

# Gazette

A Newsletter of the Committee on the Status of Women in Physics of the American Physical Society

(In the August 1988 and March 1989 issues, the *Gazette* reported on the conference on the role of women in the development of science and technology in the Third World, which was held in October 1988 at the International Center for Theoretical Physics in Trieste, Italy. The following paper and response thereto will appear in the November-December issue of the *Newsletter* of the Association for Women in Mathematics, and are reprinted here with permission of (and thanks to) the authors and editor. While the paper may be a bit far from the *Gazette's* usual "women in physics" subject matter, it casts new light on the marked differences in the experiences and percentages of women in science in different countries. *Gazette* readers' reactions to this material are warmly welcomed.)

The editor for this issue is Jin-Joo Song; assistant editor is Amy Halsted.

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### REFLECTIONS ON FIRST AND THIRD WORLD RELATIONS: Dialogue between an English and an Argentine sister

by Caroline Series and Maria Losada, Mathematics Institute, Warwick University, Coventry CV4 7AL, England. Maria Losada is from Argentina. She did her first degree in mathematics in Buenos Aires. Subsequently she lived for several years among tribal people in the Amazonian part of Venezuela. She has traveled widely through a variety of ethnias in Latin America. For the past few years she has been living in England and the U.S.A. and has just completed a Ph.D. in mathematics at Warwick University under the supervision of Caroline Series (whose life, regrettably, has not been quite so interesting).

This dialogue was written after reading a report in the Kovalevskaia Fund *Newsletter* of November 1988 of the meeting of Third World women scientists which took place at the International Center for Theoretical Physics in Trieste, October 1988.

Most of the report was a factual account of the meeting, but two paragraphs about certain tensions that arose in the meeting particularly caught our attention. For several years we have been observing similar difficulties among women's groups here in Britain in which Latin or Third World women were participating. In some cases, tensions developed to such an extent that people actually left the group in question.

We have been discussing these problems for some years, and reading this report we realized for the first time that these tensions were not at all a local phenomenon, but a symptom of something global and very deep.

This dialogue is not in any way intended as a criticism of the report. We are simply using the two paragraphs in question as illustrative, because they coincide so precisely with the nature of the conflict that we have ourselves observed.

Here is the first paragraph of the two:

"As the week drew on, it became clear that there were several sources of tension and disagreement among participants. Some women appeared reluctant to acknowledge that any form of gender inequity existed in their countries; some explicitly stated that they had no problems that were not shared equally by male scientists. (For various reasons, this tendency was particularly noticeable among certain Latin American invitees.) These participants were inclined to prefer purely scientific reports and disparaged those talks which focused on women's access to scientific education or on the impact of science and technology on women's lives."

*Caroline:* Reading this paragraph, one feels that the writer is not allowing the possibility that those women who deny that gender inequity exists in their countries actually may be describing the true state of affairs. She seems to be making the assumption, all too easy for us in "advanced" societies to make, that the position of women in less "developed" societies must necessarily be inferior to that in our own. Is it not possible that there is at least some degree of truth in what these women are saying, that in at least some regards they do not experience the problems which are facing us in the developed world? It seems to me that it may be tremendously important to listen to these Latin women. Of course, a genuine and unprejudiced listening will be, due to our preconceptions, extremely difficult.

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The "CSWP GAZETTE," a quarterly newsletter of the American Physical Society Committee on the Status of Women in Physics (CSWP), is mailed free of charge to all women listed on the computerized "Roster of Women in Physics," all US physics department chairs, and others on request. Because editorial responsibility rotates among CSWP members, please address all correspondence to: "CSWP Gazette," The American Physical Society, 335 East 45 St., New York, NY 10017.

*Maria:* I have no doubt at all that some of the tensions arose because the Latin women felt that they were not being listened to. I myself very often experience the same thing. The feeling of not being listened to is solid, almost tangible. At different moments I hypothesize different causes for it: Is it that English is not our mother tongue? Perhaps our English sisters identify cultural respectability with high technology? At other moments I am convinced that there is a totally inexplicable prejudice against Catholics. Sometimes, I almost believe that it is simple racism. But whichever reason I believe at the time, when I enquire, I am systematically told that none

of the above is true: it must be my imagination.

