LETTERS

A New Challenge from the Creationists

I am writing as the results of the Kansas primary election are in. There was a light voter turnout, and as feared two of the pro-science incumbents lost. We are clearly headed back toward significant power in the hands of those with a religious agenda against science. Just as when the earlier batch were elected, the electorate was asleep in the absence of an overt emergency, and woke up after the damage was done.

There is a contested race in one district: L. D. Anstine of Hutchinson, Kansas has taken a pro-science position. Persons with an interest in this issue should watch the outcome of this race in the November elections.

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A Reaction to a Reading of Jeff Schmidt's "Disciplined Minds"

The politics of professional work, which is the subject of Jeff Schmidt's book entitled "Disciplined Minds" belongs squarely in the agenda of the *Forum on Physics and Society.* In addition, much of Schmidt's discussion, and especially his pain, gives an eerie sense of *deja vu* to anybody who has read women's complaints about the professional world of physics.

Schmidt's basic thesis is that professionals work in the context of political agendas (...no debate from me on that...) and that professionals' training is designed to weed out those who do not possess the requisite compliance, obedience, submissiveness, etc, that will be demanded of them in their professional lives (...I have serious doubts about the validity of such an extrapolation...). He even makes the argument that political, as opposed to technical, criteria are primarily what determine the form of the certification barriers variously called qualifying exams, prelims, orals, etc.

I must admit that much of the anger and agony that saturates Schmidt's pages reminds me of the horrible feelings I sometimes had as a graduate student and post-doc. It is natural for people who are established in their professions to forget about what it was like to be in a very vulnerable and insecure position. To me, Schmidt's book read like it was from someone who never found a niche [although it might be more proper to say that Schmidt rejects the moral validity of most such available niches] and who feels the need to tell the world what hell goes on at the bottom of the food chain.

I have very little argument with Schmidt's viewpoint that professionals'activities are, in probably most cases, dictated by political forces. However, my interpretation of the significance of this is quite different from his. In particular, I don't think that professionals are, or even should be, somehow excused from or exempt from the omnipresent political nature of the life of *homo sapiens*. I believe that it is a naive, and ultimately false, assumption or hope that the work of science is supposed to be carried out primarily within a context of "Love of Truth and Beauty". Put bluntly: Why should any scientist think that he or she, by virtue of merely loving science, should be

consequently insulated from the nastier characteristics of existence of all other human beings, including competition, manipulation, domination, lying, betrayal, theft, intimidation, degradation...(I guess that's enough of a list for now...you get the idea...)?

Of course, one can reasonably ask, "Might it be possible to create a culture within science that is relatively free of such nastiness?" I think that the answer is probably "No" because science is just another tool of our species for survival. Insofar as tools resulting from scientific work lead to the accumulation of power, wealth, and other forms of "biological free energy", science is not exempt from, but rather is very much a part of, the processes of natural selection. Therefore, all the competition, manipulation, domination, struggle, etc, that is found in the world of science, whether it be in the life of a graduate student struggling to pass quals, or an assistant professor struggling to gain tenure, or an industrial scientist trying to avoid layoff, is a natural part of existence within the biosphere. Put simply: Scientists, too, are subject to the brutal forces of natural selection because scientists are living things. Schmidt's apparent belief that scientific activity should be motivated primarily by the love of ideas and/or a burning curiosity does not take this biological fact of scientists' existence into account.

One immediately practical aspect of these discussions concerns many women's complaints about males' behaviors in the professional physics world. Almost every time I read a narrative from a woman scientist about bad or insensitive treatment at the hands of a male scientist, I am reminded that I, too, was so mistreated (or at least felt uncomfortable) at some point in my working life as a scientist, or else I know of another man who was so (or much worse) mistreated. This is a *very* important consideration because probably no policy changes anywhere can eliminate the political nature of humans' relations with each other. As far as women's professional lives are concerned, although we might try to distinguish between brutalities and injustices that happen to anybody vs. those that happen to women specifically, I seriously doubt that making such distinctions is easy, or even possible in many cases. The sad truth is that sexual discrimination in science will be *passe* when women scientists, too, can compete, brutalize, manipulate, and dominate scientists with the same frequency and gusto as their male counterparts. (It will be like the Virginia Slims commercial used to say, "You've come a long way, baby...").

I realize that the viewpoint that I take above is not pretty, and even perhaps less pretty than that taken by Jeff Schmidt. However, I think it more accurately describes the possibilities (and realities) of professional life, and it hopefully is useful in the ongoing struggle to improve science by making participation in the professions of science more inclusive.

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Women in Physics and Scientific Literacy

Meg Urry presents a fine account of the recent International Conference on Women in Physics (*P&S* July 2002, pp. 11-13). That conference covered many important topics bearing on the deplorable dearth of women in physics, but it left out one crucial item. That item is scientific literacy for all citizens around the world. Despite the importance of this topic for women in physics and for the scientific development of all nations, I have found that it is nearly ignored at international physics education meetings, and indeed at most meetings in the United States. Yet the American Association for the Advancement of Science has stated in no uncertain terms, in its study

Science for All Americans, that "The life-enhancing potential of science and technology cannot be realized unless the public in general comes to understand science, mathematics, and technology and to acquire scientific habits of mind; without a scientifically literate population, the outlook for a better world is not promising."

Urry's article does, in fact, mention this topic when she states in her introductory paragraph that "a more scientifically literate public, one that includes girls and women educated in physics, will lead to more public support of science." But her subsequent report on the meeting itself ignores this topic, presumably because the meeting ignored this topic.

Well-taught high school and college physics courses aimed at scientific literacy for non-scientists would help increase the interest and participation of women in physics. Such courses can attract women by showing non-scientists that physics is comprehensible and relevant to their lives. Humanely taught courses for non-scientists can gradually replace today's image of an inherently masculine physics that has often worked to dominate or conquer nature.

Physics courses that are relevant to the needs of our times--as all science literacy courses should be--will include physics-related societal topics such as global warming, the methods of science, pseudoscience, and technological risk. In my 25 years of experience in developing and teaching a large-lecture course of this type, I have found that women are particularly attuned to such human-centered topics. If more courses of this sort were taught around the world, women and men alike would discover that physics is an interesting, relevant and humane profession.

Unfortunately, many U.S. physics departments teach nothing for non-scientists, most non-scientists' courses are small, and such courses have a priority lagging far behind courses for majors and other scientists. The situation is even worse in other nations. Attendance at many international meetings has taught me that scientific literacy is even more ignored around the world than it is in the United States. Few nations teach physics courses directed at the non-scientific majority of their citizens, at either the secondary-school or university level. Instead, physics education is directed nearly uniformly at future scientists. This narrow focus of the international physics education community is an important contributor to the dearth of women in physics.

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