

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 3

July 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, April 26, 1982 by Dietrich Schroerer, Dept. of Physics and Astronomy, UNC, Chapel Hill, NC 27514.

The Executive Committee meeting was called to order by Nina Byers at 7:30 pm on Monday, April 26, 1982 in Suite E. of the Shoreham hotel in Washington, DC. Executive Committee members present were Nina Byers, Barry (Mike) Casper, William Chinowsky, John Dowling, Eric Fawcett, Kenneth W. Ford, William J. Gallagher, Ernest C. Hammond, Malvin A. Ruderman, Alvin M. Saperstein, Dietrich Schroerer, Brian Schwartz. Other persons attending included Ralph Alpher, Earl Callen, Vernon Ehlers, David Hafemeister, L. Charles Hebel, Anthony V. Nero, Mark Sakitt, Leo Sartori, Mary Shoaf, Peter D. Zimmerman.

1. Report of the Secretary:

The MINUTES of the January 25, 1982 meeting of the Forum Executive Committee were approved.

2. Announcements by Nina Byers:

The APS Council has approved another \$1500 subsidy for the Forum Newsletter for next year, to be deposited to the FORUM account after September of 1982.

The nominating committee is made up of Caroline Herzenberg (chairperson), Barry (Mike) Casper, Charles Schwartz, and E. William Colglazier.

Discussions with Andrew Sessler on the Committee of International Freedom of Scientists are continuing about Polish scientists in particular.

Rosemary Chalk of the AAAS hopes AAAS can interact with POPA and the Forum on the issue of scientific secrecy.

3. The APS and Regulations on Technology Transfer:

Nina Byers led a discussion of who should be able to claim to speak out on behalf of the APS on political issues. The general agreement was that care should be taken by officials of the APS not to speak improperly on its behalf. Nina then appointed Earl Callen to draft a position paper for the FORUM's consideration on the restrictions associated with limiting technology transfer.

4. The POPA-FORUM Connection:

Nina Byers suggested an official exchange of committee members between POPA and the FORUM as part of the POPA reorganization now under discussion, i.e., one POPA might be ex officio member of the FORUM Executive Committee, and vice versa. Presently this is happening unofficially through people who have dual appointments. (Continued under Item 7.)

5. APS-FORUM Studies:

Leo Sartori reported on an earlier open discussion about possible arms-race studies the FORUM might

undertake. Considerable interest was expressed at the discussion, and topics have been and are being collected. Groups of individuals will be organized to convert suggested topics into preliminary proposals for possible studies. POPA-Studies chairman Tony Nero pointed out that the link to POPA might come, once sharper preliminary proposals are developed. Leo's ad hoc subcommittee, including Perter Zimmerman, Chuck Hebel, Alvin Saperstein, and Dietrich Schroerer, will organize these groups and think about possible study formats.

6. Editor's Report:

John Dowling pointed out the availability of FORUM signup postcards, and asked that these be distributed at FORUM sessions. He asked whether foreign mailings of the Newsletter were needed. He will make a proposal at the next Executive Committee meeting concerning a Journal of Physics and Society.

7. Councillor's Report:

Mike Casper reported on the APS Council meeting. The Council is reworking the constitution and by-laws. Mike proposed that the FORUM Councillor should be made a voting member of POPA (see Item 4). Nina Byers suggested she write to the Council asking that this be done. Ken Ford then moved that:

Motion No. 1: The FORUM recommends to the APS Council that in the long term one FORUM Executive member, named by the FORUM chairman, be a member of POPA and that for now POPA is encouraged to invite a FORUM Executive Committee member to meet with POPA in its meetings.

This motion passed.

It is possible for the FORUM to nominate persons to become Fellows of the APS. The awards committee is charged to pursue this possibility. The awards committee consists of John Dowling (chairman), Leo Sartori, and Joseph Lach.

How might the FORUM become involved in educational efforts? An ad hoc committee was formed to think about this; chaired by Mike Casper, and with volunteers Ernest Hammond, Eric Fawcett, John Dowling, and Dietrich Schroerer.