*Caroline:* I think that there is some truth in all of the reasons you give, but none of them is the whole story. In the First World, there seems to be a deeply rooted sense of cultural superiority, and at best we do no more than pay lip service to the idea that other cultures may have something to teach us.

*Maria:* So often I have the sensation that our values are not taken seriously: our poetry and art, our sense of beauty, our spiritual world; our capacity to love and understand the values of different races, different cultures and to merge with them, our sense of opening to the world.

While I was living in Mexico I was visited by American friends, and I wanted so much to show them some beauties that exemplify the high degree of creativity of the people of that magical country. My friends could speak Spanish. They dodged true works of art in the same way you and I would dodge lamp posts: just to avoid colliding with them. Until then, I had not believed that truly educated people could be so near to so much art and beauty and yet see and hear nothing. When my friends returned to the U.S.A., they simply repeated their cliché that Mexico was a poor and backward country.

*Caroline:* I think that we in the First World need to look deeply inside ourselves and examine the roots of our prejudice. *Why* are we so convinced that people from other cultures are not worth taking seriously? Especially now that we seem to have brought the world to the verge of total disaster, we should open ourselves to listen to and to take seriously voices coming from outside our world.

*Maria:* It is only very recently that we Latins ourselves have begun to understand that our culture may have something to offer. Look again at the paragraph from the Trieste report. When I was young, indeed up to only ten years or so ago, these Latin American scientists would have never upheld such a position. The thoughts in their minds would have been more or less these:

"High technology and big industry are good for you. They improve the quality

of life. That is what makes the First World so civilized. The position of women in these developed countries *must* be far more advanced than in our own. They seem to have strong feminists with a high degree of consciousness. The latter are always telling us how oppressed we Latin women are, how oppressed Catholic women are, how macho are our menfolk. We are backward, behind these developed countries, but some day we will grow and catch up with them, if we follow their steps, and then the position of Latin American women will improve, for we Latins will have become truly civilized."

This tight package of interrelated and inseparable concepts, feminism&gender&civilization&technology, was particularly strong among the Academic Intelligentsia. It seemed to us Latin scientists that we could buy a ticket to First World respectability by putting down and devaluing our own family structures, our own traditions, our own religion, our own history, our own culture and folk.

Many of us had never been in a nonhispanic country, let alone in a First World one. Still, we knew that "they" surely *must* have it much better than "us."

That paradigmatic package of ideas is largely gone, even from our intelligentsia, *and this is precisely what the reporter of the Trieste conference is observing.* Times have changed. The whole idea of what a civilization is has dramatically changed.

*Caroline:* Our own culture is beginning to question its own values. It has lost its direction in many respects. Not only are relations between the sexes uncertain and confused, but our values seem to be measured only in terms of money and status. A combination of our scientific success and our greed has led us to the verge of destruction of the planet itself. Perhaps worst of all, we seem almost to have lost our sense of mystery and wonder. One could say that we are in danger of losing our very souls.

At the same time, you say that Latin women have just begun to realize that their culture offers alternatives to the "Western" model. We have actually forgotten that even today large popula-

tions in the world have completely different forms of social organizations to our own. Is it possible that, in particular, the more matriarchal societies have managed to avoid some of our problems?

*Maria:* In the heights of the Andes, millions of Indians belonging to one of the oldest civilizations on earth, have, for the past few years, been organizing themselves politically in order to resist "westernization," and in order to defend their ancient cultural structures. Many of their leaders are women, a logical consequence of the marked matriarchal character of many Andean cultural institutions. Simultaneously, fifteen thousand feet down from the Andes and thousands of miles eastwards, in the depths of one of the thickest jungles in the world, Amazonian tribes who have never even heard of Andean Indians began to do likewise. Perhaps a coincidence? But all these powerful changes are certainly connected with the changes in consciousness in Latin cultures.

Particularly strong are the changes in consciousness having to do with sex-and-gender matters: we Latin women are, on the whole, (of course, there are always problems) *happy* with our position as women in our societies. We do not view ourselves as playing an inferior role in our societies. Many First World sisters, on the contrary, do seem to have such a view of themselves: they experience being a woman as a problem. But for them to make a construction of reality in which Latin American women *also have the same problem* (and actually try to convince us that we have it even worse than them!) is quite wrong.

