

NOTES

NATIONAL WORKSHOP ON MINERAL DEPOSIT MODELING

The South Asian Association of Economic Geologists (SAAEG), India Chapter organized the above National Workshop during 11-12 February, 2005, in association with the P.G. Dept. of Geology of Nagpur University. The Workshop was co-sponsored by the Geological Survey of India (GSI); Manganese (ore) India Ltd., Nagpur; Indian National Science Academy, New Delhi and the Western Coalfields Ltd., Nagpur. Few other organizations that cooperated and extended a helping hand included the Mineral Exploration Corporation Ltd., Indian Bureau of Mines and the Gondwana Geological Society, all based at Nagpur. More than 90 delegates and special invitees from various organizations and academic institutions across the country and a good number of research scholars and P.G. students of Geology, from various institutions attended the Workshop.

At the 2-day Workshop, 10 distinguished resource persons delivered invited theme based key papers and 31 delegates presented their contributed papers at a common venue. Besides, two Foundation Lectures of the Association (SAAEG) were also delivered by two distinguished invitees as an important part of the 7th Annual Convention and Annual General Meeting of the Association.

Inaugural Session of the Workshop

The Workshop was inaugurated by the Chief Guest, Dr. Arun Satputaley, a geoscientist of repute and former Vice Chancellor of Nagpur University, while Dr. R.N. Padhi,

Chairman of SAAEG's Nagpur Regional Chapter, presided over the inaugural function. Shri Seva Dass, Deputy Director General (Central Region), Geological Survey of India and Chairman, Organizing Committee of the Workshop and Dr. Pradeep Kundal, Vice chairman extended a hearty welcome to the distinguished invitees and delegates. Prof. K.L. Rai, Convenor and Shri K.G. Bhoskar, D.D.G. (Operation Maharashtra), GSI and Co-convenor briefly introduced the workshop themes and sub-themes which included special sessions on Central Indian mineralized domains of Malanjkhand region and Sakoli Fold Belt. Prof. Rai also highlighted the activities and achievements of SAAEG during the last 8 years of its existence.

In his inaugural Address, the Chief Guest, Dr. Satputaley, applauded the sincere efforts of the organizers in arranging such an important workshop and exhorted the geoscientists to contribute their might for fulfilling the dreams of the Hon'ble President of India, Dr. A.P.J. Abdul Kalam, to make India a fully developed country by 2020. Subsequently, the "Abstract-cum-Souvenir" volume of the Workshop was released by the Chief Guest. This was followed by "4th Prof. W.D. West Memorial Foundation Lecture" by Dr. D.B. Sikka, the doyen of economic geoscientists, based now at Montreal, Canada. In his lecture, Dr. Sikka put forth the challenging aspects of mineral exploration before the Indian geoscientific community in the wake of globalisation of the mineral industry, and briefly reviewed his own experiences and extensive work in the field of mineral exploration during the past 50 years. He stressed upon the need for accomplishing integrated geological, geophysical and geochemical studies so that comprehensive models of typical deposits could be evolved and properly used to orient or reorient systematic search for analogous deposits in large unexplored areas of the country.

Technical Programme

The technical programme of the Workshop comprised six technical session of two hours duration each. All these sessions were conducted at a common venue in the following sequence of deliberations:

Technical session – I, Deposit Models: Their Contribution and Applications in Mineral Exploration. This session was chaired by Dr. D.B. Sikka. The Session



Dignitaries at the dias during the inaugural function of the workshop

commenced with two invited special lectures – the first entitled “Mineral Deposit Modeling A tool in the Exploration Geological Scenario” (by Dr R N Mishra) and the second titled “Exploration Modeling for North-western Indian Shield – A Logical Dynamic Approach” (by Dr S K Haldar). Besides, 4 contributed papers, having authors and abbreviated titles, as given below, were delivered and deliberated upon during the Session. Harbans Singh, Modeling for exploration of gold paleo-placers in Siwalik group of rocks of Himachal Pradesh, H P Ghosh et al, Exploration modeling of Sargipali lead deposit, Orissa, R N Mishra, Genetic Modeling of the manganese ore deposits of North Orissa, H S Mantri et al, Empirical modeling of manganese ore deposits from Sandur belt