8. AAPT Publication of FORUM Symposia:

The proceedings of the FORUM's nuclear proliferation session in San Francisco, edited by Jack Hollander, is ready to go to the AAPT for review and decision on publication. The Rosenfeld/Budnitz solar session is still being worked on. Ken Ford will continue to pursue the AAPT publication route in the future.

9. Program Chairman's Report:

A second short course on the arms race for the 1983 April meeting in Baltimore was approved. David

Hafemeister and Dietrich Schroerer will again organize it. A Symposium on the crisis in high-school science education will be held at the January 1983 New York meeting. It is being organized by Willie Fowler, and Albert Shankar will be one of the speakers. Will the AAPT cosponsor it? Earl Callen will organize a session on secrecy in science for the April 1983 meeting in Baltimore.

10. Ground Zero:

Leo Sartori reported that Ground Zero activities took place in many places, and that it was reasonably successful without us.

ANNOUNCEMENTS:

Journal of Physics and Society: the issue of whether there should be such a journal was raised again. John Dowling, the editor of this newsletter, is charged by the **Forum** to look into such a journal and what it entails. Please send your comments, opinions, and suggestions to him - Physics Department, Mansfield State College, Mansfield, PA 16933 or call 717-662-4275.

Editorial Board of Physics and Society. The **Forum** newsletter now has an editorial board. The members are Earl Callen, American University, Washington, DC 20016 (202-686-2549), Joel Primack, Univ. of California, Santa Cruz, CA 95064 (408-429-2580), Gerry Wheeler, Montana State Univ. Bozeman, MT 59717 (406-994-3614) and William Chinowsky, Univ. of California, Berkeley, CA 94720 (415-642-4966).

Acknowledgement: Ellen Hackett has helped with each **Forum** newsletter since I took over as editor. She has now graduated and gone to work for Kodak. I wish to thank her for her past help and to wish her well.

Division of History of Physics

The APS Council established a Division of History of Physics on 22 November 1980. The new Division sponsored sessions at the APS meetings in Baltimore (22 April 1981), San Francisco (25 & 26 January 1982) and Washington (27 April 1982), and plans to sponsor sessions at the New York, Baltimore and San Francisco meetings in 1983. An election of officers was held in December 1981. For 1982 the chairperson is Martin J. Klein (Yale); vice-chairperson, Laurie M. Brown (Northwestern); secretary-treasurer, Stephen G. Brush (Maryland). The Division now has about 1200 members. A **History of Physics Newsletter** will be published in Fall 1982; copies will be sent free of charge to all Division members and available to others on a subscription basis. For further information write to S. G. Brush, Institute for Physical Science and Technology, University of Maryland, College Park, MD 20742.

A **Guide to Disarmament Media** for use in organizing and educating efforts in disarmament includes a selected list of films, videotapes and slides, written guides, and resources to disarmament materials. Also featured are tips in presenting an effective program. The Guide is available at \$1.00 per copy; 2-10 copies, 75¢ each from Media Network, 208 W. 13 St., New York, NY 10011; (212) 620-0878.

NUCLEAR ARMS CONTROL HOTLINE - 3 minute taped message updated weekly on the latest information on arms control and military budget legislation and Executive Branch policy developments. Hotline highlights key upcoming votes in Congress. (202) 543-0006. Maintained by Council for a Livable World, 100 Maryland Ave., NE, Washington, DC 20002.

HUMAN RIGHTS ORGANIZATIONS - now sharing of offices at 36 W. 44th St., New York, NY 10036 are **Helsinki Watch** (212) 840-9460 Jeri Faber, Executive Director; **Fund for Free Expression** (212) 840-9460 Sophie Silberberg, Executive Director; **Americas Watch** (212) 840-9460 Aryeh Neier, Vice Chairperson; **Lawyers Committee for International Human Rights** (212) 921-2160 Michael Posner, Executive Director.