*Caroline:* There is another example of our preconceptions in the second paragraph from the report:

"Unfortunately, conference participants were unable to agree on the formation of a Third World Association for Women Scientists. Many women seem to fear that such an organization would be viewed negatively by their male colleagues. They held that they wanted "to be judged as scientists, not as women," and they were unimpressed by the argument of some participants that women's organizations are necessary in all spheres of activity in order to protect women against discrimination and marginalization."

Why are we so hasty to interpret the reluctance of women to form an organization of Third World women scientists as fear? This very same point has arisen in our mathematical meetings, and I believe that it had nothing to do with fear.

*Maria:* Precisely. In Latin society, the sexes do not find themselves alienated and in confrontation with each other. In anthropological terms, gender complementarity works. And nobody wants to destroy it.

This is not to say that networks of women do not exist. On the contrary, networks of women are deeply and traditionally rooted in the culture. These are, to this very day and age, often based on very extended networks of matrilineal bloodlines, that is, on a large group of women descended from a common ancestress, often several generations removed. Men marry into this group. For example, my father's closest ties with other males are not with his own blood relatives, but with the husbands of his wife's sisters. A man has his deep sense of identity connected with these extended family ties much more than with any peer group of males or females, formed via his job or his friends. In other words, a man obtains his sense of identity from these family networks (*strongly centered on women!*) rather than from his job. Hence, women feel themselves at the very core of the life of their society, and are, therefore, very reluctant to upset the existing gender patterns. *An indispensable feature of these patterns is the nonexclusion of men.* This is the source of the reluctance that was interpreted as fear.

*Caroline and Maria* (separately, not in chorus!): With the development of industrialization the nuclear family emerges in such a degree that it gradually takes over from extended family networks, which finally disappear. This can be observed very clearly in England. Discussing her book *Sex and Destiny*, Germaine Greer pointed out this very fact saying that *Home*, as the main seat of the cultural and social sphere in people's lives, is now gone from our modern culture, that life doesn't take place at home any more. And that, therefore, modern women need to go out of the house in order to re-enter social and cultural life.

From this, and the fact that kinship networks cannot be improvised (for it takes centuries to form them), we have to conclude that forming peer groups is all that is left to English women.

In First World societies men bond in peer groups, which even when not exclusive are usually male-dominated. Women do not bond. This is why forming the corresponding female peer groups is so very important.

The message that we would like to send out is this. There is more than one paradigm structuring gender and power in this world. The Latin world has one; the First World, another. Neither is perfect, but we believe that the Latin one has much to offer.

The sooner the First World sisters come to terms with these facts, the sooner we will be able to establish a dialogue as women and will be able to begin to work together in the arduous task of constructing a better world.

*Postscript:* This paper was taken as a discussion topic at the European Women in Mathematics Conference in Warwick, December 1988. In the brief report of the meeting (written by two Scandinavian women), it was singled out as "the most animated discussion" of the whole meeting. There were positive responses from almost every quarter. The Latin women felt very excited because it crystallized hitherto unarticulated aspects of their cultural structures.

## REPLY TO CAROLINE SERIES AND MARIA LOSADA

by Ann Hibner Koblitz, History Department, Hartwick College, Oneonta, NY 13820

Caroline Series and Maria Losada are certainly correct in their observation that what they call "First and Third World relations" are often tainted by the condescension and sometimes outright racism evinced by some feminists from the richer countries of Europe and North America. However, I think they have grabbed the wrong end of the stick in their interpretation of my conference report in the Kovalevskaja Fund *Newsletter* and are mistaken from several points of view.

First, the Trieste conference, as I emphasized in my report, was a meeting

organized by and for Third World women scientists; the extremely small number of European and North American participants were there as observers and by and large did not take part in the discussions and debates I described. No one was putting forward the notion that the condition of women scientists in Europe and North America was to be the yardstick by which the accomplishments of Latin American women were to be measured; no one was claiming that the position of women in Third World countries was always worse than in the U.S. The Latin American women were talking not with First World but with Third World sisters—women from India, Pakistan, Thailand, Nigeria, Kenya, etc. It was to these women that they were protesting their lack of problems, and it was from these women that I heard expressions of disbelief. The context of the discussion was therefore far different from what Series and Losada assume to have been the case.

