serious, so they're often permitted in places where regular cameras are not. Moreover, they're unobtrusive to the point of being surreptitious. Thus pictures can be taken without the subject's knowledge. Finally, they can be networked for instant uploading of images to the Internet – Nokia is calling its new series of cameras “multimedia computers.”

Images, whether from a digital camera, a cameraphone, or scanned from prints from a regular camera, can now easily go onto the Internet. There exist a variety of kinds of web services for this purpose: many are intended only for viewing by family and friends and require passwords, but some are public. Flickr.com is one such extremely popular public site. A user can keep his or her images private, but according to the people we've talked to hardly any of them bother. Public images may be seen by anyone. YouTube.com

One major issue that arises with sites such as Flickr, MySpace, and YouTube is permeable boundaries – that is, public and private are no longer separated.

performs a similar function for videos, and, of course, many of us have heard about the social-networking sites, MySpace and Facebook. A typical MySpace profile contains a self-portrait, often a very artistic kind of an image. These images can be of the user, or of his or her belongings, or of anything that one wants to use to represent oneself. Images are prolific in places like MySpace and Facebook: people are expected to upload images of themselves, and each user often uploads multiple images.

I'm going to talk primarily about Flickr, in part because it's the service I know best – and in part because certain aspects of Flickr are particularly interesting. On Flickr, you can archive your own photos. You can also define contacts, people whom you want to track. When they upload new pictures, you are

alerted to their new pictures. You can also see the photos of everyone who uses Flickr – at least all of those that are public. A typical Flickr picture has a caption as well as tags. Tags are usually keywords, terms that describe the subject of the photo. The photographer can also allow comments: viewers can leave comments about each image, and all viewers can read all comments.

One major issue that arises with sites such as Flickr, MySpace, and YouTube is permeable boundaries – that is, public and private are no longer separated. The images that someone posts can be from his or her private or public life, and they may be seen by people in their private or public life. What's the use of these boundaries? Among other things, they create privacy and personal space. They tell us what's appropriate, what's expected. Boundaries also relate to meaning. When we see something (an image or text) in context – such as knowing who made it and under what circumstances – we often understand the meaning attached to it by its maker. Boundaries are related to trust. Generally, we are most comfortable showing our personal images to people whom we trust, who would not misappropriate them or do us harm. When our photos are public, a variety of things can happen to them.

Technology is enabling increased self-representation. With MySpace, for example, people who, in the past, would not have been able to publish things about themselves now have the ability to represent themselves to the world at large in the way that they want the world to see them. For example, one of my students is studying a group of young women from the United Arab Emirates who post photos on Flickr. They might not have had the opportunity to represent themselves to the outside world were it not for this technology, although they are often represented – defined and discussed – by others. They are now using Flickr to present themselves, their belongings, and their opinions to the world.

We are also finding that, with cameraphones in particular, people are taking pictures of the mundane aspects of their lives – what some call the autobiographical impulse. Of course, these pictures may be largely for themselves. But when they make them public, the rest of the world starts seeing what their daily life looks like. And so, their lives start being interpreted by others.

As a result of the increased representation that technology now makes possible, we are paying more attention to how we present ourselves. And we can keep track of others without actually interacting with them.

Furthermore, others can represent us. I can search for myself in Flickr by looking up my name as a tag; I find pictures that other people took of me.

As a result of the increased representation that technology now makes possible, we are paying more attention to how we present ourselves. And we can keep track of others without actually interacting with them. The phrase I use for this phenomenon is “distant closeness.” People are telling us that they're now watching the Flickr streams of friends and acquaintances, people whom they often say they really ought to be emailing or phoning. Furthermore, they know they're being watched, so they pay attention to which images they post, for the benefit of the people whom they know are monitoring their lives.

[Editor's note: at this point, Nancy Van House showed a series of images.]

Yesterday one of my former colleagues was posting pictures from Stockholm onto Flickr. He didn't explicitly label any of his pictures “Stockholm,” but they are tagged with his location, information the system received from my friend's cell-phone network as well as from his GPS tracking device. Likewise, my cameraphone, with which I've been taking pictures of you and posting them to the Internet, knows our location from the cell-phone network (I don't have GPS attached).

In this next picture, Deirdre agreed to pose for me to show that I could take a picture and immediately upload it from here. It knows that we're in Berkeley and what time we took the picture. It knows that our zip code, 94720, is Berkeley's zip code.

