SCIENCE & SOCIETY

Janet Raloff reports from the New York Academy of Sciences meeting on Expanding the Role of Women in the Sciences

Fear of figuring . . .

It begins before school in parents' expectations, incubates in grade school where "typical" female teachers confess it, and matures in high school where 57 percent of boys but only 8 percent of girls (as reported in one study) received a full four years of antidote. It's math anxiety, which, according to Dean Jewel Plummer Cobb of Douglass College, is a fundamental reason that women, "who constitute 52 percent of the population, make up only 10 percent of all scientists and engineers."

The "notion that proficiency in mathematics is a sex-linked characteristic," Cobb says, is widespread "among elementary school and high school teachers, college students and young mothers." Only a "wholesale effort" will eradicate it, she says. The effort must begin by calling attention to sex biases in parents who teach children that dolls and housework are for girls, chemistry and erector sets for boys. And it must continue into college where such measures as special fellowships would provide a "psychological boost." The need, Cobb concludes, for a "full spectrum of [such] programs directed at increasing the proportion of women in science careers is painfully obvious."

and how it figures in . . .

There is more than math anxiety to conquer in increasing women's participation in science — such as fear of being un- or underemployed. While the percentage of Ph.D.s obtained by women is increasing in many fields, the percentage of jobs women hold in those fields is static. And women are often paid far less than men with comparable qualifications.

- Consistent with Cobb's assertion that women are channeled into such "acceptable" professions as nursing, the largest share of doctorates to women is in the biological sciences. Among the fastest rising fields, according to Elizabeth O'Hern of the National Institutes of Health, are botany, up from 10.2 percent to 21.5 percent between 1960 and 1976; biochemistry, from 14.3 percent to 22.9 percent; and genetics, from 12.3 percent to 30.8 percent. But salaries don't keep pace, O'Hern says. In academia, for example, she finds the "discrepancy" between men's and women's salaries worsening at all ranks except that of full professor.
- In mathematics, according to Gloria C. Hewitt of the University of Montana, gains are smaller. Between 1931 and 1974, about 7 percent of the Ph.D.s were women; by 1977, 13 percent were women. Women's jobs in academia, where 80 percent of the mathematicians work, have also increased, she says, from 4.7 percent to 4.8 percent between 1975 and 1976.
- In geosciences, the need to find more energy is aiding women, according to Theresa F. Schwarzer of the Exxon Production Research Co. Women were 4 percent of the working geoscientists in 1974; by 1975, 11 percent of geoscience Ph.D. candidates were women — an upward trend Schwarzer says will continue. Women are actively recruited and hired at starting salaries "comparable" to those offered men, she says, although median salaries for women "at all levels of experience are about 75 percent of those for their male colleagues."
- In chemistry, women received 5 percent of the doctorates awarded in 1956, 10 percent in 1977, according to Alan C. Nixon, past president of the American Chemical Society in Washington. Again, however, "women suffer a considerable disadvantage in salary." One example: R&D management administrators with Ph.D.s receive a mean salary of $23,300 per year if they are women, but a mean of $34,137 per year if they are men, he said.
- In physics and astronomy, percentages don't show the whole story, says Vera Kistiakowsky of the Massachusetts Institute of Technology. For example, physics Ph.D.s awarded to women "now correspond to respectable numbers," but as percent of Ph.D.s awarded, they dropped from 4 percent in the 1920s to 1.8 percent in the '50s, and returned to 4 percent in the '70s, she says. In astronomy, the percent of women Ph.D.s plunged from 27 percent in the '20s to 6 percent in the last 20 years.

psychological challenges

Growing visibility and support of laws prohibiting sex discrimination have driven many prejudices "underground," says Columbia University psychiatrist Ruth Moulton. Similarly, women's anxieties resulting from sex bias have gone underground, too, she says. Inner conflicts she found to be prominent among women scientists include: fear of being assertive, fear of success or failure, fear of appearing unfeminine, and a hidden dependency on the support of female or male — surrogate mother or father — colleagues and supervisors for self-esteem.

Is there redress?

"We are distressed at the behavior of some professors" and academic administrators during the past two years, say Helen C. Davies and Robert E. Davies of the University of Pennsylvania. In their discussion of recourse for alleged sex discrimination, the Davieses say their "direct knowledge" of many grievances — some internal to institutions, some that have reached the courts — include cases involving harassment of complainants; "deliberate solicitation of letters" — favorable to men, unfavorable to women; alteration of letters of recommendation; falsification of curricula vitae; suppression of results of departmental and promotion-committee votes; and publication by men of women's research "without acknowledgement of joint authorship."

They cited studies indicating discriminatory hiring by universities and they report that the "network approach is still the most important recruitment means in Academe. Since the network among senior faculty is predominantly white male, [its persistence] as a major technique for identifying candidates inevitably leads to a disproportional hiring of proteges who are also white and male," they say.

They also cite a JOURNAL OF COLLEGE AND UNIVERSITY LAW article by R.S. Stitt and A.P. Limestone on tactics to be used by institutions in defense against sex-discrimination suits. The Davieses advise that women contemplating a court bout over alleged sex bias should read it. Among its recommendations, the Davieses say, is a suggestion that institutions remind the courts that "if the complainant is successful she can be awarded back pay with no loss of seniority. This last is, of course, unreasonable for any academic person, but particularly when the complainant is a scientist [doing laboratory research]," they say. Terminating the woman "can clearly cause irreparable injury" to the continuity of her research or source of funding, they say.

But the outlook is getting better. A judgment affirmed on appeal Jan. 4, 1978, rejected efforts by the defendants "to elevate the quantum of proof [of discriminatory motivation] to such a level that a litigant is necessarily doomed to failure," they say, quoting a circuit-court judge. The "judges voiced misgivings over 'the notion that the courts should keep "hands off" salary, promotion, and hiring decisions,'" they add. The judges accepted "statistical evidence that a double standard was applied in promotion decisions," the Davieses say; "an important part of the case was evidence that the person who nominally served as affirmative-action coordinator did virtually nothing to advance the rights [of campus women]."

Finally, they see hope in federal promises to increase enforcement of antidiscriminatory hiring practices and in funding agencies that threaten to withhold contracts from institutions that do not comply with "approved" affirmative-action plans.

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