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Foreword

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The origin of crystallography in India can be traced to C.V. Raman, the most distinguished scientist India has produced. Raman himself was not a crystallographer, but many of the early leaders of Indian crystallography, particularly structural crystallography, were students of Raman. Crystallography originated in India in that cradle of science, Kolkata. Raman's student, Kedareshwar Banerjee at the Indian Association for the Cultivation of Science, was the first Indian Crystallographer. The first crystallographic paper from India was by Banerjee in Nature in 1930 on the structure of naphthalene and anthracene. Thus, Indian crystallography has had a tradition of more than 70 years. Another celebrated paper of Banerjee was on the "Determination of the signs of Fourier terms in complete crystal structure analysis" communicated by William Bragg to the Proceedings of the Royal Society. This represented a conceptual forerunner of modern direct methods. Banerjee had a very active career at Kolkata, Allahabad and then again at Kolkata. He worked on structure analysis as well as on more physics oriented crystallography. The Banerjee tradition continues in Kolkata and elsewhere.

In the meantime, two other students of Raman, namely, G.N. Ramachandran and S. Ramaseshan, blazed the trail of crystallography from the South, from Bangalore and Madras. Ramachandran has undoubtedly been the most distinguished crystallographer and structural biologist from India. Indeed, he has been the most distinguished scientist of independent India. The triple helical model of collagen proposed by him represents an early triumph of molecular modelling based on fibre diffraction. The Ramachandran plot, which remains the most important descriptor and tool for validation of protein structures, immortalised G.N.R. He laid the foundation of much of what we now call molecular modelling. His outstanding contributions to crystallography are very well known: anomalous dispersion, application of Fourier transform theory and so on. He established two major schools, one at Madras and another at Bangalore. G.N.R. was

awarded, among other things, the Ewald Prize, the highest recognition the crystallographic community can confer, in 1999 at the Glasgow Congress. Ramachandran is no longer with us. But the tradition he established, the Ramachandran tradition, lives on and thrives in the two schools he established, in his country, India, and in the world.

The other distinguished crystallographer from the South, a contemporary of Ramachandran, has been Ramaseshan. He made many outstanding contributions to crystallography and material science. Just as an example, he laid the foundation for the now hugely popular Multiple Wavelength Anomalous Dispersion Method, the MAD method, in two papers, along with Venkatesan and Mani, in the mid fifties. Ramaseshan sired a large ensemble of schools in crystallography. In India, perhaps nobody has had as many students, grand-students and great-grand-students working in crystallography, as Ramaseshan has.

While Ramachandran and Ramaseshan have been active in the South in structural crystallography, A.R. Verma has been setting up a great tradition in more physics oriented crystallography. Verma had his early training in crystallography in the great British School. He made many outstanding contributions pertaining to phase transformations, polymorphism, polytypism and so on. His laboratories at Banares and Delhi were great training grounds for young crystallographers, who now occupy many important positions in different parts of India.

In addition to Ramachandran, Ramaseshan and Verma, there were many other veterans of that generation. In particular, I remember N.N. Saha of Kolkata, A.B. Biswas of Bombay, G.B. Mitra of Kharagpur, A.R. Patel of Vallabh Vidya Nagar and M.P. Gupta of Ranchi. The next generation of distinguished crystallographers included M.A. Viswamitra, R. Chidambaram, K. Venkatesan and H. Manohar. I particularly wish to recall the contributions of Viswamitra. He was a distinguished structural biologist and instrumentalist, and a man of great generosity and nobility. He passed away unexpectedly in 2001.

Eminent crystallographers abroad have considerable influence on Indian crystallography. In recent years, the influence of Dorothy Hodgkin has been perhaps the most significant, particularly in relation to biological crystallography. During the last

couple of decades, especially during the last decade, macromolecular biological crystallography has developed into a major area in the country. Developments have taken place in other areas of crystallography as well. Indian crystallography today is a rich tapestry into which are woven several strands of tradition, Indian and international. We are a several hundred strong community and I believe we form a none-too-insignificant component of international community of crystallographers.

Organized efforts by crystallographers in India were initiated by G.N. Ramachandran in the first half of the sixties in the form of annual seminars at Madras. These seminars, subsequently sponsored by the National Committee of Indian National Science Academy for the International Union of Crystallography, are now held annually at different parts of India. However, the need for an Indian Crystallographic Association was all along felt. The Association was ultimately formed in 2001. The first major activity of the Association was to co-sponsor, along with the Indian National Science Academy, the 4th meeting of the Asian Crystallographic Association at Bangalore in November, 2001, which was a resounding success. The meeting also helped the finances of the Association. One of the subsequent activities planned by the general body meeting at Jammu in 2002 was the bringing out of the Newsletter. I am pleased to write this “Foreword” to the Newsletter. I hope that the Association would progress from strength to strength in the years to come.