

Forum History at Forty (2012)*

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Physics is a major component of many of society's difficult issues: nuclear arms and their proliferation, energy shortages and energy impacts, climate change, and technical innovation. Because physics principles underlie so many of these societal issues and because physics offers a way to quantify some aspects of them, members of the American Physical Society (APS) should be encouraged to understand, analyze and debate them. This is precisely why APS members formed the Forum on Physics and Society (FPS). To those of us who have been involved in FPS affairs for a long time, it seems like only yesterday that we attended the organizing meeting at the 1972 APS San Francisco meeting. Some 40 years later, it's a good time for FPS to look back at its accomplishments and look ahead at the direction of its future activities.

The Early Years

The FPS was born in the tumultuous 1960's and 70's. The issues of that era—the Vietnam War, the Anti-Ballistic Missile system, and the energy crisis, along with the start of the environmental movement and the civil/human rights revolution—impelled that generation of physicists to consider their professional responsibilities. Many felt that the APS should have a division or forum in which appropriate science and society issues would be debated by informed participants before the APS membership. An excellent review of the early days of the Forum was published by Barry ("Mike") Casper in the May 1974 issue of *Physics Today*.

In its 40 years, FPS had too many excellent leaders to mention each by name. But I would like to describe briefly the four "founding fathers" pictured in Casper's article: Earl Callen (American University), Martin Perl (SLAC), Mike Casper (Carleton College) and Brian Schwartz (then MIT, now CUNY). Callen was the founding chair of the Forum. Although his particular interest was international human rights of scientists, the major goals of Callen's term were building membership, developing a reputation within the APS membership for quality and objectivity, and establishing effective working relationships with the APS Council.

Martin Perl can only be described as a phenomenon. While acting as the second chair of the Forum in 1973-74, he discovered the tau meson, establishing the third family of leptons. (For this discovery he was awarded the 1995 Nobel Prize in physics, shared with Frederick Reines, who was honored for the discovery of the electron's anti-neutrino). And in his spare time Perl established and edited the forum's newsletter, *Physics and Society*, from 1972-79 and mobilized two Penn State Conferences on graduate physics education (1974, 1977). Casper, the Forum's third chair, established the two Forum Awards. After that, he actively worked on arms control and became a senior advisor to Senator Paul Wellstone. Schwartz, the ninth chair of the FPS, served brilliantly and creatively in the crucial job of organizing the first Forum panels at APS meetings. While he might have been regarded as a "young Turk" by the APS establishment

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in the 1970s, he has gone on to be an APS insider, serving as the APS Education Officer and as APS Associate Executive Secretary (1991-94). He was also responsible for much of the planning for the APS centennial activities in 1999.

The FPS was the first APS forum. Recognizing that the Forum would attract members from across disciplinary lines, the APS waived the additional dues that are traditionally charged to members for joining a division, such as the Division of Biophysics or the Division of Condensed Matter Physics. (With the subsequent creation of additional fora, APS instituted a charge for membership in each forum over two per member.) Yet the APS still gives a certain amount to each forum based on the forum membership to help defray such cost of a newsletter, travel funds to APS meetings for non-APS members, summer internships for students, etc. This approach induced APS to create other fora, first being the Forum on History of Physics (1980), then the Fora on International Physics (1985), on Education (1991), on Industrial and Applied Physics (1995), on Graduate Student Affairs (2001) and on Outreach and Engaging the Public (2010). Under the leadership of FPS Chair Tony Nero, a council of the APS fora was established in order to coordinate and enhance the work of all groups.

Winning Respect

In its early days, the Forum was looked upon with suspicion by the APS leadership, which was concerned that the Forum would move issues too far and too fast. Because of this concern the APS council appointed a senior APS member to attend the Forum Executive Committee meetings to make sure that the Forum did not embarrass the APS. Embarrassment never happened.

I recall three examples in which the Forum was very even handed. The first concerns an amendment to the APS Constitution proposed by Robert March, which would have required the APS to "shun activities which contributed harmfully to the welfare of mankind." It was very difficult to obtain a speaker against the March amendment at an April 1972 FPS session. The first Forum Chair, Earl Callen, stepped forward and filled that role (in which he believed). His presentation helped to defeat the March amendment. The second example concerns the publication of a very political cartoon by the editor of *Physics and Society*. That editor was warned not to run any more such one-sided cartoons, but he ignored the warning. Although in other respects, that person had been a good and tireless editor, the Forum Executive Committee was forced to adhere to the principle of objectivity and to fire him.