LETTERS TO THE EDITOR

Washington APS Session on Creationism

Comment on pages 3 & 4 of April 1982 **Forum** newsletter:

1. Concerning a program on creationism at the Washington meeting: "There will be no **Forum** co-sponsorship unless a pro-creation speaker is on the program." No doubt the **Forum** would invite the fox into the chicken coop for a discussion with the chickens.
2. With civilization on the brink of nuclear extinction, "The **Forum** declines the request for mailing labels from Ground Zero...there was fear that provision of mailing labels might be taken as constituting a 'tacit' affiliation." Fiddling while Rome burns.

Lee Kean
427 Raley Avenue, S.E.
Carrollton, Ohio 44615
13 May 1982

On the "Disarmament, Cold War, or Nuclear War" session at the San Francisco APS meeting.

Your issue of April 1982 presented a brief synopsis of my talk to the Forum Symposium on "Disarmament, Cold War, or Nuclear War" at the San Francisco meeting of the APS/AAPT on January 28, 1982, that is subject to misinterpretation. The comment that "He (Drell) pointed out that agreements and policies are not static and attention must be given to changes" was applied to the ABM treaty and U.S. civil defense policy. I in no way suggested changes in these policies. In fact, what I said was:

"This year is the tenth anniversary of the ABM treaty, and its scheduled five-year review conference marks an important occasion for arms control. I see no persuasive reason to consider modifying the ABM treaty in 1982...Overall, the treaty remains the most substantive achievement in arms control between the U.S. and the Soviet Union."

and

"Civil defense does not offer a realistic escape from the current nuclear 'balance of terror.' It should not be used to create and support the dangerous illusion that there is a likelihood of waging and surviving a nuclear war...."

Sidney D. Drell
Stanford University
Stanford, CA 94305
19 April 1982

On Science and the Public

A major task of the American Physical Society is the enhancement of the image of science and scientists in the public eye and the encouragement of rational-scientific thinking and action on the part of government, society, and individuals. Yet today we find wide discrepancies between popular and governmental beliefs on vital matters and the views held by many - if not most - of the members of the scientific community, prominent and otherwise. It behooves the APS to act towards eliminating these discrepancies and the **Forum** to make appropriate suggestions to the Council of the APS for the initiation of such acts.

The Washington Post reports that, by 2 to 1, Americans believe that the Soviet Union is ahead of the United States in nuclear weapons. Yet the numbers, and our own experts - speaking at **Forum** Symposia - tell us just the opposite. The government tells us of the possibilities of "limited nuclear war." Yet our experts tell us of the inevitable breakdown of the C³I apparatus which is the only mechanism which might serve to limit a nuclear war, once started. The government and the people talk about the superiority in "conventional armaments" of the Soviets and of the "inevitable" need for tactical nuclear weapons to block the "impending" Soviet invasions. Yet our experts, and the numbers, tell us otherwise. More importantly in a nation founded on the principles of the "Age of Enlightenment," in which means are to be rationally related to ends, we find vast expenditures - present and impending - for weapon systems based not upon their possible uses but on the impression they might make upon the ignorant, the irrational, and the mystical. Rather than being rational-scientific, we are to "keep up with the Jones'" even though, as Hans Bethe said, that implies stumbling into an economic system as bad as that of the Soviets. It is time for the Council of the American Physical Society to place before the American people, by its statements and deeds, an image of rational thought and action to meet the threat of nuclear holocaust which may be impending.

Specifically, speaking in their role as accomplished physicists, the Council should point out, **strongly** and **publicly**, that the inherent susceptibility of the components of the C³I system to easy incapacitation from the physical effects of distant nuclear explosions makes implausible the careful orchestration of weapon use required to prevent an initially "limited nuclear war" from becoming "total." Based upon their experience with the less than perfect reliability of large scale, single-time-use systems (Murphy's Law), they should point out the implausibility of the prevention of devastating retaliatory nuclear strikes, no matter how large the opponents "damage-limiting" first-strike is. Thus, as "operationalists" we know that the concept of "strategic nuclear superiority" is now meaningless; the people should be brought to this realization. Knowing the technological capabilities of modern long distance surveillance techniques, the Council's statement should deal with the American public's fear (6 to 1 in the Washington Post's survey of 29 April 1982) that the Soviets will be able to significantly cheat on any agreement to freeze or decrease the level of strategic nuclear explosive delivery systems. Finally, the Council statement should call for the rational treatment of our common problems; for the acquisition of tools - weapon and otherwise - which are directly related to clearly envisioned national purposes; for the avoidance of a tool chest so overburdened with tools, (acquired just because they could be had) that it falls over

disasterously on its owner. ("Heat not a furnace for your foe so hot, that it do singe yourself.")

