Manoj Kanti Banerjee: A tribute

Manoj Kanti Banerjee (MKB) was born in Patna in 1930 to an eminent doctor Bhupendranath Banerjee. He passed B.Sc. (Hons.) from Patna University with first rank in 1949, and M.Sc. from Calcutta University in 1951 standing first with record marks ever scored by earlier toppers. Soon after, he was directly recruited in 1952 as a lecturer in the newly created Institute of Nuclear Physics by Prof. Meghnad Saha. To assess what role he played in Indian science, it is fair to understand the status and culture of science prevalent then in both national and international spheres. Nuclear Physics was born in 1932 with the discovery of neutron, and soon it became the core area of research in science with many top physicists like Enrico Fermi and Neils Bohr et.al joining it headlong. Recognizing its importance for India, Prof. Saha had made early effort to initiate research in this branch. He together with D.S. Kothari as a Ph.D. scholar, attempted to develop a theory of ß - decay. To emphasize the importance of nuclear physics and place it at the focus of Indian science, he founded an institute explicitly naming it as Institute of Nuclear Physics. By 1950, no trained nuclear physicist was available in the country who could help in this mission. However, his dream started taking shape with the arrival of MKB on the scene who was assigned the job of learning the subject himself and teaching the same in the post M.Sc. course, the only such course in India then. MKB not only fulfilled this mandate, but achieved much greater success of doing Ph.D. himself in the subject mostly by self effort. Subsequently, his performance reached epic proportion within a span of 8 years, when he succeeded in guiding students and creating a vibrant research group in all the three areas of nuclear physics namely, nuclear main body problem based on Bruckner theory, nuclear reactions and nuclear structure with fundamental contributions at the very cutting edge of research then.

MKB applied Bruckner theory to the study of finite nuclei by performing the first shell model calculation with Bruckner G-matrices with his student Binayak Dutta-Ray in 1959. In 1957-58, MKB in association with Levinson, developed the theory of inelastic nuclear scattering not proceeding via compound nucleus formation. With his student M.A. Nagarajan, he showed for the first time the importance of exchange effect in Stripping reactions, and with Dipta Mitra he developed the theory of heavy particle stripping. In nuclear physics, MKB (with Levinson) developed method to calculate nuclear spectra using SU(3) group. He applied first the Hartee – Bogolyubov theory to the study of rotational nuclei in early 1960s with his students L. Satpathy and Harish Chandra. It can be safely said that the gamut, the nitty gritty of the fundamentals of nuclear many body theory, nuclear reaction and nuclear structure theory struck root in the soil of India at the crucial period without any time lag vis-a-vis their emergence in international scenario. In a span of 10 years, his reputation in international science reached such a height that he was made an editor of Physics letters at its inception in 1962. Since he left India in 1966 and worked at Maryland University, he mostly worked in intermediate energy nuclear physics with many fundamental contributions. In a series of papers with Kammarata, he showed how

one can formulate a theory of π- N scattering using the divergence of the axial current as the interpolating field. He developed a Chiral Soliton model of N and Δ with M.C. Birse which became a whole program of work at Maryland. With a band of collaborators like Cohen, Lee et.al MKB developed Chiral Confining Model for Nucleon which dynamically generates the confining bag.

MKB left India in 1966 devoting 15 years (1951-1966) of the most productive period of his life to the establishment of nuclear physics research in Calcutta at par with western countries. As a scientist, he was endowed with many rare qualities. The dedication and intensity with which he pursued a problem just for the sake of understanding was without any thought of publication and worldly benefits were phenomenal. Many interesting and important results he had obtained, investing a lot of his time and energy were not published by him. If any student of colleague exhibits a little bit of newness or observes some novel features in the problem under discussion, he becomes ecstatic and showers phrase profusely. As a man, he belonged to a very high order. He was full of love and good will for others. In my visit to several laboratories in abroad, I have come across many famous physicists including Nobel laureates who were full of praise for him as a man and scientist. He was truly Ajatshatru.

L. Satpathy
Institute of Physics, Bhubaneswar