

PHYSICS and SOCIETY

THE NEWSLETTER OF THE FORUM ON PHYSICS AND SOCIETY, PUBLISHED BY
THE AMERICAN PHYSICAL SOCIETY, 335 EAST 45th ST., NEW YORK, NY 10017
PRINTED BY THE PENNY-SAVER, MANSFIELD, PA 16933

Volume 11, Number 2

April 1982

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PHYSICS AND SOCIETY is a quarterly newsletter of the Forum on Physics and Society, a division of the American Physical Society. The newsletter is distributed free to members of the Forum and also to physics libraries upon request. It presents news of the Forum and of the American Physical Society and provides a medium for Forum members to exchange ideas. PHYSICS AND SOCIETY also presents articles and letters on the scientific and economic health of the physics community; on the relations of physics and the physics community to government and to society, and the social responsibilities of scientists. Contributions should be sent to the Editor: John Dowling, Physics Department, Mansfield State College, Mansfield, PA 16933, 717-662-4275.

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MINUTES of the EXECUTIVE COMMITTEE MEETING Forum on Physics and Society, January 25, 1982

The Executive Committee meeting was called to order by Chairman Kenneth W. Ford at 4:00 p.m. on January 25, 1982 in the Whitney Room of the San Francisco Hilton. Members of the Executive Committee in attendance were: Nina Byers, Barry (Mike) Casper, William Chinowsky, Bernard Cooper, John Dowling, Kenneth W. Ford, William J. Gallagher, Ernest C. Hammond, Jr., Albert Overhauser, Alvin M. Saperstein, Deitrich Schroeer, Brain Schwartz. Other persons present included: Robert Bauman, David Hafemeister, William Kelly, Lawrence Krauss, Leo Sartori, John W. Layman, Arnold A. Strassenburg, and Gerald Wheeler.

1. Report of the Secretary:

The MINUTES of the April 25, 1981 meeting of the Forum Executive Committee were approved.

2. Report of the Newsletter Editor:

John Dowling asked for advice on the usefulness of the Newsletter; is anyone reading it? Suggestions for content included: reports on POPA studies, minutes of relevant committees, chairman reports from Forum sessions.

Alvin Saperstein moved and Mike Casper seconded that:.

Motion No. 1: The Forum Chairman shall establish a three-member Editorial Committee to advise the Newsletter Editor. This motion passed. The Vice-Chairperson of the Forum is an ex-officio member of the editorial board.

David Hafemeister moved and Bernard Cooper seconded that:

Motion No. 2: Members of the Newsletter Editorial Committee shall have staggered 3-year terms, with the chairmanship going by seniority on the committee. This motion passed. Arnold Strassenburg reported that the AAPT mailing to its members of 9,000 copies of the January Forum newsletter is going forward. This obviously is a great step in future cooperation between the Forum and the AAPT.

3. Forum-Session Proceedings:

The AAPT Executive Committee has agreed to publish one or two proceedings of Forum sessions. The two sessions under consideration are the one on "Nuclear Proliferation" and the one on the "Solar Energy Research Institute". These trial proceedings will be edited by Al Rosenfeld and Robert Budnitz. The edited proceedings will be reviewed by the AAPT Publications Committee if received by June 1982, and could then be published by Labor Day.

There was some discussion of approaches by commercial taping outfits to record Forum sessions, the consensus seemed to be to try the AAPT route first.

4. Forum Committees:

John Dowling pointed out that the nominating committee did not complete its job on time last year. The nominations with all supporting material must be in his hands by August 15 at the very, very latest for mailing to members. The committee should be appointed by April to have some preliminary discussion at the Washington meeting.

5. Treasurer's Report:

To stay within its budget the Forum must again ask for a \$1500 subsidy from the APS Council. To keep up four editions of the newsletter, travel expenditures must be absolutely minimized.

6. Forum Sessions:

Besides the Short Course on the Arms Race, the San Francisco meeting has three Forum sessions on "Nuclear Energy" (Jack Hollander), "SERI Solar Study" (Robert Budnitz) and 'Disarmament' (William Chinowsky). The Washington meeting will have three sessions. The Forum Awards session will have Wolfgang Panofsky, Hans Bethe, and Philip Morrison speaking on nuclear war. Earl Callen with Bernard Silvernagel of the APS Education Committee is organizing a program on creationism.

Brian Schwartz moved and Alvin Saperstein seconded that:

Motion No. 3: There will be no Forum co-sponsorship unless a pro-creation speaker is on the program. The motion passed by a vote of 8 to 1 with some abstentions. Nina Byers will call Silvernagel, who will then communicate this decision to Callen. Bernard Feld is organizing a session on the problems that physicists have in communicating with the public. For the Dallas meeting in March two sessions are planned: Walter Massey is putting together a session on why so few members of minorities go into physics, and Nina Byers with Peter Zimmerman is preparing a discussion on Science, Technology and War: Issues for the 1980's. At the Philadelphia meeting in the fall Tony Nero is organizing a session on air quality, energy efficiency, etc.

Ideas and proposals for future Forum sessions are being solicited. Send these to the program chairman, William Chinowsky, who will then pursue them further.

7. Ground Zero:

The suggestion to the APS that it might want to associate itself with the Ground Zero movement did not get far. Ken Ford and Leo Sartori Judged that it would be best to drop this idea. However, the Ground Zero group is continuing, and has requested from the Forum a copy of its mailing labels.

Brian Schwartz moved and William Chinowsky seconded that:

Motion No. 4: The Forum declines the request for

mailing labels from Ground Zero. In the discussion Mike Casper pointed out that to be useful Ground Zero needed quick help for its mailings, i.e. that mailing labels would be one of the greatest immediate use. The objectors to the request pointed out that the refusal was partially for questions of legality, danger of precedence, and for reasons of inadequate discussion and knowledge. There was not objection to the use of an APS mailing list -- e.g. one obtained from the APS Bulletin. But there was fear that provision of mailing labels might be taken as constituting a "tacit" affiliation. The motion passed by vote of 8 to 1 with some abstentions.

8. Short Course on the Arms Race:

David Hafemeister and Dietrich Schroeer briefly reported on the Short Course on the Arms Race of January 24. It was successful with over 100 attendees. D.H. and D.S. volunteered to hold a similar short course at the April 1983 APS meeting.

9. POPA Studies:

Tony Nero's Subcommittee on POPA Studies asked what studies the APS might do on arms control issues.

How could interested people collaborate? Should the Forum be doing this coordination? Brian Schwartz suggested that POPA is (seen as) more "professional" with its studies being "products". Maybe a conference on arms control might be organized like the earlier education conference? Bernard Cooper asked that Nero might be invited to speak to the Forum Executive Committee on POPA's thoughts on arms control. Mike Casper proposed studies in the style of those done by Kosta Tsipis, maybe the organization of a Gordon Conference on the topic.

