Sujit Kumar Mitra (1932–2004)

Sujit Kumar Mitra was an excellent scientist, a motivating teacher and above all, a wonderful human being. He made outstanding contributions to various branches of statistics and matrix theory, in particular to generalized inverses of matrices. His parents gave him an apt name: Sujit (winner of the hearts of good-natured people) Kumar (young (at heart)) and Mitra (a friend unto everyone). The above qualities truly sum up the character of Mitra. He contracted Parkinson's disease in 1978. Despite an uphill battle against physical discomfort, he remained a leading contributor in many areas of theory and application of matrices till the end and thus remained young at heart always.

Sujit was the eldest son of Ashalatha and Sunil Kumar Mitra, born on 23 January 1932 in Kolkata, India. He had his early education in Jajpur, Orissa. His first motivation and inspiration in mathematics came from his mother and his school teacher Ballav Panda. Sujit was equally good in both mathematics and Sanskrit. He had almost decided in grade IX to opt for Sanskrit instead of mathematics as additional subject but his father persuaded him to opt for mathematics. He finished his matriculation at the age of 12!

Mitra studied Intermediate science at St. Pauls College, Kolkata and obtained B Sc (Hons.) in Statistics from Presidency College, Kolkata. He completed his M Sc in Statistics from Calcutta University in 1951 and stood first in his batch. It was during this period that he was particularly motivated into research in statistics and mathematics by his teachers, C. R. Rao and H. K. Nandi. He was also influenced by another famous statistician, D. Basu, who happens to be his uncle. It was under the persuasion of Basu that he joined Indian Statistical Institute (ISI) soon after finishing his M Sc. In 1954, he went to University of North Carolina at Chapel Hill, USA to pursue a Ph D degree in Statistics. His Ph D thesis was on 'Categorical data analysis' under the supervision of Samarendra Nath Roy.

Mitra made important contributions to categorical data analysis, linear models, statistical quality control, sample surveys, statistical inference, multivariate analysis and design of experiments. His greatest contribution is to the field of matrices and in particular to the generalized inverses of matrices. His research on generalized inverses started in 1967, while refereeing a paper of C. R. Rao on generalized inverses for *Sankhya*. In the process he came up with an alternative equivalent definition of a generalized inverse. Then onwards there was a steady flow of research papers from Mitra in this area. A major area of his contribution in this field is his development of a unified theory of matrix partial orders through generalized inverses. His contributions to generalized inverses have great impact and application in linear models, multivariate analysis, control theory and

electrical network theory. He wrote a full length monograph, *Generalized Inverse of Matrices and its Applications*, jointly with C. R. Rao, which was published by Wiley in 1971, Mitra published about 100 research papers. While I was his Ph D student, I observed that he used to get a lot of results, but would write only a few of them as research papers. Once when I asked him about this, his remark was – 'Bhim! You should write a paper only if either your results and/or proofs are very elegant mathematically or they are of significant practical utility'. He compiled statistical tables, *Formulae and Tables for Statistical Work*, jointly with C. R. Rao, A. Mathai and K. G. Rama Murthi, published by the Statistical Publishing Society, Kolkata. He also prepared lecture notes on matrices meant for non-mathematicians.

Mitra's teaching style was unconventional. He did not believe in spoon-feeding. Instead of writing down the lengthy proofs, he used to motivate a topic carefully and explain clearly the steps involved in a proof or in a method. He strongly believed that if the motivation is proper, students can supply the proofs themselves looking at the books if necessary; and anything learned that way would never be forgotten. Thus his students enjoyed his teaching and learned the subject truly.

After finishing his Ph D, Mitra joined Indian Statistical Institute and except for a brief period, remained with ISI till his retirement. He was the acting Head of the Delhi Centre for a few years from 1976. He was also the Head of ISEC, in charge of evening courses, summer programmes, etc. He was a visiting professor at Indiana University, Bloomington, USA, and a visiting scientist at several other Universities in North America and Japan. After retirement he was a Professor Emeritus at ISI.

Mitra was a Fellow of the Indian Academy of Sciences and the Indian National Science Academy. He was a member of the International Statistical Institute and a Fellow of Institute of Mathematical Statistics, USA. He was the President of the statistics section of the Indian Science Congress in the year 1988. He was an Editor of *Sankhya* for a long period, and was an associate editor of the *Journal of the Indian Society of Agricultural Statistics*. He edited special volumes in statistics with other scientists at ISI.

After a long battle with Parkinson's disease, Mitra breathed his last on 18 March 2004. Mitra leaves behind his wife, three daughters and a son.

P. BHIMASANKARAM

Indian Statistical Institute,
Street No. 8, Habsiguda,
Hyderabad 500 007, India
e-mail: pbhim@rediffmail.com