

BOOK REVIEWS

needed for all Indian pteridologists to improve their quality of work.

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2. Panigrahi, G., *Indian Fern J.*, 1994, 11, 173-188.
3. Fraser-Jenkins, C. R., *Aspects Plant Sci.*, 1991, 13, 249-287.
4. Sewart, W. N. and Rothwell, G. W., *Palaeobotany and the Evolution of Plants*, Cambridge University Press, 1993.
5. Pant, D. D. and Srivastava, G. K., *Proc. Natl. Inst. Sci. India, Part B*, 1962, 28, 242-280.
6. Srivastava, G. K., *Indian Fern. J.*, 1998, 15 165-177.

D. D. PANT
G. K. SRIVASTAVA

Botany Department,
Allahabad University,
Allahabad 211 002, India

The Indian Subcontinent and Gondwana: A Palaeomagnetic and Rock Magnetic Perspective (Mem. 44). T. Radhakrishna and J. D. A. Piper (eds), Geological Society of India, P.B. No. 1922, Gavipuram P.O., Bangalore 560 019, India. 270 pp. Price: Rs 500/\$50.

Palaeomagnetic studies have had their waxing and waning periods over many decades more or less synchronizing with the ups and downs of the hypothesis of continental drift/plate tectonics. The geological postulations on the occurrence of a Meso-Neo-Proterozoic supercontinent Rodinia and its subsequent break-up into a number of cratons, some of which reassembled to form the Gondwana supercontinent, opened a new thrust to palaeomagnetic studies in the recent years. Models on the reconstructions of Rodinia and the timings and stages of its break-up differ. One model considers that the supercontinent Laurentia is at the core of Rodinia with other continental cratons surrounding it. Rodinia broke up at 720 Ma, passed through a hypothetical and geologically ephemeral Pannotia supercontinent stage at 550 Ma and finally gave the well-known Gondwana supercontinent at 510 Ma. Further, the Gondwana is divided into east Gondwana (comprising India, Australia and East Antarctica)

and west Gondwana (comprising South America, Africa and Arabia). The east and west Gondwanas were postulated to have joined along the Mozambique belt, which is still a topic of debate. So also, the possible location of Laurentia in such a setting is yet to be established. Interest in palaeomagnetic studies was revived in an attempt to unravel the patterns of assembly and break-up of supercontinents. Palaeomagnetic studies are also being taken up in recent years to identify microdynamics of cratonic blocks, analysing magnetic anisotropy of deformed terrain, magnetostratigraphy and environmental changes, which in turn can provide corroborative evidences to the geological postulations. The memoir under review is an attempt to provide the state-of-the-art of Indian palaeomagnetism and rock magnetism, and their contributions in understanding the geodynamics of the Indian Plate. T. Radhakrishna and J. D. A. Piper have successfully brought out this memoir sponsored by Geological Society of India.

The book is prefaced by Chris Kllotwijk, who provides brief summaries of all the articles appearing in the memoir and their relevance to the main theme. His information on the status of palaeomagnetic work in India is authentic and he could narrate with ease the story of birth, growth and near extinction of palaeomagnetic research in India.

Out of the fifteen articles included in this memoir, ten are original in the sense that they present results of ongoing research of the respective authors, although preliminary in nature in most cases. The other five are review articles analysing and comparing available data sets and drawing inferences on the amalgamation of Gondwanaland. Three articles are focused on the timing of the Gondwana assembly and the earlier supercontinental configurations of Rodinia and Pannotia. It is projected that India and Australia merged with each other by 1200 Ma or between 1000 and 750 Ma, and that the east and west Gondwanas existed as a coherent entity until 550 Ma. Two papers report the results of palaeomagnetic investigations of rocks of Vindhyan Super Group and Gondwana Super Group, fixing the age at 1200 Ma in one article, and predicting in the other movement of India to

higher southerly latitudes by the mid Cretaceous, before it moved rapidly northwards during late Cretaceous. An exhaustive summary of the apparent polar wander of India during Cretaceous and the associated regional tectonic implications are provided by Gray D. Acton. He reports the rates of apparent polar wander and brings its abrupt decrease at 57 Ma, corresponding to collision of India with Eurasia. Two papers report the first ever results of palaeomagnetic studies from the Himalayan region. Three phases of collisional history are inferred in the Himalaya-Karakoram region. The Ramnagar Formation of the Upper Siwalik Subgroup in Kumaun Himalaya is correlated to the Upper Pinjor Formation, and the Garjiya Formation to the Boulder Conglomerate Formation.