He moved, and David Hafemeister seconded that:

Motion No. 5: The Forum shall establish a committee to propose at the April meeting a list of concrete studies or activities on "physicists and nuclear arms issues" that the APS (POPA, Forum, etc.) might undertake. This committee will contact the Nero SOS group. The discussion focussed on the insertion or deletion of the word "nuclear". The motion passed by a vote of 8 to 2.

A Forum contributed session is being organized for the April 1982 meeting by Leo Sartori; members of the Forum Executive Committee will contribute papers to spark a discussion on appropriate study topics.

FORUM HIGHLIGHTS AT THE SAN FRANCISCO APS/AAPT JANUARY 1982 MEETING.

SHORT COURSE ON THE ARMS RACE Synopsis prepared by the two organizers: Dave Hafemeister, Physics Department, California Poly U., San Luis Obispo, CA 93407 and Dietrich Schroeer, Physics Dept., Univ. of NC, Chapel Hill, NC 27514.

On January 24, 1982 the APS Forum and the AAPT co-sponsored a short course on the arms race at the Joint Meeting in San Francisco. By at least two measures the short course was a success. Instead of a hoped-for 20 to 30 "students" there were 100 attendees as well as the "instructors." And all these arms-race devotees stayed through the Superbowl (guns-and-butter issues prevailed over football); fantastic! The content ranged from the hardest of hard calculations to the softest of teaching to the "great unwashed." Welcomes and summaries were provided by Nina Byers (UCLA) and Marvin Goldberger (Cal Tech). Henry Kelly (OTA) reminded us of the origins of strategic bombing as a concept of how to fight a war. Michael Callahan (Carnegie-Mellon) reported on laser ABM technologies, and convinced some of us that they may set real technical limitations on political alternatives. Robin Staffin (UC/LLL) reviewed the OTA MX studies which described a variety of ways of basing the MX missile. Gloria Duffy (Stanford Arms Control Program) gave a political-science overview of arms control measures that have had a "measure" of success. Then David Hafemeister (Cal Poly) showed that



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simple calculations of arms-race technologies are possible on such topics as EMP, the neutron bomb, and the credibility of a first strike. John Dowling (Mansfield State College) reviewed arms-race media resources; Mike Casper (Carleton College) showed some of his arms-race slides. Finally, Dietrich Schroerer (UNC/CH) outlined an arms race course for non-scientists, pretending to be a Soviet military planner and a test-ban-treaty violator.

Fun was had by all; though some questioned the suitability of San Francisco as a host town for such an affair. Not only is it too beautiful to contemplate as a target for military deterrence, but with its high population density it may be the second-best counter-value target in the U.S. after the Big Apple. This event may be repeated in the Spring of 1983 in Washington, which seems a more suitable location in this respect. The resource materials from the short course are available for \$6 (including postage) from David Hafemeister, Physics Dept., Cal Poly U, San Luis Obispo, CA 93407. This 180 page book should be useful for those who want to establish a course on the arms race at their institution.



FORUM SYMPOSIUM ON "NUCLEAR ENERGY, NUCLEAR WEAPONS PROLIFERATION, AND THE ARMS RACE." 26 January 1982 at the APS/AAPT San Francisco Meeting. Synopsis prepared by Jack M. Hollander, Univ. of California, Berkeley, CA 94720.

Presiding: The session was chaired by Jack M. Hollander, University of California. Participants were John P. Holdren, University of California, Berkeley; Bernard I. Spinard, Oregon State University; Gene I. Rochlin, University of California, Berkeley; and Herb York, University of California, San Diego.

The most crucial challenge of our time is to avoid a global nuclear war, which would probably destroy the entire industrialized world within 24 hours. Yet ever since World War II a nuclear arms race has been waged between the United States and the Soviet Union that could end in such a nuclear catastrophe. This "vertical" proliferation of nuclear weapons between the two super-powers was generated in the theory that mutual deterrence would increase mutual security, but it has now escalated to the point where both are in a position of permanent insecurity, in the almost certain knowledge that neither could launch a preemptive strike that would disarm the other, and that both would be completely destroyed in a massive nuclear exchange. A general nuclear war is more likely to come about through escalation from lower-level violence, such as a war in Europe or a war over oil supplies, than from a deliberate surprise attack.

People in their fifties or older saw this grim situation of opposing deterrents emerge during their adult lives. Those in their forties or older remember real-life nuclear war scenarios: the Berlin crisis and the open threats of nuclear use in the Cuban missile crisis. But those in their twenties and thirties have largely escaped confrontation with this reality. And some of their elders may have forgotten it. These memories are being reawakened by the increased bellicosity of current international relations.

The purpose of this Symposium was to re-examine the realities of the "vertical" nuclear arms race between the superpowers, and also to place into perspective the "horizontal" proliferation of nuclear weapons throughout the world, with more and more nations either already possessing nuclear weapons, or acquiring the capability to produce them. If present trends continue, the technical and institutional barriers to the further spread of nuclear weapons will diminish in size and significance over the next decade. The remaining political barrier has two components: self interest and international behavioral norms. The nuclear weapons states continue to pay attention almost exclusively to the former, attempting to intervene on a state-by-state basis when proliferation is threatened. Yet a world with many countries capable of building nuclear weapons who are restrained exclusively by narrowly defined security and self-interest considerations is a highly unstable world, and a single case (e.g. Pakistan) could lead to a chain reaction of proliferation unless there is some other, more general, restraining influence.

The nuclear weapons states have, however, done little or nothing to strengthen international norms against nuclear weapons development. So long as they continue to base their own security primarily on nuclear weapons and theories of stable deterrence, to modernize and increase their own nuclear arsenals, and to resist a Comprehensive Test Ban treaty, their credibility in arguing to other countries that nuclear weapons are dangerous to world peace and security will remain minimal. Thus, even if specific cases of proliferation do not occur in the near future, we are increasingly moving to a world of proliferative "instability", where the overall consequences of testing even a single nuclear device are likely to be impossible to contain.

