

The Indian Institute of Metals
(Mumbai Chapter)
(Incorporating Bombay Metallurgical Society)

IIM Mumbai Chapter Executive Committee cordially invites you to

Y. M. Mehta Memorial Lecture on

“Agariyas : the Iron People and the Art of Ancient Iron Making”

By

Prof. N. B. Ballal

Emeritus Fellow,

Centre of Excellence in Steel Technology,

Dept of Metallurgical Engineering and Materials Science,

IIT Bombay, Powai

Multipurpose Hall, Training School Hostel & BARC Guest House

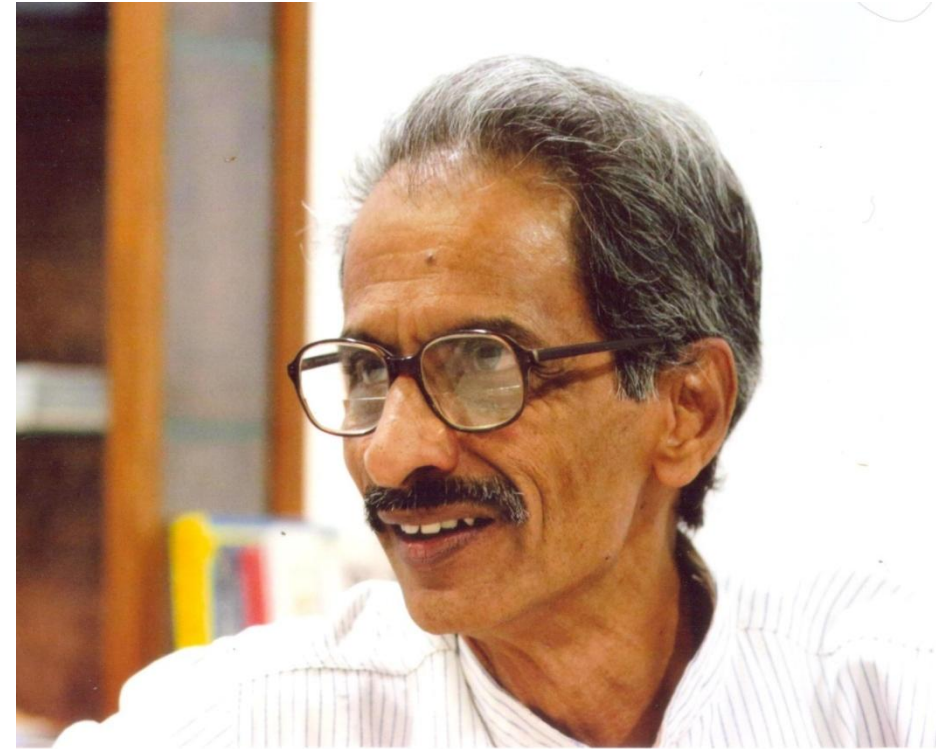
Anushaktinagar, Mumbai 400094

Wednesday, January 23, 2019; 18:30 h

(All interested in the topic are welcome to attend and join us for Tea)

Prof. N. B. Ballal

Prof. N. B. Ballal is a well known figure in the field of Metallurgical Engineering. Having graduated with a PhD in Metallurgy from IIT Kanpur, Prof Ballal has been teaching at IIT Bombay since 1979. Even after retiring in 2015, he has continued his passion for teaching as an Emeritus fellow. Generations of students swear by Prof. Ballal's acumen for teaching students and have learnt innumerable things from him in the course of their stay at IIT-B. He has significantly contributed in the field of process metallurgy, in particular, with respect to steel and iron making. His pioneer work on elctro-slag refining made him one of the frontier scientist in India. He has studied the system from lab scale to all the way to technology transfer to VSSC Trivandrum for the development of alloys for Cryogenic Engines. His keen interest in the Archeo-metallurgy and practices of the traditional metal artisans of India has brought unique distinction as he not only understood the mechanism of iron making through original Indian iron makers but also amalgamated the ancient craft to modern science.



“Agariyas : the Iron People and the Art of Ancient Iron Making”

Since the beginning of civilization India is known for making iron from ore. Well documented history explains that Porus as a token of friendship gave ingot of pure iron to Alexander. Another marvellous piece of Indian craftsmanship is Iron Pillar located near Delhi which is standing without rust for last 1500 years. Advent of iron more than 3500 years ago in India was therefore momentous and led to civilizational transformations. By the turn of the current era (CE), Indian smelters had achieved unparalleled excellence as evidenced by the Iron pillars and the Wootz steel of Damascus blade fame. The major surprise is that making iron from the ore demands temperatures in excess of 1350-1400°C, which is near the limit of temperature achievable using charcoal and atmospheric air, yet Indian produced high quality iron. This has intrigued many scientists and researcher who visited the ancient iron making again and again, as modern science dialoguing with and documenting the knowledge of people who developed and sustained excellence in their technology can be rewarding to both. This has indeed been the case when interacting with the Agariyas of Central India who have been practicing this trade till recently. The stupendous work of Prof. Ballal and his student who have catalogued, documented and demonstrated the review of ancient technology from the modern science perspective, will be presented in the talk and would indeed be learning experience for all enthusiastic learner of Ancient Indian Science.

(Please note that this is not an archeometallurgy study; it is of the practice of the people living in the present).



Agariyas smelting iron.



famous Iron pillar of Delhi



Sword of Tipu Sultan . Note the beautiful pattern of carbides on the sword.