

Conference/Symposia/Workshop Reports

International Conference on Dendrochronology for the Third Millennium

2-7 April 2000

Mendoza, Argentina

International Tree-Ring Conference on "Dendrochronology for the Third Millennium" was held in Mendoza, Argentina from 2-7 April, 2000. It was sponsored by several organisations: Tree Ring Society, Past Global Changes (PAGES); International Geosphere Biosphere Programme (IGBP), Inter-American Institute for the Study of Global Change (IAI), National Science Foundation (NSF, USA), Instituto Argentino de Nivologia, Glaciologia Ciencias Ambientales (IANIGLA), Consejo Nacional de Ciencia Tecnica (CONICET) and Centro Regional de Investigaciones Cientificas y Tecnologicas, Mendoza (CRICYT). Preceding the technical session a field excursion, "Austral Dendroecological Fieldweek" was organised from 24-31 March, 2000 at San Martin de los Andes, northern Patagonia, Argentina which provided an opportunity to students and young scientists to learn both basic and advanced methods in tree-ring research. Forty-eight participants from 19 countries attended this fieldweek. During this, participants were assigned in four research teams under the guidance of four eminent dendrochronologists. Two groups, looked at *Nothofagus pumilio* forests growing at upper treeline in the Chapelco ski area above San Martin and the other two groups, worked together with *Austrocedrus chilensis* on a dry site just above San Martin. Each group spent 1-2 days in fieldwork followed by 3-4 days of laboratory preparation and analysis. On the final day of the fieldweek each group presented its findings as a poster to the other participants.

In the technical session more than 150 scientists from all over the globe participated and discussed about the present state of art and the future strategy for the development of dendrochronology. Different aspects of tree ring studies were discussed in 11 technical sessions beginning with keynote lectures. Total 234 papers (84 Oral and 150 Poster presentations) highlighting several new research techniques, improved methodologies and various applications of tree ring research in different aspects of environmental studies were presented.

Some of the topics which were highlighted included: new concepts and ideas in environmental control of cambial activity leading to formation of tree rings, new anatomical features and techniques of use in dendrochronology, new records and new analyses of existing series, reconstruction of the periodicity and impacts of natural and anthropogenic disturbance and stress factors on forest growth, reconstruction of climate and vegetational dynamics at tree line from a variety

of environments as well as suitability of dendrochronology in tropical environments. Besides, applicability of tree rings in reconstructing large scale ocean atmospheric circulation features as El Nino - Southern Oscillation (ENSO), Pacific Decadal Oscillation (PDO), North Atlantic Oscillation (NAO), Monsoon systems, understanding long term temperature trends, drought, stream flow, and glacial advance/retreat were presented in some of the papers. Several other presentations focused on isotopic records in northern and southern hemisphere trees as climate proxies, inter-annual/seasonal variations in tree ring isotope composition.

Application of dendrochronology in understanding different geomorphic changes in coastal, glacial, peri-glacial and fluvial systems and in studies of dating natural hazards as mass movements, volcanic eruption, flooding etc. were the theme of some of the papers presented there. Dating of forest fire, drought patterns, ecological shifts, browsing influence, insect outbreaks were the other topics on which some of the workers expressed their views.

One whole session was devoted on the work related to southern hemisphere in which emphasis was given to climatic variations, forest structure, growth dynamics and forest decline in several geographic regions of this part.

The conference was concluded giving emphasis on the need to build up and expand tree ring data base from new and still unexplored geographical regions and selection of various tree species from varied ecological zones which constitute main recommendation of the conference. It ended with the decision to hold the next tree ring conference at Quebec, Canada in 2002.

Three dendrochronological oriented post conference trips were organised in different regions. These were trip to Northern Patagonia, sub-tropical northwestern Argentina, Central Chile and Tierra del Feugo which provided an opportunity to study the forest types of that region.

Vandana Chaudhary

Birbal Sahni Institute of Palaeobotany,
53 University Road,
Lucknow 226 007,
India.