My next photo is one someone else posted to Flickr from the main bus station in Helsinki,

using technology from our colleagues at the Helsinki Institute of Technology. The tags include a list of Bluetooth-device identities, or BTs. If you have a Bluetooth device, such as a Bluetooth-enabled cell phone, it has a unique number that identifies it, which it broadcasts, unless you turn off that function. In a train station or bus station, you would not be able to figure out who has which device. But with people who are together on a regular basis, it wouldn't be hard. I worked on a project where we associated Bluetooth-device numbers with names. Once the system knew who was associated with each device, it could display the names of those present when an image was taken with a Bluetooth-sensing cameraphone.

I'm not as concerned about government surveillance as I am about surveillance by our fellow citizens and the ways in which we are making information about ourselves available.

In my research, I'm finding that it's largely young people – I mean people in their twenties and thirties, not teenagers – who are using this technology. It's also people in their twenties and thirties who are designing it. When we ask them about issues of privacy and security, they're not really concerned. The technologists say, that's not our problem. It's your problem, as the social scientist, to deal with those issues. When we talk to the people who are using the technology, whose images are out there on the Internet, many assume that there's safety in anonymity. Why would anyone be watching their pictures? My assessment is that many young people don't yet have the life experience to understand what sorts of things they should be worried about.

The people most worried about the images out there are parents who are concerned about images of their children. People also don't want to publish images of their house and their possessions. We've had a couple of young women talk about stalking incidents, with ex-boyfriends watching their Flickr

stream and figuring out where they are and when. One of them even had an ex-boyfriend show up on her doorstep.

These are serious issues. Part of the problem is in the design of the technology; another part is in how we use the technology. Flickr is now owned by Yahoo, but other companies are doing similar work. The Yahoo Zone-tag system relies on the cell-phone cell-tower IDs to know where an image is taken. The designers are not sure anyone wants this, but if people are willing to buy it and use it, they're willing to make it available – including these Bluetooth devices and the Bluetooth sensing.

The result is that we are going around, basically, with devices in our pockets that are both sensing and broadcasting who we are and where we are. I'm not as concerned about government surveillance as I am about surveillance by our fellow citizens and the ways in which we are making information about ourselves available, without really thinking about it and deliberately choosing it.



Deirdre Mulligan

Nancy talked about the private use of technology, and the way it's changing some of the boundaries we traditionally think of as separating the private and the public. I'm going to talk about the public uses of video surveillance technology. While I was in law school, I worked in the Legislative Policy Office of the American Civil Liberties Union in Washington, D.C. Later, I worked at a small nonprofit. I avoided working on visual surveillance because it's a very complicated area, especially because of the way that it bleeds into First Amendment issues, which I care deeply about.

If our objective is to think about visual surveillance in public places, using individual privacy as the sole framing device is limiting.

It's very hard to talk about privacy in public. People say Eskimos have thirty ways to talk about snow. But we have only one way to talk about "public": we say it's either "public" or "private" – not a very rich lexicon. If our objective is to think about visual surveillance in public places, using individual privacy as the sole framing device is limiting. First, current law provides minimal leverage: the law is very thin in giving us ways to protect our privacy in public places. Take, for example, tort law. A former colleague of ours, Robert Post, has a wonderful article that looks at the social construction of privacy. He concludes that privacy torts promote certain social practices and norms, and that while privacy is a core component of facilitating those social practices, privacy itself is not what they seek to protect. Second, privacy is relatively unsuccessful as an organizing principle in this instance. If you try to get people worked up about the fact that somebody just took their picture in a public place, they say, well, I was in a public place. It's difficult to build political momentum around the issue.

Rather than beginning with privacy, I became interested in documenting the extent to which the architectural change – the introduction of surveillance-camera systems – would alter the public spaces in ways that might challenge norms, laws, and social practice. In 2004, the Department of Homeland Security gave local and state agencies \$193 million in grants to invest primarily in surveillance cameras. As a result, I started thinking about what happens to the capacity of public places – particularly streets, parks, sidewalks – as they become sites of surveillance. How might the introduction of this particular technology interfere with the ability of these places to maintain and support the activities we've historically ascribed to them?

Thus I'm looking at privacy as a means, or an instrument, of collective self-determination

– not just as an individual right. It's not the individual whom we're seeking to protect, but the individual as a participant in the social interactions we view as important to democratic deliberation, or appropriate to our civic space.

Not only is the Department of Homeland Security investing millions of dollars in surveillance, but drug-forfeiture money and governmental appropriations are also being used for surveillance at the state and local level. Dillingham, Alaska, now has 80 police surveillance cameras – four times the number of the District of Columbia. Fresno is another city that has had a huge expansion of cameras. They pan, tilt, and zoom; and you can access them from patrol cars. Moreover, private storefront cameras will be wired into this network so that the police can monitor 24/7 from patrol cars or anywhere else.

We don't have a very detailed or nuanced understanding of public places in the law, particularly in the context of First Amendment law and privacy law.