Moreover, I find puzzling Losada's and Series' conviction that criticisms of the position of women in Latin American society always come from outside and are therefore essentially racist. Are Series and Losada seriously claiming that descriptions of gender inequality in Latin America have been imposed by North American feminists? Are they truly unaware of the large and growing feminist movements (both in academia and in the population as a whole) in countries from Mexico to Argentina, from Peru to Brazil? Losada's rhapsodizing about matrilineal networks and the absence of alienation or confrontation in sex relations in Latin society certainly runs parallel to the categorical statement of one Brazilian woman scientist in Trieste: "In Brazil, women have no problems; we have complete equality." But both statements are at best naive, and at worst disingenuous. The sufferings of Brazilian women at the hands of a judicial system that condones widespread rape and conjugal mutilation are well known to the world through the writings of Brazilian women themselves. Well known also is the fact that in many parts of Central and South America, between one-third and two-fifths of the households are headed by women, in most cases because the man abandoned his female companion to start another, younger family.

I receive regularly several Spanish-

language publications chronicling the experiences of women in Latin American society, and I have extensive contact with women's rights activists in several countries south of the Rio Grande. Sometimes, the situation of Latin American women is better than that of their North American sisters (for example, their proportion in some scientific and technical fields is higher than in the U.S., and female support networks, as noted by Losada, are often stronger); sometimes, it is as bad or worse (abortion, divorce, and rape legislation, for instance). Both societies have tensions and difficulties; each can assuredly learn from the other. But just as it is foolish for North American feminists to set themselves up as superior in consciousness or achievement to their southern neighbors, so also would it be foolish for Latin American women to claim some sort of idyllic immunity from problems in gender relations. And indeed, generally speaking, Latin American women do not close their eyes to the instances of gender equality and injustice in their societies.\* That, in fact, is why I found the attitude of the Latin American women scientists at the Trieste conference so worthy of remark, and why I find many of Losada's and Series' comments so distressing and one-sided.

The Kovalevskaia Fund *Newsletter* attempts to report on activities in support of Third World scientists in as straightforward a manner as possible, free of sentimentality, wishful thinking, or condescension. We are concerned with realistic programs to help improve the situation, and we are skeptical of sweeping theoretical generalizations. Nor do we think that it would be useful to censor from our pages any mention of difficult and sensitive issues—such as divisions of opinion among Third World women concerning women in science groups. In fact, discussions of such matters are necessary. The success or failure of Kovalevskaia Fund projects depends in part on just such a realistic appraisal of the conditions and attitudes in the countries where we are attempting to play a role in support of women scientists.

Any discussion of gender, power, and culture is fraught with difficulties (and indeed cannot hope to achieve completeness without cognizance of the role played by race and class as well).

Our aim, I think, should be to acknowledge complexity, and avoid leaping to conclusions based on facile generalizations.

\*Material on this topic is extensive. See, for example, reports in *La Mujer en la Ciencia, la Tecnología y la Medicina* (Seattle: Kovalevskaia Fund, 1988); *Quehaceres* (feminist monthly published in the Dominican Republic); *Frontlines of Feminism* (video from Nicaragua, available from the Kovalevskaia Fund); *Mujer-Fempres*, Special Issue Against Violence, 25 November 1988 (contains articles by women from Colombia, Brazil, Argentina, Peru, and other countries of Central and South America, published by FEMPRESS of Santiago, Chile); publications of the Centro de Estudios de la Mujer (Buenos Aires, Argentina); *Tejiendo Nuestra Red* (publication of the Women of the Adult Education Council of Latin America, based in Quito, Ecuador).

## BOOK REVIEW

(This review appeared originally in the February/March 1989 issue of the *MIT Technology Review*. Look for a CSWP generated review of *Beamtimes and Lifetimes* in a future issue of the *Gazette*.)