The problem of horizontal nuclear weapons proliferation is often linked to the worldwide development of commercial nuclear energy. The important question here is: how close is the connection? Two opposing points of view were explored in the Symposium. According to the first, the connection is tenuous. In this view, the only important factor is political. Almost any country that wants nuclear weapons can make them, and in much the same way that they were made during and after World War II,

i.e., by designing and building dedicated weapons facilities. No country has ever spun off a nuclear weapons program from a nuclear energy program. France and China became weapons states without resorting to diversion from commercial nuclear energy installations, and countries such as India and Israel appear to have indigenous weapons programs based on the use of research reactors as production reactors. Uranium requirements for a weapons-production capability are modest and within the indigenous resources of most countries, whereas requirements for a commercial nuclear energy program are considerably larger. Special production facilities are cheaper than power facilities; they require less technical sophistication; and they are easier to hide. This viewpoint concludes that no significant technical barriers exist to prevent countries from making nuclear weapons, and therefore, the best policy to minimize proliferation is active diplomacy, supplemented by reliable provision of services assisting nuclear energy development (e.g., fuel enrichment and reprocessing) by supplier countries that are seriously concerned.

The opposing viewpoint argues that the economic and technical barriers to proliferation must be considered in relation to the political motivations. This viewpoint concedes that with sufficient political motivation, almost any country can succeed in acquiring nuclear weapons, with or without help from nuclear energy. However, in the presence of nuclear energy, **smaller** motivations may justify the decision to obtain nuclear weapons, because several important barriers are lowered by having nuclear energy. The technical barrier is lower because of the availability of both trained nuclear-technology personnel and facilities that produce large quantities of bomb-usable fissile materials. The economic barrier is lower because the marginal cost of adapting a nuclear energy program to produce bombs as well as electricity is much less than the cost of building a dedicated weapons facility. The political barrier is lower because a legitimate cover is provided for activities that otherwise would be unambiguously weapons oriented and thus subject both to internal dissent and to external sanctions and countermeasures. According to this viewpoint, the lowering of these barriers by nuclear energy, in a world of some 150 nations with varying degrees of motivation to acquire nuclear bombs, can hardly fail to boost some countries over the threshold. Some of these countries might otherwise never acquire nuclear weapons, while others might acquire them at a later time than they would if they had nuclear energy. Even the latter case is unsettling if one accepts that the world is in a race between, on the one hand, the growth of the probability of nuclear war as some function of the number of countries possessing the means for it, and, on the other hand, the reduction of the probability of nuclear war through increased rationality in world politics,

the development of which needs as much time as possible.



FORUM SYMPOSIUM ON "THE POTENTIAL FOR AN ENERGY-EFFICIENT FUTURE - THE SERI SOLAR CONSERVATION STUDY," 27 January 1982 at the APS/AAPT San Francisco Meeting. Synopsis prepared by Robert J. Budnitz, Future Research Association, Inc., Alameda, CA 94707.

The session was chaired by Robert J. Budnitz, Future Research Association, Inc. Participants were Henry Kelly, OTA; Arthur H. Rosenfeld, LBL; Marc Ross, Univ. of Michigan; and Charles Gray, EPA.

Scientists who participated in a major recent study of solar energy and energy conservation have found that very extensive investments in energy conservation and solar energy throughout the U.S. economy will not only save large amounts of energy, but will be the least expensive way to close the gap between energy needs and diminishing supplies over the next two decades.

The study's conclusions were presented at a special evening session of the American Physical Society's Annual Meeting in San Francisco on Wednesday, January 27, 1982. The study was funded by the U.S. Department of Energy and carried out through the Solar Energy Research Institute in Colorado.

The study looked at energy consumption in all of the major sectors of the U.S. economy: industrial, residential, commercial, and transportation. The principle goal of the study was to determine what the actual potential for energy conservation and solar energy might be, if the investments in energy facilities were made strictly on a least-cost basis. According to the study's conclusions, a least-cost strategy would result in major residential investments in conservation and solar energy, roughly \$3000 for each new and existing dwelling unit. The savings from these investments and similar investments in commercial buildings would be about half of all energy used in buildings, at a cost that is equivalent to about \$10/barrel of petroleum, less than one-third of the present world price. If these investments were made nationwide, the total savings by the year 2000 would be the equivalent of about 8 million barrels of oil per day, which is more than present imports of about 6 million/day. Savings in electricity consumption in buildings would allow deferral of over 200,000 megawatts of new generating capacity (200 large standard plants) that would otherwise be required by the year 2000.

Investment in energy conservation in industry, according to the study, could also produce major savings over present practices. The study assumed that industrial expansion would continue as otherwise projected, with an increase in industrial value added of 48% by the year 2000. The study found that cost-effective improvements in energy efficiency could keep total industrial energy consumption at today's level (zero growth) while this industrial expansion occurred.

The study had similar findings for the transportation sector, where energy use has already started to decline. The trend to more efficient automobiles, trucks, and airplanes is projected to continue, and the study predicts major economic savings from this trend. Some of the savings for automobiles will occur because of presently mandated Federal standards for auto mileage performance, but increasing pressure from technological improvements abroad is also a factor in increased auto efficiency.

The study's major finding was that the energy saved in all of these sectors would be very much cheaper than the cost of producing new energy from any of today's main producing sectors (hydroelectric, coal, nuclear power, petroleum, or natural gas). The overall savings would boost economic activity, help the U.S. balance of payments, provide more comfort, improve industrial productivity, and enhance environmental quality.

FORUM SYMPOSIUM ON "DISARMAMENT, COLD WAR, OR NUCLEAR WAR" 28 January 1982 at the APS/AAPT San Francisco meeting. Synopsis prepared by William Chinowsky, Univ. of California, Berkeley, CA 94720.

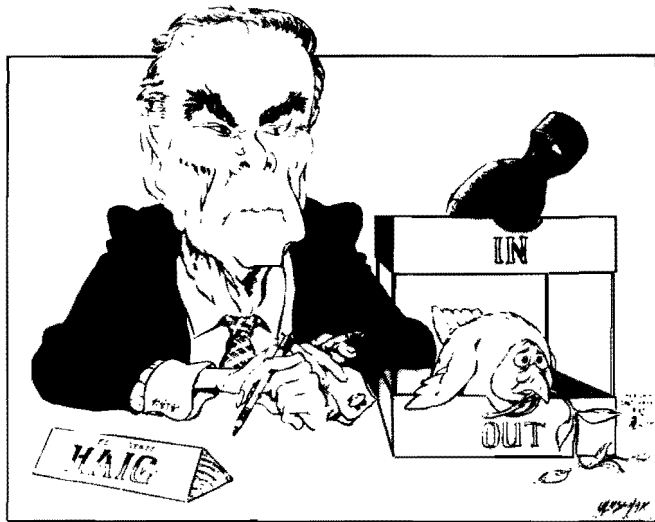
The session was chaired by William Chinowsky. Participants were Herb York, Univ. of California, Berkeley; Sidney Drell, SLAC; C. Breslauer, Univ. of California, Berkeley; and Clifford Schwartz, Univ. of California, Berkeley.

