INDIA

Is Overcoming 'Diffidence' the Route to Success?

Like many other countries, India has a professional organization for its women in science. It's not a newcomer, either. The Indian Women Scientists Association was founded in 1973; today it has a membership of more than 1000 female scientists. That's a respectable total, and it might be assumed that such a large and long-established group spends much of its time fighting clear-cut cases of discrimination. Not so. In fact, in its two decades of existence not one case of sex discrimination against a woman scientist has come before the association.

Does that fact—remarkable to U.S. and European sensibilities—indicate that there is no discrimination against female scientists in India? Perhaps not. Take the case of Vineeta Bal. Bal, 37, who is on the staff of the National Institute of Immunology in New Delhi, is one of the few immunologists in India doing basic research in cellular immunology. Recently, she was dismayed to find that, although she had been the lead author on a paper, her junior male co-author was asked to make the public presentation of their findings. He refused, and she wound up giving the talk, but the fact that he was asked, she says, reflects a form of discrimination that is subtle and difficult to confront.

Bal's tale might sound familiar to women in science in other countries. So would the representation of women in top scientific bodies. Last year, of the 628 and 698 scientists chosen as Fellows by the Indian National Science Academy and the Indian Academy of Science, respectively, only 12 and 15 were women. In the selection committees of the two academies, women are represented only in the field of medical sciences. Another familiar pattern is the generational divide on the issue of gender discrimination, with the older generation, among the first women to have scientific careers, acknowledging no discriminatory treatment, while younger women like Bal do acknowledge such treatment.

But in a pattern that does seem to set India apart, even these younger women have difficulty directly resisting discrimination. Bal, for example, says that even if the discrimination she experienced had been more explicit, it might not have been easy for her to resist directly. Although her mother, Vidya Bal, is one of the best-known feminist writers in India, and Bal herself has learned to speak out on the issues, she says that "whatever I say or do, at some instinctive level I am diffident." She finds that while her male colleagues have no qualms about pushing for promotions and salary increases, she hesitates, wondering whether she deserves such things—even though she knows her work is superior to that of many of her male contemporaries.

Such diffidence may help explain the lack of overt complaints about discrimination. Another factor, though, may be that the women who find acceptance in science are generally upper class. According to Nerges Mistry, a young immunologist at the Foundation for Medical Research in Bombay, one of the few privately funded research organizations that has done pioneering work on leprosy, class "protects some women from discrimination." In contrast to their upper-class sisters, Mistry says, women from the lower classes, who work as lab technicians or nurses, experience much more direct discrimination, in the form of sexual harassment, among other things, in the work place.

The contradictions within the position of women in science in India reflect the general situation of women in the country—which is one of the few to have had a woman as prime minister, but also one in which the female literacy rate is abysmally low and prejudice and superstition keep millions of poor women, especially in the villages, virtually shackled. Pathways into science were opened for women beginning in the 19th and early 20th centuries by a combination of social reforms, education for women, and the political movement for independence. The only women who could take full advantage of this new-found freedom, however, were women from the upper economic classes. These women had full-time domestic help that made it possible to combine marriage and motherhood with careers. In addition, their economic security and the fact that they were not the chief breadwinners in their families gave them the confidence to enter scientific research, which in India is a relatively low-paying field.

Indian women are just beginning to speak out against discrimination

In 1943, for example, Kamal Ranadive walked into the Tata Memorial Hospital in Bombay, looking for a job in its cancer research section. At the time, she was one of the few women in the field. "I was a married woman of 25 with the responsibility of a family," she says. Yet, she thought, "if the urge is strong and genuine enough, why should a combination of marriage and scientific career not work?" Ranadive was able to combine marriage and career and rose to one of the top positions in what is now the Cancer Research Institute (CRI), the leading government cancer-research facility. She set up the first tissue-culture lab in India and is known for her work on breast cancer.

Many of Ranadive's generation have now reached the top of their fields, and these women acknowledge facing little, if any, gender discrimination. Sudha Gangal, for example, once a student of Ranadive's, heads the department of immunobiology at CRI; she is one of three female department heads (out of a total of six departments at the institute). Along the way to reaching her senior position, Gangal says, "I've never encountered discrimination." Her view is echoed by K. Usha Deniz, a senior scientist in the solid state physics division of India's largest government research establishment, the Bhabha Atomic Research Centre in Bombay. "By and large I have experienced no dis-

INDIA'S SCIENTISTS AND ENGINEERS

Field	Male	Female
Science & Engineering	**1,217,658**	**209,413**
Science	833,335	200,855
Physical science	152,100	33,348
Mathematics	70,788	18,080
Computer science	373	65
Agricultural science	72,327	806
Life science	397,020	108,600
Medicine	113,015	21,653
Others	27,712	19,123
Engineering	384,323	8758
Aeronautical/Astronautical	1783	9
Chemical	38,959	2655
Civil	119,678	2525
Electrical/Electronic	92,291	2571
Mechanical	12,3524	735
Other	8088	263

