

PHYSICS and SOCIETY

The NEWSLETTER of the FORUM on PHYSICS and SOCIETY

Published by the American Physical Society, 335 East 45 Street, New York, New York 10017

VOLUME 7, NUMBER 1

FEBRUARY, 1978

1978 AWARDS TO MESELSON AND TAYLOR

The 1978 Leo Szilard Award of the Forum on Physics and Society has been awarded to Matthew Meselson of Harvard University for outstanding accomplishment in promoting the use of the methods of physics for the benefit of society.

The 1978 Forum on Physics and Society Award for outstanding accomplishments in the promotion of public understanding of issues involving the interface between physics and society has been given to Theodore Taylor of Princeton University.

The citation for the Leo Szilard Award states that "Professor Meselson was almost single-handedly responsible for the ratification by the United States of the 1925 Geneva Protocol for the prohibition of the use in war of poisonous gases and bacteriological methods of warfare. He also played a central role in the development of the positive efforts of the U.S. towards, and eventual U.S. approval of, the International Convention on the Prohibition of Development, Production and Stockpiling Bacteriological and Toxin Weapons. As head of the American Association

(continued on page 2)

IN THIS ISSUE:

New Forum Officers	page 1
Forum Awards to Meselson and Taylor	page 1
1978 Forum Officers	page 3
News of the APS Council	page 4
Physics Careers, Employment & Education	page 5
APS Committee on Education	page 6
Physics Career Expectations	page 7
Taking Care of Our Young: A Different View	page 8
1979 Forum Award Nominations	page 9

NEW FORUM OFFICERS

Dr. Mary Shoaf has become Chairman of the American Physical Society Forum on Physics and Society. Dr. Shoaf, who is Deputy Executive Secretary of the American Physical Society, was elected last year as Vice-Chairman and Chairman-elect.

The newly elected Vice-Chairman, who will assume the position of Chairman automatically in 1979, is Dr. Paul Horwitz. Dr. Horwitz is Principle Research Scientist at AVCO Everett Research Laboratories and a Research Fellow with the Center for Policy Alternatives at the Massachusetts Institute of Technology.

The new Secretary-Treasurer of the Forum is Dr. William Colglazier, who is assistant professor of Physics at the University of Montana. Last year, Dr. Colglazier was a Congressional Science Fellow of the American Association for the Advancement of Science.

Two newly elected members of the Forum executive committee are Dr. John Andelin, science consultant to the Committee on Science and Technology of the U.S. House of Representatives, and Dr. Richard Scribner, Director of Special Programs of the American Association for the Advancement of Sciences.

FOR A COMPLETE LIST
OF FORUM OFFICERS,
SEE PAGE 3

1978 FORUM AWARDS (continued from page 1)

of Science's Herbicidal Assessment Commission to study the effects of such weapons in Vietnam, Professor Meselson's program of gathering and analysis of data provided irrefutable evidence for the desirability of U.S. acceptance of restraints on chemical and biological warfare."

The citation for the Forum Award states that "Dr. Taylor has made a unique contribution to the appreciation by both the public and policymakers of the national security implications of the nuclear fuel cycle. His work, characterized by originality, a deep commitment to honesty and extraordinary eloquence, has forced a long overdue review of, and action with respect to, issues which are fundamental to the development of safe and reliable methods of converting the energy stored in atomic nuclei to peaceful uses."

"His book, Nuclear Theft: Risks and Safeguards co-authored with Professor Mason Willrich of the University of Virginia was the first comprehensive statement of the potential for proliferation of nuclear weaponry to be credible to a broad spectrum of the persons concerned with the future of nuclear energy. As a direct result of Dr. Taylor's ability to forcefully articulate these problems and to communicate them to a broad range of interests, a process has been initiated which will fully ventilate the concerns he has raised."

PHYSICS AND SOCIETY

Editor:

MARTIN L. PERL

Production Editor:

LYNN COMBS

PHYSICS AND SOCIETY, the Newsletter of the Forum on Physics and Society of the American Physical Society is published for, and distributed free to, the members of the Forum. 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, letters and columns 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 on the social responsibilities of

science. Space is preferentially given to those analyses and opinions which are less likely to be published in the established journals such as Physics Today and Science. Letters, short articles, suggestions for columns, and Forum news items should be sent to the Editor.

PHYSICS AND SOCIETY is also distributed free to Physics libraries upon request. Such requests and requests for other information should be sent to L. Combs.