15th Himalaya-Karakoram-Tibet Workshop

21-24 April 2000

Chengdu, China

&

Himalaya Field Excursion to Lhasa-Gyangze-Xigaze-Tingri (Rongbuk)-Khasa(Zham)-Kathmandu

25 April-4 May 2000

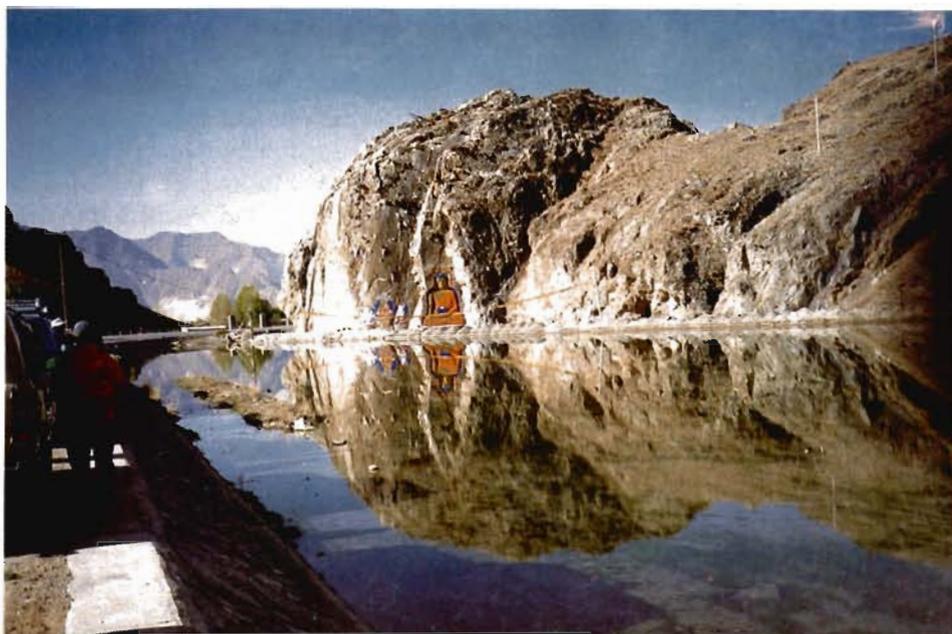


Fig. 1—Magmatic Arc Granite. Batholith Lhasa Tibet (20 Ma).

The general interest in geology around the Himalaya–Karakoram–Tibet (HKT) has generated interesting valuable data during the past decade with respect to fragmentation of Gondwanaland, dispersal of Gondwana continents and their accretion along the northern margin of the Indian Plate. The HKT Workshop has provided a common platform, since 1985 when the first workshop of the series was held in United Kingdom, to share the growing interest amongst the active group of scientists from various countries.

The 15th HKT Workshop was held in China at Chengdu University of Technology, Chengdu. Two Ministries of China— Science and Technology and Land and Resources had funded the Workshop. This Workshop is an important event for earth scientists around the world. Geoscientific contributions on the Himalaya–Karakoram–Tibet region and adjacent areas are appropriate for the Workshop. Major subjects chosen were: Geology in the Himalayas; Geology in the Karakoram and Pamirs; Geology of the Suture Zone in the HKT region; Geology of the Inner-Tibetan Plateau; Geology along the northern edge of the Tibetan Plateau; Geology along the eastern edge of the Tibetan Plateau; Synthesis of Geology and of the Periphery of Tibetan Plateau; Global Climate, Resources, Environmental Science on/and the Qinghai-Tibetan Plateau.

The Scientists from the following 16 countries participated in the 15th HKT Workshop: Australia, Canada, China, Hong Kong (China), Taiwan (China), France, Germany, India, Ireland, Japan, Nepal, New Zealand, Pakistan, Russia, United Kingdom and United States of America. About 200 scientists participated along with the Chinese delegation.

About 150 papers were presented orally and more than 100 papers were displayed.

The itinerary of the post-15th HKT Workshop field trip was Lhasa-Gyangze-Zigaze-Tingri (Rongbuk)-Khasa (Zham)-Kathmandu. The Himalayas border the southern fringe of Tibet and they are the loftiest mountain chain on earth, with the highest peak being Qomolangma (Everest). The Tibetan Plateau is the world's largest highland with an area of 2.5 million km², a mean elevation of 5000 m above sea level, and a crust thickness of over 70 km. There are many interesting geological features and varieties of geological and geophysical problems to be discovered and understood. The HKT Workshop

is the timely response to growing interest among geologists.

The Qinghai-Xizang (Tibetan) Plateau has attracted the attention of the international geoscientific community by its unique geological history and crust-mantle structure. It includes the Himalaya Mountains, the world's youngest fold mountain chain and highest mountains. The key geologic feature of this region is the Indus-Yarlung Zangbo Suture Zone (called also as Indus-Yarlung Suture Zone, IYSZ), which for years has been studied closely by earth scientists from China and abroad.

The field trip was focused on investigation of the several tectonic belts of the IYSZ. From south to north, the tectonic belts genetically related to IYSZ are the High Himalaya crystalline rock belt (Tibet Trip part A, called TTA), the South Tethys Himalaya sub-belt (TTB), the North Tethys-Himalaya sub-belt (TTC), the Indus-Yarlung Zangbo Suture Zone (TTD), the Xigaze (Shigatse) forearc basin belt (TTE), and the Gangdise magmatic arc belt (TTF). In particular, participants visited the Indus-Yarlung Zangbo ophiolite belt, which extends E-W for more than 1000 km.

