

BOOK REVIEW

PROCEEDINGS OF THE NATIONAL SEMINAR COMMEMORATING Dr. M.S. KRISHNAN BIRTH CENTENARY. Geological Survey of India, Kolkata, Special Publication No.55, Vol.II, 2001, xi+266p. Price: Rs.357, US \$ 20.00, £ 12.

The Geological Survey of India organized a seminar on 50 years of progress in Precambrian geology of India during November, 1998 to commemorate the birth centenary of Dr. M. S. Krishnan – a pioneer among earth scientists. The proceedings of the seminar was brought out in two volumes, the first one containing 22 contributions and the second 20 contributions. The first volume which was released in March 2001 was reviewed by Dr. Anand Mohan in this Journal (*Jour. Geol. Soc. India*, v.59, no.5, 2002, pp.483-484). The second volume, which has been released recently, contains papers on Precambrian terrains of South India, Eastern India, Western and Central India.

The contributions on South India cover aspects of crustal evolution, composition, source of deep crustal fluids and their role in the evolution of granulites, sedimentation, classification of greenstones and metallogeny. The first paper on crustal evolution by S.C. Sarkar gives a brief review of some of the existing models proposed by various investigators on the above aspect. While doing so, the author has raised many doubts about their unequivocal nature. Nevertheless, well constrained models which can explain, though not all but many aspects of crustal evolution should get due consideration. In the next paper by C.Srikantappa deals with the composition and source of deep crustal fluids and their role in the evolution of Nilgiri granulites. It is widely believed that pervasive influx of CO₂ from the mantle is responsible for the formation of granulites. However, the author based on the inhomogeneity in the oxygen isotopic data rejects the pervasive influx of CO₂ from the mantle and suggests internal buffering of CO₂ stored in the precursor rocks through decarbonation reaction at least in the case of Nilgiri granulites. However, experimental studies over last two decades seriously detract from the appeal of carbonic fluids as important agencies in deep crustal metamorphism.

The communication by G.Lakshminarayana et al., which is third in the sequence, incorporates the recently accrued formation wise account of sedimentological attributes and inferred depositional environments in addition to the data acquired by them on Cuddapah basin. The study has shown that the depositional environments and palaeo- flow patterns varied with time during the progress of Cuddapah sedimentation and scope for a two-fold classification of

Cuddapah Super group which includes the lower Papaghni and Upper Nallamali groups. The succeeding article by M.S. Jairam et al., describes the litho stratigraphy, structure, metamorphism and plutonism of Jonnagiri schist belt. The litho-stratigraphy of the schist belt was established by taking magmatic evolution of different litho units (a debatable criteria) and regional structure. The structural study also supports the idea of structural unity across the Dharwar craton. An ensialic basement is suggested for the schist belt. Further, based on field evidences two distinct phases of granitic rocks have been identified and finally an island-arc setting is proposed for the evolution of the schist belt. I personally feel it is premature to arrive at such conclusions in the absence of regional tectonic scenario, geochemical and isotopic data.

The paper by T.Srinivasa Rao, which is next in order reviews the historical development of the litho-stratigraphy of 'Purana' Formation and discusses aspects of structure, metamorphism, tectonics and mineral resources. Some of the salient conclusions drawn by the author are: (i) inclusion of all 'Purana' sediments of the Prahlanthi-Godavari valley under Godavari Supergroup is inappropriate because of independent basin evolution. (ii) the Alabaka occurring in the eastern belt deserves the status of Supergroup. (iii) the rift origin of Purana basin is contradicted. (iv) the western and eastern belts were juxtaposed to the present position during post-Sullavai and pre-Gondwana period. The next communication by N.R. Ramesh and B. Venkataramana describes the gold mineralisation associated with the quartz-carbonate veins carrying sulphides cutting across the BIF bands of Ranibennur Formation of Chitradurga Group in Budapanahalli area of Shimoga schist belt. The mineralisation is believed to be remobilised or epigenetic type. It is the firm belief that the South Indian Granulite terrain is amalgamation of different micro- terrains through palaeosutures, since individual terrains have different geological, geochemical, geophysical and isotopic signatures. With this in view, K.Gopalakrishna has synthesised and analysed all available geological, geochemical and geophysical data of Madurai terrain and concluded that the MT terrain evolved in a palaeo-Andean type margin of a proto-microcontinent during the

Precambrian. The succeeding paper by P.Prabhakar and M.A.Mallik describes the geochemical characteristics and as well the ore bearing potential of Koheda granites of Karimnagar district, A.P. From their study they have concluded that the mineralisation of base metal and molybdenite may have occurred separately or represent complex elemental zoning. The last paper in this section is by K.L. Chandrashekaraiiah and L.H. Janardhana Rao. The authors through regional geochemical survey of the Raichur greenstone terrain, have shown that the contact zone of schist and granite and associated pegmatites host a variety of rare metals and rare earth elements and call for further detailed geochemical studies.

