



11

Why I became a scientist

Bindu A Bambah

Environmental influences play a crucial role in women's participation in the sciences. The stress on mathematics and science in school is perhaps the earliest influence in choosing a career in science. The men and women who teach girls influence their perception about whether or not women can be successful in science.

I was very lucky because I had a number of positive role models in my school years by having teachers who were very encouraging and who awakened my scientific perceptions. The first contact I had with the scientific method was in 1967, at the age of 10, the year when Dr. Christian Barnard performed the first heart transplant. Our teacher, Ms. Jessica Keller, an avid science enthusiast, brought a pig's heart into class and explained the procedure to us. It was truly amazing. Then, in 1969, the first moon landing occurred and we were taken to see the moon rocks. The world of outer space inspired me to study the physical aspects of nature.

Later in high school, our physics teacher, Sister Vincent, introduced us to quantum mechanics, with all its scientific mystery. Our chemistry teacher, Mr. Pyaara Singh, told us the tale of Kekule's snake to explain the structure of benzene. I am truly indebted to my teachers for not having any gender bias, for lifting our spirits and telling us that we must unite to fight for our rights

and march on till the goal is won. Now, when I look at the materialism that has penetrated all walks of life and also at the exam-oriented education of our students, I feel that we must have such dedicated and inspiring teachers in school.

I never had as much fun with science as I had during my school years, thus when the choice of a career course was to be made I knew I wanted to study science.

After much deliberation, I decided to join the integrated physics course at Punjab University in my home town, despite the fact that due to my success in the National Science Talent Search Examination I had offers from the Birla Institute of Science and Technology (BITS), Pilani and the Indian Institute of Technology, Kanpur to join their integrated programmes. This was the first decision in my life prompted by gender. I must admit that having been in a girls' school I was daunted by suddenly having to compete with men.

This was perhaps one of the many acts of cowardice that occurred during my career. It is because of these acts of cowardice triggered by gender issues that I did not fully live up to my true potential as a scientist. Here I was, an honors student, with a rank among the top ten in the country in the science talent exam, and I took the soft option of living at home and going to college, when I could have gone anywhere. Was it my choice? Or was it the fear psychosis engendered in young girls by our society? One thing I do know for sure. If I had been a boy with the same talents, these doubts would not have arisen, and I would have ventured out more confidently into the competitive world of science. Luckily for young girls nowadays, the situation has changed. The elite institutes have become gender-even and the doubts which I had, I hope, are no longer an issue

My aim was to do mathematical biophysics, but I had not counted upon the pull of the strange and wonderful world of elementary particles. In M.Sc., I had the fortune of having two really inspiring teachers. Dr. Jatinder Bajaj and Prof. M. P. Khanna, who were full of enthusiasm about fundamental particle physics. It was a glamorous and exciting world and I was drawn into it. It had all the mathematical precision and complexity that I instinc-

tively liked. It was abstract as well as natural, so I decided to do a Ph.D in elementary particle physics. What I did not realize was that with my basically fearful but competitive nature, I was entering the most cut-throat and exacting field in the world. It was a jungle out there and I was a small town girl hampered by years of fear-conditioning, ill-equipped for this beautiful but dangerous world of elementary particles and the male domination in the field.

I entered the University of Chicago, with a big chip on my shoulder and a big ambition to do elementary particle physics. I was the only woman in the freshman class. I was surrounded by highly competitive young men, who did not take me seriously at all. I did, however, have the opportunity to work with the renowned physicist, Prof. Yoichiro Nambu. He was very inspirational, albeit formidable, and I learned a lot from him. I could have learned much more had I not been coping with the problems of being a woman in a man's world.

For the first time, I felt that the speculative intuitive type of woman was less likely to succeed than the silent unoriginal type. There was the overwhelming feeling that the flexible all-round intellectual woman was not tough enough to bear the toil of scientific research. My love for physics and keenness to be a physicist were in constant conflict with my need to fit in and have a healthy social life. In the end, in spite of many opportunities to do research in the United States (US), I decided to return to India, because I felt unable to cope with the social pressures of being a woman in physics in the US. It really was difficult to be an acceptable scientist and an acceptable woman at the same time. It is very difficult to gain acceptance to the "boys' club" in physics. If a woman had to do well it is better to be a follower than a discoverer, was the message I got.

In India, I felt while there was not such overt discrimination against women, there was a subtle one. Men were the leaders, but women were quite well-represented. They rose to a certain comfort zone and then did science within that zone. It was conducive to work this way, until one reached a certain stage and found that the competitive urge had died away. Unlike the US where the few women in science supported each other, in India, I found that

women in physics did not unite, but competed against one another. There was and is no “sisterhood” as in the States, perhaps because a woman here vies for acceptability by the male community. It is very difficult to defend women’s competence if the person bringing you down is another woman.

I have recently been influenced by a question asked by biophysicist Evelyn Fox Keller. How far is the nature of science bound up with the masculine ways of thinking which engendered it, and can science be truly universal and objective if it is so conceived? Now, it is my opinion that both gender and science are socially constructed categories. Historically, the stronger conjunction has been that of science and the socially defined masculine attribute of reason, as opposed to the socially constructed feminine attribute of emotion. We have to shift our focus and acknowledge the need for diversity among scientists, the key to which is gender.

Theoretical physics is mathematically neat; it explains the world around us in a fundamental fashion. It would be enriched if more women were prompted to study it. All the gender-biased adversities have made me stronger and even more ambitious to succeed, and I do science without regret or apology. I hope my experience will help young girls faced with the same choices. They should go out there, support one another and seize the day.