A leading light

An obituary of V. S. Huzurbazar

Vasant Shankar Huzurbazar was born on 15 September 1919 of Shankar Aboji and Ganga Huzurbazar in Kolhapur, Maharashtra. Emerging as a topper in all subjects in Rajaram High School at quite an early age he had his first encounter with 'probability' in a chapter of 'Higher Algebra' by Hall and Knight and also in a chapter in a textbook on Inductive Logic, which he borrowed from his elder brother out of curiosity. However, further progress in this direction was delayed by the total absence of probability and statistics in the undergraduate mathematics curriculum of Bombay University. He was initiated into mathematical research with the publication of his first paper while he was studying for M Sc. at the Banaras Hindu University during 1940–41. During this period an historic event occurred when, largely through the personal efforts of P. C. Mahalanobis, the Council of the Indian Science Congress agreed to start a separate section on Statistics and invited Sir Maurice Hallet, Governor of U.P. to inaugurate its session in 1941. The inaugural lectures of Sir Maurice and Mahalanobis in which Statistics was described as the 'arithmetic of human welfare', and a concluding popular lecture on 'probability theory' by the eminent physicist Sir C. V. Raman made a deep impression on the young Huzurbazar and influenced him in no small measure to pursue higher studies in the virgin field of statistics.

In 1946, supported by financial assistance from the Banaras Hindu University, Bombay University and J. N. Tata endowment, he left for Cambridge and started his research under the guidance of the renowned mathematician and geophysicist Sir Harold Jeffrey, Plumian Professor in Astronomy and Experimental Philosophy. Sir Harold was already a controversial figure amongst statisticians for his propounding the notion of inverse probability and its relationship with the Bayesian approach to statistical inference. On the completion of his doctoral thesis which was adjudged as the best among all the theses in Mathematics submitted to the University of Cambridge in 1949–50, Huzurbazar was awarded the coveted Adams Prize. The basic results of his thesis were published in the *Proceedings of the Cambridge Philosophical Society* in 1949 and also included in a later edition of Harold Jeffrey's well known book *Theory of Probability*.

During his stay in England he came into contact with the late Sir Ronald Fisher, pioneer in modern statistical theory. Fisher had introduced his celebrated method of maximum likelihood for the estimation of parameters of a probability distribution, but several

basic questions relating to this method necessitated further research. Huzurbazar published a famous and widely quoted paper in the *Annals of Eugenics* in 1948 where he showed that a consistent solution of the likelihood equation is unique and that it has the property of maximum likelihood with a probability approaching 1 as the sample size approaches infinity. He showed that for the class of distributions admitting sufficient statistics, the likelihood equation has a unique solution for samples of any size, and this unique solution makes the likelihood function an absolute maximum. In this context Huzurbazar made a famous conjecture that, for independent and identically distributed random variables $X_1,\ldots,X_n$ with a distribution depending on an unknown parameter, if the conditional distribution of X_1 given a statistic $T(X_1,\ldots,X_n)$ is independent of the parameter for each i then T is globally sufficient. One particular version of this conjecture was solved by V. N. Sudakov. Finally the conjecture was settled by J. K. Ghosh. Huzurbazar's work on sufficiency and related problems is the subject matter of his monograph *Sufficient Statistics* published by Marcel Dekker, New York in 1976.

After his return from Cambridge, Huzurbazar settled down to a long and distinguished career in the department of Mathematics and Statistics at the University of Poona and guided its destiny during 1953–76. Owing to his untiring efforts Poona University has become a centre of excellence in the field of Statistics in India.

Since 1979, till his death on 15 November 1991 he served as a Professor at the University of Denver, Colarado in the U.S. In the light of his long teaching and research experience he had recently undertaken a project to write quality text-books for the use of graduate and research students in Statistical Inference, Probability Theory and Measure Theory. Huzurbazar was a member of the International Statistical Institute since 1971, a Fellow of the American Statistical Association, Fellow of the Indian National Science Academy since 1957, Fellow of the Indian Academy of Sciences since 1961 and President of the Statistics Section of the Indian Science Congress during 1966–67. In recognition of his outstanding contributions to the field of Statistics the President of India conferred upon him the title of Padma Bhushan in 1974.

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