FORUM ON PHYSICS AND SOCIETY OFFICERS AND EXECUTIVE COMMITTEE FOR 1978

CHAIRMAN:

Mary L. Shoaf
American Physical Society
335 East 45 Street
New York, New York 10017

(212)682-7341

VICE-CHAIRMAN:

Paul Horwitz
AVCO Everett Research Laboratory
2385 Revere Beach Parkway
Everett, Massachusetts 02149

(617)389-3000

SECRETARY-TREASURER:

E. William Colglazier
Department of Physics
University of Montana
Missoula, Montana 59801

(406)243-6274

DIVISIONAL COUNCILLOR:

Earl Callen
Physics Department
American University
Washington, D.C. 20016

(202)686-2549

PROGRAM COMMITTEE CHAIRMAN:

Paul Horwitz

EXECUTIVE COMMITTEE:

- John Andelin
House Committee on Science and
Technology
B374 Rayburn Howe Office Building
Washington, D.C. 20515
- Benjamin S. Cooper (Past Chairman)
3106 Dirksen Senate Office Bldg.
Senate Committee on Interior and
Insular Affairs
Washington, D.C. 20510
- Roland Good
Physics Department, Davey 102
Pennsylvania State University
University Park, Pennsylvania 16802
- Lee Grodzins (Past Chairman)
Room 26-421
Physics Department
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139
- David A. Lind (APS Council Appointee)
Department of Physics
University of Colorado
Boulder, Colorado 80309
- Gloria B. Lubkin
Physics Today
335 East 45 Street
New York, New York 10017
- Richard A. Scribner
AAAS
1776 Massachusetts Avenue
Washington, D.C. 20036
- Mary Beth Stearns (APS Council
Ford Research Staff Appointee)
Ford Motor Company
Dearborn, Michigan 48121
- Victor L. Teplitz
Physics Department
Virginia Polytechnic Institute and
State University
Blacksburg, Virginia 24060

--- NEWS OF THE APS COUNCIL MEETINGS ---

NOVEMBER 1977 (MIAMI) AND JANUARY 1978 (SAN FRANCISCO)

Earl Callen, Forum Councillor
American University

The tax status of the APS is being challenged by IRS. APS now enjoys the 501(c)3 tax exempt status of a scientific, educational or charitable organization. IRS proposes changing APS to the 501(c)6 category, that of a limited exemption, business league. Council has directed the Society's officers, with the advice of legal counsel, to protest the IRS examiner's report to retain the 501(c)3 status.

APS Pres. George Pake testified before Congress, and met with Science Advisor Frank Press and Secretary of Energy James Schlesinger, successfully advocating establishment of an Office of Energy Research in the Department of Energy. John Deutsch, an MIT chemist, is the first Director of the Office of Energy Research.

The APS will withdraw from membership in the Council of Scientific Society Presidents (CSSP). CSSP has taken positions on controversial issues which do not necessarily reflect the views of the members of the constituent societies. For example, CSSP issued a statement on exemption of academics from the retirement provisions of ERISA, the federal retirement act, and CSSP publicly endorsed the Science Court. APS has no position on either of these. The Forum publicized both sides of the Science Court controversy, but has not come out either for or against the concept.

"Fellow, American Physical Society" lives. The resolution to drop the category of Fellow failed to attain the 2/3 vote needed to change the Constitution. A majority voted for abolition, but not enough. (Maybe everybody should be made a Fellow. That would simplify the election process. I think anybody ascetic enough to be a physicist deserves the honor.)

Reports continue to come in of atrocities in Argentina. No response has been received from Argentine President Jorge Videla to a series of letters from APS presidents requesting information about missing Argentine scientists.

George Pake has written to Secy. of State Cyrus Vance supporting expansion of the activities of the Organization of American States Inter-American Commission on Human Rights, and calling for on-site investigations in Argentina.

Two Romanian physicists, Constantin Pomponiu and Mihaela Sararu, are in political trouble because of their putative intent to visit Vienna while on a trip to Poland. Dr. Pomponiu successfully defended his doctoral dissertation in 1975, but his degree has not been validated by the Ministry of Education, and Ms. Sararu is being officially prevented from completing her Ph.D. George Pake has written for information to Romanian Pres. Nicolae Ceausescu.

Czech nuclear physicist, Dr. Vladimir Lastuvka has been held for a year in Litomerice Prison, in northern Bohemia. In a search of his rooms, police found copies of Charter 77 and other literature deemed to be "anti-State material". The prosecutor states that Lastuvka was "on the point of signing" Charter 77, and the physicist is charged with incitement and "attempting to sign" the document, which Lastuvka denies. Pake has written to Czech Pres. Gustav Husak.

Mark Azbel, at last released from the Soviet Union, toured the U.S., partially under APS auspices. In a luncheon address to the APS Council, Azbel appealed to the Society to continue speaking out on behalf of the human rights of Soviet scientists.

