

OBITUARY



Asoke Mookherjee
(1931-2006)

The sad and untimely demise of Prof. Asoke Mookherjee on the 15th February, 2006 certainly marked the end of an era for Ore Geology in India. With his death we lost not only an ore geologist *par excellence*, but also an erudite scholar, an eminent teacher, a visionary and above all an excellent human being. Prof. Mookherjee was born on 15th May 1931 and passed his matriculation examination from Dinajpur Zilla high school (now in Bangladesh) in 1947, on the eve of independence. Immediately thereafter, he came to Calcutta and joined the I.Sc. course in the Presidency College, with Geology as the fourth subject. Subsequently, he took up honours in Geology, 'not out of any fascination for the subject, but in sheer frustration and anger, having scored the lowest mark in it of all the subjects', as he candidly confessed later. Thus, he passed B.Sc. with geology honours in 1st class and topped the 1954 batch of M.Sc. in Geology from the same college. Then he joined the Geological Survey of India and worked there for a little less than a year before joining IIT Kharagpur as lecturer in 1956. He pursued post-doctoral research work at Princeton and University of Western Ontario. Later he visited University of Heidelberg and IGEM, Moscow, for collaborative research. He served IIT for thirty five years including as Dean of Students and Academic Affairs, each for three years and superannuated in 1991. From 1991 to 2001 he was associated with the Department of Geological Sciences, Jadavpur University as Emeritus Professor of CSIR and INSA. Prof. Mookherjee was a Fellow of all the three Academies (FNA, FASc, FNASc), life Fellow of the Geological Society of India and was the recipient of many awards, the last one being the celebrated Wadia Medal of

the INSA. Prof. M. Deb, another distinguished ore geologist in India, edited a seminar proceedings volume entitled "Crustal Evolution and Metallogeny in the Northwestern Indian Shield" in 2000 and dedicated the same to Prof. Mookherjee as a Festschrift, on the occasion of the latter's 65th birthday.

Looking back at the history of development of the science of ore geology in India, Prof. Mookherjee is considered as the architect for the physico-chemical quantification of ore formation, based on thermodynamic rationale. This is evident from his papers in sixties on the Zawar Pb-Zn deposits and experimental determination of solubilities (and precipitation) of Zn and Cd in hydrothermal solutions, a vexing problem in genesis of hydrothermal ore deposits. Mookherjee made novel and seminal contributions in the field of metamorphism of sulfide ores, especially thermal metamorphism by post-ore dykes and also by introducing the term "metamorphogenic", as distinct from the conventional "metamorphic" ores. He demonstrated the ductile behavior of pyrite during regional metamorphism of massive sulfide ores, contrary to the commonly believed brittleness of the mineral. He had profound knowledge in ore microscopy for identification of ore minerals, their texture including (mis)interpretation of ore textures, as he used to say at times, albeit in a lighter manner. Sitting with him for long hours with the microscope was truly an incredible learning process. Mookherjee was instrumental in initiation of researches on fluid inclusions and experimental sulphide phase equilibrium studies at IIT Kharagpur. In the event of experimental failures, his omnipresent words of inspiration were heartening.

Mookherjee made outstanding contributions to the complex sulfide-sulfosalt mineralogy of the Rajpura-Dariba polymetallic sulfide deposits, including optical/XRD/crystal-chemical descriptions of many rare sulfosalt minerals. One of these turned out to be a new Pb-Ag-Tl-Sb sulfosalt phase, which he named as *Rayite*, after his teacher, late Prof. S.K. Ray. His understanding of ore microscopy came in handy in this endeavour. He was a member of the International Association of the Genesis of Ore Deposits (IAGOD), and acted as the Vice-Chairman of the Working Group on Ores and Metamorphism (WGOM).

Mookherjee often used say – there are three types ore geologists– those who look at the ores in field (and through microscope), those who cook the ores (in laboratory) and finally those who think about the ores. Mookherjee certainly had seen wide variety of ores, both in India and abroad. More importantly he seriously thought about the ores, from all possible angles. Such serious thinking went a long way in the publication of his book “Ore Genesis – A Holistic Approach” in 1999 that is considered as a treatise in Ore Geology, which filled the vacuum after publication of the Stanton’s book (Ore Petrology, 1972). Going through the pages of this comprehensive contribution, the readers are reminded, not only of Mookherjee’s in-depth and scrupulous knowledge of the subject but also his unmatched style of English. Mookherjee was an insatiable reader and a conscientious writer. Apart from ores in particular, geology (and science) in general, English always remained his passion. He published many center-spread articles in the

Statesman and the *Times of India*, on various societal issues. Later in 2005, he compiled some of them and published in the form of a book entitled “*Indian Society and Science: viewed from the Interface*”. In the last chapter in this book (*Reminiscences of a Geologist*), Mookherjee quotes from the famous book by Thomas Kuhn (*The Structure of Scientific Revolutions*), which says ‘science progresses, not by gradual accumulation of knowledge but by radical changes of paradigm or worldview, following periods of *normal science* when the characteristic activity is the comparatively humdrum one of puzzle-solving’. Dr. Nigel Cook, Chairman, IAGOD and Chief Editor of Ore Geology Reviews wrote a condolence message to this correspondent when informed about the demise of Prof. Mookherjee. Nigel’s e-mail says – ‘This is very sad news indeed. Although I never met him personally, I had enormous respect for Professor Mookherjee not only because of his major contribution to our subject through the large volume of science he produced and published, but because he dared to challenge and speak out when he disagreed with established dogma. He will be very much missed’. Perhaps these lines substantiate Prof. Mookherjee’s scientific thoughts – in line with – the ‘Kuhn philosophy’. Yes, Prof. Mookherjee, we all will miss you. We pray to the Almighty for your soul to rest in peace.

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BISWAJIT MISHRA

ASOKE MOOKHERJEE — A TRIBUTE

Prof. Dr. Asoke Mookherjee, F.N.A. passed away in Kolkata on the 15th February, 2006 after a long ailment. I saw no mention of this event in any Kolkata daily so far. Perhaps, geologists have fallen from grace in this new world of sound bytes and scams. I was his contemporary in Presidency College, and again as Emeritus Scientist of CSIR. We literally wrote our books in adjacent work spaces - his encyclopedic sweep of the whole subject of Ore Genesis which will remain a reference manual for decades in India and mine on the craft of searching for mineral deposits, a midjet in contrast in both bulk and coverage.

Our 1954 M.Sc batch of Presidency College Geology had made a record of sorts – seven with first class. Asoke had stood first and the last name was Dipak (D.K. Ray of GSI). Many of us had joined GSI as Geological Assistants and went to the 1955 GSI Training Camp. Dr. M.K. Roy

Chowdhury was the officer-in-charge. Asoke and myself were tent mates; and I still recall the sight of late B. Laskar rushing towards the jungle at Rakha Mines camp at 11 pm with a petromax in hand to see the advancing elephant clearly. Needless to tell that Asoke and myself were both running in the opposite direction along with other trainees, two very nervous youngsters at the beginning of their career. On our return, Asoke was posted with late Sailesh Chakravarty in M.P. for mapping in the manganese field. John Straczek was the overall co-ordinator. This USGS man treated the Indians with scant civility. Of course, Asoke was far down the ladder to get the heat.

But he was wise enough to leave GSI and join the IIT, Kharagpur as a lecturer in the Department of Geology. With time, he rose both in rank and fame till he retired in 1991. Our courses converged at that point once again and till mid