Personal Reflections

Why did I opt for Career in Science?

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Seeding

One of my early childhood memories goes back to when I was in Std III. Our class teacher asked all the students: What does your father do? As the school was in the campus of Banaras Hindu University (BHU), most of us were children of university staff members. I recall replying that my father was a professor. "Professor of what?" the teacher asked. I did not know. So the teacher told me: "Your father is a Professor of mathematics". My feeling of inadequacy at not knowing the full answer was instantly replaced by one of elation. So my father did the same subject that I liked best.

I narrate this incident to underscore the fact that my early liking for mathematics was not dictated by my father, or by others telling me that I should grow up to be a mathematician just like my father. I know of cases where children are consciously or unconsciously pressured to emulate the achievements of their parents.

That I liked maths and science was noticed by my father who made me acquainted with the recreational aspects of mathematics, with its wealth of anecdotes, puzzles and paradoxes. He did this either directly or by giving me books of this nature. He also encouraged me and my brother to do experiments. Our house in the BHU campus was spacious enough for him to provide a chemistry lab for my brother and myself to play with.

In those days it was customary for visiting faculty from other universities to stay with their local host and so we had mathematicians like N R Sen, Ram Behari, A C Banerjee or Vaidyanathaswamy staying with us on such visits. Even if I did not understand what they were talking about, the overall ambience did help in creating an aura about mathematics.

Growing

However, a crucial development, which helped foster a competitive spirit in me took place when I was in the VIII standard. My maternal uncle Moreshwar Huzurbazar, or *Morumama* as I used to address him, came to live with us in order to do an MSc in mathematics at the BHU. He was a brilliant scholar, having done very well at the BSc

exam of Bombay University. [Later in his life he was a Professor and then Director of the Institute of Science, Bombay.]

Morumama discovered that I enjoyed doing mathematics. He also noticed that my father had two blackboards built into the walls for my brother and myself to write or draw as we wished. He found a new use for the boards. Once in a while he would write a mathematical problem or puzzle, under the title 'Challenge Problem for JVN'. The problem would remain on the board till either I solved it or gave in and asked for the answer (which, I am glad to say happened rather rarely).

Morumama's problems were certainly outside my school syllabus: they called for analytical reasoning and 'trick solutions' which would light up for me some hidden aspect of mathematics. My lasting regret has been that no record has been kept of those problems. But so far as I was concerned, I developed an attitude of taking on the challenge posed by a difficult question.

I should mention too that some teachers I encountered at school were also inspiring. Occasionally I would take Morumama's problems to school. Mr Pande, my maths teacher would have time for discussing it, even though he himself could not solve it. How many teachers, overburdened as they are with a large student population and an overstuffed syllabus, can today find time for such excursions into the byways of mathematics? I recall taking up a whole period discussing the proof of the so-called difficult converse: 'If the angle bisectors of the base angles of a triangle are equal, then the triangle is isosceles'. [Perhaps, readers of *Resonance* unfamiliar with the proof may try to find one! It is easy to show that the base angle bisectors of an isosceles triangle are equal; but try proving this converse.]

Perhaps I should mention that books like '*Men of Mathematics*', '*The World of Mathematics*', '*Living Biographies of Great Scientists*', etc., played a key role in bringing to my impressionable mind the excitement and frustrations of creative geniuses. Science is not a drab subject to be memorized, but an arena of adventures. It was revealing to know about the pride and prejudices of great scientists, and to learn that they too occasionally made mistakes. But science has a self-correcting mode that leads ultimately to the right answer. This was one motivating influence in my opting for a career in science.

Decision Making

I have stressed my liking for mathematics, but I should add that I liked physics too. Here,

however, my school syllabus was not very exciting and apart from an occasional puzzle, I did not get to share the excitement of learning and experiencing how nature's laws work. So physics was my second favourite and close on its heels came sanskrit.

So far as my liking for sanskrit goes, I owe a lot to my late mother and to Morumama. My mother inducted me into Kalidasa and Bhavabhuti...identifying the power and beauty of the language, which one can appreciate only through the works of literary geniuses like these. And Morumama inducted me into the literary gymnastics and puzzles that this language seems uniquely fit to describe.

I wish our university system were flexible enough to allow a science student to do a course on sanskrit too. But alas, no! After my matriculation I had to make the choice: and I could have sanskrit only if I opted for arts.

But the point of decision making came at the end of the intermediate science examination, the stage now identified with the higher secondary or standard XII. The BHU had an engineering college with a national reputation (now part of the Institute of Technology). It was difficult to get into, and much sought after. I was expected to do well in the ISc examination, and one of the options before me was to go for the engineering degree.

I recall visiting the BHU Engineering College at the time of the annual exhibition, which was put up by students for the general public. In fact I used to visit the exhibition every year and enjoy the clever way machines were used to do work. On this particular occasion, some college faculty members greeted me and said that they hoped to see me as a student there next year.

However, for me the decision was already made. I had developed sufficient attachment to mathematical sciences so that the alternative of opting for engineering did not even enter my mind. The thrill of solving problems whose solutions one did not know, must be even greater, I felt, than solving Morumama's problems whose solutions were known, at least to him. I had seen my father working on such problems with long calculations spread over several pages all lying on the floor all around where he sat.

Indeed my future projections at this stage took me to the Mathematical Tripos at Cambridge, where I felt, one's mettle is really tested. I had decided to try for it after completing my BSc at the BHU. My father, who had had a very successful career at Cambridge was all for it.

Passage to Cambridge

There were two hurdles, however. Getting into Cambridge was difficult. Simply doing well at the BSc was not sufficient...for the external assessment of the standards of education at Indian universities was rather low even in the 1950s. And, even if one got admission, the finances would pose another problem.

Fortunately, several plus points in my case helped. The achievements of my father helped in establishing a basic credibility level of my own first rank at the BSc examination. Even then, the Cambridge University refused to give me an affiliated status, which would have allowed me to get the degree in two rather than three years. The reason? The BSc degree of Bombay University was recognized for this status, but not the BSc of Banaras Hindu University. So I was given admission but for the full three year course.

The problem of funds was solved by my getting the prestigious J N Tata Endowment scholarship. Here again my antecedents helped: for my father had been a successful J N Tata Scholar himself. Nevertheless I had to go through a tough interview conducted alone by the Chairperson of the Endowment, the redoubtable Mrs Piroja J Vesugar. Although she passed me, she did not fail to issue a warning. She mentioned a few names of recent Tata scholars, who were sons of distinguished Tata scholars, but who had done not so well at Oxbridge. So don't be complacent, she said. I have greatly valued that advice.

I should close this account with a brief discussion of another career option which was open to me at the time. When I called on Mr R P Paranjpye, Senior Wrangler at Cambridge of the 1899 vintage, he asked me: "After doing the Mathematical Tripos, will you go for the IAS?" For he was voicing a view common in those days, that a Cambridge degree was a good stepping stone for the Indian Administrative Service. When the great RPP himself distinguished himself at Cambridge he was expected to join the Indian Civil Service. But he opted for a teaching career.

My answer to Mr Paranjpye was likewise quite definitive: "No Sir, I wish to enter a career of teaching and research'.

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