NOTES

INTERNATIONAL SYMPOSIUM ON APPLIED GEOCHEMISTRY IN THE COMING DECADES

A three-day international symposium on applied geochemistry was organized by the Indian Society of Applied Geochemists (ISAG) at the National Geophysical Research Institute (NGRI), Hyderabad during 10-12 August 2001. K. Surya Prakash Rao, Secretary, ISAG was the convener. K.K. Dwivedi, President, ISAG presided over the inaugural function. The following themes were covered in the symposium (1) Magmatism, Metamorphism and Metallogeny, (2) Geochemistry of Sedimentary Deposits, (3) Exploration for Metals and Non-Metals, (4) Isotopes in Hydrocarbon Research and Exploration, (5) Geoanalysis and Geochemical Data Processing, and (6) Environmental and Experimental Geochemistry. About 190 delegates from various organizations/universities both from India and abroad participated in the symposium. 121 abstracts were received, out of which 55 oral presentations and 32 poster presentations were made. H.K. Gupta, Secretary, Department of Ocean Development (DOD), Government of India inaugurated the symposium and in his keynote address on gas hydrates, mentioned about the plans to start a pilot plant in the coming 3-4 years for extraction of gas hydrates from the offshore region. Robert Kerrich, Department of Geological Services, University of Saskatchewan, Canada, presented the inaugural keynote address and pointed out the significant contribution of direct interaction between mantle plumes and island arcs to the crustal record. He observed that the formation of supercontinents was important in the origin of mineral deposits.

Following are the salient points under each theme.

Magmatism, Metamorphism and Metallogeny

S.M. Naqvi in his keynote address emphasized the need to understand the role of sedimentation in metallogeny. T.C. Devaraju indicated that the layered ultramafics, east of Rangapura (long.76°05' and lat. 13°52') are rich in PGE mineralisation. G.V.S.P. Rao, using the remanant magnetic data of komatiite from Rajasthan, brought out its similarity to the Deccan Trap and related igneous activity in north-west India. Based on the studies of pillow basalts from Andaman-Nicobar Islands, S.H. Jafri suggested their accretion at the leading edge of the Eurasian continent during Mid-Eocene to Late Oligocene subduction event.

Geochemistry of Sedimentary Deposits

M.V. Ramana Murthy in his keynote address highlighted the mismatch between academicians and professionals and pleaded that in exploration geochemistry endeavours one has to accomplish the envisaged objective with due consideration to geological inputs. The keynote address by Anil L. Paropkari focussed on the status of geochemistry and mineral resources of oceans. P. Raja emphasized the importance of pedochemical processes and their implications for soil development. G. Parthasarathy reported the structural and thermal properties of carbonaceous matter (graphite) from East Antarctica.

Exploration for Metals and Non-Metals

A large number of papers, mostly on gold and some on diamond were presented under this theme. R.P. Viljoen of South Africa, in his keynote address, put forth the significant advancements of satellite data analysis and the latest geophysical techniques in selecting exploration targets across the globe and, more particularly, in South Africa and Australia. The keynote address by Asoke Mukherjee focussed on the role of crustal fluids in metallogenesis. R. H. Sawkar, K. Sreeramachandra Rao, C. Manikyamba, Y. Safonov (Russia), T.S.M. Hussain and N. Rajendran have succinctly dealt with the techniques, processes, constraints and path-finder elements for gold exploration and their relevance to mining industry. The need for special survey strategies for effective exploration of kimberlites/ lamproites was emphasized by S.K. Verma. He mentioned that EM exploration is particularly useful for weathered kimberlites, and more so, when used in conjunction with magnetic data. Asis Bhattcharya discussed the applications of remote sensing in exploration programmes.

Isotopes in Hydrocarbon Research and Exploration

Kuldeep Chandra, in his keynote address, stressed the importance of stable isotopes of carbon, sulphur and hydrogen for differentiating crude oils. Papers presented under this theme mostly dealt with the role of chemical and stable isotopic composition in natural gases from Cambay and Cauvery basins, as well as the role of $\delta^{13}C$ and $\delta^{18}O$ data of Proterozoic carbonates and soil carbonates.