A highly publicized controversy occurred with the newsletter in 2008. The editors wanted to promote a debate between those who accepted the scientific findings that man's activities were having an impact on climate-change and those who did not. Unfortunately, they chose a highly controversial and outspoken non-scientist, Christopher Monckton, to represent the arguments of the climate deniers. Monckton subsequently presented his piece to journalists as a peer-reviewed paper from a "learned journal" and touted it as evidence for APS support of his position. The newsletter tightened its editorial oversight and now adds a disclaimer to every article; "These contributions have not been peer-reviewed. They represent solely the view(s) of the author(s) and not necessarily the view of the APS."

By now, the FPS has long since won the respect of the APS Council. They no longer appoint a representative to the Forum Executive Committee. The Forum is regarded as a source of manpower and ideas for the APS to utilize in preparing its public positions. Of the 38 chairs of the APS Panel on Public Affairs from 1975 to 2012, six of these have been chairs of the FPS.

As of January 2012, the Forum had just over 6,055 members, 12.1% of the total APS membership of nearly 50,055. The vast majority of Forum members are active physics researchers and professors who are already overly committed to their professional careers. These FPS members are not actively publishing on the Forum issues of arms control, energy and environment. However, these members do want the FPS to hold debates, publish a viable *Physics and Society* newsletter, sponsor occasional studies, offer short courses and give awards. As in any division of the APS, the heavy lifting is carried out by the 1% of the membership who volunteer to be more heavily involved.

FPS Sessions

One of the most important activities of the FPS has been to sponsor sessions at APS meetings on topical science-and-society issues. Some FPS sessions have had more than 1,000 attendees. Over the first 27 years up to 1999, the FPS offered 197 sessions for an average of 7.3 +/- 1.7 per year. Over the next 13 years (2000-2012), FPS offered 111 sessions for an average of 8.5 +/- 1.7 per year, an increase of 16%. This rise is somewhat remarkable since sessions are now rarely held in Washington, DC, an easy source for experts on policy-related issues. The March meeting has had an average of 3.0 per year and the April meeting has had an average of 5.8 per year, twice that of the March meetings. The total number of FPS sessions from 1972 to 2012 is 311, for an average of 7.8 per year. To provide more in-depth background on certain issues, FPS has offered short courses on a number of topics. If one adds the sessions from the two Penn State conferences and seven short courses, the total number of sessions rises to about 375, for an average of 9.4 per year.

The approximate break-out by topic of the FPS sessions in the two time periods and in total follows.

	<u>1972-1999</u>	<u>2000-2011</u>	<u>1972-2011</u>
National Security	51 (26%)	24 (22%)	75 (24%)
Policy Process	36 (18%)	19 (17%)	54 (17%)
Energy	26 (13%)	6 (5%)	32 (10%)
FPS Awards	25 (13%)	13 (11%)	38 (12%)
Education	20 (10%)	12 (11%)	32 (10%)
Environment	14 (7%)	11 (10%)	25 (8%)
Miscellaneous	16 (8%)	29 (26%)	45 (14%)
Contributed Papers	9 (5%)	0 (0%)	9 (3%)

Trends: The following categories remained essentially constant: National Security at 24% of all sessions, Policy Process at 17%, Awards at 12%, Education at 10% and Environment at 8%. But each area has had changes of content. For example, simplistically, National Security moved from SS-18s and Star Wars to Terrorism and Proliferation. The big changers were as follows. Energy topics have dropped in frequency from 13% to 5%, although two short courses on energy topics held in 2008 and 2011 at UC Berkeley produced 1000 pages in 2 AIP Conference Proceedings. “Miscellaneous” sessions have risen dramatically from 8% to 26%, implying that FPS is becoming more eclectic as we considered the debate over biological evolution, physics and art, physics and entertainment, and more. Contributed Paper sessions dropped from 5% to zero, as FPS decided that the diverse collection of ten-minute papers lacked focus.

FPS Goals for APS Sessions: The goal of Forum sessions is to present the best arguments on both sides of an issue in a no-holds-barred debate. Unfortunately, this goal is occasionally abused by people who wish to offer views that are unscientific or that confuse the debate. For instance, at the spring 1986 APS meeting in Washington, DC, the Forum held a session on the pros and cons of the Strategic Defense Initiative (SDI). Organizers invited representatives from the Reagan administration and from the Congressional Office of Technology Assessment, along with some university faculty. It never occurred to us to invite Lyndon LaRouche's Fusion Energy Foundation. However, this group felt they should have been invited and they attempted to shut down the session. As Forum Chair at the time, it was my task to go head-to-head and threaten them with police action if they would not be quiet and allow the session to continue. They did

quiet down, and the details of lasers in space were quantified and debated. It can be difficult to define when a position should be categorized as "unscientific." Luckily this issue doesn't come up very often.

