A STATISTICAL APPRAISAL OF ORE VALUATION (with applications to Kolar Gold Fields) by D. D. Sarma. Published by the Andhra University, Waltair, 1979, 167 p., Price Rs. 30.

This book is a summarised version of the author’s Ph. D. thesis (1975) and has nine Chapters dealing with practical problems of ore reserve and average grade estimation in Kolar Gold Fields. It includes a valuable suggestion for reduction in developmental sampling without loss of resulting precision (Ch. 6) and includes program listings (Ch. 7). The main parts of the book are: (i) Analysis of assay data (Ch. 4) and ‘Economic aspects of ore distribution and sample size (Ch. 6).

A large number of assay data are analysed by statistical methods and presented in a coherent manner. Geostatistical theories are reviewed in Chapter 2 and log-normal model is preferred over exponential model. Normalisation of assay values could have followed power transformation (Box and Cox, 1964) which include log-normal transform ($\lambda = 0$). Little use is made of Matheron's regionalised variable theory or of Spectral methods in practical applications. Appropriate time-domain stochastic (spatial) modelling, such as ARIMA $(p,d,q)$ model (Box and Jenkins, 1970) is more relevant since it includes Matheron’s model $(p,l,q)$ and since sample points are not lost in time-domain in contrast to frequency domain (Spectral methods). Since assay data fluctuate with irregular frequencies, spectral methods are not readily interpretable.

Using the log-normal distribution, the average grade of block is regressed by Multivariate Regression and by Trend Surface (Polynomial) Methods. Since assay values are significantly positively correlated in the ore shoots and lean zones, stochastic (spatial) modelling is more appropriate for grade forecasts, average grade estimation, etc. The author has not given the practical success of his average grade estimation in the blocks not used by him for Multivariate Regression and Trend Surface studies.

The book is a valuable reference on the distribution of gold assays at Kolar area and on application of log-normal model in ore estimation.

References
