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## G. N. Ramachandran – Reminiscences

I met G. N. Ramachandran at the Indian Institute of Science, Bangalore around 1941 or so when he had just joined the institute. Within a year he had done enough work in optics which would have earned him a doctorate very easily, but was submitted for a mere master's degree. The late K. S. Krishnan was the examiner who was known to delay reports unmindful of the enormous anxiety it caused to the candidates and

Raman had to write to him to speed up the report!

Because of my early association I could freely talk to him about various scientific subjects which he could grasp very quickly and go to the root of the matter. I had useful interaction with him after his return from Cambridge. The trio, Ramachandran, S. Ramaseshan and V. Chandrasekar, were working on an important paper on optics published in the *Journal*

*of the Optical Society of America* and later as an article in the *Handbook der Physik*. During that time I had useful discussions with him on magneto-optic resonance. We had discussions at his home every week and I remember reporting the famous Lamb-Rutherford paper.

Of my work on nuclear magnetic resonance, particularly radiation damping and NMR of flowing liquids, he was the only one who could fully understand its

importance. I remember my discussions with him on the possibility of maintaining self-sustained oscillations through flowing liquids which would perhaps have resulted in an NMR laser; that was not to be because of very poor experimental facilities. During that period Ramachandran was trying to focus X-rays through reflections in poly-crystalline materials like copper. I suggested and made a simple focusing arrangement using a thin sheet of mica and some vacuum. Ramachandran published this in *Physical Review* and he has acknowledged my suggestion which resulted in the work of late Y. T. Thathachari.

I have always marvelled at his paper on collagen and how with hardly a few spots on the X-rays photographs he could arrive at the structure. Had he tackled other bio-molecules, particularly DNA, it would have been a boost for science in India and worthy of Ramachandran's innate genius. However on his return to IISc from Chennai, he founded a very active school on molecular biology which has contributed a lot to that branch of science in India.

I met Ramachandran early last year as an inmate of the voluntary health scheme resort at Chennai. In spite of his physical disability due to an incurable syndrome, he was mentally fully active and I had the occasion to talk to him about some of the

work I had been carrying out on time and gravitation and related matters. He was very quick to understand the key points and was immensely happy. I remember him smiling and wishing me all the best.

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Every morning, after breakfast, G. N. Ramachandran and I used to walk to the Physics Department at the Indian Institute of Science, Bangalore. Then he told me that after joining the Electrical Engineering Department at IISc, he used to meet C. V. Raman every evening and talk with him for an hour or two. He also used to request Raman to take him into the Physics Department. I asked Ramachandran, 'Did Raman ask you questions in physics?' Ramachandran said: 'No. He used to tell me that he was writing up his Baroda lectures on optics. (This appeared later as a book entitled *Lectures in Physical Optics*, published by the Indian Academy of Sciences.) He discussed with

me, item by item, the various aspects of optics that had interested him (Raman). I never knew that optics could be so exciting. I used to ask him hundreds of questions, to which he invariably gave clear answers. These meetings in the evening were long discussion sessions and after one such long session, late in the evening at about 7 p.m. Raman said, "I think I will try to get you transferred to my Department." My joy knew no bounds. I feel that it was during these conversations and discussions that I really understood the physical basis of Fourier theory and Fourier transform' (This proved to be of great use to Ramachandran for his researches in X-ray crystallography.) Raman sent a copy of the book *Lectures on Physical Optics* to S. Chandrasekhar, to which Chandrasekhar replied: 'I was delighted to receive the other day a copy of your *Lectures on Physical Optics* with your inscription. I had earlier seen this book with Pancharatnam when he visited us last summer. I was most impressed with this book at that time, and I am very happy now to possess a copy. By accident it happens that I am lecturing on advanced optics and I intend to make use of your book in these lectures . . .'

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