Those who have been giving attention to problems of weapons proliferation and arms control will be familiar with the first two names, but perhaps not know of the others. Drell and York are long-term members of the arms control establishment who have made many contributions to negotiations; Breslauer is a political scientist who specializes in Soviet Union foreign policy; Schwartz is a long-established critic and conscience on societal issues.

York's talk, "Negotiating with the Soviets: Personal Experiences", was rich in anecdotes of the wearying and tiresome negotiating process. In it he reminded us that people bring with them their biases, prejudices, and fears as well as prepared bargaining positions. A main message was that the Soviets do genuinely want to negotiate arms control and reduction agreements, but not to their perceived disadvantage. They wish to be dealt with seriously as great power equals.

In Drell's talk, "Arms Control and Weapons Decisions for the Eighties", the positions taken departed somewhat, but not greatly, from official posture. He promoted his latest proposal for yet another numerical measure of weapons strength as a basis for discussion of limits. He pointed out that agreements and policies are not static and attention must be given to changes. The ABM treaty will be reviewed soon and the decision must be made whether to renew or modify its provisions or scrap it altogether. An important domestic issue that will be raised again is civil defense policy. That also is under review and will raise the possibility of drastic revisions.

Breslauer, in his talk, "The Soviet Approach to Arms Control", introduced a political context to the session. His analysis of Soviet policy has produced conclusions at variance with official and popular "myths" about Soviet motives, behavior and intentions. He argued that Soviet policy has been consistent, not shifting in unreasonable and confusing ways. Its development is subject to conflicts among various civilian and military power groups whose views diverge in a way not unfamiliar to us in this country. It was strongly stated that the Soviets do not have a policy based on the notion that a nuclear war can be won by themselves or anyone.



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In his presentation, "Physicists, Politics and Nuclear War", Schwartz emphasized that all previous policy has failed to reduce the level of nuclear arms and strongly criticized the role of physicists in making or promoting it. He saw little hope for future success with what are essentially unchanged official views. He finds no real commitment to, or movement toward, disarmament anywhere and sees the problem as a political one, not a technical one. He showed little patience with apolitical "experts" who profess to be aware of failure and also despair for the future, but nevertheless continue their involvement with the standard processes. He argues that it is not possible to separate technical considerations from the political context. His proposed solution is massive, popular political pressure for changes in direction. An example cited was the current campaign, initiated and promoted by "outsiders", for a freeze on further nuclear weaponry advances.

A personal comment - No other issue facing society approaches the importance of these central problems of survival. The Forum has a responsibility to continue such sessions to educate, stimulate discussion and take a lead in the search for successful solutions.

FORUM SESSIONS AT WASHINGTON

- 26 April, Monday 9 am - Executive Room. Forum contributed paper session AH. A. Nero is chairperson, Leo Sartori is an invited speaker.
- 27 April, Tuesday 9 am - Diplomat Room. "Scientific Freedom and Communications" - a joint symposium of the Forum and the Committee on the International Freedom of Scientists. R. Spencer Oliver of the Helsinki Commission will speak on "The U.S. and the Helsinki Accords," Mark Azbel on "Scientific Freedom and the Freedom of Scientists in the USSR," J. F. Westerkamp of Buenos Aires on "Scientific Freedom in Latin America: The Role of Governments," W. W. Havens, Jr. of APS and Ed Gerjouy of University of Pittsburgh will speak on "U.S. Controls on Release of Scientific Information of Foreign Nationals." Kurt Gottfried chairs the session.
- 27 April, Tuesday 7:30 pm - Forum Room. Forum Prize Session. Philip Morrison's talk is "Caught Between Asymptotes," Hans Bethe speaks on "We Are Not Inferior to the Soviets in Nuclear Weapons" and W.K.H. Panofsky will speak on "MAD Versus NUTS." Ken Ford chairs the session.
- 28 April, Wednesday 7:30 pm - Blue Room. "Scientists and Public Opinion - How to Influence Decision Makers on Nuclear War Issues." Speakers are Matthew Meselson, William A. Higinbotham,

and Noam Chomsky. Bernard Feld chairs the session.

AGENDA FOR EXECUTIVE COMMITTEE MEETING OF THE FORUM

The meeting will be on Monday evening, 7:30 P.M., on 26 April 1982. The room will be announced at Session AH. The agenda is as follows:

- 1. Minutes of previous meeting, D. Schroeer
- 2. Chairperson's report
 - a. Forum - POPA link
 - b. Forum - CIFS actions to support Polish colleagues
- 3. Progress report on Forum-AAPT publication of Forum symposium proceedings, Ken Ford
- 4. Wrap-ups on San Francisco Arms Race Short Course, D. Schroeer
- 5. Progress report on organization of working groups on the arms race, Leo Sartori
- 6. Forum activities, W. Chinowsky
 - a. Forum Symposia
 - b. Membership Drive
- 7. Editor's report, John Dowling
 - a. Newsletter report
 - b. Journal on Physics and Society
- 8. New activities
 - a. Topical conference on the arms race
- 9. Report on Ground Zero, Leo Sartori
- 10. New Business

LETTERS TO THE EDITOR

ON RETIRED PHYSICISTS:

Retired physicists may be a partial answer to the national problem of upgrading the quality of pre-college instruction in science and mathematics. As you know, the shortage of qualified high school teachers of physical science and mathematics in this country is serious and projected to get worse. In addition, very few school districts can afford the sort of district-wide science and mathematics supervisory support that formerly provided teachers in individual schools with a measure of quality control, as well as an important resource for answering difficult questions, planning special programs and the like.

Could retired physicists help fill the needs for trained teachers and special resource personnel? Given the fact that there are retired physicists throughout the nation and that the teacher shortage is also a nationwide phenomenon, it seems to me that this idea, if implemented, could provide satisfying second careers to a reasonably large number of people. I propose substantial, part time employment that both the

school districts and physicists could count on rather than arrangements where a physicist would make an occasional guest appearance in a classroom. I'm sure that certification problems and labor union requirements would pose implementation barriers, but those issues could be resolved at least in some states and school districts. Since there simply are not enough teachers who are certified to teach physics and mathematics, retired physicists would not be taking jobs away from other qualified people.

Could APS in cooperation with AAPT explore the possibility of assuming a broker role by putting interested retired physicists in contact with school districts that would genuinely like to use their services?

