Tradition and change in physics graduate education

About 1400 physicists earned doctorates in the United States during the 1972–73 academic year, a number expected to decrease to about 800 to 900 within five years. Each year these graduates compete for about 400 to 500 US job openings that can lead to permanent positions in higher education or government agencies that have traditionally employed physicists. These basic facts generated five days of presentations and discussions of problems and possible solutions during the conference on tradition and change in physics graduate education held in August at Pennsylvania State University, sponsored by the Forum on Physics and Society and the committee on education of the American Physical Society and by the American Association of Physics Teachers.

The meeting had been designed to be small and informal, but instead of the expected fifty or sixty participants over 150 physicists came from industry, government, universities and colleges. Among them were department chairmen, post-docs, graduate students, leaders of industrial laboratories, physicists deeply involved in applied physics or engineering and retired and unemployed physicists. Informality and openness were preserved as the conference members examined the future of physics graduate education and of the physics community itself as it nears the end of a period of extraordinary growth. Occasional hot arguments and fierce debates never disrupted the meeting's sense of comradeship and community.

BRIAN SCHWARTZ

During a break between sessions of the conference, from left to right, are Martin Perl (Stanford Linear Accelerator Center), co-organizer, I. Richard Lapidus (Stevens Institute of Technology), Stanley Shepherd (Pennsylvania State University) and David Wolfe (University of New Mexico).

Three themes dominated the conference. The first was a thorough examination of the origin and extent of the long-range physics employment situation, a primary problem because the post-war high-technology industries—aerospace, nuclear physics, and electronics—needed more physicists in their formative years than they do now. The post-war demographic factors—high birth rate, sharp increase in the numbers of students going to college and the consequent rapid growth in physics faculties—are now causing severe employment problems for PhD's in many academic disciplines.

A second dominant theme was dispelling the myth that there exists a simple, single solution to the employment problem. It became clear that there are only many piecemeal solutions, many so-called "five and ten percent" solutions.

The third major activity at the conference was the proposal and examination of some "five and ten percent" solutions. There was nearly a consensus that physics graduate enrollments should not increase again. First-year graduate enrollment has decreased by about one-third. Departments have decreased the number of appointments, received fewer applications and reduced funds to support graduate students.

Many of the other "five and ten percent" solutions required that physics faculties as well as graduate students adjust to the reality that more than half of all new physics PhD's will have to build careers outside of traditional physics employment. Most emphasized greater diversity in graduate training with more attention to applied physics, interdisciplinary fields such as biophysics and public-interest physics, and classical physics.

Another solution proposed that older physicists, more secure economically and professionally, are best suited to move into the new fields and should become increasingly flexible and mobile. The openings in traditional areas would be left for younger physicists.

There was little doubt that each physics department offering graduate training would have to answer this question: Is physics a discipline to be limited only to the purest and most basic research, or is it a broad discipline encompassing many of the applications of physics? Clearly, the size of an economically secure physics community, the nature of physics graduate education in the future, and the counselling of students about career options depend on the answer to this question.

AAAS council retains sole right to elect fellows

The new constitution of the American Association for the Advancement of Science now assigns to its council the authority to elect fellows. APS fellows are no longer eligible for automatic election as AAAS fellows. Members of the APS who are interested in becoming fellows of the AAAS should contact the AAAS Executive Office, 1776 Massachusetts Avenue, N.W., Washington, D.C. 20036, for information concerning nomination and election procedures. □