Turning to our own membership, the Council could suggest that it become more involved with public education about the scientific aspects of the nuclear war threat - through participation in public forums and the inclusion of pertinent aspects of the problem in elementary and service courses in physics and physical science. The Council's recommendations to its membership and the impact of its public statements would be augmented by the provision of APS funds for the development of appropriate educational materials and for the staffing of pertinent research committees.

The public is becoming aware of its needs. The APS is in a position to service those needs, to the benefit of itself and of our civilization. It should act promptly and decisively to maximize its beneficent impact.

Alvin M. Saperstein
Dept. of Physics
Wayne State University
Detroit, MI 48202
30 April 1982

Committee on Opportunities in Physics: A Report by Earl Callen, Physics Department, American University, Washington, DC 20016.

The Committee on Professional Concerns (COPS) met at the Washington APS meeting and discussed the following items:

Accreditation of Physics Departments: Some 175 schools in the US give a Ph. D. in Physics, and a lot more have masters and bachelors programs. Is that too many? Should there be minimum standards? Accreditation? How? The professional concerns committee of the AAPT has been thinking about this, and wants a joint AAPT-APS committee to look into it.

One's first thought is that there is no non-inflammatory way to recommend that a school lose accreditation. But there may be other mechanisms. If it is in fact decided that there should be some monitoring of quality, it could be done by recommending to the States that they each look at their own schools. Or the AAPT and APS could encourage the Princeton Testing Service, for example, to institute a low but standardized Ph.D. - level exam, and suggest that all new Ph.D.s voluntarily take this test. Those who pass could be considered to have passed their "Professional" examination. Some schools themselves might

require passing the test as part of the Ph.D. qualification process. The AAPT Professional Concerns Committee and APS-COPS are just starting to think about this touchy issue. My opinion is that it is an important matter, worthy of serious consideration. The COPS committee feels that way too, and the committee voted to encourage the AAPT to keep the collaborative effort moving forward.

Retired Physicists: The COPS have really stimulated something here. There are now several ideas before us - teaching, self-study seminars, and recareering. Wm. Blanpied suggests using retired physicists to help fill the vast void, in numbers and even more so in quality, in physics and mathematics teaching in the elementary and secondary schools. The APS Committee on Education is now following up on this. Clearly there are serious problems of union busting; the teachers unions must be brought in on this early, so that volunteers do not undercut efforts to obtain adequate salaries for teachers -- one major cause of the shortage in the first place. But no doubt, given good will on both sides, there are ways to have retired scientists come into the classrooms as resource persons to assist certified teachers. The same approach will be helpful in getting by the "education certification" barrier. Tom Moss and Nina Byers are designing a questionnaire to discover the degree of interest among our retired physicists. They will work with Wolf Franzen of the Educational Committee.

Another idea, suggested by Nina Byers, is to model self-study seminars after the "institutes for retired persons" organized by the New School, in New York, and by UCLA. The idea here is that those who want to keep their minds active, but find barriers to going back into their former work places, can get together and give each other seminar talks and tutorials on what is going on in science.

Ed Edelsack, who started this whole effort, suggests that the APS utilize the resources of the American Association of Retired Persons (with 13 million members).

Physics Entrepreneurs: A planned course was cancelled because of insufficient enrollments. Do members want such a course? There are people available to tell you how a physicist starts a business, what the problems are, and what it takes to make it go. A two day course could be given at the Baltimore meeting next April, for example, but we need to know if there is interest. It will cost you some money. Let us know. Write me at the above address.