William A. Blanpied, Head
Office of Special Projects
National Science Foundation
Washington, DC 20550
9 February 1982

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One place retired physicists -- particularly those with teaching experience -- could make themselves very useful is in explaining and popularizing physics to nonspecialists. The new science and technology magazines are having a hard time finding people who can both understand science and write about it. Many other publications ranging from children's magazines to local newspapers, are looking for articles about science. Most of these publications are looking for free-lance writers who could write occasional articles -- an ideal arrangement for retired scientists. You could look in the annual **Writer's Market** series published by **Writer's Digest** for specific details.

I can verify that there's a hungry market out there -- I'm making a reasonable living as a free-lance science and technology writer. And while some of the magazines don't pay very well, that might not bother retirees seeking only a modest income. People who feel uncertain about writing for general audiences might be able to team up with a technically untrained free-lance writer who could polish the prose.

There are also other opportunities in writing and popularizing, ranging from preparing technical manuals to giving volunteer demonstrations at local schools or museums. And people looking for full-time "second careers" might consider trade publications; I know of one retired government worker on the editorial staff of a technical trade magazine.

P.S. I'm not retired.

**Jeff Hecht**  
59 Newell Road  
Auburndale, MA 02166  
18 January 1982

"Elderhostel" is an educational program for retired people who are still interested in improving their minds. They live on a college campus for one week (usually in the summer when the regular college population is down somewhat). The tuition, room and board are held down to \$150.00, no exams, no grades, no credits. Usually 3 courses are offered. The address of Elderhostel is 100 Boylston St., Suite 200, Boston, MA 02116.

My point is that I see no courses in their large catalog that have anything to do with physics. And "in my book", far too few people have any appreciation whatsoever of the beautiful science called physics. Here's an opportunity for a personable physicist who is retired (or even not retired) to spread the word. I don't see why a number of courses couldn't be made up to fit this situation.

Another activity for a retired physicist is to join an outfit like **Recording for the Blind** located in 28 cities in the U.S. They record textbooks for blind and visually handicapped people. You would be surprised at the number of technical books requested (particularly math). So physicists who can read aloud are in demand. All volunteers usually donate only 1½ hours per week. The cassettes are free to the blind.

**Bob Kernohan**  
105 Euclid Place  
Oak Ridge, TN 37830  
23 January 1982

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ON THE FAS PETITION

Page 8 of the January, 1982, number of **Physics and Society** is devoted to a petition sponsored by the Federation of American Scientists titled "Nuclear War is Suicide".

I am writing to protest this petition.... To proclaim that "Nuclear War is National Suicide", while failing to discuss the source of the principal threat of nuclear war, and making it seem to be the fault of American policy, is a shameful disgrace to everyone involved, and at present that includes **Physics and Society**. As long as you serve as a propaganda medium rather than a medium of thoughtful exchange, you aggravate the risks of nuclear war.

Lawrence Cranberg
1205 Constant Springs Drive
Austin, TX 78746
27 February 1982

QUOTE WITHOUT COMMENT

Editor's Note: the following communication was sent to various DOE facilities in the U.S. We reprinted it here for informational purposes for Forum members.

"Listed below are directives from the DOE Acting Secretary and the Assistant Secretary for International Affairs. They are forwarded for your information and implementation. Please be sure that these new guidelines are distributed to all appropriate program elements under your jurisdiction and assure compliance with them.

"From the Acting Secretary to DOE Assistant Secretaries: To ensure consistency with the President's evolving policy on Poland, please obtain the concurrence of the Office of International Affairs on activities regarding Eastern Bloc countries. This includes foreign travel, anticipated visits and all issues relating to technology transfer.

"From the Assistant Secretary for International Affairs to DOE Assistant Secretaries: Acting Secretary Fiske, in moving to implement the President's economic sanctions against the USSR, has asked me to coordinate the department's program. To accomplish this, I am requesting that each of you take the following steps:

1. Notify, in writing, your headquarters, field and laboratory components that all interaction (including informal contacts, such as correspondence and meetings) with the USSR is frozen until further notice. Provide copies of these notifications to me.
2. Ensure that any requests for exception be forwarded to you for review.
3. Refer any request for exception to me for review.

"Please note that Acting Secretary Fiske requests that activities with all Eastern Bloc nations, not just the USSR, also be coordinated with this office and I suggest that you notify your headquarters, field and laboratory components of this requirement as well.

"So that the impact and effectiveness of these steps to implement the President's program can be fully assessed, it is necessary that we receive, by noon Thursday, December 31, very brief statements of all current activities (as set forth in the Acting Secretary's December 30 memorandum) with the USSR and Eastern Bloc countries."



EDITOR'S NOTE: Following is the text of the congressional resolution calling for a freeze in nuclear weapons. Interested readers are urged to express their opinions on this resolution to their congresspersons.

CONTE-MARKEY JOINT RESOLUTION FOR A FREEZE AND REDUCTION IN NUCLEAR WEAPONS

Whereas, the greatest challenge facing the earth is to prevent the occurrence of nuclear war by accident or design;

Whereas, the nuclear arms race is dangerously increasing the risk of a holocaust that would be humanity's final war; and

Whereas, a freeze followed by reductions in nuclear warheads, missiles, and other delivery systems is needed to halt the nuclear arms race and to reduce the risk of nuclear war;

Resolved by the House of Representatives and the Senate of the United States of America and Congress assembled,

(1) As an immediate strategic arms control objective, the United States and the Soviet Union should:

- (a) pursue a complete halt to the nuclear arms race;
- (b) decide when and how to achieve a mutual and verifiable freeze on the testing, production, and further deployment of nuclear warheads, missiles, and other delivery systems; and
- (c) give special attention to destabilizing weapons whose deployment would make such a freeze more difficult to achieve.

(2) Proceeding from this freeze, the United States and the Soviet Union should pursue major, mutual, and verifiable reductions in nuclear warheads, missiles, and other delivery systems, through annual percentages or equally effective means, in a manner that enhances stability.



PROPOSED CHANGES IN EXECUTIVE ORDER ON NATIONAL SECURITY INFORMATION.

Editor's Note: The following letter was sent to Mr. Douglas Walgren, Chairperson; House Subcommittee on Science, Research and Technology; House Office Building; Washington, DC 20515, by the undersigned people from Argonne National Laboratory to protest the revised scheme for classifying material. Interested readers should see Science, 215, 636 (1982) for more details on this important issue.

Dear Mr. Walgren:

Judging from proposed changes regarding classification of national-security information, we are apprehensive about the functioning of the revised executive order. The changes extend secrecy over public-funded federal information and move our government towards becoming a closed institution. The implementation process leaves room for considerable arbitrary and self-serving enforcement. Waste, inefficiency, ineptitude, and corruption in government would be further shielded from public and congressional scrutiny. Important policy decisions could have a larger ideological or partisan political content than acknowledged. We suggest that Congress legislate more durable regulations for the pro-

tection of national-defense information and establish a standing commission to ensure even-handed implementation of classification and declassification standards.

