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My journey in science

V Kalpagam

It all started in our own house. My father did his M.Sc. by Research in Physics from Madras University and then joined as a lecturer in the then-famous Nizam College in Hyderabad which was affiliated to Madras University. He took us to his laboratory during our formative years. He used to inspire us always by explaining the scientific significance of all the things that we came across in our daily life. We had plenty of popular books to read at home. Quite a few colleagues of his used to visit our house and we children had good interaction with them and their children, most of whom were our classmates in school. I was very fortunate to have supportive parents and good advisers from the beginning. Our maternal grandfather was an engineer and one of my maternal uncles joined IIT Kharagpur for B.Tech the year it started.

I studied in a missionary school. The teachers always spoke of the importance of education and the importance of standing on one's own legs. Some of these teachers were my father's students at their graduation studies. They used to speak very highly of him and advised me to achieve that status. At that time I never thought that I would follow his footsteps, but I had the zeal to do well and top in the class. There was always a keen competition between me and my friend who happened to be the maternal aunt of the famous cricketer V. V. S. Laxman. This competition contin-

ued till our Intermediate (present 12th std) stage after which we parted ways as she went for medicine.

The Principal of our school, Miss De Lima was loved by one and all. During our Ethics class when she quoted sometimes from scriptures she made it a point to quote from Hindu Epics, Bible, Koran etc. The poet queen or the Nightingale of India Sarojini Naidu, visited our school often, being a friend of the principal and was indeed a role model for us. Her special connection to Nizam college also caused her to take more interest in me due to the fact that my father was teaching in Nizam college.

I was lucky to be introduced to Prof. Bhagavantam at an early age as he and my father were research colleagues. I was also lucky to listen to lectures delivered by Sir C. V. Raman and a number of other scientists who came to Nizam college from time to time. May be all this had an influence on me though at that time I didn't have any clear ideas.

After my H.S.C. (10th std) results when I had to join college, I took up PCM (Physics, Chemistry and Mathematics) in Inter and B.Sc, not having any interest in biology and not wanting to do medicine. I chose to do my M.Sc. in Physics at Osmania University. When I passed my M.Sc. my father's maternal uncle, a Barrister at Chennai was keen that I should take up the Civil Services Exams as a cousin of my father was in the IPS. However I had no interest in that field and did not pursue that line.

S.Bhagavantam was then the Vice-Chancellor of the Osmania University. I met him and requested him to take me as his student for research. Within a year of my joining him he came to Bangalore as the Director of I.I.Sc. Thus my journey to Bangalore started with him. I had done a little work on Light Scattering Studies of Polymer Solutions at Osmania. At I.I.Sc. the light scattering instrument was just then procured by the Inorganic and Physical Chemistry Department. Hence Prof. Bhagavantam advised me to join the IPC department.

In the IPC department I had to take a number of courses in Physical and Inorganic chemistry and do quite a bit of laboratory work to familiarize myself with the subject and techniques involved. Finally after a few years of struggle when one submits

the thesis one feels that one has achieved something in life. At this stage, I have to thank all my kith and kin, teachers, colleagues, friends and foes who assisted me constantly to reach this end. From there the next part of one's journey starts - a job. I was lucky to get a position in the same department. in I.I.Sc. Thus I could continue to be in the field of science till the day of my retirement.

Even as I was settling down in my job, I was selected under UNDP to visit M.I.T., USA, to study about the emerging subject "Materials Science' as the Institute was planning to introduce this subject as a core course for the Engineering students. I was attached to Prof. Smakula of the Electrical Engineering Department. Apart from teaching this course for the freshers in the department, he was working on crystal structures. Any way, I was free to move around, attend some classes in Materials Sciences and frame the syllabus. This subject was taught in different Engineering Departments by staff with different backgrounds. They gave a lot of importance to practical work. Back home, we had to be satisfied with just giving lectures in one semester.

I also had a very enjoyable meeting with Prof. Vikram Sarabhai. I saw his name plate on one of the doors in the same floor where I was working. He was visiting MIT now and then, it seems. On the third day of my work there, he himself called on me and enquired about my welfare, work and so on. He was delighted to know that I was from I.I.Sc. He gave me a vivid description of his experiences at I.I. Sc., Physics Labs at Ahmedabad, starting of ISRO and so on, apart from talks about arts and other related subjects.

After my return from the US apart from taking the materials science classes, I continued with my research work on light scattering studies of polymer solutions. One by one students joined to do their Ph.D. Slowly we drifted from polymers to copolymers. We also dabbled with the mechanical properties of these materials trying to understand how they vary from a polymer to copolymer. During those days getting chemicals was a herculean task as the budget was meagre and everything had to be imported. It was a difficult task to make the students understand to share the poverty!! Any way we continued trying to collaborate with Central

Leather Research Institute (CLRI), Madras. They were working on graft copolymers.

A lot of my work focussed on understanding how polymer degradation occurs. The idea was to make biodegradable copolymers so that they can be used for biomedical purposes. Copolymers are obtained by grafting synthetic polymers taking natural polymers which degrade, as a backbone. If a medicine could be enclosed in a biodegradable capsule then the medicine would be slowly released at a particular site and thus would avoid the need of taking the medicine a number of times a day. We did a little preliminary work on this aspect in collaboration with Sri Chitra Tirunal Medical Institute at Trivandrum. About a dozen students got their Ph.D. working on these problems and we could publish quite a few research papers in International Journals.

I had the pleasure of framing and setting up the polymer science lab at Sri Jayachamarajendra Institute, Mysore when they started B.E. in Polymers. I was a member of their Board of Studies and an examiner. I had a lot of interaction with CLRI Madras; Madras University, I.I.T. Delhi, Madras and Kanpur as an examiner for Ph.D. theses, viva voce, paper setting for Materials Science and Polymer Science. I also gave a number of popular lectures for Institution of Engineers, HAL, ITI, NAL and so on, apart from participating in Materials Science and Polymer Science conferences by way of presenting papers, chairing sessions etc. I was also a memeber of different professional societies including American Chemical Society.

It has been a satisfying journey. During this I have had company and ample support of my husband Prof. V S R Rao, who was also a professional scientist and a professor at the Indian Institute of Science. There were of course issues involved in balancing family and profession, but nothing that could not be handled.