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### ***Beamtimes and Lifetimes* by Sharon Traweek Harvard University Press**

Reviewed by Michael Riordan

Having exhausted the supply of primitive cultures, anthropologists have recently turned to the study of the much more developed societies and subcultures in our midst. "Repatriated" anthropology, as it is called, seeks to uncover the unwritten assumptions, traditions, and social organization of groups in modern society—whether a religious community, a corporation, or even a collection of scientists.

One such scientific community is the subject of *Beamtimes and Lifetimes: The World of High-Energy Physicists*, by Sharon Traweek of Rice University. Traweek has been observing physicists since the early 1970s, when she served as a public information officer at the Stanford Linear Accelerator Center (SLAC) in California (where I have worked for several years). Besides

SLAC, her formal fieldwork has taken her to such outposts as the Fermi National Accelerator Laboratory near Chicago and Japan's National Laboratory for High-Energy Physics (KEK).

Historians and sociologists have been studying the high-energy physics community for years, but—speaking as a member of the “tribe” Traweek examines—I think her anthropological perspective offers fresh insights. In particular, her focus on the day-to-day interactions among physicists sheds light on the social rituals and relationships that shape scientific discovery.

### **Moral Tales and Intermarriage**

The world of high-energy physics is not a single, uniform entity. It encompasses about 10 distinct communities, centered upon the major particle accelerators and colliders in Europe, Asia, and North America. The natives spend much of their time on jets or trains, speeding between universities and the research centers or traveling to and from capital cities, where the funds for this expensive branch of science are disbursed. Although such activities promote homogeneity, distinct subcultures manage to spring up at these far-flung laboratories.

For her study, Traweek chose to concentrate on SLAC, the subculture she knows best. Organized in the early 1960s, this highly successful national laboratory sports strong in-house groups with powerful, outspoken leaders jealously guarding their fiefs. These teams build and maintain the enormous particle detectors necessary to observe phenomena in the subatomic realm. User groups from outside universities wishing to employ these research facilities generally have to strike up alliances with SLAC group leaders. So massive and complex is the equipment that only the in-house scientists understand its every nuance.

The coin of this realm is “beamtime”—access to SLAC's high-energy particle beams. This scarce resource is doled out by the all-powerful lab director at periodic meetings of his Program Advisory Committee. Success in this competitive hierarchy, observes Traweek, is largely determined by the quality of one's ideas and the sensitivity of a group's particle detector. Only by com-

bing these resources to obtain beamtime can high-energy physicists hope to make the important discoveries that will enhance their reputations and careers.

In describing the physical setting at SLAC, the complex detectors, and the theoretical ideas that guide experimental work, Traweek's treatment is uneven. Eloquent passages give way to statements that are misleading or just plain wrong. She is at her best, however, in discerning the educational practices and odd social customs of the natives. How does a fledgling graduate student or beginning postdoc come to see himself (or, rarely, herself) as a practicing scientist and attain full membership in this daunting community?

Having endured the lengthy rite of passage myself over a decade ago, I found Traweek's third chapter—“Pilgrim's Progress: Male Tales Told During a Life in Physics”—to be particularly astute. The journey begins, she notes, with “moral tales” told to the neophytes about the objectivity, meticulousness, and long hours of hard work required in their chosen profession. They are cautioned to put aside more “frivolous” concerns that may detract from the precious time they have to spend on physics.

At the postdoctoral level, the apprentices must cultivate self-assertiveness and independence if they are to survive and find a permanent position in high-energy physics. They have to leave textbooks behind and learn how to tap into the vast reservoir of oral information—the “gossip” exchanged daily by peers and superiors. From this, observes Traweek, “the young physicists learn the significance of the lifetimes of detectors, research groups, laboratories, careers, and ideas.” Anxiety over the passage of time—and fear of obsolescence—in these five areas becomes an important driving force in their lives.

Here they also begin to establish the networks of colleagues whose support will be important for future success. In a field where a hundred scientists can be required to mount a major experiment, this network building is crucial. One of the ways these links are forged, notes Traweek, is by a kind of intermarriage. The group leaders find their best grad students and postdocs jobs with

their allies, expecting these colleagues to return the favor one day. Such exchanges cement the alliances between groups and extend the power of the leaders.