All of this is occurring with little public input. When Fresno was about to go forward with its new surveillance plans, it had absolutely no policies controlling where cameras were to be installed, who would have access to the information, how long the data would be kept, and for what purposes it could be used. We intervened there, and we're working in San Francisco right now. I've also been interacting with the Department of Homeland Security and their external Data Privacy and Integrity Board to develop national policy on the introduction of video-surveillance systems into public places and the policies that should govern their use.

There is a dearth of research on this topic, and we haven't learned much from existing research. Great Britain has millions of cameras, but very few studies to figure out whether they are effective and how they are influencing the people living in those spaces. The first thorough study of Great Britain's surveillance systems did not take place until 2004;

it looked at fourteen case studies and found that the cameras actually had no statistically significant influence on crime in either direction. Where there were differences – even though they were statistically insignificant – they were found to be effective only in very limited instances, for example, in car parks. In other words, if they're used in a closed environment and we're dealing with property crime, then there may be some – albeit statistically insignificant – effect.

The importance of public places is a research topic that spans several disciplines. My undergraduate degree is in architecture and art history. I was very interested in urban planning, and I spent a lot of time thinking about how we construct spaces to facilitate different kinds of interactions and activities within them. The significance of public places is also widely recognized across political theory, sociology, and anthropology. It's consistently tied to public and civic life – to the experiences of a public to get along or to have public disputes, to figure out the meaning of what it is to be a member of a community or society. What you find, in these disciplines, is a very deep specificity of place. If you're a cultural anthropologist, places are not fungible. They are very specific sites for certain kinds of social practices. But if you look at law, the place under discussion is a public place – we don't care *which* public place. We don't have a very detailed or nuanced understanding of public places in the law, particularly in the context of First Amendment law and privacy law.

In 2004, my colleague Ken Goldberg put a camera in Sproul Plaza to commemorate the Free Speech Movement's fortieth anniversary. Placed high up on the Student Union building, it's not at all obvious to the people below that they are under observation. The camera pans, tilts, and zooms; as it does, it picks up a plaque that reads: "This soil and the airspace extending above it shall not be a part of any nation and shall not be subject to any entity's jurisdiction." This is the Free Speech Monument. If I could read the wording on the Monument with the help of this camera, I could surely read the text of people's books or the numbers people are dialing into their cell phones. I could watch people who clearly didn't know I was watching them.

Anyone, anywhere in the world, could log on to this camera. You had to provide an email

With a surveillance camera, there's a permanent record of your physical presence that people can return to years from now and say, oh, you were at that demonstration, you were in this space.

address, but then you got access to the camera. You could also manipulate the camera; it was not fixed. So I could follow you as you walked across the square. I could post up to five images a day, and I could comment on them, and so could other people.

We can look at some of the images and read some of the comments. This is a picture taken of a woman who came pretty regularly to Sproul Plaza. She is lying on the side of the fountain and reading a book. She is scantily clad. This picture was taken like a *Playboy* centerfold: straight down from the top and cropping off her head and legs. Ironically, she was reading *The Crying of Lot 49*.

We could have had an interesting conversation about the way in which she was actually making herself into an image, long before the picture was taken. We could also discuss the fact that the image the camera captures is different from what you could see if you were in this public place. You might respond by saying, well, "if I'm in the public place, I can see the people." But you couldn't see the top of their heads. If you had tried to take this particular picture of this woman, you would have ended up in the fountain. Robert Post, in his article, talks about the "density and intensity" of interactions that are necessary to maintain civility rules. If the person who was taking the picture of that woman in Sproul Plaza had tried to take that picture in real space, for example, he would have received a lot of community censure and perhaps been the recipient of the subject's self-help efforts. This technology is also eroding proximity. Nancy talked about "distant closeness" – when we feel very close even though we're distant. This phenomenon is undermining Post's density and intensity in a way that makes it much more difficult to enforce behavioral norms. What are its implications for public forums?

It's important to think about the ways in which visual surveillance of this kind alters our understanding of a public place. First, the physical boundaries of the space become indeterminate. In legal language, the courts figure out whether, from a Fourth Amendment perspective, my privacy is protected by asking if I had a reasonable expectation of privacy. In order to formulate a reasonable expectation of privacy, I must have some understanding of where I am and who else is there. In this setting, while I was physically in Sproul Plaza, the other people there, via the camera, were actually in remote places, Estonia for example. Suddenly, this space has no physical boundaries. I can't look around me and make an assessment of who is present: I don't know whether my colleague is watching or my mother. What if I happen to be a student who is supposed to be wearing a veil and not holding hands with a guy?

We have learned that surveillance activity also facilitates the preemptive exclusion of individuals.