There is only one contribution on Eastern India by T.K. Sen. The paper aims to report the results of the work carried out in south central and southern parts of the Bonai granite complex, low grade metamorphic belt fringing northern part of the BGC and parts including older enclaves and younger intrusives. From the study significant conclusions have been drawn which necessitates a closer look at the earlier findings.

There are three contributions on Western India. The first one by S.S. Garhia et al. is about controls of gold mineralisation in Bhukia prospect of south eastern Rajasthan. The objective is to highlight the structural relationship between mineralisation and host rocks and controls of localisation of ores. A model of synkinematic replacement mineralisation controlled by fold development during second phase of deformation has been proposed. The next paper by Shabbir Hussain et al examines the precious metal (gold & PGE) potential of the volcanic hosted massive sulphide deposits (VMS) and ultramafic rocks (UM) located in the northern parts of South Delhi Fold belt in Chitar-Sendra area of Rajasthan. The study indicates that both gold and PGE are higher in the copper rich zones of VMS as well as in the UM rocks. Hence they recommend that other UM bodies in the area be explored for their precious metal content. The last in the series is the paper by L.S. Shekhawat and D.W. Joshi. The paper embodies results of specialised thematic mapping in Talwar-Garhi area, Rajasthan. The mapping, according to the authors has brought out a new outcrop pattern and geological details having bearing on highly debatable stratigraphy of the area.

The last section of the volume contains seven papers on Central India. The first paper by K.G. Bhoskar and A.K. Saha is on polymetallic mineralisation in Sakoli fold belt. The study includes detailed ore microscopic and fluid inclusion data besides field observations. According to the authors it is difficult to establish linkage between mineralisation, volcanism and granitic activity in SFB, though earlier

workers have tried to project a regional metallogenic model on the basis of limited work in small isolated sectors. According to them the data base is inadequate to postulate a general metallogenic model and suggests acquisition of more detailed field and laboratory data. There have been only a few reviews on the tectonothermal evolution of the Bastar craton and the paper by H.M. Ramachandra et al. not only updates the present knowledge but also compares the Bastar craton with other well known cratons in the Precambrian of India. The significant observation made by the authors is that the tectonothermal evolution of Bastar craton is comparable to Southern India, South Africa and Greenland. Characterization of Precambrian continental crust is fundamental in understanding the evolution of crust during Precambrian. With this objective in mind A.K. Basu has reported detailed information on the geological, structural, geophysical and mineralisation aspects of the Bundelkhand crustal block which may facilitate construction of evolutionary models by future researchers.

The next paper by R.N. Srivastava et al. is a succinct review of the acid volcanism (CPF) in the lower Vindhyan basin Sonbhadra and adjoining areas of U.P. An attempt has also been made to discuss the sedimentation and depositional environment of different litho-members of the C.P.F. Based on visual interpretation of satellite imageries on different scales and digitally enhanced data products of sub-scenes, supplemented by geological maps and other field data Arindam Gupta and Auditeya Bhattacharya have appraised the lineament system transecting south central part of the Indian Peninsular shield. They have postulated rifting and doming mechanisms for the evolution of N-S and E-W, NNE-SW and NW-SE respectively. An update of the Proterozoic cover sediments of south eastern Chhattisgarh state and adjoining parts of Orissa incorporating all the available new data has been attempted by Nitish Das et al. The contribution is significant as it brings out the lower and upper age limits of the sediments.

The laudable effort to put together enormous amount of data in this volume by Geological Survey of India speaks volumes of its concern to propagate the importance of Precambrian in geological history – an era which has a record of 3/4th of earth history, to young researchers. The volume merits the readership of all who are seriously involved in the study of Precambrian. I recommend that this volume be placed in the bookshelves of all university libraries.

*Department of Geology
Bangalore University*

B. MAHABALESWAR