Although the main focus of *Beamtimes and Lifetimes* is the subculture of SLAC, the author has sharpened her perspective by studying the customs of KEK in Japan, where she found far more cooperation among physicists and more interest in the common goals of the group. One's entrance to an experimental group comes at the end of graduate school, and membership lasts for life. Rather than pitting his postdocs one against another, as Traweek claims is the case in the United States, the Japanese group leader plays “a generative nurturing role” in their personal and professional lives.

### **The Cooperative Edge**

Although Traweek doesn't pursue the point, her cross-cultural study provides useful insights into the present difficulties of U.S. high-energy physics. During the 1970s, when she did her core research for this book, our country was the unquestioned world leader in the field. The competitive instincts fostered by their adversarial culture enabled U.S. physicists to reach the experimental frontiers far more quickly than their European or Japanese counterparts, who until recently had to be content with performing the thorough, detailed studies that confirmed the startling U.S. discoveries. One has only to read the roster of postwar Nobel prizewinners in physics to recognize how lopsided things have been.

During the 1980s, however, the Europeans have pulled even, and the Japanese are making impressive gains. U.S. physicists have done a great deal of soul-searching to discern why. Most lay the blame at the foot of the federal government, whose support of high-energy physics has fallen in real terms since its 1970 peak. But Traweek's thought-provoking book makes me wonder whether the more cooperative scientific cultures of our European and Asian partners are finally beginning to bear fruit.

On the other hand, Traweek's concentration upon SLAC to the virtual exclusion of other U.S. laboratories and

university groups may exaggerate the adversarial nature of U.S. physics. SLAC is one of the most competitive—and most successful—centers for high-energy physics in the entire world. More cooperative subcultures exist—for example, at MIT or Fermilab. Thus, her observations may hold true only for the SLAC subculture she has examined so closely.

Despite these shortcomings, *Beam-times and Lifetimes* is a groundbreaking work about how modern science functions. As the only anthropologist studying high-energy physics, Traweek brings a unique and valuable perspective to the study of this curious and important community.

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MICHAEL RIORDAN is a physicist at the Stanford Linear Accelerator Center. He recently received the 1988 Science-Writing Award in Physics and Astronomy from the American Institute of Physics for his book *The Hunting of the Quark* (Simon and Schuster, 1987).

## HONORS, AWARDS, OPPORTUNITIES

Are you an outstanding woman graduate student in physics? Then consider applying for the Luise Mayer-Schutzmeister Award. Request an application from Professor Gerald Hardie, Physics Department, Western Michigan University, Kalamazoo, MI 49008-5151. The award consists of \$500. Applications, transcripts, and letters of recommendation must be received by Professor Hardie by 17 January 1990.

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Oklahoma State University (OSU) has been selected by the U.S. Department of Education as a center for graduate research in optical materials and lasers. Fellowships are available which carry a stipend of \$12,050 each year, remission of all tuition and fees, and an allowance to attend scientific conferences. For information write to the Graduate Admissions Committee, Dept. of Physics, Oklahoma State University, Stillwater, OK 74078. Information regarding research opportunities can be obtained from the committee, or from physics faculty members at OSU. Deadline for application is 1 February 1990.

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Former CSWP Chair Mary K. Gaillard of the University of California at Berkeley has been elected to the Executive Committee of the APS Division of Particles and Fields, effective 1 January 1990.

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Caroline Herzenberg, 1989 president of the Association of Women in Science and a physicist at Argonne National Laboratory, has been inducted into the Chicago Women's Hall of Fame. Nominations come from women's organizations and others, and final selection is made by the Chicago Commission on Women, based upon outstanding leadership and on professional and volunteer contributions.

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Hurry and apply for the SDE Fellowships from Sigma Delta Epsilon Graduate Women in Science. The deadline is 1 December 1989. These fellowships are open to applicants in all the natural sciences (physical, environmental, mathematical, computer, and life sciences) at graduate or postdoc level. The SDE Fellowships are for research or research support broadly defined, not for tuition or scholarship support. Applications are available from university and college grant offices, or from Graduate Women in Science, P.O. Box 4748, Ithaca, NY 14852.

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Margaret W. Rossiter, History of Science professor at Cornell University, author of "Women Scientists in America," and recent recipient of a MacArthur Fellowship, will deliver a plenary lecture at the AAAS meeting in New Orleans on Saturday 17 February at 1 PM.