These tectonic belts possess distinct features and have been well studied. In addition, they retain integrated remnants of oceanic crust and trench-arc systems that are well displayed compared to other known suture zones. As a consequence this field trip offered a systematic understanding of the movement history of the Indian and Eurasian plates, as well as broader aspects of tectonics illustrated by the Himalayan collisional-orogenic processes.

In the coming millennium, many countries are probing new strategies of scientific research for the future-sustainable development of humankind. Earth sciences can be predicted to make vital contributions to solve such important issues as

population, natural resources and environment facing human society in the 21st century. Now is the right time that earth sciences are evolving into the Earth System Sciences and the Qinghai-Tibet Plateau will not only remain as the field laboratory for Continental Dynamics, but also become the most important and unique site for establishing the theory of Earth System Sciences. The scientific significance of the Qinghai-Tibet Plateau and the Himalayas is global and research belongs to scientists from all over the world.

The Indian subcontinent share a common interest along the HKT region. In the plenary session of Himalaya Karakoram Tibet Workshop, it was resolved that Prof. Anshu K Sinha, Director, BSIP, India be entrusted with the responsibility to organise 17th Workshop during Spring of 2002 in India.

Anshu K Sinha

Birbal Sahni Institute of Palaeobotany,
53 University Road,
Lucknow 226 007,
India.

Tenth International Palynological Congress

24-30 June 2000

Nanjing, China

The theme of 'Tenth International Palynological Congress' was "2000, The year of the Dragon : A New Century for Palynology". It was jointly organised by the authorities of Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences(NIGP), International Federation of Palynological Societies(IFPS), Palynological Society of China (PSC) and 265 scientists from Africa, Australia, Brazil, Canada, China, Czech Republic, Denmark, Estonia, France, Germany, Hungary, India, Iran, Ireland, Italy, Japan, Malaysia, New Zealand, Norway, Philippines, Poland, Romania, Russia, Slovenia, Spain, Sudan, Sweden, The Netherlands, Turkey, UK, USA and Vietnam, etc. were gathered. The Congress was inaugurated by Mr Zhang, Vice-Mayor of Nanjing, followed by welcome reception extended by Prof. Sha Jingen, Director, NIGP, and other dignitaries.

The scientific programs included Plenary session, Technical sessions, Symposia, Society meetings and Field trips. During Plenary session three invited lectures were delivered : Prof. Owen Davis (U.S.A.) President, Organising Committee 10th-IPC presented Long Terrestrial Records of Climate and Vegetation change from western North America; Prof. M. Kedves (Hungary) covered Trends and New aspects of the Basic and Applied Palynology and Prof. Chen Junyuan (China) spoke about the Dawn of the Animal Diversity.

Technical sessions/Symposia (i.e. Paleozoic Palynology, Mesozoic Palynology, Cenozoic Palynology, Quaternary Palynology, Microphyte Fossils and Acritarchs, Important Mesozoic Palynologic Events and Stratigraphic Boundaries, Mesozoic-Cenozoic Marine and Non-Marine Dinoflagellates, Quaternary Palynology in the Middle and High Latitudes of Asia, Palynostratigraphy and Sequence Stratigraphy, Archaeological Palynology, Polar Palynology : Arctic, Antarctic & Qinghai-Xizang (Tibet) Plateau, New Technology; Pollen Morphology, Systematics and Evolution; Ecology and Palaeoenvironment; Pollen Exine; Palynological Evidence for Monsoon Activity and impact in the Late Cenozoic; Aerobiology, Medical Palynology and Entomopalynology, APD Symposium : Pollen Data-bases and Global Change in the Monsoon areas and 2. PSC Symposium) 188 papers (201 oral and 87 posters). Contributions showed current status of palynological investigations in different countries, applications of computer technologies in palynological studies, new approaches to integration of morphological and palynological data in phylogenetic reconstruction, advances in micropalaeo-phytological fossil studies, new palynotaxa from Carboniferous and Eocene sediments, vegetational and climatic changes during Quaternary Period, pollen vegetation relationship, biodiversity of pollen and phytosociological data, effects of global warming on tropical vegetation, sporoderm ontogeny of Gymnosperms and Angiosperms, LM/SEM/TEM details of palynological features of some taxa; significance of pollen, spores and dinoflagellate cysts for taxonomy, stratigraphy, palaeoenvironment, palaeoclimate and hydrocarbon exploration, etc.