Technical Session – II, Mineral Deposit Modeling – Central Indian Scenario, Part-A Focus on Malankhand Region. This session was chaired by Dr R N Mishra. Its deliberations commenced with three invited state-of-art special lectures that included (a) SAAEG-sponsored 2nd Dr M S Krishnan Memorial Lecture titled “the Central Indian Craton – Structure, Tectonics & Mineralisation A revisit” (by V Divakara Rao), (b) “Structural Features of Mineral Belts of Central India-Correlation of Geophysical Signatures” (by Shri K Venkata Rao and Shri K G Bhoskar), and (c) “Central Indian Suture and its Significance in Localisation of Mineral Deposits (by Shri Ashwini Kapoor, Shri Rajiv Shrivastava and Shri R D Mehrotra)

The contributed papers presented and discussed during this Session included the following. J N Solanki et al, Gold and copper in Nandgaon Volcanics and associated Malankhand granitoids, K L Rai and H K Pandey, Modeling of metallogenically- specialized granitoids and associated ore deposit at Malankhand, Santosh Kumar and Vikoleno Rino, Petrology and geochemistry of enclaves in granitoids of Malankhand

Technical Session – II Mineral Deposit Modeling Central Indian Scenario, Part B Focus On Sakoli Basin The invited special key paper of this Session entitled “Sedimentary cycle and Plutono-volcanic Activation Two Major Geological Processes controlling Ore formation in Proterozoic Basins and Mobile Belts of Central India” was delivered by Dr A K Bhattacharya. The contributed papers subsequently presented and discussed included the following. K Sashidaran et al, Geochemical characteristics of the synorogenic granites of Sakoli Fold Belt and their metallogenic significance, K C Mahapatra and P K Raut, Copper-gold-PGE mineralisation in Central and South-western parts of Sakoli Fold Belt, A K Saha et al, Parsori

Cu±Au deposit of Sakoli Fold Belt – an example of ore deposition by fluid focusing, K Kameshwara Rao, Silicified shear-zones and associated base-metal prospects of eastern part of Sakoli Fold Belt, P K Raut and K C Mahapatra, Stream-sediment survey as a basic tool for mineral exploration—a case study from Sakoli Fold Belt, D V Subba Rao et al, Geological, mineralogical and geochemical studies on mafic-ultramafic dyke swarms in the environs of Chhattisgarh and Indravati basins, Bastar Craton implications for nature of Proterozoic basic-ultrabasic magmatism, S K Mahanto and D P Kurty, Genetic modeling of the migmatites of Kanker from Bastar Craton. A popular lecture on “Growing threat to diamond industry by the imitations- Moissanite, YAG, GGG and fabulite”, was subsequently delivered by Dr A N Singh

Technical Session – III, Ore Genetic Modeling This session was chaired by Prof B Mishra. Two invited state-of-art special lectures delivered under the deliberations of this Session were Orogenic Gold Deposits from the Dharwar Craton” (by Dr Biswajit Mishra) and “Platinum Group Metal Exploration in India- Scope, Problems and Progress” (by Dr T C Devaraju). These were followed by the presentation of following contributed papers. T C Devaraju et al, PGE mineralisation in the Hanumalapur segment of Channagiri Ultramafic complex, Western Dharwar Craton – a case study, Abhinaba Roy, Layered mafic-ultramafic complex of the Betul Belt in Central India and its PGE potential – a reconnaissance study, K R Randive and K R Kashyap, Distribution of platinum in lamprophyre, microbasalt and tholeiitic dykes of Chhaktala area of Jhabua district, M P – a preliminary study, P R Golani and M L Dora, Antithetic relationship between the base metals and REE mineralisation in Betul Belt, M P