An example of even-handedness was the March 2007 session in Denver on "Nuclear Weapon Missions in the 21st Century." This session focused on the merits and needs for Reliable Replacement Warhead (RRW) and not its design. The event was timely in that a few days before the session, Lawrence Livermore National Laboratory won the contract to develop the RRW because of its more traditional, but already tested design, while Los Alamos National Laboratory's more advanced design took second place because it had not been tested. The panel was balanced between government, universities and non-governmental organizations. It consisted of John Harvey (NNSA Director for Policy and Planning, last minute replacement for NNSA Director Linton Brooks), Lt. General Robert Kehler (Deputy Commander of the Strategic Command), Bruce Tarter (former LLNL Director and chair of AAAS Study on the RRW), Sidney Drell (a member of the Jason group that had studied the RRW issue), Ivan Oelrich (Vice President of the Federation of American Scientists, who had written a paper "Missions for Nuclear Weapons After the Cold War."). The Bulletin of the American Physical Society contains the lineups for the other 302 sessions, many of which I view as truly historic.

AAPT Booklets

The American Association of Physics Teachers has often shown an interest in FPS sessions and short courses. The AAPT published three FPS sessions as informative booklets for its members:

Nuclear Energy, Nuclear Weapons Proliferation and the Arms Race by Bernard Spinrad, John Holdren, Gene Rochlin and Herbert York, January 1982, 48 pages.

Nuclear Weapons and Nuclear War by Philip Morrison, Hans Bethe and Wolfgang Panofsky, April 1982, 35 pages.

Acid Rain: How Serious and What to Do by Myron Uman, George Hidy, Michael Oppenheimer and Leonard Weiss, April 1985, 47 pages.

Physics and Society

P&S is in its 41th year. Martin Perl was founding editor (1972-79, SLAC). He was succeeded in 1980 by the late John Dowling (1980-86, Mansfield State University). Art Hobson (University of Arkansas) was editor from 1987 to 1996. Al Saperstein (Wayne State University) was editor from 1997 to 2003, when Jeff Marque joined him as Co-Editor until 2009. Cameron Reed is the current editor. *P&S* fulfills an extremely important function by informing FPS members of current topics. It is much more than a newsletter. Since there are not many journals that cover the many applied-physics issues, *P&S* provides a useful outlet for physicists who have viable data or theory to publish. It has long been a goal of the FPS to convert *P&S* from a "quasi-journal" to a full-fledged subscription journal. The display at the Atlanta Centenary showed the evolution of the *P&S* masthead and front-page. With the passage of time the contents of *P&S* have shifted from more general commentary to the more technical aspects of physics and public policy issues.

Thanks to the diligence of the current editor, Cameron Reed, the FPS-*P&S* web site has an archive of all the back issues, with the exception of issues from Volume 1 (1972) and the July 1973 and April 1980 editions. The site also includes an index, arranged by topic. It is interesting to examine these older issues. The March 1973 issue tells us that the Forum leadership (Mike Casper, Anne Cahn, and Joel Primack) will describe at the upcoming Washington APS meeting the Congressional Fellowship Program, which was to begin in September 1973. This issue tells us that Edward Teller and Sam Goudsmit debated "Science and Secrecy" and that Philip Boeffey and Ralph Nadar also debated.