Azbel stated that he is a free man today because of APS support. He called on the Society to send an observer to the Sharansky trial, but noted that the time to act is before arrest. In the Soviet Union once one is charged with a "political crime", it is almost too late. (One helpful thing the Society could do would be to publish the itinerary of Soviet scientist visitors. Society members could then find opportunity to talk to the Soviet visitors on behalf of their beleaguered colleagues.)

APS sends Physical Review Letters to Victor Brailovsky, now running the Moscow Seminar.

An issue Forum members might wish to think about is the funding of the APS Industrial Postdoctoral Fellows. Last year the Society paid half the salary of three fellows, plus \$2,000 to \$4,000 of expenses for interviews, relocations, travel to meetings, and insurance. It seems that many companies are willing to pay the entire salary. The situation is complicated by the proposal to recommend fellows to companies that already hire physicists, but with the fellow to be placed in work in which physicists have not traditionally been employed. (Last year fellows were placed only in companies that have not hired physicists in the past.) This year APS will suggest that the company contribute \$14,000 and that the APS contribute the remaining \$4,000 of salary plus \$3,000 to \$4,000 of expenses. The intent is to use the saved money to fund more fellows.

SPECIAL FORUM DISCUSSION MEETING ON THE PROPOSED
JOURNAL OF PHYSICS AND SOCIETY

Washington Meeting of APS: Monday, April 24, 4:30 p.m.

ANNUAL FORUM BUSINESS MEETING

Washington Meeting of APS: Wednesday, April 26, 11:30 a.m.

PHYSICS CAREERS, EMPLOYMENT, AND EDUCATION

PHYSICS CAREERS, EMPLOYMENT, AND EDUCATION, (AIP Conference Proceedings No. 39), the proceedings of the 1977 conference on Changing Career Opportunities for Physicists has just been published by the American Institute of Physics. The proceedings contains the 45 papers which were given at the conference held at the Pennsylvania State University in August of 1977. The contents included reports on: the present and future employment situation for both Ph.D and non-Ph.D. physicists; the relation of physics funding and educational enrollments to physics employment; nonacademic careers for physicists; public policy careers for physicists; changes in the physics education of physicists; and innovations in physics courses and curricula. The volume can be obtained from the American Institute of Physics Marketing Services, 335 East 45th St., New York, New York, 10017. The cost is \$18.50 if payment accompanies the order; otherwise there is an additional \$2.00 billing charge.

1978 COMMITTEE ON EDUCATION OF THE AMERICAN PHYSICAL SOCIETY

The following list, submitted by Roger Herman, gives the present membership of the APS Committee on Education. The associated numbers indicate the final year on the Committee.

CHAIRMAN: Professor James R. Stevenson 1979
School of Physics
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-5200

MEMBERS:

Professor Benjamin F. Bayman 1980
School of Physics & Astronomy
University of Minnesota
Minneapolis, Minnesota 55455
(612) 373-3333

Dr. Frederick J. Darnell 1979
Central R & D Department
Dupont Experimental Station
Wilmington, Delaware 19898
(303) 772-2761

Professor Wesley O. Doggett 1980
Department of Physics
North Carolina State University
Raleigh, North Carolina 27607
(919) 737-2505

Professor Charles P. Frahm 1981
1978 Address:
Optical Science Center
University of Arizona
Tucson, Arizona 85721
(602) 884-3007,

Dr. R. Glen Kepler 1981
Department 58-10
Sandia Laboratories
Albuquerque, New Mexico 87115
(505) 264-7520

Dr. Mary L. Shoaf 1979
Deputy Executive Secretary
American Physical Society
335 East 45 Street
New York, New York 10017
(212) 682-7341

Dr. Bernard G. Silbernagel 1981
Exxon R and E Company
P. O. Box 45
Linden, New Jersey 07036
(201) 474-2597

Professor Werner Wolf 1980
Department of Engineering and
Applied Science
Yale University
New Haven, Connecticut 06520

EX OFFICIO:

Professor Roger Herman
Department of Physics
104 Davey Laboratory
The Pennsylvania State University
University Park, Pennsylvania 16802
(814) 865-6092

Dr. Sidney Millman, Secretary
American Institute of Physics
335 East 45 Street
New York, New York 10017

PHYSICS CAREER EXPECTATIONS AND OPPORTUNITIES

Wayne M. Saslow
Texas A&M University

To The Editor:

I just read your article "Taking Care of our Young". I am very much in agreement with you, but I think some clarification is needed, particularly regarding your point about the lack of physics career opportunities - it all depends on how one views such opportunities. A very bright and ambitious student who has gone into particle theory would probably not be interested in working for an oil company on geophysical problems. Indeed, the disinterest would probably be mutual. On the other hand, students with less rigid expectations might well consider such a job. Therefore, med school can be a more valued possibility for a very ambitious student, such as you mentioned, whereas a bread-and-butter job might suit nicely a student with less rigid expectations. The real problem is one of distribution - there aren't enough jobs in some areas of physics, whereas there are more than enough jobs for Ph.D's who are more flexible.