Technical Session IV Mineralisation or Deposit-specific Studies This session was chaired by Dr A K Bhattacharya. The proceedings of the session comprised an invited key-paper entitled “Polymetallic Mineralisation along the Narmada Lineament in Madhya Pradesh” (by Shri V K Khadse and Shri K K K Nair) and presentation of 3 contributed papers that included the following. R R Meshram and K B Ingle, Study of Dumortierite and mylonite from Bhandara District of Eastern Maharashtra, K V Rao et al, Mohar Cauldron geological and geophysical signatures, U Chakrabarti and Abhinaba Roy, Influence of depositional environment on the ash content of Barakar coals from Sohagpur basin, Central India

Technical Session – V Metallogenic and Genetic

Modeling of Deposits from Other Cratons This session was chaired by Dr Finn Barret (from Australia)

The proceedings of the Session comprised an invited special paper entitled "Tungsten Mineralisation Associated with Granitic Magmatism in South Delhi Fold Belt – Focus on Sewaria Region" (by Dr R Krishnamurthy) and the presentation of following contributed papers Sheo Prasad and Sanjiv Sharma, Genetic modeling of mineralisation in Delhi Supergroup rocks of South-western Haryana, S Singnenjam and V Ganesan, Tectonomagmatism and Metallogeny in Southern Granulite terrain, V Palanisamy, Tectonomagmatic evolution of Dharmapuri Alkaline Province with reference to Mo – mineralisation in Harur – Uttangarai Shear Belt, Tamil Nadu

Technical Session VI Quantitative Approach to Deposit Modeling and Computer Processing of Large Datasets This session was chaired by Dr S K Haldar The proceedings of the session included an invited talk entitled "Geostatistical Approach to Ore-body Modeling" by A S Chachane and P R Yerpude and presentation of following contributed papers S N Patel, Geostatistical technique for deposit modeling a case study of Banera–Rajpura–Dariba–Bhinder Belt of Rajasthan, Virendra Mohan and R P Rai, GEM 20 an effective technique of geophysical exploration as evidenced in Malankhand area of M P, R N Mishra, Proto-model on database for Chiria Iron Ore Deposit, Singhbhum (Jharkhand), R S Bains et al Neutron activation analysis database of REE and trace-elements and its application in petrogenesis and mineral exploration, S M Dandekar and R M Umthay, Relevance of mineral inventory in deciding exploration strategies with special reference to base-metal exploration in India

Valedictory Session This was chaired by Dr D B Sikka Other panelists on the dias included Shri Seva Dass (Chairman, O C), Shri R N Padhi (Chairman, SAAEG's Nagpur Chapter), Prof K L Rai (Convenor), Shri K G Bhoskar (Co-convenor) and Shri R M Umthay (Organising Secretary) The chairmen of different technical sessions summarised the proceedings while highlighting the notable gains of the deliberations and few recommendations of the respective session

Shri Seva Dass and Shri Bhoskar made the significant observation that the Workshop was marked with well-knit interaction between the academicians and professionals all through its proceedings and hoped that such ties will be strengthened further paving the way for meaningful and useful contributions in the important field of mineral deposit modeling in near future Shri Padhi lauded the cooperation

of the delegates and urged the authors to send their full papers within a month so that they can be reviewed and published soon Prof Rai noted that despite numerous constraints, the Workshop has been quite successful and may be considered as an important milestone in formulating new strategies for mineral exploration in the country in near future In his concluding remarks, Dr Sikka called upon the geoscientists to take up comprehensive studies on type deposits covering all aspects so that their modeling may lead to significant clues for orienting or reorienting exploration programmes in future He advised the universities to train the young geoscientists properly so that they can effectively and innovatively face the difficult challenges of mineral resource assessment and development in the year to come

The SAAEG-sponsored Young Geoscientist Award for best presentation of research- oriented paper at the Workshop was announced by the Convenor, as per the recommendations of the Judges Committee The award went to Dr (Miss) Vikoleno Rino for the best presentation of her paper (jointly with Prof Santosh Kumar) on the geochemical study of enclaves in the granitoids of Malankhand region of Madhya Pradesh

The Workshop concluded with a vote of thanks by Shri R M Umthay, Organizing Secretary of the National Workshop