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The American Association of University Women (AAUW) offers a rich assortment of sizable grants and fellowships, too many to summarize here. Request flyers on both fellowships and grants from the AAUW Educational Foundation, 2401 Virginia Avenue, NW, Washington, D.C. 20037.

## "WOMEN RETURNERS" PROGRAM IN THE U.K. DEEMED A SUCCESS

The difficulty encountered by women attempting to return to physics after time off to have children has long been

of concern to the CSWP. At the January 1988 Joint Meeting of the APS and the AAPT, the CSWP organized a symposium entitled "Career Reentry/Retraining: Opportunities for the Midlife Physicist in Transition" (see report in the *Gazette*, May 1988).

An innovative and highly successful program has been developed in the United Kingdom, to deal with the problems these women face and to ease their transition back into full-time employment in science. Entitled "Fellowship Scheme for Women Returners to Science and Engineering," the program is coordinated by Daphne F. Jackson, professor and chair of the Physics Department at the University of Surrey. The program is funded by a consortium of industry and charitable bodies and institutions, including the U.K.'s Institute of Physics.

To participate in the program, a woman returner first contacts the program coordinator, and supplies a CV, any employment ideas she may have, and a list of geographically convenient universities. The program places women in the physical and biological sciences, with an emphasis on information technology, biotechnology and application in industry. The coordinator contacts the university departments on her behalf, and a rigorous interview of the applicant is conducted. If the applicant and institution accept one another, together they design the applicant's retraining program. In most cases applicants are placed at a university and in a research area that receives support from one of the program's industry sponsors.

The fellowships are part-time and last for two to three years. Fellows are provided with two integrated types of support: (1) new training or retraining in recent experimental, theoretical, or computational research techniques; and (2) application of those techniques to a research project of interest to the academic department and the sponsor. The fellows also may have teaching or lecturing opportunities.

In theory, women returners could locate and arrange such positions without the coordinator's help, and surely some do. But many others lack the confidence and/or current knowledge of university specialties and application procedures. The coordinator helps the applicant to

recognize her skills and to clarify objectives. This important first step even has helped some women who were not accepted into the program to find positions on their own.

Since the program began in 1986, 150 applications have been received. Sixty percent of the applicants have a graduate degree and one-third have experience in industry. Twenty-seven fellowships have been awarded so far.

Despite initial anxieties and some inevitable difficulties, holders of the returners fellowships are making a success of their retraining. Those who had been long away from science or whose retraining was in a relatively new field found the transition particularly challenging, but many commented on the generous and valuable support of their colleagues, departments, and families. The program is young, but a profile from December 1988 indicated that three of the returners already had made the transition to full-time employment and more were expected to do so in 1989.

While the success of the individual fellowship holders is gratifying, the long-term success of the program depends on its ability to change attitudes about employment of part-timers and of older individuals. For more information about this program, including extensive commentary from the women who are participating, see page 25 of the May 1989 issue of the journal *Physics World*, or request a profile from the program coordinator, Professor Daphne Jackson, Physics Department, Surrey University, Guildford GU2 5XH, United Kingdom.

### WORKSHOP ON WARMING UP THE "CHILLY CLIMATE"

An unusual workshop was held for teaching assistants (TA's) and all entering graduate students in the Department of Physics and Astronomy at the University of Rochester this fall. The TA's received an outline of basic classroom techniques in areas such as preparation, spoken communication, encouragement and response to ques-

tions, use of the blackboard, lab and course content, and student interaction. What made the workshop unique was that considerable time was devoted to how teaching techniques and attitudes can encourage or discourage women, and other nontraditional students.

The workshop was organized by Arie Bodek and Priscilla Auchincloss of the University of Rochester Physics and Astronomy Department faculty. It was brought to the CSWP's attention by committee member Robert Knox of the University of Rochester who supplied material from it to the committee and to the *Gazette*.