If, as you suggest in your article, we are to have 20% fewer new Ph.D's per year, with no other adjustments, I am forced to conclude that their number must come from the ranks of our very best and most ambitious students, for the others have lower expectations and will find jobs outside academia, the best govt. labs, the best corp. labs, etc. Either that, or we really must lower the expectations of our very best students, and this would be terrible for morale. On the other hand, not having a job prospect at the end of the road is also terrible for morale.

What this means to you, at SLAC, is fewer Ph.D. students. What this means for me, at Texas A & M, is unclear. I am turning out my first student next spring, and it appears that he'll certainly be able to find a job, but not necessarily one in physics proper. If the job prospects continue like this, it would not be inappropriate for me to take on another student, so long as I am willing to give the student a serious recommendation and if it is clear to him or her that the academic and related possibilities are poor. For me, as opposed to you, decisions with respect to students will largely depend upon what is happening outside the physics community proper. Therefore, in a practical sense, it is primarily the first-rate institutions that must make the bulk of the adjustments: fewer students, lower expectations, or some combination thereof. I am not necessarily saying that Texas A & M is not capable of tightening its belt, but only that relatively few of our students have suffered (or will suffer) the disappointment that so many of yours have suffered.

One solution involving lower expectations is for the major institutions to turn out as many Ph.D.'s as in the past, but to lower their job expectations (on the average). Another solution is for the majors to accept fewer students. This will mean more students, with automatically lower expectations, for the other institutions. I think, however, that it is inappropriate to think in such narrow terms.

Physics has traditionally fed people into other areas. Part of this year's Nobel Prize in Medicine went to a woman physicist who developed the radioimmunoassay technique. The ranks of geology and geophysics are filled with physicists. Much of the work on ultrasonics as a tool for medical diagnostics has been done by physicists. It is clear that physicists have the versatility to perform first-class work in other areas. Unfortunately, that is not so clear to prospective employers who often find little indication of breadth in a given student's course work or thesis research. It is a terrible pity that the typical physics curriculum, under the pressure of preparing the student for in-depth modern research, has chosen to exclude so much honest bread-and-butter classical physics. Where are fluid mechanics, elasticity, and

acoustics, so necessary, for example, to any geophysical or oceanographic work? There is not even a hint of them on my own records, and I can well imagine the reluctance of a prospective employer in those areas to hire me because I have the potential to learn them.

For this reason I am doing two things with regard to my present graduate student. First, I am taking personal responsibility for giving him a broad training which includes a significant amount of classical physics. Second, I am taking seriously the idea that I may have to sell a prospective employer on physicists in general, as well as on him in particular.

We, as physicists, should not lose sight of or discard the "ancient" knowledge that our discipline has developed. I think that if a small, but significant, fraction of our students go into other areas, it is a good thing, both for them and for those areas. Where else but in physics can they obtain an education which so impresses upon them the importance of a fundamental scientific understanding? Unfortunately, physics must regain its reputation for breadth, and this could be helped immensely by our teaching more bread-and-butter classical physics.

TAKING CARE OF OUR YOUNG: A DIFFERENT VIEW

Lincoln Wolfenstein
Carnegie-Mellon University

To The Editor:

I believe the editorial entitled "Taking Care of Our Young" in the August 1977 Newsletter takes a very narrow view of the problems of the education and employment of Ph.D. physicists.

The problem is clearly a part of a larger problem, the lack of jobs for educated people in general. The problem is more acute in some fields, such as the humanities, and less acute in some, but it is almost universal. The solution endorsed by Perl, if extended to the general problem, calls for restricting the number of people allowed to have higher education. Now it may be that some people go on to graduate study who do not have the intellectual ability to take advantage of it and that serves no purpose. But I do not believe we should stop educating people simply because at the moment our economic system cannot provide enough jobs that require higher education.

My opinion is based on my belief that not only does everyone have a right to the education he is capable of undertaking but that this represents one of the highest values of being human. I believe that learning physics is to discover some of the greatest triumphs of the human spirit, and I want more, not less, people to be able to share this.

