

and sustainable development of mineral resources in the mineral-rich, yet backward parts of the country like Chhattisgarh and Jharkhand, in the foreseeable future.

About 18 invited papers including 4 keynote addresses were presented in five technical sessions. They covered a variety of topics highlighting the applications of computers in the fields of mineral exploration and resource assessment,

deposit modelling from mining point of view and ground-water data processing for modelling and management.

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## NATIONAL SYMPOSIUM ON EXPLORATION AND SURVEY FOR NOBLE METALS AND PRECIOUS STONES

Geological Survey of India (GSI) is celebrating its 150<sup>th</sup> anniversary of service to the nation (S.V. Srikantia, *Jour. Geol. Soc. India*, v.57, pp.279-282, 2001) during the current year. A series of seminars are being held at some important centers to mark the occasion. In this series belongs the national seminar organized by the GSI and held at the auditorium of Central Research Institute for Dryland Agriculture (CRIDA-ICAR) in Hyderabad on 22<sup>nd</sup> and 23<sup>rd</sup> May 2001. The seminar was inaugurated by Dipak Chatterjee, Secretary, Ministry of Mines, Government of India. He felt that the financial crunch faced by GSI, which was coming in the way of intensification of mineral exploration and advanced research involving expensive instruments was largely due to its unplanned past recruitment that is consuming bulk of the allocated funds. Further the lack of recruitment in recent years has left the GSI with an ageing work force that is unable to meet the present-day challenges. He therefore felt that some pruning and possible re-look into GSI's charter of functions may be necessary. This criticism not only calls for introspection by GSI, but also in-depth assessment by the geoscientific community. Mineral exploration, which is the mainstay of the Ministry of Mines, forms only a small percentage of GSI's work. GSI has recently diversified its activities to meet the societal needs in the fields of seismology, environmental geology, engineering geology, geothermal and glaciological studies, Antarctic expedition, publication of results of research and exploration through special volumes, brochures and maps etc. – fields which are beyond the purview of the Ministry of Mines. This anachronism has been high-lighted by M.S. Rao (this issue, p.85). The bloated strength of ancillary staff along with the numerically depleted and ageing personnel is a fall out of rapid expansion during the successive Five Year Plans and sudden contraction recently through economic

liberalization. Rather than wielding the stick – the traditional weapon of bureaucracy – a more positive and sympathetic approach towards the organization in distress is called for, so that the yeoman services rendered in the past by GSI under trying circumstances in inhospitable and arduous terrains, are amply rewarded. These are points to ponder.

The Seminar is notable for many achievements:

- 1) The pre-seminar volume (Spec. Publ. no.58, 2001) containing 70 papers and covering nearly 680 pages reflects a commendable effort. The volume contains several review papers and status notes on the gold potential of Eastern Dharwar craton, Southern granulite terrain, Sakoli and Mahakoshal belts of Central India, Sonbhadra prospect in the Son valley, Bhukia prospect in Rajasthan and other areas. Discovery of kimberlite in Narayanpet (Andhra Pradesh), and in Bastar and adjoining areas in Chhattisgarh was highlighted. PGE mineralisation in Baula in Orissa was also emphasized. Geothermal fluids as a potential source of gold etc. was pointed out. Over 50 papers from this volume covering these subjects were presented in two parallel technical sessions of the seminar.
- 2) The Symposium on Cuddapah Basin conducted in a novel way through post during the 125<sup>th</sup> year celebrations of GSI (1976) under the inspiring leadership of the late Ch. Narasimha Rao and assisted ably by S. Rajaraman and N.K. Sood was brought to public attention through a belated publication. Although Ch. Narasimha Rao was jocularly compared to Don Quixote by S.K. Majumder, and to W.F. Smeeth for all-igneous theory of the Dharwar by others, Narasimha Rao's diehard espousal of the igneous cause has resulted in the discovery of felsic volcanics and

volcaniclastics in the Cuddapah basin. This volume is precious piece of history.

- 3) Half a million scale geological map of Andhra Pradesh was released on the occasion. This probably completes the publication of ½ M scale geological maps of all the States of Southern India, which is a feather in GSI's cap.

S.K. Majumder, Sr. D.D.G. of Southern Region and

his able band of officers and staff (particularly U.C. Pati, Convener) deserves kudos for the seminar's success. Ravi Shanker, D.G., GSI delivered the Presidential Address and ably conducted the valedictory session. On the whole, it will remain a memorable symposium for years to come.

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## CORRESPONDENCE

### COMPUTER-BASED MINERAL DEPOSIT MODELLING IN KOLAR GOLD MINES - BGML EXPERIENCE

A.K. Talapatra (Jour. Geol. Soc. India, v.57, pp.231-237, 2001) has cited three Precambrian mineralized belts situated in Rajasthan (Pur-Banera-Bhinder belt), Bihar (Hesatu-Belbatan belt) and West Bengal (Purulina-Bankura belt) where application of mineral belt modelling with qualitative data was tried. This helped him to identify clusters of "control cells" containing base metals and other minerals. According to him, this study has further shown a few "barren cells" tending to cluster with control cells. Hence he feels that it is possible to locate a few potential areas within the barren cells. Talapatra recommends using this method with available geological variables in conjunction with the available geochemical and geophysical variables. It would have been more useful had Talapatra cited at least one case study with details to appreciate his techniques using qualitative data.

We wish to share the experience of Bharat Gold Mines Ltd. (BGML) on a somewhat similar exercise undertaken by an expert group during 1981-83 for locating blind ore shoots in the unexplored and underexplored parts of Champion Lode in Kolar gold mines. Champion Lode is 8 km long on the surface along N-S strike and is only 500 m long at 3.2 km depth where the mining operations have been suspended because they are uneconomic.

The study by the expert group involved the following aspects: Value distribution and population statistics, polynomial trend analysis, gradient analysis, edge detection studies, harmonic trend analysis, auto correlation and semi-variogram analysis, Markov chain analysis, maximum entropy method of spectral analysis, fast Fourier transform method, trend surface analysis, exploratory data analysis (EDA), probability mapping and simulation, and study of spectral variation.

The findings of the computer aided study are: In the test areas I and II, nine unstopped areas were identified as possible sites for locating ore shoots between 26<sup>th</sup> and 48<sup>th</sup> levels (2500 to 4800 ft depth) and the predictions were as follows:

Method Used	Predicted grade
Population statistics	> 60 inch dwf
Semivariogram	high nugget effect with poor values
Polynomial trend analysis	>60 inch dwf in 50% of the area
Harmonic trend analysis	>70 inch dwf in most of the area
Neighbourhood simulation	100-320 inch dwf
Markov chain	partly prospective up to 100 inch dwf

In the test area near Oorgaum mine at the sites recommended by the expert group, BGML drilled 4 diamond drill holes. Contrary to the expectation of the R&D team, the results were totally disappointing. Hence BGML did not carry out further drilling at the other sites recommended by the expert group.

An important experience of this study was the realization that any geostatistical and computer modelling of ore body carried out in total isolation of basic geological inputs viz., lithology, structure, control of mineralisation, variation of grades, enrichment of ore and behaviour of lode with depth is bound to be sterile. This work should be a lesson for all others who wish to use geostatistics for modelling of vein type of deposits, like Kolar, Hutti, HCL and HZL etc.

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