Geoanalysis and Geochemical Data Processing

C.R.M. Rao in his keynote address stressed the importance of fratogel immobilized 8-hydroxy quinoline resin in the effective concentration of certain trace metals in sea water. T. Suryanarayana in his keynote address emphasized the need for development of a statistical tool to check consistency in geochemical data and analysis. A.V. Chugaev presented new Sm-Nd and Rb-Sr data on the Champion Reef of Kolar Gold Fields, identifying two separate events corresponding to the time of vein formation and later cooling. V. Balaram highlighted the role of NGRI as a centre of excellence in the field of economic geology. Y.J. Bhaskar Rao gave an overview of the application of laser ablation multicollector ICP-MS in cosmochemistry, geochronology, isotope geology, mineral exploration, as well as sedimentary and environmental geochemistry. P.S. Jain discussed the latest advances in ICP technology and B. Joseph proposed a new chemical index of weathering as a tool to asses the degree of weathering. B. Kumar stressed the urgent need to set up a national facility at NGRI for hydrocarbon exploration using multi-disciplinary studies. K. Chandra Sekhar discussed the factors that control the mobility, transformation and accumulation of toxic phases of heavy metals in the ecosystem.

Environmental and Experimental Geochemistry

A.K. Shyam in his keynote address highlighted the various methods of storage/disposal of coal-ash and emphasized the need for detailed geological studies in locating suitable disposal sites for accumulation of ash, and for monitoring the quality of groundwater at such sites. G.L.N. Reddy reported the abnormally high concentration of U and Th in the soils, lake sediments and granites from Hyderabad and their health hazards. R. Srinivasan observed that the granitoids of the western part Hyderabad are enriched in radioactive elements. Shakeel Ahmed dealt with the application of statistical methods in determining the priority of monitoring wells in fluoride-rich aquifer zones.

Concluding Session

The President, ISAG summarized the proceedings of the symposium and sought the views of the participants. S.M. Naqvi stressed the need for more application-oriented studies for the economic development of our nation and pointed out that the mind-set of the scientists has to be reoriented accordingly. Kuldeep Chandra focused on studies related to modelling in mineral exploration, petroleum geochemistry and related fields. Dhana Raju highlighted the lack of expertise in various aspects of polymetal deposits, ore beneficiation etc. K. Surya Prakash Rao pleaded with the scientific community that such conferences should also bestow their attention for updating syllabi according to changing conditions and demands of the universities to help the student fraternity in their academic pursuits and employment.

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BOUGUER ANOMALIES OVER THE CONTINENTS AND OCEANS

Why, in general, the Bouguer gravity anomalies are negative in continental areas and positive in oceanic areas? Extending the question further, why the predominant negative and positive anomalies respectively correspond to the mountain peaks and ocean depths? Although the Bouguer gravity data are not brought on to an even datum, there is fairly a good inverse correlation of Bouguer anomalies with height/depth as well as seismic data. This obviously indicates the excess mass reflected as gravity lows and the deficit mass as gravity highs with respect to the geoid/ellipsoid surface. This is in contrast to the theory of the gravity field which is proportional to the excess or deficit mass. Mathematically speaking, the observed anomalies are proportional to the vertical gradient of gravity, indicating excess mass above the geoid as gravity lows and deficit mass below the geoid as gravity highs. If this were true, far reaching implications arise in the understanding of the theory and interpretation of Bouguer anomalies.

This question is raised because of the conflicting versions about the role of datum in the theory of Bouguer anomaly by Dobrin, Willliam Lorie and Ervin. This controversy arises because of uncertain datum and conventional plotting of anomalies with respect to the horizontal datum and comparison of anomalies with elevations. This may be overcome by applying free air correction factor to all the anomalies for a constant height, in free air, as in the case of airborne surveys. The validity