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Road to research

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From my childhood, I knew that mathematics was the stepping stone to enter the world of Science, and that was what together with Sanskrit, our elders learnt. And that I too would learn the same.

Mine was a 'joint family' of the feudal zamindari system, consisting of my father and his two older brothers, my grandmother, mother, two older aunts, and cousins and my brother and two sisters. Daughters were very well taken care of, including their education. My hometown was Chandernagore – a small French township on the banks of the river Hooghly. It had a French Convent School, a Church, and various other schools and colleges, and some French nationals.

I was a student of St. Joseph's Convent – where we followed Junior and Senior Cambridge Course. In my J.C. Course there was Mathematics and Hygiene and Physiology apart from the usual subjects covering History, Geography, English and French (compulsory!). No Bengali, no Sanskrit!

This combination of hygiene, physiology and mathematics was, for me, the first taste of the future Science Cosmos. I liked solving arithmetic and geometry problems, and watched with wonder my teacher (who was a Nun) perform dissection on a toad and expose the inner system. My father was a quiet person with immense intellectual yearning and depth. My

mother, married at eleven but trained by my father, could recite Tagore fluently till the end of her life and taught me my mother-tongue. My maternal grandfather was another strong influence at that point of time.

Then there was turmoil in the country – the second World War, famine, Gandhiji's August movement, the INA-movement, partition, the end of Foreign rule and India's Independence !

It was somewhat similar in my personal life also – much turmoil and movement. Marriage before my Junior Cambridge Exams (which made me move to Calcutta) – in spite of which I sat for the exams and did fairly well – then childbirth, and many mishaps and many other breaks in the smooth running of academic and family life.

For about 5 – 6 years there was a break in my formal education, but this did not deter me from academic pursuits. I started learning Sanskrit at home, from Pandit Sivaprasad Bhattacharya – and this opened up a panorama of another world, a treasure house which has sustained me throughout my long life.

In between, my brother came to Calcutta to study Physics Honours in Presidency College and stayed with me. This made me think of starting my formal academic career again. I had to sit for Matriculation Examination as a private candidate and obtained a 1st Division and the subjects covered were History, Geography, Maths, English, Bengali, Sanskrit. As Presidency did not allow girl students in the Intermediate (i.e. XII) classes, I went to Loreto College with Physics, Chemistry, Maths and French as an 'additional subject' and English and Bengali. There were very modest labs, but very sincere teachers – and from here my liking for science started crystallizing. I can still remember Prof. Bose-Majumder drawing geometry figures on the black-board, and Prof. Ganguli demonstrating Physics experiments in the lab! In the final University exam I obtained a 1st Division, but this was due to my brother helping me at home throughout – especially with my Physics and Maths.

Now the portals of Presidency College were open to me. The teachers here were a different set – which is partially true even now. I had physics as my Honours (or Major) and Maths and Chemistry pass (minor) subjects. I was interested in experiments

as well as in theory. In spite of my many difficulties at home – as a mother and a housewife – I did manage somehow.

We had the very good fortune of having Professors like K.C. Kar, R.L. Sengupta, P.C. Mukherji, P.Sen, P.C. Bhattacharya, and S.N. Bose, M.N. Saha, B.D. Nag Chaudhuri, S.N. Ghoshal and others. We were the last batch of M.Sc. Physics students who had the very good fortune of watching Prof. S.N. Bose lecturing on Special Theory of Relativity. He retired that year. In M.Sc. Physics we had to opt for a 'Special paper' and my choice was 'Nuclear Physics'.

That was the time when scientists and others were aware of the devastating effects of nuclear energy. The atomic bombs had been dropped on Hiroshima and Nagasaki in 1945. A new research area was developing – that of 'biophysics'. It was Prof. M.N. Saha who had the vision of establishing the Department of Biophysics in the Institute of Nuclear Physics and appointed Prof. N.N. Dasgupta – a Cosmic Ray Physicist as its head. Initiation of my research career started as a Ph.D. student under the guidance of Prof. Dasgupta in 1957. I learnt many many things from Prof. Dasgupta – as a scientist, as a teacher, as a human being. My first research note was sent (and accepted) in Nature in 1959 and he omitted his name as one of the authors. He instructed me to give him thanks for guidance. This was a life-long lesson for me (and all his students).

Listening to scintillating lectures by national and international scientists was something we students enjoyed, and these enriched our understanding very much. We had plenty of opportunities for this and were encouraged by our teachers. I still retain the habit. I remember listening to Homi Bhabha at the Bombay Science Congress, G.N.Ramachandran, Dirac. Emilio Segré – these are the seeds of a future life – form that are sown in the mind and act as intellectual fertilizers.

While doing my Ph.D. I accompanied my husband (the late Prof. Sivatosh Mookerjee) a biologist, who went as Visiting Fellow at the Rockefeller Institute in 1960. After a few months it was suggested that I visit Sloan Kettering Institute for Cancer Research which had a Biophysics Division. I went, with my first pub-

lication copy of the Nature article, and was asked to join after some time, as my visa needed to be changed. Very fortunately Dr. J.S. Laughlin – the Head – allowed me to use the data I obtained in that lab later for my Ph.D. thesis work. A publication in Radiation Research came out of that study. My exposure to cancer therapy, cancer patients in the attached Memorial Hospital – was a turning point for my future research life. I saw Leo Szilard, one of the brains behind the ‘nuclear explosion’, suffering from leukaemia, and undergoing chemotherapy which was at a very early stage at that time. He had ‘donated’ himself for research.

On my return to India I submitted my thesis, got my Ph.D. and joined Saha Institute in the Dept. of Crystallography and Molecular Biology and ventured deeper in the study of Molecular Biology.

In 1972 my husband joined the School of Life Sciences, J.N.U., New Delhi. The only other Science department then was the School of Computer and Systems Sciences and Shri G Parthasarathi was the Vice Chancellor. I came from Calcutta, keeping my lien at the Saha Institute, and as a Visiting Fellow was teaching Biophysics to the students of School of Life Sciences. It was in 1974 that the present School of Environmental Sciences was formed, and then Dean Prof. (Late) S.N. Biswas and few other colleagues we toiled day and night trying to give the new School and the new subject a comprehensive form.

The SES took about two years to take off, after which there was no looking back! Without teaching research is barren and without research, teaching is stale. As teachers we are supposed to inspire the students, but, students inspire us too!

The core of our research activities was centred around drug and radiation effects, separately and in combination on cell and cellular components, and on drug structure and modeling. The course that I attended in ICTP Trieste (1980) helped a lot.

On my retirement from J.N.U. in 1991 we came back to Calcutta and very unfortunately I lost my husband in 1993. He stood like a rock behind me in all my travails. Now, I look after the ‘Sivatosh Mookerjee Science Centre’ which is a part of the Asutosh Mookerjee Memorial Institute. My inner source of strength and inspiration is the Belur Math, Ramakrishna Mission. It has been so since my girlhood days from when I was 12 years old...