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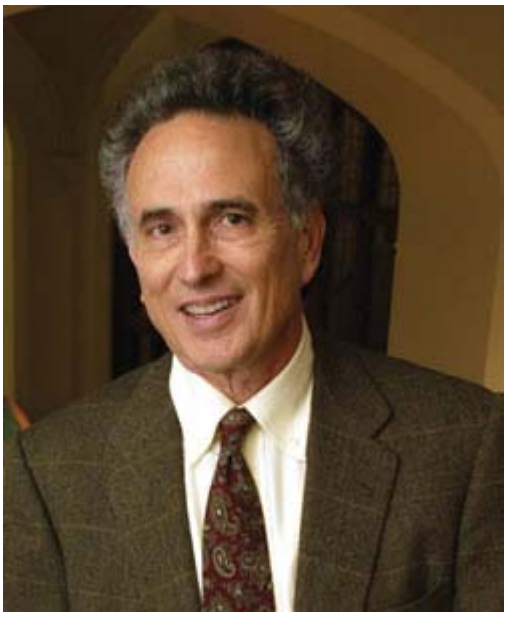
To POPA: A Former Chair's Farewell

by Robert Socolow

Ed. Note: *Robert Socolow, a Professor of Mechanical and Aerospace Engineering at Princeton University, was Chair of the APS Panel on Public Affairs (POPA) in 2010. Upon completing his term on POPA in the fall of 2011, he delivered the following farewell address.*



Robert Socolow

It has been a privilege to be associated with the Panel on Public Affairs for the past four years. This remarkable unit has no counterpart in other professional societies. It is a product of the 1960s and 1970s, a time when physicists were particularly inclined to scrutinize their motivations for being physicists. Our first answer was that we hoped to discover a few of nature's secrets. But many of us, nearly as much, hoped to use our specialized knowledge to address social problems. We had a broad agenda, starting with but going beyond nuclear weapons and nuclear power. The slogan was "science for the people."

I was a physics major at Harvard when Sputnik raced overhead in October 1957. Immediately, President Eisenhower summoned scientists to Washington to explain this new accomplishment. From Cambridge came James Killian, George Kistiakowsky, Norman Ramsey and one of my teachers, Edward Purcell. Late in the afternoon, Purcell and Ramsey would return to the physics building, after having written pamphlets about why a satellite can't fall straight down, and after working out the implications of Sputnik for strategic weapons delivery systems. To those of us who were hanging around doing problem sets, they said: "Somebody has to do this full time." Twelve years later, after seven joyful years with quarks, I acted on their advice. In my generation, many did.

Numerous institutions designed to encourage "science-based decision-making" emerged in the following two decades. Among the important ones still with us are the President's Council of Advisors on Science and Technology, the Council on Environmental Quality, the Natural Resources Defense Council, the Environmental Defense Fund, and our own POPA.

During the past four years, APS and POPA have been reexamining their communication strategies. A Hegelian process is under way: Thesis, Antithesis, Synthesis. Consider the incautious 2007 APS Statement on climate change, with its famously ill-chosen word, "incontrovertible." The Statement produced a bitter minority response; then, two years ago, a moderate Commentary; and then, still under way, the codification of a tightened process for producing Statements. The deep message we can all extract is that physicists care passionately about what their Society tells the world. However, passions inflamed can destroy an institution. I am proud of how APS, and POPA, preserved themselves while encouraging debate and producing a credible Commentary.

At the level of studies rather than statements, an APS study, *Direct Air Capture of CO_2 with Chemicals*, which I co-chaired, is generating its own Hegelian process. Some POPA committee members and staff did not find the report congenial. A principal concern was that the report does not make recommendations to governments. Like the original APS statement on climate, in the aftermath of an adversarial process POPA and APS are now codifying the kinds of studies POPA should and shouldn't conduct.

For both APS statements and POPA reports, in my view, the danger during the current Synthesis stage is too much codification. Be careful not to suppress the lively interloper.

When I became Vice-Chair of POPA four years ago, I exhorted POPA members to invent studies in which they were willing to invest serious time. It seemed to me that POPA then was less committed to conducting studies and producing reports than it had been. I argued that studies and reports are the principal reason for POPA's existence, a statement that I think is not controversial now. POPA meetings are now mostly about studies.

The questions I brought with me onto POPA were: 1) What kinds of studies are professional societies in general –and POPA in particular–well suited to conduct? 2) What kinds of studies does the broader society need somebody to conduct?

Technology assessments constitute one important class of needed studies. In 1972 the U.S. created the Office of Technology Assessment (OTA) within Congress to do such studies. OTA was shut down in 1995. The needs OTA filled are not being filled to this day. Studies are sorely needed, in particular, that address the world's future energy system. The energy system over the next few decades may well be traded in for another one–with lower carbon intensity and with new strategies related to transport. Both the public and policy makers need help as they contend with a discourse riddled with self-interest. Who will provide independent advice about the promise of new technologies, such as batteries, geothermal energy, and small nuclear power plants?

Not long ago, one could presume that the general public, as well as decision makers, welcomed the engagement of scientists. We were regarded as uniquely able to conduct impartial and authoritative studies. Right now, it seems to me, any such special standing is in jeopardy. Think hard about Governor Rick Perry's mental model that led him to invoke Galileo in the way that he did in a debate last month. He associates the current science establishment with the 17th century Catholic Church–and himself with those who, like Galileo, challenge established wisdom. In places like POPA, we scientists need to examine that charge, not write it off. He is giving us a wake-up call.