Ombudsman: The COPS have quietly played a gentle ombudsman role in a couple of cases now. Like accreditation this is a touchy issue. It is the one over which a past APS Executive Committee tried to abolish our professional concerns committee in the first place.

But that will not happen again. The times and the people involved are different now. I sense more confidence among APS Council members in what we are doing, and in the people doing it. The COPS decided to consider problems as they come up, on a case basis, and to keep the APS offices fully informed in each instance of what we are doing. What seems to have got the APS Executive Committee especially inflamed last time was the consideration of guidelines for professional employment. We are not looking at those now. So far we don't seem to be in hot water.

DoD Physical Science Fellowships: Former COPS Chairperson and continuing member Ralph Alpher (the new COPS Chairperson is Israel Jacobs, of G.E.) has been active in finding out about the nature and probable impact of these fellowships, and in acquainting the Army Science Board with physics manpower problems. The purpose of the DoD fellowships is to encourage the development of expertise in areas of particular interest to the military - for example high power microwave generators, composite materials, VLSI and vertical-lift aerodynamics. ONR will administer 45 fellowships. ARO (Army) and AFOSR (Air Force) will presumably have equal numbers. Alpher represented APS in a presentation to the Army Science Board. He spoke of science manpower forecasting, impact of Federal science fund curtailment, of cutbacks in student support programs, and the implication for national security of the generally low U.S. science literacy vis-a-vis the Soviet Union and our economic competitors.

A Proposed APS Council Statement on Nuclear Weapons and Nuclear War by Mike Casper, Dept. of Physics, Carleton College, Northfield, MN 55057.

The APS Council met in Washington, DC on April 25, the last day of Ground Zero Week. In that context, I was amazed to find that the issue of nuclear war, now at the forefront of public concern, was nowhere on the Council agenda. That seemed to me outrageous and I so informed my colleagues. The response was: "Well, what do you think we should do?"

On reflection, I came up with a "Proposed APS Council Statement on Nuclear Weapons and Nuclear War." (see attached) I would appreciate criticism or comments about this proposal.

In the meantime, to its credit, the Council Executive Committee decided to consider action on the nuclear weapons/nuclear war issue at its June meeting. I re-

quested that my "Proposed APS Council Statement" be considered in those deliberations and appended an explanatory letter, which reads in part:

Points I and III, dealing with the Freeze and Nuclear War Education, are self-explanatory. Point II probably deserves some elaboration.

In the preamble paragraph of the statement, I attempted to describe the historical context in which we physicists now find ourselves as we deliberate about what to do about the prospect of nuclear war:

The atomic bomb story is the drama of our time. It began nearly forty years ago when physicists created a weapon of unprecedented destructive power. Since that time, members of our profession have been key contributors as enormous numbers of nuclear weapons have been designed and built and numerous sophisticated delivery systems have been devised and deployed. Now, in 1982, people around the world are becoming very nervous about how the atomic bomb story will end. That concern is well-justified, I believe. So far the story has all the makings of the most horrible tragedy in human history and there is a significant chance it will happen in our lifetime.

That is the historical context. It suggests both a special responsibility and a special opportunity for us as physicists. The unique role that physicists have played in developing nuclear arms over the past forty years has brought us to center stage in this drama. We must not stand aside and just let the holocaust happen. If we speak now with wisdom, people will listen.

What can we do now that befits our historical role and center stage position? We can say, "enough is enough; we will participate no more in the buildup of nuclear arms that is leading the world to nuclear destruction." That would have an impact.

Of course, the American Physical Society cannot speak with one voice for all physicists. What it can do is amplify individual voices to assure that they will be heard. It can circulate the proposed "International Voluntary Pledge of Physicists about Nuclear Weapons" to APS members and to professional associations of physicists in other countries, including the Soviet Union. Whether or not any individual physicist signs the pledge is a matter of personal choice. What the APS would be doing is simply giving him or her an opportunity to join with physicists around the world in saying "enough is enough."

