sedimentary basins associated with the Deccan volcanics and, furthermore, the geodynamics of colliding plates can be constrained by vertebrate dispersal events.

In the coming years, I perceive an increasing need towards collaborative ventures involving vertebrate palaeontology, a subject that is strongly multidisciplinary and interactive. In fact, without support from sedimentology, palaeomagnetic stratigraphy and geochronology, no meaningful research can be undertaken.

Once again with a deep sense of gratitude, I thank the Geological Society of India for bestowing this honour on me and, on my part, I would strive to uphold the high ideals established by my far worthier predecessors.

PRESENTATION OF THE PROF. M. R. SRINIVASA RAO AWARD TO PROF. V. RAJAMANI

Dr. Kurien Jacob, President, Geological Society of India in presenting the Prof. M. R. Srinivasa Rao Award to Prof. V. Rajamani said:

I have great pleasure in announcing the M. R. Srinivasa Rao Award, for the year 1989, to Prof. Vedharaman Rajamani, Professor of Geochemistry, School of Environmental Sciences of the Jawaharlal Nehru University, New Delhi.

Prof. Rajamani took his B.Sc. degree from the Madras University, and M.Sc. (Applied Geology) from the I.I.T., Bombay. In 1972, he was awarded the M.S. degree by the State University of New York at Stony Brook and the Ph.D. degree in 1974 of the same university.

In 1977 he joined the Jawaharlal Nehru University, New Delhi, as Asst. Professor and later served as Associate Professor from 1979–86. Since 1986 he has been a Professor of Geochemistry at the JNU.

For the past ten years the research interests of Prof. Rajamani are on the problems of petrogenesis and ore genesis in Archaean greenstone-granite terrains. The basic assumptions in his endeavour are: (1) the earth's interior is the ultimate source for everything that is ever accessible to us on the earth ; (2) magmatic processes are the major mode of transport of matter from the mantle to the crustal levels ; (3) mineral deposits are integral parts of rocks in which they occur and, (4) rocks, associated mineral deposits and their sources can be taken together as a chemical system and, therefore, basic principles of crystal chemistry and thermodynamics of mineral-forming processes can be applied towards better understanding of crustal genesis, crust-mantle evolution and formation of mineral deposits. With these assumptions, an integrated geological, geochemical and geochronological study on the famous Kolar Schist Belt has been undertaken by him.

By careful petrogenetic studies, he has suggested that komatiitic magmas in the Kolar Schist belt were formed by lower percentages (<20%) of melting of a variety of sources at depths equal to or greater than 150 km by adiabatic melting processes. By quantitative modelling of both major and trace elements including rare earth elements (REE), chemical evidence for adiabatic mantle melting were presented for the first time in petrology. Until this study, komatiitic magmas were thought to have been formed by large extents of (>50%) mantle melting and, therefore, their chemistry was used to infer the chemical nature of Archaean mantle and its heterogeneity. Because of the demonstration that komatiitic magmas can also be generated by low percentages of melting, geochemists may have to revise their komatiite-based models for the early mantle.

He has shown that a 4 km wide belt, wherein komatiitic rocks are relatively a minor component compared to tholeiites, include komatiitic rocks with all the REE patterns reported so far from greenstone belts of different continents. Komatiitic as well as tholeiitic rocks on the western part of the N-S trending belt had come from LREE depleted sources, similar to ocean ridge basalts. The eastern side suite with similar major element chemistry had, however, come from LREE-enriched source and seems to have had an island arc type tectonic setting. The tholeiitic rocks had been derived from lithospheric sources at shallow levels which probably included a high proportion of komatiitic melts derived from the asthenosphere. The voluminous tholeiites and the minor komatiites need not always be genetically related as was believed to be the case prior to his studies of the Kolar Belt.

Origin of granitic rocks in several Archaean terranes is a topic of greatest controversy in early crustal genesis. They are thought to require an intermediate step of basalts. He has suggested that the granitoids around the Kolar belt were of mantle origin, probably derived by liquid immiscibility processes of magmas generated from the lithosphere. Further, the granitic gneisses present on both sides of the belt had different origin and histories, are of different ages and are, therefore, spatially unrelated at the time of their formation either to themselves or to the rocks of the belt. The well-known, gold-rich Champion quartz lodes, again present only on the eastern side could be genetically related to the generation, intrusion, crystallization and fluid separation from the 'Champion-Gneiss' magmas. These lodes are not probably related either genetically or temporally to the auriferous-sulfidic lodes of hydrothermal exhalative origin. All these observations led Prof. Rajamani and his coworkers to propose that the Kolar Schist Belt could be a suture between two late Archaean continental terrains.

In addition to the research on the Kolar Belt, a geochemical study on the nature and genesis of early Proterozoic Aravalli volcanics near Nathdwara was undertaken by him. He has shown again that different extents of partial melting of sub-continental mantle sources at different physical conditions were dominant petrogenetic processes in basalt petrogenesis rather than open system crystallization of magma chambers. The dominant tholeiitic and minor komatiitic rocks in the Proterozoic Aravalli also seem to have petrogenetic relation similar to those of Archaean Kolar Belt outlined before.

In view of Prof. Rajamani's outstanding contributions to petrology and geochemistry, the Council of the Geological Society of India unanimously decided to award the M. R. Srinivasa Rao Award to Prof. Vedharaman Rajamani.

On behalf of the fellows of the Society, and on my own behalf, I warmly congratulate Prof. Rajamani, and express our expectations of further valuable contributions from him in future years. I have now great pleasure in presenting the M. R. Srinivasa Rao Award to Prof. Vedharaman Rajamani.

Reply by Prof. V. Rajamani

Mr. President

Thank you very much Dr. Kurien Jacob, for the appreciative words spoken of me. I also thank the council of the Geological Society of India for having honoured me with the Prof. M. R. Srinivasa Rao award for our contributions to petrology and geochemistry. My contributions to understand the petrogenesis of greenstone belt volcanics and their surrounding granitic gneisses were made possible because of the sincere efforts of my associates, Drs. K. Shivkumar, Talat Ahmad, N. Siva Siddaiah, S. Balakrishnan, S. K. Behera and E. J. Krogstad, and of my own guru Prof. G. N. Hanson. On behalf of all of them I gratefully accept the award.

I take this opportunity to suggest a few things for the consideration of the earth scientists of India. It is well-known that geochemistry is an important and powerful tool to understand and to solve many geological problems. In the geological study of any area we are principally interested in the rock-story, as rocks are our only records. We study the nature, origin and sources of different rocks, their genetic and geometric relations, the processes responsible for the collation of rocks to make up the crust and the processes that lead to economic mineral concentration during the formation of the crust.

The earth's crust is made up of rocks, rocks are made up of minerals and minerals are made up of elements. The subject geochemistry deals with the distribution and migration of elements in the earth, and the physicochemical laws governing their distribution and migration. For any serious geological study of an area obviously we need high quality geochemical data as well as sufficient theoretical background to interpret the data for our stated objectives. For a meaningful research in earth sciences, students of geology should have the necessary background in basic sciences including analytical chemistry and instrumentation.

It is needless to discuss the inadequacies of the existing curriculum in earth sciences in India to carry out meaningful research. There is an urgent need to modernise our geological education to face future challenges particularly in areas of resource development and environment. This process has already been initiated in the biological sciences. Let us also do it as soon as possible.