Letters

Sexism and Hypocrisy

The appalling meeting of primatologists at the University of California at Santa Cruz (UCSC) (News & Comment, 28 Sept., p. 1494) was a topic of conversation all over the Santa Cruz area for months before it happened, not only because of the breathtaking audacity of holding a scientific conference that barred male scientists, but because UCSC was knowingly sanctioning a meeting that could violate both state and federal antidiscrimination laws, and was getting away with it. Equally astonishing was the fact that male scientists let it happen without so much as a before-the-fact whimper. There were plans to bar male journalists from the meeting as well.

Imagine the publicity and outcry that would result if a group of male researchers decided to hold a meeting on, say, prostate surgery or male impotence and barred women because "it had to do with male life histories." Imagine that they decided to forbid women science writers. Imagine two of the men making a statement that matched for sexism and silliness the statements of Adrienne Zihlman and Mary Ellen Morbeck that they had accomplished far more at their meeting because they were spared "male posturing and filibustering."

Sexism and hypocrisy at universities? Imagine that.

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Science covers many scientific controversies; how many have included a cartoon caricaturing one side of the debate as immature? The coverage of the recent all-female primatology conference at the University of California at Santa Cruz (UCSC) seems to illustrate the phenomenon about which Adrienne Zihlman and Mary Ellen Morbeck were concerned.

Women scientists have certainly played a major role in the development of naturalistic studies of primate behavior and ecology, a subset of "primatology" in which I suspect the ratio of females to males is at least 50:50 (as a graduate student I was once introduced to a class of Harvard undergrads in order to demonstrate that there are some men in the field). However, the issue is not really whether the conference was a biased sample of the field, as much as whether such a bias represents discrimination. My own opinion is that as a one-time event, which essentially was testing an hypothesis (that women can get more done without men around), the answer is no. Only if such conferences become regular, and the attendants start discussing jobs and grants (you know, an "old boy network"), do we XY types need to cry "foul."

Meantime, the test of the hypothesis will be in the publications that result, which all will have access to. The burden of proof is now on the organizers.

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The Future of Universities

I would like to call attention to errors and inadequacies in a recent, widely distributed report, "Science and technology in the academic enterprise: Status, trends and issues" (*1*). The appearance of this discussion paper is timely; one might hope for suggestions for improving the quality of research and education at universities. Instead, the emphasis is bureaucratic. The report suggests that all the "historic decisions" were made by federal "policy makers." After World War II, it states, "the federal government assumed primary responsibility for the quantity and quality of basic research in the United States," which "meant that U.S. basic research and graduate education would be carried out as joint university activities." No mention is made of the possibility that the idea of combining research and teaching at universities might have come from Germany and might have been developed in the United States before World War I at such universities as Johns Hopkins, Harvard, and Chicago.

The report calls for "appropriate output measures" for "productivity per investigator." Does this mean time and motion studies for labs? The report states, with no supportive evidence, that maintaining the preeminence of the academic research enterprise will necessitate reconsidering the major premises of the enterprise, but it does not specify those premises.

The second part of the report presents a mass of data provided by the Division of Policy Research and Analysis of the National Science Foundation. The emphasis is on dollar inputs rather than quality outputs. All doctoral institutions are listed together, as may be appropriate for government purposes, but such listing is hardly informative about the role of research universities. Some of the carefully described changes in expenditures over time may be substantially misleading because of the limitations of the data.

For these and many other reasons, this document is not an adequate basis for a serious discussion of the future of universities.

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REFERENCES

1. Government-University-Industry Research Roundtable, National Academy of Sciences, National Academy of Engineering, Institute of Medicine, "Science and technology in the academic enterprise: Status, trends and issues, A discussion paper" (National Academy Press, Washington, DC, 1989).

Transmutation of High-Level Nuclear Waste

The Policy Forum "High-level nuclear waste: Is it possible?" (14 Sept., p. 1231) by Konrod B. Krauskopf must have been written with a deep sense of frustration, as this "nonproblem" has turned out to be the nemesis of the nuclear industry. Krauskopf's solution—"indefinite postponement" of long-term burial of radioactive nuclear waste with the hope of finding a burial place some time in the future—is, in a sense, the policy that the Department of Energy (DOE) follows today by continually moving up the date of burial and spending hundreds of millions of dollars annually seeking such a place.

Another approach would be to burn up the nuclear waste by transmutation. The physics of this concept have been known since the early 1960s, when there was little concern about waste on the part of the nuclear establishment. Now that the problem is so acute, a number of laboratories have been making proposals to investigate this alternative method.

Concerning the argument that partitioning, which is chemical reprocessing, is difficult and expensive, one must remember that if the country was able to produce plutonium for weapons within a short period of time during World War II, there is little doubt that separation of transuranics and fission products could be readily developed.

The Japanese have two projects under way in this area: one involves burning the long-lived actinides in a fast reactor, and another uses accelerator-driven neutrons in a target assembly. Hanford National Laboratory has proposed to separate the long-lived fission products and transmute them into shorter-lived and stable isotopes in the Fast Flux Test Facility. Brookhaven National Laboratory has several concepts of burning

nuclear waste using both accelerators and reactors. Los Alamos has recently also proposed using an accelerator to transmute waste in a target. Argonne National Laboratory has proposed to burn the activides in the Integrated Fast Breeder Reactor, which is under development. The Russians also want to join an international effort for the development of partitioning, recycling, and transmutation of fission products. The time has come to divert some of the repository funds in order to mount a concerted effort to avoid thousands of years of geological storage, or at least to minimize storage to several hundred years.

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Proton Microprobe Development

I have just read a fabulous article by Jeremy Cherfas in the Research News section of *Science*. The fable (a narrative or statement not founded on fact) was headed, "Proton microbeam probes the elements" (28 Sept., p. 1500). The article is enthusiastic about technology but weak on history.

The "remarkable new instrument devised at Oxford University" is not new and was not devised at Oxford. The scanning proton microprobe was developed at the U.K. Atomic Energy Research Establishment, Harwell, by J. A. Cookson, A. T. G. Ferguson, and F. D. Pilling in 1970 (*1*).

The men largely responsible for putting proton-induced x-ray emission, Rutherford scattering, and microprobes together were again those at Harwell, not those at Oxford (*1*).

The problems of funding multidisciplinary research on proton microprobes are common ones, faced by all proton microprobe groups, of which Oxford was about the twelfth to commence operation, in 1980.

The techniques of computer-generated multi-elemental mapping and associated high-efficiency quantitative data extraction were developed at the University of Melbourne in 1977 (*2*).

The techniques required for the application of scanning proton microprobes to biological tissues were largely worked out in the 1970s at Melbourne, Heidelberg, and Uppsala universities; warning was given then about use of the preparative techniques later used in the Alzheimer's work (*3*).

The final paragraph of the article speaks of new possibilities of proton microscopy—an area in which Oxford has little experience. Secondary electron imaging was first used with the proton microprobe at Harwell; channeling contrast microscopy was developed at Melbourne; scanning transmission ion microscopy (STIM) at these energies was developed at the universities of Oregon and Melbourne, as was stereo-STIM. STIM tomography was developed at Tokyo, Oregon, Darmstadt, and Melbourne universities, 3-D STIM tomography at Sandia and Lawrence Livermore laboratories, and channeling STIM at the University of Melbourne. I apologize if I have left out contributions from other groups—there are approximately 40 proton microprobe groups around the world, many of whom have made important contributions.

The group at Oxford does good work, and they have contributed much to ion optics in particular; but they have not pioneered the techniques mentioned in the article, and doubtless they would not make such claims.

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