Recommendations of the Workshop

Major recommendations that emerged from the deliberations of the Workshop included the following

- (1) Comprehensive studies covering all geological, geophysical and geochemical aspects should be carried out on representative and type deposits of various metallogenic domains, so that good and reliable models thereof may be produced for formulating effective strategies of mineral search and detailed exploration in the virgin terrains
- (2) Well-knit cooperation and collaboration between the academicians and professionals is essential for the above-stated comprehensive studies and processing of meaningful data sets

For this purpose, the various agencies and/or organizations should come together and promote reviews of work already accomplished, chalk out new lines of research and encourage in-depth interaction among the interested researchers from time to time Such a coordinated effort alone can ensure well-planned work for effective strategies involving exploration for new deposits in future

- (3) While evolving a deposit model, the field data should

be well-supported/ authenticated by adequate laboratory investigations/testing so that the contemplated model is as realistic and representative of its class, as possible

- (4) In order that the domain-specific conceptual models to guide future strategies of mineral exploration may be developed, more time for in-depth interaction among the concerned geoscientists should be provided for in such workshops. In fact, smaller workshops concentrating on specific and promising domains e.g. Kotri–Dongargarh belt, Sakoli fold belt, South Delhi fold belt, etc. may be organized from this viewpoint in future
- (5) During the deliberations on Central Indian deposits, it was observed that the researchers and professionals from different organizations or disciplines used different terms like Bhandara craton, Sakoli craton,

Bastar Craton, Central Indian sub-craton, etc. for the same cratonic domain. It is recommended that in order to avoid the prevailing confusion, such different nomenclature should be avoided and the term “Bastar Craton” only should be used in pertinent publications in future

- (6) Postgraduate students and research scholars specialising in mineral exploration, mining geology and or mineral development planning should be given proper training in field work as well as laboratory-based techniques oriented to data generation, collation and interpretation for the modeling of mineral deposits

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DELHI CHAPTER OF THE GEOLOGICAL SOCIETY OF INDIA

The Delhi chapter of the Geological Society of India began its activities on 11 May 2005 with a lecture on the “Tsunami Warning System for India” by Dr Harsh Gupta. The idea of a chapter of the Society at Delhi was mooted by several earth scientists, both young and old to provide a platform for all the geoscientists in the National Capital Region (NCR) as well as from the adjoining states of northern India to meet and discuss matters of common interest in geology and to take up some activities of direct societal relevance.

A core group consisting of Dr H K Gupta, Prof S K Tandon and Dr K R Gupta met on 1 April, 2005 and chalked out a framework of activities that included (a) Bimonthly lecture meetings, (b) Popularization of geological sciences in schools in the region, (c) Organising an earth and environmental science Olympiad for Class XII, B Sc and M Sc students, (d) Organize public lectures on aspects of geological science relevant to society and (e) Take up activities like summer camps in Himalaya, publication of popular science booklets and outreach programmes aiming at school children.

The 11 May 2005 meeting at Delhi was attended by 31 participants from various organizations in and around the National Capital Region (NCR) of Delhi. While welcoming the participants to this first meeting, Dr H K Gupta,

Secretary, Department of Ocean Development and Vice President of the Geological Society of India expressed the hope that the Delhi Chapter will play a prominent role in fulfilling the objectives of the Society. Prof S K Tandon, Council member of the Society pointed out that a rich capital in terms of human resource is available in the NCR, which could be gainfully tapped in the interests of the geological sciences and the objectives of the Society.

Dr K R Gupta, Convener of the Delhi Chapter of the Society, stressed the need to identify specific problems/themes to be addressed in a stipulated time-frame. He also highlighted the need for a permanent abode for the Delhi Chapter of the Society.

The second meeting of the Chapter is scheduled to be held on 15 July at the Department of Geology, Delhi University with focus on ‘Oil Sector in India’ with Shri D N Avasthi and Shri Avinash Chandra as lead discussants.

It is fervently hoped that the small beginning of the activities of the Geological Society of India in the National Capital Region will soon gather momentum and serve the cause of geological sciences in service of the society at large.

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