AAAS Meeting Draws a Crowd

The annual meeting of the AAAS, held in San Francisco on 14 to 19 January, attracted the largest turnout for several years. More than 6000 are estimated to have attended. The meeting, which was held in conjunction with the winter meeting of the American Physical Society and the annual meeting of the American Association of Physics Teachers, was reminiscent in some respects of the big AAAS annual gatherings of the late 1960s and early 1970s—even down to the presence of demonstrators, this year from the animal rights movement. Some highlights of the more than 250 sessions:

Science's Public Persona

Although no single theme ran through the meeting, each of the three major evening speakers hit on topics that were evidently on the minds of many of the attendees—public attitudes toward science, how research and development will fare amid the scramble to cut the federal deficit, and the dismal state of scientific literacy in the nation.

Stanford president Donald Kennedy kicked the proceedings off with a keynote address that was at times feisty, at times lugubrious. Kennedy spoke of a paradox: "Despite the stunning successes of American science, it finds itself increasingly inhibited by negative public attitudes."

At the national level, he argued, the academic and scientific communities are increasingly viewed as "just another interest group." At the local level, activists and animal rightists have succeeded in delaying the construction of new scientific facilities in the San Francisco area, with campaigns that have involved "some of the worst science-bashing and fear-mongering of recent times," Kennedy opined. Then there is "a new and corrosive popular mistrust of scientists and their work," evident in responses to cases of alleged scientific misconduct—the "shameful" attack on David Baltimore, for example (*Science*, 24 June 1987, p. 1720).

Kennedy offered a few thoughts about fighting back. "We need a lot more stiffness in the face of the special political interests that are hostile to American science," he said. Scientists occasionally do battle with "the creationists, the right-to-life advocates . . . and the animal liberation crowd. But we don't give it much of our time unless we are especially threatened." And scientists often find it hard to oppose "those forces hostile to science that arise from sources with which many scientists are sympathetic—the environmental movement, for example," which contains groups that have opposed genetic engineerng. "If organized science entered the battle against all these forces with the same invigorated self-interest they annually bring to the appropriation cycle of the National Institutes of Health and the National Science Foundation, we would all be better off," said Kennedy.

Finally, Kennedy warned against the tendency to oversell science on utilitarian grounds, particularly the growing fad for touting research as the answer to the nation's flagging competitiveness. Such a pitch, he said, may sow the seeds of a backlash when research eventually fails to deliver the goods. It could also reinforce the "pernicious notion" that "if one appropriates research money geographically economic prosperity will distribute itself along with it," and "encourage our patrons to adopt a procurement model for research."

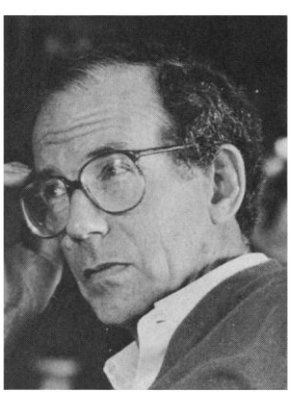
Instead, suggested Kennedy, "we should approach our patrons with some humility, and a grateful acknowledgement that they have made a society that can afford to subsidize discovery—not because it can make us richer or healthier but because it can make us better for knowing these wonderful and mysterious things."

Whether or not humility would help keep the funds flowing, the federal government is going to have a tough time in the next few years picking priorities among the myriad scientific projects competing for a share of the hard-pressed federal dollar. Frank Press, president of the National Academy of Sciences, took as the theme of his public lecture the difficulties facing federal support for R&D as the Administration and Congress struggle to get the deficit under control. In particular, he noted that there is no good mechanism for ensuring support for issues crucial to the health of the scientific enterprise that cut across agencies and disciplines—scientific training, for example.

Taking his cue from an Academy report released last month (*Science*, 23 December 1988, p. 1626), he called for the appointment of a science adviser with a high status in the White House and a strong advisory apparatus to assist him (or her). He urged the development of priorities in crosscutting areas early in the budget process. These would be flagged by the President, who would issue marching orders to individual science agencies, and they would be identified as separate items in the budget transmitted to Congress. Press also suggested that Congress itself should develop a mechanism for considering these requests as a whole, rather than dividing the science budget between 20 or so different subcommittees as it does now.

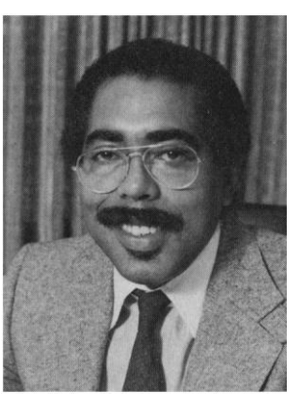
AAAS president Walter Massey, in a lecture the following day, focused on the lamentable state of science education and public understanding of science, which he suggested will be a serious problem for international competitiveness. Massey exhorted the scientific community itself to take the lead in seeking solutions, rather than simply wait for the federal government to do something.

The AAAS, he said, should ask its members to devote a certain number of hours each week in working with local schools, museums, and so on to improve the level of scientific education. Professional societies should ask their members in every college and university to double the number of



Donald Kennedy. *Warned against overselling the utilitarian potential of research, urged scientists to combat critics.*

Frank Press. *Suggested a mechanism for giving budget priority to key interdisciplinary scientific programs.*



Walter Massey. *Scientists themselves should take the lead in improving science education by working with local schools.*

minorities that earn Ph.D.'s in their disciplines, and the AAAS, together with the National Academies of Sciences and Engineering, should ask each funding agency to include in every research grant funds to enable undergraduates to participate in research-related projects.