Second, typically, when we experience a public space, we walk through it and don't leave little footprints behind us. Our image does not remain after we've escaped the space. But with a surveillance camera, there's a permanent record of your physical presence in this space that people can return to years from now and say, oh, you were at that demonstration, you were in this space. Remember the John Kerry – Jane Fonda photo? Suddenly, we can move from this discrete event to composite pictures. At some point, these discrete events, put together, can become something quite different – out of the disparate bits of information we can create or discover different kinds of knowledge. Our ability to assess the context in which we're supposed to act reasonably becomes frustrated by the removal of these physical, temporal, and relational boundaries.

What are some of the effects of altering or embedding these spaces with surveillance systems? First, I think it will make people more cautious as they become more familiar with the fact that they're monitored constantly and that people can take close-up pictures.

I know women who don't wear skirts anymore, particularly if they know they're going to be on an elevator or an escalator. That may seem like an extreme precaution to take, until your photo gets out on the web.

From social-science and legal literature, we also know that certain populations are more regularly monitored. There's already a pretty rich literature on "shopping while black" and "driving while black." I predict that there's going to be a rich literature about being black, poor, female, or otherwise visually unique in public. I routinely get phone calls from people who are in police facilities where cameras are involved and who are deeply uncomfortable with them. For example, "we watched a black kid on a corner with a cell phone for two hours, and I have no idea why. There was no rationale." Surveillance cameras make police activity invisible, unlike the police who are out on the beat and actually in the public place.

Based on social-science research that was done in the EU, we have learned that surveillance activity also facilitates the preemptive exclusion of individuals. The philosophers Jeremy Bentham and Michael Foucault focused on the possibility of constant surveillance to reform individuals by encouraging the quick internalization of the norms of the watchers. Recent investigations of surveillance-camera systems find that exclusion rather than reformation is more often the goal. The cameras are used more routinely to exclude people who fail to conform to social expectations of optimal behavior in the place at issue. For example, the homeless and vagrants are excluded from shopping malls and the downtown district.

Moreover, there have been some horrible incidents related to the objectification of the watched by watchers. In New York, an image of somebody committing suicide was captured on a police surveillance camera and ended up on the Internet.

Our First Amendment doctrine protects the ability of people who are engaged in certain kinds of speech to remain anonymous. Let's think about associational interests. Most private places are accessed by walking through public places. I can't get into my psychiatrist's office, or the ACLU, or the medical clinic, without walking through a public place that, today, is probably fully monitored. This in-

cludes the doorstep where I cross the threshold from the public to the private. One could respond by pointing out that the surveillance cameras are not targeting a specific kind of speech. Nonetheless, their presence may have specific repercussions for certain kinds of expressive activity.

What will happen to privacy as public surveillance moves from the snapshots that we have today to twenty-four-hour surveillance? Basically, we are giving in to open-ended searches. The problem is that, generally, what we do in public is considered in plain view, and therefore it's not even considered a search.

These are just some of the concrete issues that have arisen from the specter of public surveillance. In terms of the framework for this research, the focus has been on privacy as related to individual interest, to the detriment of thinking about the role that privacy plays in supporting relationships among citizens and between citizens and the state. The changes in technology we are witnessing today are altering our experiences in the public and the private arena. We need to take a holistic view of these changes and explore their effects on people through the lens of social science as well as the law. ■

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Noteworthy

Select Prizes and Awards

Frances E. Allen (IBM Thomas J. Watson Research Center) is the recipient of the 2006 A.M. Turing Award, given by the Association for Computing Machinery.

Peter Ashton (Harvard University) has been awarded the 2007 Japan Prize by the Science and Technology Foundation of Japan.

Norman R. Augustine (Lockheed Martin Corporation) is the recipient of the Franklin Institute's Bower Award for Business Leadership.

Timothy J. Berners-Lee (Massachusetts Institute of Technology) received the Charles Stark Draper Prize from the National Academy of Engineering.

Klaus Biemann (Massachusetts Institute of Technology) was awarded the Benjamin Franklin Medal in Chemistry by the Franklin Institute.

Mina J. Bissell (Lawrence Berkeley National Laboratory) is the recipient of the 2007 Pezcoller Foundation-AACR International Award for Cancer Research.

Barry R. Bloom (Harvard School of Public Health) has been awarded the Grand Cross of the Order of Makarios III, the highest honor given by the Republic of Cyprus.

Lawrence D. Bobo (Stanford University) was named a 2007 Guggenheim Fellow.

Lucille Clifton (St. Mary's College of Maryland) was awarded the 2007 Ruth Lilly Poetry Prize.

Philippe de Montebello (Metropolitan Museum of Art) was awarded a Legion of Honor medal by the French government.