What are the similarities between the current scientific enterprise and an established church? We scientists are remote, we believe we deserve deference, we extract considerable financial resources from the general population to run our affairs, and we intrude on people's lives with conclusions about evolution and the vulnerability of the planet that many people don't want to hear.

We must not underestimate the threat now looming in the form of a growing public disenchantment with the scientific enterprise. Scientists believe that the scientific way of knowing is privileged relative to other ways of knowing that are rooted in myth. We must not take for granted that others do. Over the next decade, the highest priority for the APS and POPA is to retain the public's trust by demonstrating the worth to society of the fundamental values of science.

The second P of POPA stands for "public." It has two meanings: the government and everybody. Be careful not to forget the second meaning, especially now. This is never easy for an organization based in Washington.

I will close with thanks to the POPA staff and all the POPA members I have worked with. The commitments of time and energy and the resulting creativity emerge from deeply personal commitments to connect physics with public service. POPA is a force for good in this world.

Robert Socolow's research interests include global carbon management, carbon dioxide capture from fossil fuels and storage in geological formations, nuclear power, energy efficiency in buildings, and the acceleration of deployment of advanced technologies in developing countries. He was a member of the National Academies' Committee on America's Energy Future (2007-2009) and its Committee on America's Climate Choices (2009-2011). He received the APS Leo Szilard Lectureship Award in 2003.

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POPA Reports Bring Physics Perspective to Public Policy Debate

APS's Panel on Public Affairs, more commonly known as POPA, has been an important part of the Society's advocacy arm for many years. It has weighed in on many issues of public policy important to the physics community, as well as more general issues that would benefit from the perspectives of physicists.

"It is the body within the American Physical Society that delivers the opinion of the physics community on issues being debated by the Congress and within the administration," said Francis Slakey, APS Associate Director of Public Affairs, and the staff advisor to POPA. "In particular it's energy, environment and national security."

POPA has been in existence since the early 1970s, but in the early 2000s it took on a new, more focused approach to putting together reports. This new paradigm emphasizes relatively short but detailed evaluations of technical subjects, usually resulting in about two reports a year. The reports generally concentrate on evaluating or exploring in depth a specific aspect of a technical subject where physics expertise can offer fresh insights. The idea is to produce reports aimed at national decision makers, within a timeframe that can influence the debate on an important subject. Reports vary in length from about 15 to 25 pages, and take approximately a year to produce.

Past reports have weighed in on a range of subjects including nuclear weapons and energy, NASA's moon and Mars program, helium and hydrogen policy, missile defense, and the energy needs of the upcoming century. "The concept is that we could fill the gap between long term research studies that the National Academy of Sciences does…and short quick research issues the Congressional Research Service does," Slakey said.

This method of putting reports together has been effective. Information and recommendations in recent reports by the panel have made their way into the legislative process and regulatory policy. An example is the report, *Energy Critical Elements: Securing Materials for Emerging Technologies,* written in collaboration with the Materials Research Society and released in February of 2011, which found that the US needed to do more to secure its supply lines of rare and exotic elements critical to future scientific research.

The report's findings, which included having the Department of Energy work with the Department of the Interior to put together a comprehensive report on better ways to produce, collect and recycle these rare elements, were incorporated into several bills working their way through Congress. Slakey said that although report findings can often take between five and six years before becoming legislation, the recommendations from the Energy Critical Elements report were brought up before Congress in just a matter of months.

"That's the thing about POPA studies," said Robert Jaffe, vice chair of POPA and chair of the group that produced the Energy Critical Elements report. "They're really done with a conscious effort to fold them into the policy development process as easily as possible."

Similarly, a POPA report issued in 2008 about the uncertain state of nuclear forensics research in the US prompted congressional action. Representative Bill Foster, himself a former Fermilab physicist, brought the issue to the floor of the House. Many sections of his bill were later incorporated into the Defense Authorization Act of 2009 and passed into law. In conjunction with the report, POPA put together an education module for high schools which taught students about what nuclear forensics is and how it's done. The kits were distributed to about 1000 classrooms across the country.

"Outcomes of POPA reports are not just limited to Congress or the administration," Slakey said.

A typical POPA study starts as an idea or proposal at one of the three annual meetings of the panel. The ideas are first discussed in one of its subcommittees, then brought forward to the full committee for further evaluation and refinement.

During these group discussions, issues are weighed such as the proposed report's relevance to physicists and public policy, whether the study can be put together in time to have an impact, and whether there could be a well defined route for the report to affect public policy.

If the proposed idea makes it through the full committee, a taskforce is appointed to put together a small study, only a few pages long, that outlines the areas of research a full report might go into. Once the preliminary study is assembled, it's circulated among the members of POPA, and followed by a presentation and discussion at the next meeting. The committee then votes on whether to go forward with a full report.

Once a report gets the green light, a full report committee is assembled, bringing in experts from across the relevant areas of sciences and public policy. How the committee then proceeds varies somewhat depending on the needs of the report. In the case of the Energy Critical Elements report, the committee, after several teleconferences throughout early 2010, held a conference in April where each member presented a white paper on their subjects in the report, then gathered in Washington, DC in September to meet with those who might be affected by the study, such as people in the Department of Energy and the Office of Science and Technology Policy as well as executives in the mining industry. Between October and November the report was written up and finally presented publicly at the annual meeting of the American Association for the Advancement of Science in February of 2011.

However, the process does not stop with the publication of the report. Members of the APS media and public affairs team then work to get the word out to members of Congress, industry regulators, scientists and the general public. Editorials are written and sent to news outlets. If there is congressional action on the subjects of the report, the lead author is often called before the Senate or House committee that oversees the matter.

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