"Perhaps the most important thing we can do to generate support for science is to show that we are doing our bit to address this national crisis in science education," Massey said. ■ COLIN NORMAN

"Oh, I Thought You Were a Man."

The woman who played a major role in the discovery of fission was once required to work in a converted carpenter's shop with a detached entrance, so as not to fluster her male colleagues. When the British physicist Ernest Rutherford met Lise Meitner (1878–1968) for the first time, he exclaimed with astonishment: "Oh, I thought you were a man." Meitner spent the rest of Rutherford's visit playing the role of hostess to Mrs. Rutherford.

And so it went. At a AAAS session on "the uneasy careers and intimate lives" of great women in science, the biographical sketches combined themes of frustration and genius and farce. For instance, Meitner's first lecture at the University of Berlin was entitled, "Problems of Cosmic Physics." A newspaper reporter at the time wrote that Meitner spoke on "Problems of Cosmetic Physics."

Perhaps it was fitting, then, that three of the five women profiled during the session were physicists, since, as Stephen Brush of the University of Maryland at College Park noted, women make up only 7% of employed physicists and astronomers, the lowest percentage of any of the sciences. Said Brush: "Physics seems especially repulsive to girls." Only half as many girls as boys take physics in high school, and only one quarter of all high school physics teachers are women, even though women comprise half of all high school teachers.

Though common themes run through their stories, the women profiled were all individuals. Meitner was shy and "almost timid," said Sallie Watkins of the University of Southern California. Others were painfully self-effacing. When Marie Goeppert Mayer (1906–1972), the winner of the Nobel Prize in physics for her elucidation of the structure of atomic nuclei, was offered a part-time job at Argonne National Laboratory in 1946, she replied: "But I don't know anything about nuclear physics."

Carnegie Institution of Washington

Nettie Stevens. *The first to observe that the X and Y chromosomes determine sex.*

Others were not so retiring. Dorothy Wrinch (1894–1976), the mathematician turned biologist who proposed a theory on protein structure, wanted to be "a woman Einstein" and "aspired to both professional and popular acclaim," said Pnina Geraldine Abir-Am of Harvard University. A vigorous suffragette, Wrinch confronted "men with an air of moral self-righteousness."

For all their differences, there were many striking similarities in their stories. The women seemed blessed by supportive parents, often a father who encouraged his daughter's interests and talents. Mayer, for example, came from a family of seven generations of professors. "She was said to have been told by her father that she should not grow up to be a woman, meaning a housewife," said Robert Sachs of the Fermi Institute at the University of Chicago.

The women also had mentors, a crucial ingredient in the rise of most famed scientists. For instance, Wrinch had Bertrand Russell. Meitner had Max Planck. Mayer had Max Born.

The women, too, faced a world that only grudgingly yielded to the aspirations of female scientists. Finding a paying job was a difficult feat. Cecilia Payne-Gaposchkin (1900–1979), the astrophysicist who showed that the atmospheres of stars are composed primarily of hydrogen and helium, found no opportunities for her in England. Indeed, during her undergraduate days at Cambridge University, Rutherford "gave her the distinct impression he wasn't interested in female students," said Peggy Aldrich Kidwell of the Smithsonian Institution. Payne-Gaposchkin went to Radcliffe and Harvard, where she held low-paying jobs until finally becoming one of Harvard's first woman professors in 1956.

Finally, the women struggled to get the credit they deserved for their work. Though no longer excluded, "women were being systematically and effectively marginalized in the world of education," said Watkins of Meitner, who for reasons that are still being debated, did not share with Otto Hahn the Nobel Prize for the discovery of fission.

Apparently, these days are not over. Brush notes that every biology textbook mentions that sex is determined in humans by the X and Y chromosomes. But few mention that the observation was made by Nettie Stevens (1861–1912) of Bryn Mawr College.

Women still face difficulties translating their contributions to positions of legitimate scientific authority, said Abir-Am. "Now, the key problem of women is no longer whether they can make great contributions but whether they can acquire the resources to preserve their scientific authority and thus protect their contributions from those to whom authority comes naturally in our culture, i.e. men." ■ WILLIAM BOOTH

A World of Megacities

Like "a gigantic Las Vegas," the largest cities in the world attract the "gamblers" of society, the young and the fecund who see in a huge metropolis not overcrowding and poverty, but hope and opportunity. And more and more, the cities of their dreams are no longer New York, London, or Paris, but Jakarta, Dacca, or Karachi.

By the year 2000, 17 of the 20 largest cities on Earth will be located in the Third World. All will support populations greater than 10 million persons, with São Paulo and Mexico City expected to exceed 25 million inhabitants. This is a world far different from the one in 1950, when the largest cities were located in the developed countries, and only New York, London, and Shanghai had populations greater than 10 million.

Not only are the locations of these "megacities" shifting from developed to developing nations, the pace and scale of growth are "beyond anything in human experience," said John Kasarda of the University of North Carolina in Chapel Hill at a AAAS session on the prospects and problems of giant cities. For instance, it took New York City some 150 years to reach a population of 8 million souls. It will take Mexico City only 15 years to add 8 million people to its existing population.

Yet despite the popular image of the destitute living in shantytowns and rummaging through the garbage dumps for their dinner, there is no consensus that megacities are all bad. Kasarda, for instance,