I believe that future historians who will write the atomic bomb story will see this time as a critical juncture. As the latent fears of people world-wide about the prospect of nuclear war surfaced in spontaneous expressions of concern, they will ask "what did the physicists do?"

Will we be remembered as tragic figures who built the Bomb, but then stood by temporizing in the final act? I hope not. We can choose instead a role of moral leadership, joining with the physicians and the bishops and other heroic figures in sounding the alarm and stopping the world's mad rush toward nuclear suicide. The choice is ours to make. Now is the time to act.

PROPOSED APS COUNCIL STATEMENT ON NUCLEAR WEAPONS AND NUCLEAR WAR

We physicists were instrumental in creating the first nuclear weapons and our profession has prospered from its association with those weapons. In the beginning, perhaps it was plausible to believe that nuclear weapons might serve as an instrument of peace. However, it is now time to say "enough is enough." The existence of tens of thousands of thermonuclear bombs in the world's arsenals, the prospect of proliferation to nations around the globe, and indications that some political leaders now believe that nuclear war is somehow survivable or winnable all constitute a peril to the human race. There is a significant probability of nuclear war in our lifetime and that might well mean the sudden simultaneous slaughter of hundreds of millions of human beings. As physicists and as citizens, we pledge ourselves to do all in our power to prevent that holocaust.

In particular, we have adopted the following three-point program:

I. Nuclear Weapons Freeze: As a Council we endorse the proposal for a bilateral freeze on production, testing and deployment of nuclear weapons and nuclear weapons delivery systems. So that the members of the American Physical Society can independently voice their opinions on this issue, we have instructed the Executive Secretary to poll them about the freeze proposal by mail ballot.

II. International Voluntary Pledge of Physicists About Nuclear Weapons: If physicists and others with scientific and technical training were to refuse to participate, the nuclear arms race and the proliferation of nuclear weapons to other nations could not continue. In recognition of this fact and in order to provide an opportunity for physicists everywhere to join together to say "enough is enough," the American Physical Society is circulating to its own members and to professional associations of physicists in other countries, including the Soviet Union, the following "International Voluntary Pledge of Physicists About Nuclear Weapons":

"I believe that the nuclear arms race must be reversed and the proliferation of nuclear weapons halted if the human race is to avoid a nuclear holocaust. Consequently, I personally pledge not to use my knowledge and training as a physicist to participate in the design, development, production or testing of nuclear weapons or nuclear weapons delivery systems. I further pledge to assist to the best of my ability in the education of my fellow citizens about nuclear weapons, the strategic arms race and the consequences of nuclear war."

III. APS Program of Nuclear War Education: We have created a new Standing Committee of the APS Council to develop and oversee a program of public education about nuclear war. The first Chair of the committee is who will be aided in his/her duties by a full-time staff assistant.

Among the first projects of the nuclear war education committee will be a conference to design and develop materials for physicists to use in public education. The committee will sponsor speaker-training workshops at each major meeting of the society to instruct physicists in the use of these materials to prepare them for educational presentations. The committee will also help to plan research studies and schedule sessions at APS meetings on nuclear-war-related topics.

Irina Brailovsky's Plight by Earl Callen and Joseph Goldman, Physics Dept. American University, Washington, DC 20016.

The exchange of Letters (*Physics Today*, May, 1981 and May, 1982) between Irina Brailovsky, Russian refusnik, and Anatoly Logunov, rector of Moscow State University, leaves out some of the story. Being acquainted with the principals and with the Soviet system, we feel compelled to respond. One of us (E.C.) visited the Brailovsky's in 1973, and again with Irina in 1981, just before Victor's trial. The other (J.G.) is an immigrant from the Soviet Union, knows the Brailovsky's personally, was a fellow physics student with Logunov at Moscow State University, and met with him occasionally thereafter.

The Brailovsky's applied to emigrate 10 years ago. Their visa requests were rejected on grounds of knowing state secrets, although neither had ever held a security clearance or worked on a classified project. Arrested in late 1981, Victor was held incommunicado, tried without a lawyer, convicted of "defaming the Soviet State," and internally exiled.