SOURCE: COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, DEGREE HOLDERS AND TECHNICAL PERSONNEL SURVEY, 1981

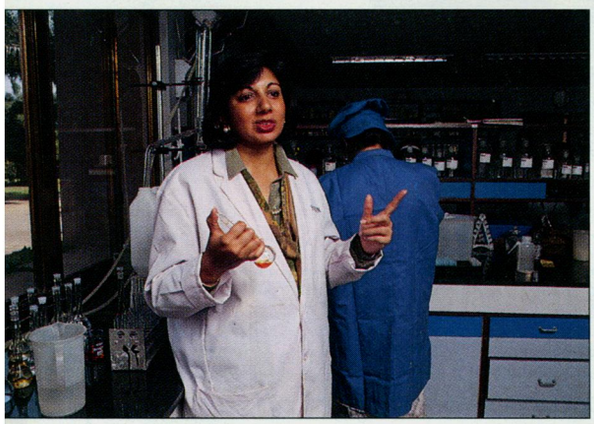
crimination in terms of gender," says Deniz.

Women of the younger generation, however, like Bal, tell a somewhat different story. And even Gangal, who says she faced no discrimination, concedes that women scientists are frequently overlooked for important positions, particularly in the area of policy-making, as well as for awards. In addition to the paucity of women chosen as fellows of the two top academies, in the last two decades only a handful of senior women have received awards from the academies for their work, and these, too, were in biomedical research.

What is happening in the top ranks of Indian science, however, doesn't reflect what is happening at the entry level, where there are plenty of promising young scientists starting off. In the last 5 years, for example, 22% of the awards given by the National Science Academy to young scientists for doctoral and postdoctoral research have gone to women.

What happens to these promising young female scientists between the time they earn their Ph.D.'s and the time they should be reaching the inner circle of the scientific elite? The answer is that "they are forced by their families to get married," says Kunthala Jayaraman, the feisty and articulate director of the department of biotechnology at Anna University in Madras. "I get mad at them. I lose 30% of my women students halfway through their research."

SWAPAN PAREKH/BLACK STAR



Generation gap. Kamal Ranadive *(right)*, is one of the first generation of Indian women to gain prominence in science. Kiran Mazumdar *(below)* is one of the younger generation, who are more likely to acknowledge gender discrimination.

Family pressure, though, isn't the only reason Jayaraman loses a high proportion of her female students. There are also institutionalized obstacles. For example, she says, women students registered for a Ph.D. had to return to their dorms by 8:00 P.M., because the university authorities thought it "unsafe" for them to be out after that hour. Curfew has now been extended to 9:30 P.M., but even this relaxation, says Jayaraman, is unfair for women working in laboratories and competing with male colleagues who are free to work whatever hours they choose at the lab bench.

If female students do manage to hang on and get Ph.D.s, however, the dynamic shifts, Jayaraman argues, and they are often quite successful in the early stages of their careers "because women are more hard working." But the obstacles emerge again as women reach mid-career, where networking contacts and "fitting in" are as important for making the next step up the career ladder as quality of work is. "Men feel more at ease with their male companions and women don't push ahead to get into committees, which are training grounds for higher positions," says Deniz. "The diffidence of women" works against them, she feels.

As they overcome this diffidence, says Jayaraman, one step women should take is to strike out in new directions and enter areas—such as physical science, engineering, and industrial research—which have traditionally been male preserves, in contrast to biomedical research, where there have for decades been large numbers of female researchers.

Yet when women do venture onto male turf, they often find winning acceptance even more difficult than it is in the "women's" sciences such as medicine. Kiran Mazumdar is the daughter of the first Indian master brewer working for a leading beer manufacturer in Bangalore in south India (the previous brewmasters had all been from Britain). Initially, Mazumdar was interested in both applied and basic science: fermentation science (which includes bacteriology, enzymology, and the details of fermentation) and genetics. Her father encouraged her to accept a fellowship to a university in Australia to study fermentation science rather than going to England to study genetics.

When Mazumdar returned to India in 1975 after completing her fellowship, she found that there were no jobs for her. Although she was able to work along with her father, who by then had become an independent consultant to several breweries, none of them would accept her as a master brewer, despite her qualifications. "I realized that it was a male-dominated profession," she says. "None of the breweries would entrust me the job of brewmaster, although I was well qualified." The excuses given for not employing her were that the job was tough, the hours were irregular, and she would have to handle unions. In any case her potential employers told her, they did not want the "responsibility" of having a woman in this job.

In despair, Mazumdar accepted a job in Britain as a maltster and was all set to leave India when she was offered the chance to set up a company producing industrial enzymes in collaboration with an Irish firm, Biocon Ltd. What began in 1978 as a small enterprise in her garage has today grown into a substantial and recognized firm.

Given her experiences, Mazumdar can hardly claim that women are given the same treatment as men in Indian science and technology. That view puts her firmly with the younger women on one side of the generational divide that seems to characterize women in science in India today. Much like their counterparts in other countries, including the United States, the older generation, among the first women to have scientific careers, acknowledge no discriminatory treatment. Their successors, however, are beginning to see that discrimination does exist, even if it is subtle. Perhaps, as the younger generation begins to overcome its ingrained diffidence, the Indian Women Scientists Association may soon hear its first complaint on the grounds of gender discrimination.

–Kalpana Sharma

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