But what about jobs? I think the first question, one which Perl dismisses as irrelevant, is whether there are national needs that educated people could work on. I believe there are such needs, some of which, like energy and environmental problems, can utilize the efforts of physicists. But, Perl argues, these may be needs, but they are not jobs. However, it is a fact that if the present high-school generation is to have jobs a decade from now, many millions of new jobs must be created. We should not take it as a foregone conclusion that these jobs will not be created where the needs are. Since the nature of these jobs will be in great part determined by political decisions, it may be appropriate that educated people and professional

TAKING CARE OF OUR YOUNG: A DIFFERENT VIEW (continued)

societies undertake efforts to influence the political decisions in the appropriate direction.

In discussing the proper production rate of Ph.D. physicists it is important to ask what are reasonable expectations as to their future employment. While most Ph.D.'s are trained in basic research, it seems to me quite proper that most Ph.D.'s find their ultimate career outside of the university of basic research laboratory. It is impossible to tell when a young man of 22 embarks on a Ph.D. whether he has the ability to make continuing contributions to basic research. If we believe that basic research in physics is important and exciting, we must expect that those who are to make a career of it must pass a number of hurdles and that only the best will make it all the way. It is important that the others find useful jobs that make use of their education; I am impressed, from the various AIP reports as well as personal accounts, by the variety of endeavors that physicists have gone into successfully.

What then is our responsibility to the young people considering a Ph.D. in physics? First, we must discourage in every way possible those who do not have the ability to really take advantage of the Ph.D. education. Second, we must be absolutely frank with every prospective student in estimating the probability that he may be able to pursue a career in basic research. It might be worthwhile to try to get all physics professors to subscribe to a code of ethics that requires that such an estimate be given in writing to every new Ph.D. student. Third, for those students who have the ability and, aware of the employment risks, want to do Ph.D. research, we have the responsibility to share with them the excitement of discovery and the wonders of human knowledge.

NOMINATIONS NEEDED FOR 1979 FORUM AWARDS

Nominations for the 1979 Leo Szilard Award and the Forum on Physics and Society Award should be sent to John P. Andelin, Award Nominating Committee Chairman. The Forum Executive Committee will consider the nominations at its April 24 meeting in Washington, D. C.

LEO SZILARD AWARD FOR PHYSICS IN THE PUBLIC INTEREST

Purpose: To recognize outstanding accomplishment by a physicist in promoting the use of physics for the benefit of society in such areas as the environment, arms control, and science policy.

Nature: The award consists of \$250 and a certificate citing the contributions of the recipient.

Establishment and Support: This annual award is being established and supported by the Forum on Physics and Society as a memorial to Leo Szilard in recognition of his concern for the social consequences of science.

Rules of Eligibility: Any living physicist is eligible. The recipient will be chosen by the Executive Committee of the Forum on Physics and Society.

APS FORUM AWARD FOR PROMOTING PUBLIC UNDERSTANDING OF THE RELATION OF PHYSICS TO SOCIETY

Purpose: To recognize outstanding accomplishment in the endeavor to promote public understanding of issues involving the interface between physics and society.

Nature: The award consists of \$250 and a certificate citing the contributions of the recipient.

Establishment and Support: This annual award is being established and supported by the Forum on Physics and Society.

Rules of Eligibility: To be eligible for consideration, within the past two years a person must have made significant contributions to the public understanding of science and society issues through such means as newspaper or journal articles, books, films, etc. The recipient will be chosen by the Executive Committee of the Forum on Physics and Society.

(The following guidelines for the Leo Szilard Award and the Forum on Physics and Society Award were adopted by the Forum Executive Committee at the February, 1977 meeting.)

The Leo Szilard and Forum Awards were established to encourage and stimulate physicists to do more public interest science. There was a definite desire that the "outsider" sector of public interest science was one to be encouraged and stimulated, because this is the sector that requires strengthening.

The awards were intended to go to certain categories of physicists and writers:

1. They could go to those who were young and unknown, and whose accomplishments needed recognition.
2. They could go to those whose work and views did not get recognized or heard in our established channels of communication.
3. They could go to older physicists and writers who might be recognized in their research specialty, but who were "outsiders" in their public interest science work.
4. The awards were not intended primarily for famous physicists who have already received all sorts of honors and recognition.
5. Nor were the awards intended primarily for famous statesmen of science.

The awards were intended for the "outsiders", for the "boat-rockers", for those who go against established interests when the actions of those interests are not in the public interest.

PHYSICS AND SOCIETY

The Newsletter of the
Forum on Physics and Society
of the
American Physical Society

VOL. 1, NO. 7

FEBRUARY, 1978

The American Physical Society
335 East 45th Street
New York, N.Y. 10017