Referring to Irina, Logunov writes that "during the period of my association at Moscow University (since October, 1977) in the position of rector, this individual did not work at the university nor did she have any relation with it". Of course not. Irina, a fluid dynamicist, had been employed as an applied mathematician by Moscow University under a previous rector, since deceased. She had been fired (as was Victor) when they applied to emigrate.

At that time Moscow University had failed to certify that Irina could be released without jeopardizing state security. Later, after she was fired, and after this individual Logunov had become rector, another university committee had reconsidered her case and cleared her. Their report was signed by Logunov himself, who has admitted in private conversations that there is no reason to detain Irina. Logunov claims to have told this to the Ministry of Interior orally, but refuses to forward to them the written committee report. He is said to take the position that his dealings with the Ministry are always oral.

In his **Physics Today** letter, Logunov asserts that "Moscow University and myself in particular do not have and can never have any connection with the solution of the question of an exit visa". Five years ago, Logunov could have gotten away with the obfuscation, but not now. By now, so many immigrants have gotten out, so many Party members and Soviet officials who have been themselves responsible for filling out the forms required by OVIR and the KGB have emigrated, that we have a pretty good idea how the system works, although the forms, and the very procedures, are themselves secret.

There is a form which OVIR requires to be sent from the employer. The employer (in this case Logunov, as current rector) must explain that the person involved does or does not know state secrets. The final entry on the form is crucial. On this line the employer must certify that "because of this reason this person can, or cannot, be allowed to emigrate", or words to that effect. Upon each rejection and reapplication OVIR goes back again to the institution where the individual worked, for the required clearance. This is the regular procedure, secret but absolutely well known to Russian officials and to the emigrant and refusenik communities. For Logunov to deny this is perhaps understandable, for he is an ambitious man, at 54 or so already the rector of the Soviet Union's greatest university, vice president of the Soviet Academy of Sciences, a member of the Central Committee of the Communist Party, and a member of the Supreme Council of the USSR. Logunov is a man on the make. But in doing so he forsakes the superb humanitarian tradition of physicists at Moscow State University. Mandelstam, Lansberg, Leontovich, Tamm, and

Khaikin perhaps did not achieve such heights, but they would not have acted in this way.

Logunov wants to move high in the Soviet firmament, but he also wants to be well regarded by his fellow scientists. He desires to travel in the West and to be welcomed by physicists at our conferences and our universities. We do not think he should be. As long as he personally blocks the emigration of Irina Brailovskiy, we call upon scientists and persons of good will everywhere to shun Academician Anatoly Logunov.

SHOULD SMALL Ph. D PHYSICS PROGRAMS SURVIVE?

by Kenneth W. Ford.

This contribution is based on a talk given at last year's APS meeting in Baltimore. The author is Executive Vice President-designate at the University of Maryland, Adelphi, MD 20783 and was Chairperson of the **Forum** in 1981.

There are not enough physics graduate students to go around. From a national perspective, the "shortage" is not a problem, because supply and demand are more or less in balance for the principal products: physics Ph. D.'s (although, if nonstandard careers are included, the market could accommodate a greater supply of Ph.D.'s). From the perspective of an individual small department, on the other hand, it is a serious problem. Such a department, having little success in attracting doctoral students, may find it hard to justify to itself and to its administration the continuation of a program for which the cost per student seems exorbitant.

At New Mexico Institute of Mining and Technology, where I served as president (and taught a little physics) for the past seven years, the question of phasing out the physics Ph.D. program never arose. I concurred with the department that there was no reason even to think of it. Nevertheless, the anemic numbers--graduate student enrollment and Ph.D. production--in that department illustrate the problem that some departments have--even if they are good. New Mexico Tech's physics department has 13 faculty members and annual grant and contract expenditures of about \$1 million. This fall, the department will enroll one new graduate student. Last year, it enrolled six. Total graduate student enrollment in the department is ten. In five years, seven Ph. D's have been awarded. The trend, if any, is down, not up.