Anthony S. Fauci (National Institutes of Health) has been awarded the 2007 George M. Kober Medal of the Association of American Physicians.

George Feher (University of California, San Diego) has been awarded the 2007 Wolf Foundation Prize in Chemistry.

Merton C. Flemings (Massachusetts Institute of Technology) is the recipient of the Benjamin Franklin Medal in Materials Engineering, given by the Franklin Institute.

Harry Furstenberg (Hebrew University of Jerusalem) has been awarded the 2007 Wolf Foundation Prize in Mathematics.

Henry Louis Gates, Jr. (Harvard University) is the recipient of *Wired* magazine's 2007 Rave Award and the National Arts Club's Gold Medal for Lifetime Achievement in African and African American Scholarship.

Herbert Gleiter (Institute of Nanotechnology, Germany) was awarded the 2007 Acta Materialia Gold Medal.

Michael F. Goodchild (University of California, Santa Barbara) is the recipient of the 2007 GITA Lifetime Achievement Award, given by the Geospatial Information & Technology Association.

Stephen C. Harrison (Harvard Medical School) is the recipient of the 2007 UCSF/Merck Life Sciences Achievement Award.

Thomas Kailath (Stanford University) is the recipient of the 2007 IEEE Medal of Honor, given by the Institute of Electrical and Electronics Engineers.

Hilary Koprowski (Thomas Jefferson University) was awarded the 2007 Sabin Gold Medal by the Sabin Vaccine Institute.

Tanya Luhrmann (Stanford University) was named a 2007 Guggenheim Fellow.

Ruth Barcan Marcus (Yale University) has been awarded the Lauener Prize for an Outstanding Oeuvre by the Lauener Foundation for Analytical Philosophy.

Cormac McCarthy (El Paso, Texas) was awarded a 2007 Pulitzer Prize for fiction for *The Road*.

Perry L. McCarty (Stanford University) was awarded the 2007 Stockholm Water Prize by the Stockholm International Water Institute.

Margaret Murnane (University of Colorado at Boulder) has been named a Fellow of the Association for Women in Science.

Harry Noller (University of California, Santa Cruz) was awarded the 2007 Paul Ehrlich and Ludwig Darmstaedter Prize.

Geraldine Richmond (University of Oregon) was named a 2007 Guggenheim Fellow.

Jose A. Scheinkman (Princeton University) was named a 2007 Guggenheim Fellow.

Martin Scorsese (New York, NY) received an Oscar for Best Director of a Motion Picture for *The Departed*, given by the Academy of Motion Picture Arts and Sciences.

Kay Kaufman Shelemay (Harvard University) was named a 2007 Guggenheim Fellow.

Maxine F. Singer (Washington, D.C.) is the recipient of the 2007 NAS Public Welfare Medal.

Stephen Smale (University of California, Berkeley) has been awarded the 2007 Wolf Foundation Prize in Mathematics.

Larry R. Squire (University of California, San Diego) is the recipient of the 2007 Herbert Crosby Warren Medal, given by the Society of Experimental Psychologists.

Steven W. Squyres (Cornell University) was awarded the Benjamin Franklin Medal in Earth and Environmental Science by the Franklin Institute.

Timothy M. Swager (Massachusetts Institute of Technology) was awarded the 2007 Lemelson-MIT Prize for invention and innovation.

Charles Taylor (Northwestern University) was awarded the 2007 Templeton Prize for Progress Toward Research or Discoveries About Spiritual Realities by the John Templeton Foundation.

Craig Tracy (University of California, Davis) is a recipient of the 2007 Norbert Wiener Prize in Applied Mathematics, presented jointly by the American Mathematical Society and the Society of Industrial and Applied Mathematics.

Robert L. Trivers (Rutgers University) was awarded the 2007 Crafoord Prize in Biosciences by the Royal Swedish Academy of Sciences.

Srinivasa S.R. Varadhan (New York University) was awarded the 2007 Abel Prize in Mathematics by the Norwegian Academy of Science and Letters.

Ajit Varki (University of California, San Diego) is the recipient of the International Glycoconjugate Organization Award for 2007.

Charles F. Westoff (Princeton University) is the recipient of the 2007 Laureate Award of the International Union for the Scientific Study of Population.

Nancy S. Wexler (Columbia University) was awarded the Benjamin Franklin Medal in Life Science by the Franklin Institute.

Harold Widom (University of California, Santa Cruz) is a recipient of the 2007 Norbert Wiener Prize in Applied Mathematics, presented jointly by the American Mathematical Society and the Society of Industrial and Applied Mathematics.

Ada Yonath (Weizmann Institute of Science, Israel) has been awarded the 2007 Wolf Foundation Prize in Chemistry and the 2007 Paul Ehrlich and Ludwig Darmstaedter Prize.