Our analysis of the proposed order indicates significant differences and trends compared to previous executive-branch directives on government information. Where the Carter order "tightened" standards for classification, the new directive would invert classification standards from "may not be considered" to "shall be considered," and new categories for classification are added: national-security vulnerabilities, special activities (presumably clandestine foreign intervention), public cryptology, and confidential sources. The "identifiable" criterion for damage to national security would be eliminated as a condition for classification. Because declassification would not automatically take place, dissemination of information already published is in jeopardy. The former prohibition against restoration of classification on published documents is revoked, and reclassification is authorized. Also, arbitrary procedures for prolonging classification could be implemented. Prohibitions against the classification of basic scientific data and other information not related to national security are being removed. Even the existence of certain documents could be denied.

The scope of the order has been extended from officers and employees of the U.S. government to its contractors, licensees and grantees. The overall emphasis in the proposed changes is to broaden the scope, duration, and ease of classification. The burden is shifted from having to justify a classification action to having to justify an exemption to classification.

The implementation process proposed in the executive order does not set up checks and balances on reclassification. Although in some situations restoration of classification may be advisable and practicable, such judgment should not be left only in the hands of the classification agencies. A better alternative would be to set up an independent or statutory government-wide classification-review commission. Anything less controlled may invited challenges on constitutional grounds.

In short, important national-security information can be safeguarded in a practical and durable way, but the lessons of the **Progressive** case must be taken into account; otherwise, meaningful nondeducible information may be compromised by the system set up to protect it, or information concerning improper government activities may be kept from the public. In order to minimize unnecessary incursions on the public right-to-know, and in order to avoid periodic quadrennial revisions of classification practices, we encourage congressional action to set statutory standards and to establish an impartial commission for knowledgeable review and adjudication.

Sincerely yours,

| | | |
|---------------|----------------|-------------------|
| A. De Volpi | D. Rote | Building 208 |
| C. Herzenberg | G. S. Stanford | Argonne National |
| J. Lee | E. Waldridge | Argonne, IL 60439 |
| G. E. Marsh | | 15 February 1982 |

TEACH-INS ON AMERICAN CAMPUSES by Paul F. Walker, 68 Holworthy St., Cambridge, MA 02138.

EDITOR'S NOTE: What follows is a slightly edited version of Walker's report on the Union of Concerned Scientists convocations on 11 Nov. 1981. The original report was in the **BULLETIN OF THE ATOMIC SCIENTISTS** 38, No. 2, 10-11 (1982).

As marches and rallies against nuclear weapons build in Western and Eastern Europe, speculation mounts concerning the likelihood of the United States following activist, European footsteps. This is exactly what occurred some 20 years ago in the nuclear test ban movement, culminating in the 1963 Limited Test Ban Treaty. Whether an American movement can be repeated is open to question, but telling signs are beginning to appear across the country.

On November 11, 1981—Veterans' or Armistice Day—over 150 campuses in 41 states held teach-ins, reminiscent of college forums during the Vietnam era, concerning the threat of nuclear war. The purpose of the sessions, according to the Union of Concerned Scientists' organizing memorandum, was "...to bring together the faculty and students of a campus and its community for an educational exposition concerning the threat of nuclear weapons, the growing possibility of nuclear war, and the urgent need to reduce the risks."

The demise of the SALT II Treaty in 1980 and the arrival of the Reagan Administration, including some 32 members of the hawkish Committee on the Present Danger in high-level foreign and economic policy positions, led most arms control groups to plan for a prolonged period of retrenchment. However, many public interest and other groups, including the eight November 11 co-sponsors—the Arms Control Association, Coalition for a New Foreign and Military Policy, Council for a Livable World, Council on Economic Priorities, Federation of American Scientists, International Physicians for the Prevention of Nuclear War, National Council of Churches and Physicians for Social Responsibility—have found that grassroots interest in nuclear weapons and war is finally on the rise because of

- The demise of SALT II;
- The heady, often belligerent talk of war—nuclear war-fighting, "demonstration" nuclear bursts in Europe, the need for nuclear superiority, arms control through arms build-up;
- The burgeoning European awareness and activism;
- American economic woes—a deepening recession.

sion, large federal deficits, rising unemployment and sluggish interest rates.

Believing the nuclear war issue to be a cogent one, the Union of Concerned Scientists decided to test interest in the issue on campuses last fall. November 11 was chosen for two reasons, one practical and one symbolic: it was a mid-week holiday at many universities, providing more freedom for campus organizers to plan day-long activities for an available audience without disrupting class schedules; and it was a day commemorating the end of World War I and its veterans. Union Chairman and MIT physicist Henry W. Kendall emphasized the importance of the date "both to veterans and to the victims of war; World War III would leave no veterans."

The November 11 teach-ins or "convocations," included many of the campuses that had been active in anti-Vietnam activities 10 to 15 years ago: Harvard, MIT, Boston University, Chicago, Cornell, Princeton, Yale, Berkeley, Michigan, Wisconsin, Notre Dame, Stanford, UCLA, Columbia and others. It also included smaller, less well-known, or less predictable colleges and universities: Framingham State, Holy Cross, Lesley, Clark, Haverford, Lehman, Merrimack, Rensselaer, Swarthmore, Smith and others in the East; Cleveland State, Kansas, and Wayne State in the Midwest; Arizona, San Diego, Santa Cruz, Montana, Nevada, New Mexico, Oregon and Washington in the West; and Agnes Scott, Guilford, Chapel Hill, Southwestern, Texas, Vanderbilt and Virginia Commonwealth in the South.

Events varied from campus to campus: seminars, featured speakers, film festivals, candlelight vigils, marches, citywide bell-tolling, a "die-in," folk concerts and many other activities which local organizers believed helpful in raising awareness of nuclear weapons issues. Most campuses reported turnouts of 500 to 2,000 students and concerned individuals. The overall turnout for 150 campuses was estimated at 100,000, probably the largest simultaneous gathering to discuss a deadly serious issue since Vietnam days. Union staff provided central coordination and support materials from Cambridge, Massachusetts: a weekly newsletter—"Network News"; a slide show—"The Threat of Nuclear War"; a 100-page briefing book; occasional memos; an annotated book list for campus bookstores; a list of available films, professionally designed posters and leaflets; and national press releases. Local campuses were free to organize their sessions as they saw fit but were also responsible for local financing.

