

Sivaraj Ramaseshan (1923–2003): A tribute

Sivaraj Ramaseshan is no more. He was an outstanding contributor to the science and the academic life of the country for more than half a century. His efforts and accomplishments covered three areas: crystallography, materials science and scientific publications. He also gave valuable advice on technology development. In all these, he has left an indelible mark by striving for excellence and helping to build institutions. He had endeared himself to a large community of scientists through his sharp intellect, fine sense of humour and a basic humane nature. Sivaraj will be badly missed, for we have few with his commitment and dedication. He was a treasure.

Sivaraj came from an enlightened family with stars in the scientific arena. His father was a senior officer in the Accounts Department of the Government of India. His uncle, C. V. Raman, was a dominant personality in the scientific scene and a giant in experimental physics. Another close relative was the astronomer S. Chandrasekhar. Sivaraj did not have far to go for inspiration. He had his early education in different parts of the country, but his real training in physics was under the tutelage of Raman himself, at the Indian Institute of Science (IISc). He obtained his doctorate degree from Nagpur University for the thesis he wrote under Raman. Raman remained his hero throughout his life.

Sivaraj's early work pertained to magnetism, paramagnetic resonance and optics, but he decided to take up crystallography as his life's interest in the early 1950s, as a young member of the faculty of the Department of Physics at IISc. His visit to several laboratories in the US and elsewhere helped him to further his efforts in launching a school of crystallography. He trained a number of people who later turned out to be leaders, thus giving rise to a mammoth Ramaseshan tree in crystallography. A significant contribution of Ramaseshan to crystallography relates to anomalous scattering. This work should have got much more recognition than it has. An important influence in his professional career was that of Dorothy Hodgkin with whom he worked for a period in Oxford. Dorothy became a close family friend and was another source of inspiration to Sivaraj.

The Indian Institute of Science in the early 1960s was a small and serene place.

The departments were tiny, with just one professor. Ramaseshan had to leave IISc for IIT Madras to become Professor and Head at the department of physics. That was the period when a number of young stars left IISc for similar reasons. After a short period at IIT Madras, where again he established a group in crystallography, Sivaraj returned to Bangalore in 1966 to set-up the materials science division at the National Aeronautical Laboratory (NAL). It was a new challenge that offered itself at a time when Sivaraj was extending his interests to materials research. Sivaraj successfully established the first complete materials research centre in the country at NAL, with a number of young and capable scientists and a fine group of research students. These young co-workers have since emerged to become leaders in different areas of science, from astronomy to theoretical physics. An important aspect of his research at NAL was on physics at high pressures.

Towards the end of 1970s, Satish Dhawan invited Sivaraj to join IISc as the Joint Director. Soon he succeeded Dhawan as the Director of IISc. I must recall here that Satish and Sivaraj were academic co-hearts and close friends from way back when they were young faculty members at IISc. They had much in common. They enjoyed reading on various subjects, and were both concerned citizens who shared idealism and scholarship. Sivaraj formally retired from IISc in 1984. Retirement only meant a new beginning for other academic pursuits and Sivaraj became an honorary professor at the Raman Research Institute (RRI) where he continued till the last day.

During his later career, Sivaraj played an important role in developing materials technologies and advising industry and R&D institutions regarding technology alternatives. He was also involved with bodies responsible for science and technology policy and industrial development.

In 1970, when Raman passed away, the Indian Academy of Sciences and RRI needed attention. Sivaraj shouldered much responsibility to ensure that these institutions not only survived, but also grew in stature. RRI could fortunately find a fine director, V. Radhakrishnan, to lead it. The Academy required considerable restructuring. Sivaraj's contributions in ini-

tiating a new programme of scientific publications of the Academy are truly worthy of note. After lengthy discussions with several scientists, a new journal of physics, *Pramana*, was started. Sivaraj was the founding editor. As time passed, journals devoted to astronomy, biology, genetics and materials science were started and at the same time, the Proceedings of the Academy were reorganized to cover different subjects. Having worked closely with Sivaraj during those days, I can vouch for his extraordinary, selfless effort in creating a place for India in scientific publications. The effort involved not only starting the journals, but also ensuring proper production, adequate funds and publicity. As part of this drive, *Current Science* was brought under the auspices of the Academy and its editorial and administrative structure changed appropriately. Today, *Current Science* is the most visible science journal from India. In addition to publications, Sivaraj worked for the Academy on a day-to-day basis. He was editor of publications and later President of the Academy. He brought out the collected works of C. V. Raman; it was a labour of love.