Society Meetings covered CIMP Meeting, PSC Meeting and two IFPS Meetings. Half-a-dozen Field trips were organised pre and post Congress. Pre-Congress field trips (16th to 22th June) covered Kaifeng-Xi' an archaeological Palynology, Mesozoic- Cenozoic stratigraphy of North Xinjiang and Kunming-Xishuangbana, while Post-Congress field trips (2nd to 7th July) Quaternary and Recent Vegetation of Changbaishan, Trans-Himalayas Excursion and Yichang (Three Gorges of the Yangtze River). Besides, a Mid-Congress tour was also arranged to visit relevant organisations and historical places in Nanjing and suburb. As announced by Dr Liu Gengwu, Secretary General, Organising Committee the full text of contributed papers may be available in proceeding volume.

Asha Gupta

Birbal Sahni Institute of Palaeobotany,
53 University Road,
Lucknow 226 007,
India.

Indian Sub-continent Biomisation workshop
20-22 July 2000
Jena, Germany

The INDSUBIO (Indian Sub-continent Biomisation) workshop was held from 20th July to 22nd July, 2000 at Max Planck Institute for Biogeochemistry, Jena, Germany. The workshop was related with the characterization and mapping of palaeobiomes at Indian Sub-continent level.

The Global Palaeovegetation Mapping (BIOME 6000) project is a community-wide collaboration inaugurated in 1994 under the joint auspices of 4 of the 11 elements of the International Geosphere-Biosphere Programme: IGBP-GAIM, IGBP-DIS, IGBP-GCTE and IGBP-PAGES. The aims of BIOME 6000 are : Create fully-documented pollen and plant macrofossil data sets for 6000 and 18000 years before present. Construct global maps of biomes for these periods, using a standard objective biomisation technique based on plant functional types (PFTs).

Biomes are defined in terms of their characteristic PFTs. The pollen spectra which are used are translated into biomes by means of an objective algorithm based on fuzzy logic. The method assumes that each pollen spectrum has a degree of affinity (which can be expressed numerically) with each biome. Biome assignment is based on ranking these affinity scores and assigning the pollen spectrum to the biome for which it has the highest affinity score. The steps in the biomisation method are: definition of the PFTs (for each specific region), construction of a PFTs vs taxon matrix, construction of a biome vs PFTs matrix, calculation of affinity scores, assignation of pollen (and/or macrorest) spectrum to the biome with which it has the highest affinity.

The method has been validated using modern pollen surface samples, and applied to data from most regions of the Earth for 6 and 18 ka (for instance Europe; Africa; Eastern North America; Russia and Mongolia; China; Western North America; Alaska; Japan). The already available maps document the major changes in biomes between glacial and interglacial states.

The data has been used to validate climate simulations made within the PMIP (Palaeoclimate Modelling Intercomparison Project) and TEMPO (Testing Earth System Models with Palaeoenvironmental Observations) projects, to evaluate simulations changes in dust sources at the LGM (Last Glacial Maxima) and to make quantitative reconstructions of climate modifications. Crucial regions that are not covered by the existing BIOME 6000 are Indian subcontinent and South East Asia. A new initiative within BIOME 6000 is seeking to partly remedy this lack.

Indian Subcontinent Biomisation (INDSUBIO) is a new initiative designed to develop data sets from the Indian subcontinent and, in parallel, to develop modelling tools appropriate for this specific region. By using data on modern

pollen rain (0 ka) together with palaeopollen data (6 ka + 18 ka mainly), it would be possible to document the vegetal evolution for the different regions of Indian subcontinent and to demonstrate the importance of this region at a more global scale (for example: in terms of monsoon dynamics).

As a first, INDSUBIO is being co-ordinated in the following ways: Developed PFTs and biome classifications appropriate for the Indian subcontinent, using extant maps and knowledge of the ecological controls on the vegetation; compile the pollen data sets for modern (0 ka), Mid-Holocene (6 ka) and Last Glacial Maxima (18 ka); develop a vegetation modelling scheme appropriate for the Indian subcontinent, based on modifications to the BIOME 4 model. The future INDSUBIO project is designed to provide a framework for collaboration within the following institutions: Max Plank Institute for Biogeochemistry, Jena, Germany; French Institute, Pondicherry, India; Birbal Sahni Institute of Palaeobotany, Lucknow, India; The Centre Europeen de Recherches et d'Enseignement de Geosciences de l'Environnement, Aix-Marseille, France.