The memoir also includes two papers reporting the magnetic anisotropic studies of rocks of the Aravalli mountain belt, while two other papers report preliminary investigations on the utility of magnetic techniques to identify environmental changes. One paper reports a lower geomagnetic field during the Cretaceous through palaeointensity measurements of a swarm of dolerite dykes. The opening paper reviews the anomalous pole positions from Bushveld Complex in South Africa.

The title of the book rises an expectation that the papers are focused on palaeomagnetic and rock magnetic studies in India that contributed to our knowledge on amalgamation and breaking up Gondwana and northward convergence of India towards Asia. Out of the 8 papers projecting this objective, the majority concentrate on Neoproterozoic palaeomagnetic records. India pioneered the palaeomagnetic research in the sixties and seventies, with the TIFR, CEG in Osmania University and NGRI vying with each other under the leadership of C. Radhakrishna Murthy, V. L. S. Bhimasankaram and R. K. Verma, respectively. Their work was not convincingly reviewed or referred. A wide gap in the coverage of Indian palaeomagnetic data is clearly visible in the memoir by omission of their work on the consideration that Deccan Trap palaeomagnetism was adequately reported in the recent literature. The editors claim that the topics of the articles are so wide and diverse that they defied

subgrouping subject-wise. Proper subgrouping of the articles would have helped them to realize the need to include two or three additional articles covering the reviews of the benchmark papers by Indian researchers of earlier decades that led to a clear understanding of continental drift.

An introductory chapter reviewing the present status of our knowledge of amalgamation and breaking up of the

Gondwanaland and movement of the plates, along with the principles involved in inferring their palaeopositions would have benefited the general reader.

The above comments relate to the choice and organization of material and does not undermine the quality of most of the papers and their contribution towards better understanding of the dynamics of the Gondwanaland.

I strongly recommend the memoir for all libraries and institutions engaged in earth science activities.

I. V. RADHAKRISHNA MURTHY

*Department of Geophysics,
Andhra University,
Visakhapatnam 530 003, India.*

MEETINGS/SYMPOSIA/SEMINARS

Fifth Training Course in Glaciology

Date: August–September 2000

Place: Manali/Hamta Glacier

The course consists of two components comprising theoretical lectures at Lucknow and Manali followed by field demonstration/training on the Hamta Glacier. The main objective of the course is to train the scientists interested in the study of snow, ice and glaciers including exposure to the field aspects.

Contact: Dy. Director General
Geological Survey of India
Training Institute
GSI Complex, Bandlaguda
Hyderabad 500 068
Tel: 4020859
Fax: 040-4022680

37th Annual Convention and Meeting on the Earth and its Climate

Date: 19–21 December 2000

Place: Cochin

The special theme invites papers covering various aspects of climate including the interrelationship between atmospheric, oceanic and solid earth components of the earth system. Apart from the special theme, the convention will cover other topics – Cyclones and storm surges, Imaging techniques in exploration, New strategies in oil and mineral exploration, etc.

Contact: Dr. P. R. Reddy
Indian Geophysical Union
NGRI Campus, Uppal Road
Hyderabad 500 007
Tel: 040-7172911
Fax: 040-7171564
e-mail: postmast@csngri.ren.nic.in

National Symposium on Insect Pest Management Strategies: Current Trends and Future Prospects

Date: 1–2 February 2001

Place: Chennai

The symposium envisages the recognition of the value and relevance of eco-friendly technologies and formulation of novel strategies for insect pest management. The topics include Role of predators and parasitoids, Use of biopesticides, Transgenics in IPM and Insect resistance.

Contact: Rev. Dr. S. Ignacimuthu
Director
Entomology Research Institute
Loyola College
Chennai 600 034
Fax: 044-8265542
e-mail: eri_lc@hotmail.com