Association of American Publishers 2006 Awards for Excellence:

Daron Acemoglu (Massachusetts Institute of Technology), with James A. Robinson, for *Economic Origins of Dictatorship and Democracy*

Robert A. Alberty (Massachusetts Institute of Technology) for *Biochemical Thermodynamics: Applications of Mathematica*

Derek Bok (Harvard University) for *Our Underachieving Colleges*

David Brion Davis (Yale University) for *Inhuman Bondage: The Rise and Fall of Slavery in the New World*

George Hutchinson (Yale University) for *In Search of Nella Larsen*

Laura L. Kiessling (University of Wisconsin-Madison), with Evelyn Jabri, for the journal *ACS Chemical Biology*

Sanford Levinson (University of Texas) for *Our Undemocratic Constitution: Where the Constitution Goes Wrong (And How We the People Can Correct It)*

Tak Mak (University of Toronto), with Mary Saunders, for *The Immune Response*

Fergus Millar (University of Oxford) for *A Greek Roman Empire: Power and Belief under Theodosius II (408–450)*

Franco Moretti (Stanford University) for *The Novel*

Richard Schmalensee (Massachusetts Institute of Technology), with David S. Evans and Andrei Hagiu, for *Invisible Engines*

Glenn T. Seaborg (University of California, Berkeley), with Walter D. Loveland and David Morrissey, for *Modern Nuclear Chemistry*

Jean Tirole (Institut d'Économie Industrielle) for *The Theory of Corporate Finance*

New Appointments

Lee C. Bollinger (Columbia University) has been elected to the Board of Directors of the Washington Post Company.

Robert A. Brown (Boston University) has been elected to the Board of Directors of DuPont.

Frances D. Fergusson (Vassar College) was elected President of Harvard University's Board of Overseers.

Herbert Gleiter (Institute of Nanotechnology, Germany) was elected to the Presidential Board of the German Academy of Natural Sciences Leopoldina.

Donald Green (Yale University) has been elected to the Editorial Advisory Board of *Campaigns & Elections* magazine.

Russell J. Hemley (Carnegie Institution of Washington) has been appointed Director of Carnegie's Geophysical Laboratory.

John P. Huchra (Harvard-Smithsonian Center for Astrophysics) has been elected President of the American Astronomical Society.

Rudolf Jaenisch (Massachusetts Institute of Technology) has been appointed to the Scientific Advisory Board of PrimeGen Biotech LLC.

Donald Levy (University of Chicago) has been appointed Vice President for Research and for National Laboratories at the University of Chicago.

Manuel Martínez-Maldonado (Ponce School of Medicine) has been named executive Vice President for Research at the University of Louisville.

David McCullough (West Tisbury, Massachusetts) has been elected to the Board of the Smithsonian's National Museum of American History.

Paul G. Risser (University of Oklahoma) has been named Acting Director of the Smithsonian's National Museum of Natural History.

John W. Rowe (Columbia University) has been appointed to the Rockefeller Foundation Board of Trustees.

Erkki Ruoslahti (University of California, Santa Barbara) has been appointed to the Board of Directors of Advanced Cell Technology.

Select Publications

Poetry

Carl Phillips (Washington University in St. Louis). *Quiver of Arrows: Selected Poems, 1986–2006*. Farrar, Straus & Giroux, May 2007

C. D. Wright (Brown University). *One Big Self: An Investigation*. Copper Canyon, March 2007

Fiction

Aharon Appelfeld (Ben Gurion University of the Negev). *All Whom I Have Loved*. Schocken, February 2007

Lydia Davis (New York, NY). *Varieties of Disturbance: Stories*. Farrar, Straus & Giroux, May 2007

Lynn Margolis (University of Massachusetts, Amherst). *Luminous Fish: Tales of Science and Love*. Chelsea Green, March 2007

Nonfiction

Daniel Aaron (Harvard University). *The Americanist*. University of Michigan Press, March 2007

Richard C. Atkinson (University of California, San Diego). *The Pursuit of Knowledge: Speeches and Papers of Richard C. Atkinson*. University of California Press, April 2007

William J. Baumol (New York University), Robert E. Liton (Kauffman Foundation, Brookings Institution), and Carl J. Schramm (University of Virginia). *Good Capitalism, Bad Capitalism, and the Economics of Growth and Prosperity*. Yale University Press, May 2007

David Bevington (University of Chicago). *This Wide and Universal Theater: Shakespeare in Performance, Then and Now*. University of Chicago Press, May 2007

John C. Bogle (The Vanguard Group, Inc.). *The Little Book of Common Sense Investing: The Only Way to Guarantee Your Fair Share of Stock Market Returns*. John Wiley & Sons, March 2007