Over 500 faculty, professionals, government representatives, students, activists and others spoke at campus sessions. Speakers included those long involved in arms control debate and policy; for example, Paul Warnke, former chief SALT II negotiator and director of the U.S. Arms Control and Disarmament Agency; George Kistiakowsky, Professor Emeritus at Harvard and former science advisor to President

Eisenhower; Herbert Scoville, Jr., former CIA deputy director; Philip Morrison, Institute Professor at MIT and physicist on the Manhattan Project; and Jerome Wiesner, former MIT president and science advisor to President Kennedy. Present and former national and local politicians also spoke: for example, John Culver, former Senator from Iowa; Congressman Morris Udall of Arizona; Senator Gary Hart of Colorado; Governor Jerry Brown of California; former Congressman Robert Drinan of Massachusetts; and Cambridge, Massachusetts city councillor David Wylie. Among physicians who took part were Howard Hiatt, dean of the Harvard School of Public Health; Bernard Lown, cardiologist and head of the International Physicians; and Helen Caldicott, pediatrician and head of Physicians for Social Responsibility. University presidents included Theodore Hesburgh of Notre Dame and Marvin Goldberger of California Institute of Technology. Nobel Laureates were represented by Hans Bethe of Cornell and Owen Chamberlain of Berkeley. And there were media personalities: Carl Sagan, Robert Blake and more.

The teach-ins may very well be the first tolling bell of an anti-nuclear arms movement of the 1980's. As Carl Sagan stated before 1,500 people in the Cornell audience: "If you refuse to think about these issues because they are too difficult and too agonizing, then you are making a contribution toward future holocaust." The Reverend Theodore Hesburgh echoed these sentiments at Notre Dame: "The world's other problems become meaningless if we don't solve this one — and do it quickly."

A "Scientists' Declaration" issued by the Union of Concerned Scientists and signed by Robert F. Bacher, Hans A. Bethe, Paul J. Flory, Richard L. Garwin, Henry W. Kendall, George B. Kistiakowsky, Lewis Thomas, Victor F. Weisskopf and Jerome B. Wiesner, called for "America's technical community" to "bring our recommendations to every campus, every community, every newspaper, every political leader in the country." Their recommendations included a comprehensive test ban, a missile flight-test ban, substantial and verifiable reductions in nuclear arsenals, and a coordinated and intensive program to encourage non-proliferation.

Forthcoming events this year—including the April "Ground Zero" educational forums, the June United Nations Special Session on Disarmament and the fall congressional elections—will tell if the concern and momentum of the November 11 educational forums will escalate and if the organizing groups are able to provide strong, long-term and effective leadership of a movement. What is clear is that: both the United States and the Soviet Union are at a turning point in nuclear weapons and strategy; and thousands of Americans, perhaps reflecting the concerns of their neighbors across the Atlantic, are deeply troubled over the nuclear dilemma and are willing and anxious to devote money and energy to resolve the urgent problem.

FAS NUCLEAR WAR EDUCATION PROJECT NEWSLETTER

The newsletter will be published on a monthly basis by the staff of the Nuclear War Education Project. The first issue was scheduled to appear in February, 1982. The newsletter is planned as an indispensable guide for anyone involved in, or wishing to become involved in, nuclear war education and related activities.

The newsletter will contain a calendar of events, information on how and where to obtain resources, how to organize study groups, courses, seminars, workshops, etc., how to implement ideas, reviews of books, films, events, and much more.

THEY WELCOME INPUT

If you have an event to add to the calendar, information about resources, an article or an idea about nuclear war education, please send your information to the following address:

FAS NUCLEAR WAR EDUCATION PROJECT
Quigley Center for International Studies
1246 Social Sciences Building
University of Minnesota
Minneapolis, MN 55455
Attn: John Harris/Eric Markusen

To receive a free subscription to the newsletter, send your name and address to:

FAS NUCLEAR WAR EDUCATION PROJECT
307 Massachusetts Avenue, N.E.
Washington, D.C. 20002

FILM REVIEW:

EIGHT MINUTES TO MIDNIGHT: A Portrait of Dr. Helen Caldicott.

Produced by Mary Benjamin. 16 mm, color, 60 min., 1981. \$800 purchase from Direct Cinema Ltd., P.O. Box 69589, Los Angeles, CA 90069. \$150 (general), \$100 (college), \$75 (high school) rental from Caldicott Project, Direct Cinema Ltd. Library, P.O. Box 315, Franklin Lakes, NJ 07417. Reviewed by John Dowling, Physics Dept., Mansfield State College, Mansfield, PA 16933.

Eight Minutes to Midnight documents Helen Caldicott's struggle to arouse and inform the public about nuclear power and the arms race. The film opens with Caldicott speaking to a group of Boston-area doctors on the nuclear issues. It accompanies her on speaking engagements to Australia, Harrisburg, Colorado, New Mexico and the Washington Rally of May, 1979. The film also intermixes sketches of her hectic, frustrating and demanding life as pediatrician,

author, spokesperson, etc. But what comes across strongly in the film is Caldicott's articulation, drive, intelligence, and her sense of values. Occasionally, she still makes a too broad or a too sweeping or a wrong statement, but she is improving. Caldicott's performance is impressive - impressive from the standpoint of her grasp of the problems, her charisma, and her dedication.

Helen Caldicott has always spoken from her heart, and hopefully always will. But she now sees nuclear power as "... the pimple on the pumpkin...", with the pumpkin being the nuclear arms race. In this film she is speaking effectively and directly to the real heart of the matter, as the following quotes attest: "I view nuclear weapons and nuclear power as the greatest health hazard the world has ever known.", "We're killing ourselves to make the bombs to kill ourselves better.", and "This is the most important issue ever, ever to face the human race...you must take the world on your shoulders like Atlas and make a total commitment. You inherited the earth - it is your birthright..."

This film conveys some hope in today's otherwise bleak atmosphere. A hope based not on any breakthrough in arms control, rather on the fact that a dedicated person can make a difference in slowing the arms race. **The Eight Minutes to Midnight** refers to the time left to the human race. If we are to live beyond the eight minutes it will be because people like Helen Caldicott have made "a total commitment" to reach out and move people to act.



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REPORT OF THE FORUM COUNCILOR by Barry M. Casper, Carleton College, Northfield, MN 55057

Some items from the last two meetings of the APS Council, on November 22, 1981 in New Orleans and on January 24, 1982 in San Francisco:

1. APS Studies: The Breeder Reactor Safety Study is dead for now. Both the Nuclear Regulatory Commission and the Electric Power Research Institute were willing to provide support, but only if the Department of Energy was also a sponsor. When DOE declined, the study died. One council member suggested DOE support might be revived if we call the breeder a weapon.