In order to encourage the exchange of ideas among physicists, many of the FPS symposia are published in *P&S*. Examples include: SDI (September 1986), a forum-sponsored study of land-based intercontinental ballistic missiles (July 1988), energy research (July 1989), safeguards on plutonium and highly enriched uranium (July 1990), pseudoscience (July 1990), a forum-sponsored study of energy (October 1991), powerlines and public health (January 1992), climate change (October 1992), environmental physics (July 1993), physics and law (October 1993), risk and nuclear power (July 1994), theater ballistic missiles (October 1994), legacy of radiation from cold war (July 1995), sustainable technologies (October 1995), linear low dose radiation (January 1997), monitoring nuclear materials (July 2006), reflections of presidential science advisors (October 2006, January 2007), what are nuclear weapons for (October 2007, April 2008) and nuclear weapons at 65 (January 2012). Among the talks in these various symposia, one of my favorites is the one by James Randi (October 1989) on "Fooling Some Scientists Some of the Time." The unplanned juxtaposition of Randi's talk and the big APS debate on "cold fusion" at the 1989 Baltimore APS meeting was indeed timely. The April 1991 issue of *P&S* contains a nice debate between Peter Zimmerman and Art Hobson on the use of high technology conventional weapons in the Gulf War. *P&S* also reviews recent books and describes recent events in physics and public policy. Over the years *P&S* has published a wide variety of letters on both popular and unpopular topics. Many times an editor (and the editorial board) has disagreed sharply with the contents of some of the letters to the editor, but openness has often dictated their publication as long as the view makes some logical points. As pointed above, *P&S* publishes a disclaimer at the end of each article stating "These contributions have not been peer-reviewed. They represent solely the view(s) of the author(s) and not necessarily the view of the APS."

Forum Studies

Over the years the FPS sponsored three studies, which were published by AIP Press. They arose after a small group of individuals decided to study selected issues in depth. The individuals contributed their own time, talent and energy. FPS contributed some funds toward helping the authors hold occasional meetings and lent its auspices for publication of the results.

Civil Defense: A Choice of Disasters, edited by John Dowling and Evans Harrell, 1986, 248 pages

The Future of Land-Based Strategic Missiles, edited by Barbara Levi, Mark Sakitt and Art Hobson, 1989, 310 pages.

The Energy Sourcebook: A Guide to Technology, Resources and Policy, edited by Ruth Howes and Anthony Fainberg, 1991, 550 pages.

Each of these studies contains the caveat: "This volume was prepared by a study group of the Forum on Physics and Society of the American Physical Society. The American Physical Society has neither reviewed nor approved this study." This disclaimer is only fair since the APS Council did not take an active role in the development of these studies. Time has eclipsed the large-scale plans for civil defense structures and the evacuation of cities. Land-based missiles will not be confined to single warheads, but there has been reasonable (although slow) progress on strategic arms control. The energy issue may have been forgotten in the press in the 1990's, but FPS members knew it would return in the 21st century, which it has. Hopefully, many physicists will blow the dust from the Howes-Fainberg volume and use the timeless principles within to help solve the problem. These studies have held up over the years and remain good references today.

Physics Jobs

The first "job crisis" for young PhD's took place in the early 1970s. The Forum responded by organizing two conferences at Penn State University (August 19-23, 1974 and August 1-3, 1977). Martin Perl and Roland Good were the driving forces behind these conferences, which examined the data and possible responses by the physics academic community. Of course, there was no easy solution then, or now, to the vulnerability of young PhD's and post-docs in a tight job market, but the conference developed a number of

partial solutions. The results of the first conference on "Technology Change in Physics Graduate Education" were published in the 64-page, February-1975 issue of *Physics and Society* and it still remains the newsletter's largest single edition. The results of the second conference on "Changing Career Opportunities for Physicists" was edited by Martin Perl and published in the AIP Conference Series (Physics Careers, Employment and Education, AIP 39, 1978, 340 pages). These studies were a precursor to the later studies by the APS Committee on Careers and Professional Development and the Young Scientists Network.

Congressional Science Fellows

In 1973, APS chose its first two APS Science Congressional Fellows in an AAAS program with different societies (IEEE, OSA, etc.) when Ben Cooper and Richard Werthamer were selected. Cooper served a long and distinguished career on the Senate Energy Committee, rising to the position of the staff director under Democratic Senator Bennett Johnston (and as a FPS chair). Dick Werthamer served his congressional year with Republican Congressman Charles Mosher of Ohio and later served as Executive Secretary of the APS. Since then, some 150 physicists have served as Science Congressional Fellows, either as APS or AIP Fellows or as fellows from other scientific organizations. Many Fellows have remained active in the FPS leadership. Forum members Mike Casper, Richard Scribner and Joel Primack played distinct and significant roles in the creation of the APS Congressional fellowship program which former FPS chair Scribner directed for many years at AAAS.

FPS also started summer internships in collaboration with the Society of Physics Students. They ran for at least 3 summers. See <http://www.spsnational.org/programs/awards/fellowships.htm>.

