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Interview

Science to history: the Raman Effect

Abha Sur, part of the humanities faculty at the Massachusetts Institute of Technology and author of 'Dispersed Radiance: Caste, Gender, and Modern Science in India' tells *Vijaysree Venkataraman* what brought about her transformation from a physical chemist into a science historian.

Q. Scientist to full-time science historian — how did that happen?

A. While doing my PhD in Chemistry at Vanderbilt University, one evening I was excitedly telling someone about James Watson's book *Double Helix*. I must have been a little loud because a professor stepped out into the corridor and handed me a copy of Rosalind Franklin's biography saying I might like it.

Before reading that book, I had not thought much about the issue of gender in science. At IIT Kanpur, I was distinctly uncomfortable at sexist remarks thrown around casually but was unaffected because at that point I only identified with the successful.

Watson's caricature of Franklin did not bother me either. But her biography proved to be an eye-opener.

In 1988, I won a fellowship at Harvard's Bunting Institute. There were 40 women from other fields — artists, historians, philosophers — in the programme. I was reading a lot more and was able to see larger connections between science and society. In 1993, I became a fellow at MIT's Dibner Institute for the History of Science and Technology and won a National Science Foundation professional grant to conduct studies in the history of science.

Q. So how did you pick the subjects of your study?

A. The history of spectroscopy in India was my original focus. I also started reading 'Journey Into Light: Life and Science of C. V. Raman'. From that biography, I learned of the scientific controversy between him and the German-British physicist Max Born. It gave me new insights into Raman's way of thinking and also brought up the issue of nationalism in science.

I was also intrigued by the fact that there were women researchers at the Indian Institute of Science (IISc) in the 1930s. The book mentioned Raman's student, Sunanda Bai, who had a post-doctoral fellowship to study in Sweden but committed suicide on the eve of her departure. Fifty years had passed but people seemed scandalized by that event. I was fixated by her story and the silence surrounding her death.

Finally, someone pointed me to her contemporary Anna Mani, another of Raman's graduate students. She had retired as the Deputy Director General of the Indian Meteorological Department and was back at the Raman Research Institute. She insisted that she never suffered because of her gender.



Abha Sur

When I asked her about life in the lab she talked about an odious male colleague who seemed to take special delight in making women feel inept. Learning from peers was difficult because Raman had quaint notions about interactions between men and women in his lab. So her experience as a scientist was not completely gender-neutral, as she liked to believe. These stories came pouring out. When I wrote about her life in *The Hindu* in 2001, many readers got in touch with me and I knew there was a thirst to know more.

Though Mani had no idea why her friend committed suicide, she provided a lot of background information about Raman's lab and IISc. He had thought highly of his student's skill as an experimentalist and also supervised the graduate work of Lalitha Doraiswamy, who gave up research willingly when she married S. Chandrasekhar (of the Chandra telescope fame). None of Raman's women students got a Ph.D.

Q. What about Meghnad Saha, the astrophysicist featured in your book? How did you pick him?

A. C. V. Raman and Meghnad Saha were two of India's pre-eminent scientists in the first half of the twentieth century. His 'Theory of Ionization' changed astrophysics from a qualitative into a quantitative discipline, but non-scientists may not be able to appreciate the game-changing nature of his work. Saha was the anti-thesis of Raman in terms of social station, political involvement and cultural upbringing. Raman came from a privileged South Indian family; Saha was from rural Bengal. His family was lower in the caste hierarchy and of modest means. Saha's scientific writing was not flamboyant like Raman's, nor did he receive any big scientific honor. Applied science held no appeal for Raman but Saha believed in using science to alleviate hunger and poverty. And there was animosity between these two scientists.

Q. Why is study of history of science important — any practical applications here?

A. History of science is important to scientists, of course. They would like to know what has gone on before them. When they succeed, they want the world to know about their contribution. But socially informed history of science helps us understand the social process of science. We can learn from mistakes of the past.

When we figure out how discrimination based on gender or some other factor enters the system, we can address those issues. Coming to the caste dimension, in India we hear heart-wrenching stories of dalit boys and girls committing suicide at scientific institutes. The atmosphere at these places of learning must have been so alienating. It is not enough to say people should be admitted. What happens after that? How can we fight deeply held prejudices? Policies must be based on our history.

Q. Are there obstacles to studying the history of Indian science?

A. Not having access to archives is a real impediment. In India, access to lab notebooks, professional correspondence, and private papers of famous scientists is tightly controlled — even when the documents are housed in public institutions. Full access is given only to those commissioned to write biographies of the scientists by the families themselves, or by the Indian scientific establishment.

Also, things get destroyed when you don't take care of them — there are instances of basement stacks getting flooded. A scientist's family may not have preserved their diaries.

Then there are entrenched attitudes. Portraying the lives of scientists, flaws and all, is seen as diminishing their life's work. Sadly, any critique of science tends to be seen as anti-science. We have to grow up — we cannot take a shortsighted view of history.

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