

Proceedings of the Second Prof. R. Balasubramaniam Memorial Lecture Held at DMRL, Hyderabad

The Second Professor R Balasubramaniam Memorial Lecture was organized at Tamhankar Auditorium, DMRL, Hyderabad on December 09, 2013 under the auspices of INAE Study Group on Indian Engineering Heritage on Metallurgy. The lecture, titled 'The Role of Traditional Technologies in the Early Urbanization and Today', was delivered by Prof. D.P. Agrawal, NASI Platinum Jubilee Fellow & Director (Hon), Lok Vigyan Kendra, Almora.

Prof. Agrawal initiated the talk with a maiden remark, "The Traditional Knowledge Systems have not received the attention so far that they deserve for their role in the first millennium BCE urbanization nor for their role and relevance in inclusive and sustainable development today". He added, the Ganga Valley fertile alluvium was ideal for agriculture but the forests had to be cleared both for large scale agriculture and various building and industrial activities metal was required. Copper compared to iron was both scarce and soft without alloying. Iron was more abundant but such metal minerals were not available in the Gangetic alluvium. But the nearby rocky areas like the Uttarakhand hills had plenty of copper and Iron minerals. The early inhabitants of Uttarakhand could observe and experiment with such colourful minerals which led to smelting of copper and later on, iron. Such early metallurgy was not possible in the Ganga valley. Similarly they could also learn through trial and error methods the medicinal uses of minerals and a variety of herbs. This led to development of early chemistry and medicinal science along with the use of a variety of herbs that grew in the sub-Himalayan region. In fact, about 800 medicinal herbs of the Himalayan system were used in the Ayurveda. There are references to king Ashok exporting medicinal herbs to Greece!

In his concluding remark Prof. Agrawal said, "A sustainable use of Himalayan medicinal herbs and water harvesting can generate enough income to increase the percapita income several fold in a few years time in Uttarakhand".

The welcome address was delivered by Dr. Amol A. Gokhale, Outstanding Scientist and Director, DMRL.

Dr. S. Srikanth, Director, CSIR-National Metallurgical Laboratory, Jamshedpur & Chairman of the INAE Study Group on Indian Engineering Heritage on Metallurgy, in his '*Introductory Remarks*' talked briefly about the Study Group itself, and also mentioned the immense contributions made by the Late Professor R Balasubramaniam towards the cause of archaeometallurgy and the rich metallurgical heritage of India.

The programme was chaired by Dr. G. Malakondaiah, Distinguished Scientist & Chief Controller R&D (HR & TM), DRDO Headquarters, New Delhi. Dr. Malakondaiah in his address fondly recalled the days at Banaras Hindu University when he taught Professor Balasubramaniam (then an undergraduate student) and of the multiple talents that Bala possessed and was known for at IT-BHU (now IIT-BHU). He also made reference to the seminal contributions made by Prof. Bala in the study of the Delhi Iron Pillar.

Dr. S. Jaikishan, Member of the Prof. R. Balasubramaniam Memorial Lecture Committee, shared his reminiscences and gratifying personal experience of working closely with Professor Balasubramaniam in various aspects of Indian archaeometallurgy, especially the documentation and study of Cannons.

The event concluded with the vote of thanks proposed by Dr. R. Balamuralikrishnan of DMRL. Several INAE Fellows graced the occasion with their presence.