Physics Education

Over the years, the Forum organized some 30 sessions on education issues. Former FPS chairs Ruth Howes and Ken Ford took an active role in organizing the Forum on Education in 1991. The Forum on Physics and Society maintains an active interest in physics education issues, but is now in a supportive role with the Forum on Education and the APS Committee on Education.

Short Courses

In order to study physics and society issues more deeply, the Forum organized a series of short courses, which last for 2 to 3 days. The participants hear some 20 hours of lectures from 24 assorted experts; later they received copies of the 500-page AIP Conference Proceedings. The \$100 fee (\$80 for students) also covered two box-lunches and four cups of coffee. For an additional \$35, the participants can come to the banquet hall. The short courses are at bargain prices with no FPS outlay because the speakers generously agree to attend without charging for their time, travel or hotels and institutions have generously provided a free venue. The short-courses and proceedings must be highly professional to attract this caliber of speakers. The Forum offered 3 short courses on arms race matters (1982 at APS San Francisco, 1983 at APS Baltimore, 1988 at George Washington University), three on energy (1985 at Office of Technology Assessment, 2008 and 2011 at University of California at Berkeley) and one on climate change (1991 at Georgetown University). The last two short courses attracted 200 attendees each. The results were published in the AIP Conference Series:

Physics Technology and the Nuclear Arms Race, edited by D. Hafemeister and D. Schroerer, AIP 104 (1983), 380 pages.

Energy Sources: Conservation and Renewables, edited by D. Hafemeister, H. Kelly and B.G. Levi, AIP 135 (1985), 676 pages.

Nuclear Arms Technologies in the 1990s, edited by D. Schroerer and D. Hafemeister, AIP 178 (1988), 480 pages.

Global Warming: Physics and Facts, edited by B.G. Levi, D. Hafemeister and R. Scribner, AIP 247 (1992), 326 pages.

Physics of Sustainable Energy: Using Energy Efficiently and Producing It Renewably, edited by D. Hafemeister, B.G. Levi, M. Levine and P. Schwartz, AIP 1044 (2008), 447 pages.

Physics of Sustainable Energy II: Using Energy Efficiently and Producing It Renewably II, edited by D. Hafemeister, D. Kammen, B.G. Levi and P. Schwartz, AIP 1401 (2011), 495 pages.

APS (Forum) Awards

The FPS presents nominees to the APS Council for two APS awards, the Joseph A. Burton Forum Award and the Leo Szilard Lectureship, for significant work on physics and society issues. The Burton-Forum Award "recognizes outstanding contributions to the public understanding or resolution of issues involving the interface of physics and society." The Szilard Lectureship "recognizes outstanding accomplishments by physicists in promoting the use of physics for the benefit of society in such areas as environment, arms control and science policy."

The Awards were first offered by the FPS (and not the entire APS) in 1974; David Inglis received the first Szilard Award and Ralph Lapp earned the first Forum Award. Initially a modest honorarium of \$250 was given, along with a handsomely scripted scroll. The honorarium became even more modest in 1985 when the Szilard Award had to be shared among the seven dominant authors of the papers on the "Nuclear Winter" calculations. The embarrassingly small stipend led the FPS Executive Board to conclude that it was better to offer no honorarium rather than an amount that would (in this case) only buy one good dinner. In desperation, the FPS then moved from monetary awards to symbolic art, plus a travel stipend to receive the award. Two California artists created statues whose bases are engraved with the names of the awardees. The winners kept the statues for one year after which they passed them to the next year's winners. The statue accompanying the Szilard Award, which was created by David Smith, is a dolphin, the symbol of Szilard's novella, *The Voice of the Dolphins*. The Burton Forum Award statue is an abstract spherical model of the Earth created by Crissa Hewitt. After many years of transcontinental shipping, the awards now reside in my backyard as a statute (Burton-Forum) and in my home-office (Szilard).

In 1986, the two FPS Awards were promoted to awards of the entire APS, but this promotion in status came with pressure to create permanent endowments for the awards. In 1997, the Forum Award was endowed with \$70,000 from the Apker Award Endowment, creating an annual honorarium of \$3000, plus travel expenses to the April meeting. The Forum Award was renamed the Joseph A. Burton Forum Award in honor of Joe Burton, beloved former APS Treasurer and long-time FPS supporter. In 1998, the Szilard Award received an endowment of \$70,000 from the MacArthur Foundation, the Energy Foundation, the Packard Foundation, the FPS and a number of individual donors. In order to create a climate for graduate students to consider careers in physics and society, the award was changed to a lectureship, and its name was changed accordingly to the Leo Szilard Lectureship Award. Starting in 1999, the recipient has received a \$1000 honorarium and travel money to present talks at an APS meeting and at universities or research laboratories.