Because there were no women among the 28 entering physics TA's, eight advanced women graduate students from physics and other departments were invited to participate in the workshop, to lend a balance and to verify some of the situations described. The workshop began with broad observations about the "chilly climate" as it has been called, for women in the physics classroom. It was observed that while women typically

## Inaugural Reception

*Tuesday, January 23; 5:00-7:00 p.m.*

*Sponsored by the AAPT Committee on Women in Physics*

AAPT's Committee on Women in Physics would like to honor incoming AAPT President Judy Franz and all female past presidents of AAPT and APS: Janet Guernsey, Melba Phillips, Mildred Dresselhaus, and Chien Shiung Wu. Please join us in this celebration at the Science and Technology Museum which is located within walking distance of the Atlanta Hilton. The museum exhibits will be open during the reception so that you might take advantage of this time to enjoy some of the exhibits.

**Registration:** Space is limited, so please register by using the registration form below. The registration fee will cover hors d'oeuvres, drinks, and the museum admission. Partial funding of the reception will be met by corporate sponsors.

The Committee on Women in Physics also wishes to hear from physicists whose careers were affected by these five women. Please send your letter to Mary Fehrs, Department of Physics, Pacific University, Forest Grove, OR 97116.

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*Please return this form including payment either with your meeting registration or separately before January 10, 1990, to the AAPT Executive Office, 5112 Berwyn Road, College Park, MD 20740.*

*Each ticket is \$10. Make check payable to AAPT.*

I am enclosing \_\_\_\_\_ for a total of \_\_\_\_\_ tickets (\$10 each).

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compose a significant fraction of introductory undergraduate classes, this is not so in upper-level physics. Part of the evident loss of interest and confidence can be attributed to the "chilly climate" factor. The workshop discussion covered the interaction of stereotyping with the capacity of human beings (particularly students) to fulfill expectations, whether these are actually stated or simply perceived.

The next portion of the workshop dealt with micro-inequities, or discriminatory behaviors that are so subtle that neither person in an interaction is conscious of them. Among the examples cited were excluding someone from a conversation by lack of eye contact or by using overly technical language, and instances of offering (or not offering) help inappropriately. The micro-inequities were countered with suggested alternative behaviors. Finally, the workshop presented several composite, hypothetical situations of negative TA-student interaction, and invited discussion on possible alternatives.

Overall, the workshop stressed two points: (1) treating all students equally, be they female, handicapped, foreign, minority, male, or a nonphysics major; and (2) making all students feel confident, competent, and included.

Bodek and Auchincloss report that response to the workshop was emphatically positive, discussions were lively, and attitudes were questioned and modified. The presence of women participants was essential. The TA's evaluated the workshop on a questionnaire, and their comments and suggestions will be incorporated when the workshop is presented next year.

Auchincloss said that the hypothetical situations were seen as too obvious by some participants, so next year the cases will be drawn directly from real experiences. It was felt that realistic subtlety in the cases would promote a more balanced discussion, for example a case of unfair labeling of a man as sexist. Another possibility for making the situations more realistic would be to use live or videotaped actors to portray them, or to engage the workshop participants in role-playing.

One of the most gratifying results of the workshop is that graduate women in computer science and geology at the University of Rochester are considering proposing similar "climate" workshops in their own departments. The workshop materials form an excellent basis for development of similar programs for TA's and faculty in other institutions. They make thought-

provoking reading too. For a complete set of the workshop materials, write to Amy Halsted at the American Physical Society.

### **"WOMEN IN SCIENCE" VIDEOTAPE OFFERED**

At its meeting on 6 October 1989, the CSWP viewed a 10-minute videotape entitled "Women in Science," produced by IBM Corporation at the Thomas J. Watson Research Center in Yorktown Heights, New York. The tape features informal interviews with a number of women scientists, including several physicists. The women respond to questions about what led them to their science careers, what they do and what they enjoy about it, and how they combine their careers with having a family. The CWSP found "Women in Science" to be of high quality and useful in attracting and inspiring young women toward a career in science.

Single copies of the videotape can be borrowed at no charge from IBM. The tape is not copyrighted and may be copied freely, but IBM asks that the original tape be returned. To request a tape, write to: Andrea Minoff, IBM, Thomas J. Watson Research Center, P.O. Box 218, Yorktown Heights, NY 10598. Telephone: (914) 945-3167.

**The American Physical Society  
335 East 45th Street  
New York, New York 10017**

