## Lessons from a life in mathematics for India's women in science



Rohini Godbole **20/07/2023** 

I first met professor Mangala Narlikar in 1980 in the majestic colonnade of Mumbai's Tata Institute of Fundamental Research (TIFR). I was a young postdoctoral fellow in the theoretical physics group, and she was (as I knew first) the wife of the renowned astrophysicist, Jayant Narlikar. It was after quite some time that I learnt that she was a mathematician herself. In her trademark quiet manner, she explained to me that after a prolonged break, she was back to mathematics research in her spare time, focussing on number theory.

Mangala was my introduction to Indian women in science. Here was someone who kept her relationship with science alive after marriage and resumed research after her daughters were born. I was impressed. The number of women faculty at TIFR at that time could be counted on the fingers of one hand.

Personally, at that time, I was more anxious about how to make the transition from a young researcher to a faculty member, while managing other aspects of life. I didn't think too much about the additional challenges that my gender could pose. As a daughter to a mother who went back to academia after three of her children were born, I could identify with Mangala's choices. I was impressed with the quiet strength one always felt around her.

After the Narlikars moved to Pune to establish and nurture the Inter-University Centre for Astronomy and Astrophysics in the 1980s, and I left TIFR, we met only at academy meetings and conference dinners. But it was not a case of out of sight, out of mind. While thinking about *Lilavati's Daughters*, a collection of biographical essays by Indian women scientists, I reached out to her. She was different from many other women featured in that volume, in that her contribution to mathematics started somewhat late and emerged in her spare time.

But it was multifaceted and made a significant contribution to mathematics education. Her simple and honest account of her journey in science was typical of educated women of her generation, who often found novel ways to break the norm. "I can only describe myself as a part-time scientist, if a pure mathematician can be called a scientist at all... I had accepted the philosophy of my parents, namely, that the first priority for a young lady should be the family and her spare time can be used for any study or hobby," she wrote.

She wrote about finding her way back to science after coming back from Cambridge with her husband. "We got accommodation just across the street from TIFR. That was a lucky break for me. It was not difficult to visit the school of mathematics again and pick up the threads of maths research in my spare time." Her assessment of her life and her choices was dispassionate. "In retrospect, I feel that I should have striven harder and continued my research all through," she wrote. But she also admitted that she equally enjoyed housekeeping, taking care of her children and watching them grow. As she would often attest, her choices were a representation of the lives of many women of her generation who were well educated but always put household responsibilities before their personal careers. In fact, her husband Jayant Narlikar wrote in his autobiography *My Tale of Four Cities* that he regretted the injustice of not enabling her to utilise the opportunities and continue pursuing mathematics at Cambridge. Further, he says, it was this realisation that strengthened his resolve in encouraging and supporting all their daughters in their academic pursuits.

Mangala's contributions to mathematics education will be her lasting legacy. Not restricting herself to teaching and giving lectures (which, by all accounts she did extremely well), she also wrote books on how to make mathematics interesting and accessible to students who were scared of it. Through these, she reached out to young people often stymied by the complexity of science. "It is rewarding to help school kids to understand and enjoy mathematics, which is often a dreaded subject," she wrote.

Her pleasant and charming personality masked a core of steely convictions that was extraordinary. In her sunset years, she wrote an article in Marathi describing her battle with cancer, and how she firmly held on to her rationalist beliefs and refused repeated requests from loved ones to supplant the medical treatment with religious rituals.

From another article on her by the Marathi writer Mrinalini Chitale, I learnt that while she was more than ready to give financial help to those who needed it for education or illness, she was equally dismissive if somebody requested help to finance a grand marriage ceremony. She lived the life of a rationalist and scientist. In her life and through the way she lived it, Mangala showed that it is possible for Indian women to sculpt our lives in the way we want. Her life showed us that there is more than one way to be a successful woman scientist.

One path was lit by trailblazers such as Janaki Ammal and Anna Mani, who showed that gender barriers in science could be smashed by the single-minded pursuit of research. Another, quieter path was etched by Mangala, who showed the world that it was possible for a woman scientist to make different choices, but fiercely guard the freedom and space to do so. We often have one vision of what a successful scientist can be — a bouquet of impactful publications, some awards, a permanent position in a top institute, global collaborations and finally, helming a research body.

Mangala's triumph lay in showcasing that another way was possible. It is not necessary that every woman trained in science should devote her life to research; but if she chooses not to, it should be of her own volition and not by force. And it should always be possible for women to find their way back to their passion. Rest in peace, Mangala. I am particularly gratified that news of your demise emphasised your stature as a mathematician over your familial relations. While it is certainly a recognition of your achievements and contribution, it is also a reflection of the change in the way society has begun to recognise women of science. People like you also paved the way for all of us who came after.

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