POPA/Forum Differences

There often is confusion on the roles of the two APS entities that deal with physics and society issues. The Panel on Public Affairs (POPA) was established in 1974 under the leadership of APS Chair Pief Panofsky, two years after the Forum was established. The major distinction is that POPA is an APS committee whose members are elected by the APS Council and whose role is to advise the APS council, whereas the FPS

(and other forums) is a membership organization, whose executive board is elected by the members and whose roles include publishing a newsletter and sponsoring invited sessions at APS meetings. As a membership unit, the FPS is responsible to the FPS membership and not the Council, much as the Division of Condensed Matter Physics is responsible to the condensed matter physicists. These distinctions become blurred in the sense that all divisions and fora are responsible to the Council if the actions of the APS units run counter to the goals of the APS. POPA has sponsored studies of certain issues, after receiving outside grants to pay the expenses of experts. POPA also prepares reports by POPA members, and gives advice to the Council on a wide variety of issues. The advice from POPA generates about 3 APS resolutions and 5-10 letters per year for use by the APS leadership per year. On the other hand, the Forum organizes sessions to raise technical issues in a public arena, publishes a quasi-journal *Physics and Society*, carries out Forum studies, offers short courses, and organizes the presentation of two APS Awards each year.

POPA submits proposals for APS studies to the Council for its consideration. If the Council supports the proposal, POPA assists the APS Executive Director and the Council in selecting the study participants and obtaining funds. Arguably, the most famous APS study was the 1987 Directed Energy Weapons Study. The Forum also carries out studies, with modest budgets of about \$5,000, as compared to POPA studies with budgets of about \$600,000. POPA has helped organize about a dozen APS studies and the Forum has produced 3 studies. In recent years, POPA found it more difficult to obtain funding for the more lengthy studies, with the result that POPA has undertaken several POPA "reports" written by POPA members on possible health effects from the EM fields of powerlines, helium conservation, energy policy, Patriot defense performance, economic growth, the hydrogen initiative, Moon-Mars program, national missile defense, nuclear power and proliferation resistance, interim storage of nuclear spent fuel, electricity storage, nuclear forensics, readiness of U.S. nuclear weapons, nuclear weapons in the 21st century, technical steps to support nuclear weapons drawdown, integrating renewable electricity on the grid, and energy critical elements.

Forum Problems and Future

There has been an interesting trend in the make-up of the Forum leadership over the years. The early Forum leaders were essentially all from academia, but this is not true today. This year, the Past Chair, the Chair, the Chair-Elect, the Vice Chair, the Secretary-Treasurer and *Physics and Society* Editor hail from a variety of locations: 2 national laboratories, 2 universities, 1 federal agency, 1 non-governmental organization. This is a good overall mixture of Forum leadership since each one adds a different perspective. At any rate, it is very important for the Forum to continue to present the issues and show young PhD students that there are career paths other than the academic route. Our task has been complicated by the shift of the April APS meeting from Washington, DC to other cities around the country. It is far, far easier and cheaper to organize a critical physics and society session in Washington than it is in the cities beyond the beltway. It is amazing that the Forum sessions have continued to be so vibrant away from the city that affects physics and society the most—that is Washington, DC. It is imperative that the Forum keeps the candle of professional responsibility well lit. We cannot slip backwards to the old days when APS meetings had no sessions on physics and society issues. The FPS continues to be a way for physicists in all fields of endeavor to keep easily abreast of the technical aspects of problems facing society. At the personal level, the Forum's members have been a great source of friendship, knowledge and inspiration to me and the other members.

A number of our members have moved on from forum activities to larger roles. Examples include former Executive Board members Vern Ehlers, a former Physics Department Chair from Calvin College, who served as a Republican Congressman for nine terms from Michigan (1993-2011), and Rush Holt, former Assistant Director of the Princeton Plasma Physics Laboratory, who is serving in his 7th term as a Democratic Congressman from New Jersey. They were joined in 2008 by Bill Foster, particle physicist from the Fermi National Laboratory, who served from 2008-2011, giving the House 1% research physicists for its membership. I like to think that the Forum's examination of the critical aspects of science and society issues not only helped send them on their way, but also shaped their approach to some of the issues that they deal with today. Many other Forum members have had active roles in the public service.