I would like to write a few words about my association with Sivaraj. When I first got to know him, he was a young faculty member in the Department of Physics at IISc. He was clearly one of the finest faculty members in the campus and it was a pleasure to talk to him on various topics. He was a great conversationalist and had interest in art, history and literature. He enjoyed talking about science and



S. Ramaseshan with Subrahmanyan Chandrasekhar.

scientists. I used to meet him almost everyday, often in his house at lunch time. I spent many enjoyable hours in the company of Sivaraj and Kausalya those days. They were an ideal couple; warm, friendly and full of life. I can never forget those days at IISc when there was little social life, but we had a small group of like-minded close friends. Dhawans and Ramaseshans were the natural hosts to a young faculty member like myself. We discussed issues, shared our vision and commiserated together. We also shared many a meal and lots of laughter.

Sivaraj was a shy person in many respects, although one would not think so when listening to his excellent lectures. I remember talking to him for hours about matters where he had to categorically state his views to certain persons. Eventually, he would agree but often end up making a mild statement, filled with pleasantries. Sivaraj did not want to hurt anyone and avoided saying anything that may be unpleasant. Basically, he enjoyed knowing people and talking to them.

I recollect many interesting occasions and incidents from our years of association. I still remember the days when he wrote the article for the *Handbuch der Physik* with G. N. Ramachandran. A particularly enjoyable trip we took together was to Shillong in 1961, to participate in a symposium on organic chemistry. The long train journey from Bangalore to Kolkata and the road trip from Guwahati to Shillong were memorable. When visiting a host in Assam, Sivaraj ate raw areca

nuts offered by the host and became giddy. Fortunately, he recovered soon. We had a long talk afterwards on the unusual alkaloids in areca nuts. We spent hours talking about the folklore of Kama-kshi temple. Another occasion I often recollect is the Sadashivnagar session of the Indian National Congress held next to IISc. We went to see the procession and there was Pandit Nehru standing on the roadside along with the crowds. Pandit Nehru later visited the RRI along with Indira Gandhi. Raman was in great form, lamenting in a loud voice about the ills of Indian science.

On one occasion, when my family and I visited the Ramaseshans in IIT Madras on our way from Kanpur to Bangalore, there was an amusing episode. Sivaraj came home from the department to be with us, but we had the nagging fear that the Director of the Institute would call up Sivaraj to enquire why he had gone home during working hours. The Director had the reputation of being a strict headmaster, who kept a note of the whereabouts of professors and about their hours of arrival and departure from the departments.

I did collaborate with Sivaraj on one or two problems, but we have no joint papers. We solved the structure of a heterocyclic compound in 1960, but someone else published it by the time we completed the work. We did high-pressure work on phase transitions of some crystals, but did not publish it together. Over the years, I have spent hours and days discussing journals, elections, annual meet-

ings and other activities of the Academy with Sivaraj. We worked in unison and there was not a single occasion for discord.

In recalling the colourful and interesting life of Sivaraj, one cannot forget to mention the important role played by Kausalya. She has been a fine companion to Sivaraj and a great source of strength. My wife and I have always enjoyed her company and her positive outlook. She took care of Sivaraj during the last few months like nobody else could. It is so difficult for me to think of Kausalya without Sivaraj, but that is to be. I am sure that all of us would pray to the almighty to bless her and the children with the strength to bear this great loss.

Before ending, I would like to recall the many fine qualities of Sivaraj. He stood for excellence without being arrogant. He carried his accomplishments and recognitions lightly. He was a good communicator without being pompous. He loved people because it was his nature. He loved life and laughed easily. Wherever he is, he is probably reading a book, with music in the background, and planning a new science journal.

So long Sivaraj, we will miss you. Good bye, my dear friend.

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