Bill Bradley (West Orange, NJ). *The New American Story*. Random House, March 2007

Allan M. Brandt (Harvard University). *The Cigarette Century: The Rise, Fall, and Deadly Persistence of the Product that Defined America*. Perseus Publishing, March 2007

Archie Brown (Oxford University). *Seven Years that Changed the World: Perestroika in Perspective*. Oxford University Press, May 2007

Zbigniew Brzezinski (Center for Strategic and International Studies, Washington, D.C.). *Second Chance: Three Presidents and the Crisis of American Superpower*. Basic Books, March 2007

Noam Chomsky (Massachusetts Institute of Technology). *Interventions*. City Lights, May 2007

Jean Comaroff (University of Chicago) and **John L. Comaroff** (University of Chicago), eds. *Law and Disorder in the Postcolony*. University of Chicago Press, November 2006

Robert Dallek (Boston University). *Nixon and Kissinger: Partners in Power*. HarperCollins, May 2007

William Theodore deBary (Columbia University). *Confucian Tradition and Global Education*. Columbia University Press, April 2007

Daniel Dennett (Tufts University), **John Searle** (University of California, Berkeley), Maxwell Bennett (University of Sydney), and Peter Hacker (University of Oxford). *Neuroscience and Philosophy: Brain, Mind, and Language*. Columbia University Press, May 2007

Greg J. Duncan (Northwestern University), Aletha C. Huston (University of Texas, Austin), and Thomas S. Weisner (University of California, Los Angeles). *Higher Ground: New Hope for the Working Poor and Their Children*. Russell Sage Foundation, April 2007

Robert A. Ferguson (Columbia University). *The Trial in American Life*. University of Chicago Press, March 2007

Richard Freeman (Harvard University). *America Works: Critical Thoughts on the Exceptional U.S. Labor Market*. Russell Sage Foundation, April 2007

Nathan Glazer (Harvard University). *From a Cause to a Style: Modernist Architecture's Encounter with the American City*. Princeton University Press, February 2007

Fredric Jameson (Duke University). *Jameson on Jameson: Conversations on Cultural Marxism*. Duke University Press, November 2007

Kathleen Hall Jamieson (University of Pennsylvania) and Brooks Jackson (University of Pennsylvania). *UnSpun: Finding Facts in a World of Disinformation*. Random House, April 2007

Chalmers Johnson (Japan Policy Research Institute, Cardiff, California). *Nemesis: The Last Days of the American Republic*. Metropolitan, February 2007

Arthur Kleinman (Harvard University), Joao Biehl (Princeton University), and Byron Good (Harvard Medical School), eds. *Subjectivity: Ethnographic Investigations*. University of California Press, February 2007

Gardner Lindzey (Center for Advanced Study in the Behavioral Sciences) and William McKinley Runyan (University of California, Berkeley), eds. *A History of Psychology in Autobiography*, volume 9. American Psychological Association, March 2007

Lynn Margulis (University of Massachusetts, Amherst) and Dorion Sagan (Northampton, Massachusetts). *Dazzle Gradually: Reflections on the Nature of Nature*. Chelsea Green, May 2007

Douglas Massey (Princeton University). *Categorically Unequal: The American Stratification System*. Russell Sage Foundation, April 2007

David Nathan (Harvard Medical School). *The Cancer Treatment Revolution: How Smart Drugs and Other New Therapies are Renewing Our Hope and Changing the Face of Medicine*. Wiley, March 2007

Alexander Nehamas (Princeton University). *Only a Promise of Happiness: The Place of Beauty in a World of Art*. Princeton University Press, March 2007

Martha C. Nussbaum (University of Chicago). *The Clash Within: Democracy, Religious Violence, and India's Future*. Harvard University Press, May 2007

Norman J. Ornstein (American Enterprise Institute) and John C. Fortier (American Enterprise Institute), eds. *Second-Term Blues: How George W. Bush Has Governed*. Brookings Institution Press and the American Enterprise Institute, April 2007

Ronald Paulson (Johns Hopkins University). *Sin and Evil: Moral Values in Literature*. Yale University Press, March 2007

Michael C. J. Putnam (Brown University) and Jan M. Ziolkowski (Harvard University). *The Virgilian Tradition*. Yale University Press, May 2007

Arnold Rampersad (Stanford University). *Ralph Ellison: A Biography*. Knopf, April 2007

Arnold S. Relman (Brigham & Women's Hospital, Boston, Massachusetts). *A Second Opinion: How to Prevent the Collapse of America's Health Care*. Public Affairs, May 2007

Richard Rorty (Stanford University) and Pascal Engel (University of Geneva). *What's the Use of Truth?* Columbia University Press, March 2007