What had previously been known as the Alternative Energy Study was given specificity and a new name, Emerging Energy Technologies, by POPA members Charles Hebel, Robert Budnitz, and Tony Nero. In the revised proposal, special emphasis was given to the study of new technologies for energy storage and backup and for energy transport, conversion, and distribution. At the November meeting, optimism was expressed that this would give the study new life, but by January, prospects for funding seemed dim.

2. APS Council as a "Rubber Stamp": I regret to report that, so far at least, being your representative on the Council has been a frustrating experience. To my surprise, I found at the last two meetings that many others on the Council share my frustration. A topic of discussion at both meetings was whether it was really worth the considerable expense to the APS membership to bring the Council together three times a year to perform what has become essentially a *pro forma* function. The term that kept recurring in the remarks of Council members in describing our role was "rubber stamp." As in most large organizations, direction and control has gravitated over time to the managers, in this case to the office of the Executive Secretary. Before each of our meetings, a smaller group, known as the Executive Committee and appointed by the APS President, has already met with the recommendations. The Council spends the better part of a day discussing a succession of mostly trivial matters and ratifying the Executive Committee recommendations, moving rapidly through an overcrowded agenda to adjournment. ^

Some Council members are comfortable with this "Board of Directors" role. Many others, including myself are profoundly dissatisfied. Right now, the Council meetings are basically a waste of time and money. I would like to see the Council reassert its role as the Society's main deliberative and decision-making body. In addition, as the representative of the **Forum on Physics and Society**, I would like to promote a close and constructive working relationship between the Forum and the Council's Panel on Public Affairs, which oversees many APS programs of par-

ticular interest to **Forum** members. To institutionalize such a relationship, I have more than once suggested that the Forum Councilor serve as a member of POPA, but so far even that minimal suggestion has fallen on deaf ears.

It is not especially satisfying to be a rubber stamp, so I was very pleased to find so many other Council members share this dissatisfaction. Perhaps a palace revolution is in the offing.

3. Nuclear War and the APS: I sense a receptivity among many elements in the APS for the Society to facilitate the contribution of physicists to the growing public discussion and debate about the prospect of nuclear war. POPA's Subcommittee on Studies, chaired by Tony Nero of the Lawrence Berkeley Lab, is looking into possible topics for APS studies in this area. The **Forum** Executive Committee has established a nuclear war task force, chaired by Leo Sartori of the University of Nebraska. That task force is looking for ideas for possible new APS or Forum programs and activities in the general area of physicists and the prospect of nuclear war. Please send suggestions to Sartori at the Physics Dept., University of Nebraska, Lincoln, Nebraska 68588.

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**BRIEF NOTES FROM THE CHAIRPERSON, Nina Byers, Dept. of Physics, University of California, Los Angeles, CA 90024.**

There will be a **Forum** session of contributed papers (session AH on Monday morning) at the Washington meeting. There will be perhaps as many as ten contributed papers on issues relating to physics and society and, in addition, an invited talk by Leo Sartori. Leo worked for some years in the Arms Control and Disarmament Agency and is now back at his regular job at the University of Nebraska.

Leo is chairperson of the **Forum** ad hoc committee on studies related to the nuclear arms race. This committee has been established to look into possible topics for such studies. This activity is presently a joint **POPA/Forum** enterprise. Tony Nero, chairperson of POPA's subcommittee on studies, together with Bob Budnitz and Leo Sartori, is looking into the same questions because **POPA** has suggested that studies be undertaken by interested groups on issues relating to the arms race. Precisely which studies will be sponsored by **POPA**, which by the **Forum**, and where and how they will be published has yet to be decided. I would encourage all interested Forum members to attend the **Forum** contributed paper session AH Monday morning and communicate to Sartori and Nero their interest. It is hoped that study groups, encouraged by the **Forum** and

POPA, will form in various places. (POPA is the APS Panel on Public Affairs.)

The Forum Awards Committee and Nominating Committee are appointed and are obliged to finish their work by June. Please send any suggestions for recipients of the Forum and/or Szilard Award and for officers and members of our executive committee to me for transmittal to the relevant committee. Self-nominations are encouraged.

John Dowling, Editor of the Forum Newsletter, is encouraging contributions. Anticipating that he will be inundated with more contributions than he can fit into available space, we have given him an editorial Board to help him resolve possible conflict. The Editorial Board consists of Earl Callen, Gerald Wheeler, and Joel Primack; the vice-chairperson of the Forum will be an ex-officio member of the board.

We believe that now is the time to invite all our fellow Society members who are not now Forum members to join the Forum. According to our

BYLAWS, the objective of the Forum is the advancement and diffusion of knowledge regarding the interrelation of physics, physicists, and society. The Forum is to provide members of the Society opportunity for discussion of and involvement with such matters. The Newsletter and Forum symposia are our main functions. We are increasing our level of activity with the encouragement of local study groups and topical conferences. Our concerns presently are with the threat of nuclear war, the need for arms control and to reverse the arms race, contraction of funding for scientific research and teaching, lack of adequate support for education - particularly physics education in the public schools, and the protection of science teaching from attacks, such as those which endeavor to require equal time for the teaching of creationism in the public schools.

Finally, I want to encourage all our members to attend the very interesting Forum symposia that have been organized for the Washington meeting. We hope to have discussion from the floor and thereby to encourage fellowship among our members.

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**PROFESSOR DIETRICH SCHROEER  
DEPARTMENT OF PHYSICS AND ASTRONOMY  
UNIVERSITY OF NORTH CAROLINA  
CHAPEL HILL, NORTH CAROLINA 27514**

FROM THE CHAIRPERSON OF THE FORUM

Dear Forum Member:

The last decade has seen a period of involvement of physicists with issues of science and society. The Forum has shared this concern and hopes to do more with your help. The Forum has been instrumental in the development of the CONGRESSIONAL FELLOWS PROGRAM, THE FORUM AWARDS, CONFERENCES ON PHYSICS EDUCATION AND EMPLOYMENT CONCERNS, Symposia at national meetings, and the establishment of the APS Panel on Public Affairs.

At present The Forum membership numbers approximately 3,158. For the next year, there are no Forum dues for current APS members. The Forum will, however, be given \$2.00 per member to support the Newsletter and other Forum initiatives. As a member of the Forum, I would like you to recruit at least one (preferably more) of your colleagues to join The Forum. To do this, you (or your colleagues) should send this form with names and addresses to the Secretary of The Forum: Professor Dietrich Schroerer, Department of Physics and Astronomy, University of North Carolina, Chapel Hill, North Carolina 27514.

This form can be detached, folded and mailed. The reverse side is already addressed.

Very truly yours,

Nina Byers, Chairperson  
Forum on Physics and Society

Yes, I want to join the Forum on Physics and Society

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