Richard Rose (University of Aberdeen), William Mishler (University of Arizona), and Neil Munro (University of Aberdeen). *Russia Transformed: Developing Popular Support for a New Regime*. Cambridge University Press, December 2006

Michael Sandel (Harvard University). *Ethics in the Age of Genetic Engineering*. Harvard University Press, May 2007

Theda Skocpol (Harvard University) and Lawrence R. Jacobs (University of Minnesota), eds. *Inequality and American Democracy: What We Know and What We Need to Learn*. Russell Sage Foundation, May 2007

Geoffrey Stone (University of Chicago). *War and Liberty: An American Dilemma: 1790 to the Present*. W. W. Norton, April 2007

Richard J. Zeckhauser (Harvard University) and Peter Schuck (Yale Law School). *Targeting in Social Programs: Avoiding Bad Bets, Removing Bad Apples*. Brookings Institution Press, November 2006

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

Recent Academy Publications

Occasional Papers

Francis M. Bator (Harvard University). *No Good Choices? LBJ and the Vietnam/Great Society Connection*. American Academy, 2007

Pavel Podvig (Stanford University) and **Hui Zhang** (Harvard University). *Russian and Chinese Responses to U.S. Military Plans in Space*. American Academy, 2007

Books

Joel E. Cohen (Rockefeller and Columbia Universities), **David E. Bloom** (Harvard University), and **Martin B. Malin** (American Academy). *Educating All Children: A Global Agenda*. MIT Press, 2007

Jeffrey Lewis (Harvard University). *The Minimum Means of Reprisal: China's Search for Security in the Nuclear Age*. MIT Press, 2007

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Fellows and Friends Contribute a Record \$1.5 million to the Annual Fund

In the recently completed fiscal year, the Academy's Annual Fund reached a new level. The fund surpassed the \$1.25 million mark for the fourth consecutive year and exceeded \$1.5 million for the first time, with gifts up 7 percent over the previous year. More than 1,200 donors helped to accomplish this goal.

Vice President and Chair of the Academy Trust Louis W. Cabot remarked that "contributions at all levels from Fellows are vital. New research projects and studies and a growing number of programs and activities across the country rely on resources provided by the Annual Fund each year."

The Academy is indebted to the Fellows, staff, friends, and foundations that support its work. We are particularly grateful to a growing number of leadership donors, including Leonore Annenberg, Stephen D. Bechtel, Jr., John P. Birkelund, Louis W. Cabot, John E. Cogan, Jr., Arthur Gelb, Michael E. Gellert, William T. Golden, F. Warren Hellman, Robert P. Henderson, Walter B. Hewlett, Tom Leighton, Martin Lipton, Peter Nicholas, John S. and Cynthia L. Reed, Gerald Rosenfeld, and E. John Rosenwald, Jr.

A complete list of contributors to the 2006–2007 Annual Fund will appear in the Academy's *Annual Report* to be published in the fall of 2007.

The members of the Development and Public Relations Committee are Louis W. Cabot and Robert A. Alberty, cochairs; Jesse H. Choper, Alan M. Dachs, Michael E. Gellert, William T. Golden, Charles M. Haar, Jack W. Peltason, and Nicholas T. Zervas. ■

Academy Seeks New Editor for *Dædalus*

The American Academy of Arts & Sciences is seeking a new editor for its quarterly journal *Dædalus*. The editor, who should be knowledgeable about both print journals and electronic media, will be appointed as a senior member of the Academy staff and will be expected to be in residence in Cambridge. The editor will also participate in the development of Academy publications and programs. Fellows who wish to recommend candidates for this position are encouraged to contact the Academy by email (daedalussearch@amacad.org) or by telephone (617-576-5010).

AMERICAN ACADEMY OF ARTS & SCIENCES

Norton's Woods, 136 Irving Street, Cambridge, MA 02138
telephone 617-576-5000, facsimile 617-576-5050,
email aaas@amacad.org, website www.amacad.org

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Bulletin Spring 2007
Issued as Volume LX, Number 3
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The Bulletin of the American Academy of Arts & Sciences (ISSN 0002–712X) is published quarterly by the American Academy of Arts & Sciences. Periodicals rate postage paid at Boston, MA, and at additional mailing offices. Postmaster: Send address changes to *Bulletin*, American Academy of Arts & Sciences, 136 Irving Street, Cambridge, MA 02138.

The views expressed in the *Bulletin* are those held by each contributor and are not necessarily those of the Officers and Fellows of the American Academy of Arts & Sciences.

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Norton's Woods
136 Irving Street
Cambridge, MA 02138-1996 USA

telephone 617-576-5000

facsimile 617-576-5050

email aaas@amacad.org

website www.amacad.org