Birbal Sahni Institute of Palaeobotany will act as nodal centre in providing :- The provision of acquiring the modern and fossil pollen and plant-macrofossil data previously generated by scientists of the institute; the generation of new modern and fossil pollen data for North India; the design and implementation of field programmes for the vegetation ecology of the region, subject to the availability of independent funding to undertake such work; the provision of radiocarbon dating of new cores obtained and analysed within the framework of the project.

The role of individual institute collaborating in INDSUBIO project are well defined in the Memorandum of Understanding (MoU) for the proper implementation of the project. Prof. Sandy P Harrison of MPI-BGC interacted with all the participants of the workshop for three days with computerized database and other documents. She hopes that the MoU as an agreement of collaboration between the four Institutes within the framework of the INDSUBIO project would be accepted by the signatories of all the institutions.

Asha Khandelwal

Birbal Sahni Institute of Palaeobotany,
53 University Road,
Lucknow 226 007,
India.

31st International Geological Congress

6-17 August 2000

Rio de Janeiro, Brazil

The thirty-first International Geological Congress (IGC) was held in Rio de Janeiro, a coastal city of Brazil, known for its beautiful beaches and huge granite tors of which Sugar

loaf and Corcovado are world famous tourist spots. The Rio centro, the gargantuan venue of the congress, was originally built for the Earth Summit on Environment in 1992, had five pavilions. The opening ceremony of the congress was held in the grand auditorium situated in pavilion five. For the eleven days the geologists of several nationalities dotted venue.

IGC is organized every fourth year to debate the most significant advances in the geological sciences and promote discussions focussed on a single theme. 31st IGC's focal theme was "Geology and sustainable development: Challenges for the third Millennium". On this occasion academician, scientists and students from 113 countries assembled in Rio de Janeiro, Brazil to participate in the Congress. 11 days long mega-event of Geology was spread over 9 colloquia, 4 special lectures and 11 special and 28 general symposia. Each special and general symposia consisted of many sections. The special symposia covered the following themes: Origin and Evolution of the Earth; Geosciences and Human survival, environment and natural hazards; global change and future environment; structure of the lithospheric motions; Global tectonic zones; Metallogeny; Basin analysis; Energy and Mineral resources for the 21st Century; New technologies for geosciences; and progress of international geosciences projects.

On invitation from organising committee, Prof Anshu K Sinha convened and chaired session of special symposium (F: Global tectonic zones—F-1: UHP metamorphism and continental subduction in collisional orogen, ILP-IMA) along with LeoAlfraneo Hartmann (Brazil). There were seven papers presented in the session. It discussed an important discovery of Coesite-bearing UHP rocks. Since the first discovery of Coesite-bearing UHP rocks from the Western Alps in 1984, many UHP terrain have been identified in global collisional orogenic 'belts'. They are restricted to the orogenic belts younger than 750 Ma reflecting much higher geothermal gradients in the Archaean-Proterozoic Earth. Lenses of medium to high temperate eclogites, although often broadly transformed to amphibolite or basic granulite, are relatively abundant in the highgrade metamorphic units of the Bohemian Massif. The Chinese Continental Scientific Drilling (CCSD) project is being carried out since 1997. A deep scientific hole will be made within the Dabie-Sulu UHPM belt. The hole hit through Coesite-bearing Eclogite and garnet or spinel peridotite. A relatively large diamond is also discovered in the eclogite around the drilling site. A pilot hole of 2000 m and a main hole of 5000 m will soon follow through the protoliths of Coesite-bearing eclogite with age approximately 800 Ma. An updated review of Scandinavian UHP in the Western Gneiss Region of Norway was presented. The transition from HP to UHP eclogite facies in the outer Nordfjord area is manifested by a change from quartz to Coesite. In the Western Alps, two tectonic units with UHPM overprint have been discovered. In both units the UHPM recrystallization, acquired during the early stages of the Alpine

Orogeny, has been largely obliterated by a late-Alpine greenschist-facies retrogression. Cong Bolin *et al.* argued that whether or not Continental lithosphere like oceanic lithosphere could be dragged down to depth of 670–720 km? What kind of physical and chemical changes would these deeply-subducted continental materials experience. Sinha (India) in his paper: Continental Subduction of Indian Margin in Himalayan Orogen leading to development of UHPM regime, presented the latest scenario of discovery of coesite from Himalayan continent to continent collision zone and suggested further researches to discover diamond bearing rock- assemblage from this grey area. In the discussion it was argued that under the ILP Projects further global researches and workshops should be organised.

The IGC was novel experiment of collective & co-operative attempt of Latin American countries, the main feature of the congress was the extended discussion on recent developments in all the spheres of geology. The Rio congress was first in the continent of South America and for the first time congress issued the Abstract volume in the form of CD-ROM. It was for the first time all accepted abstracts (a record

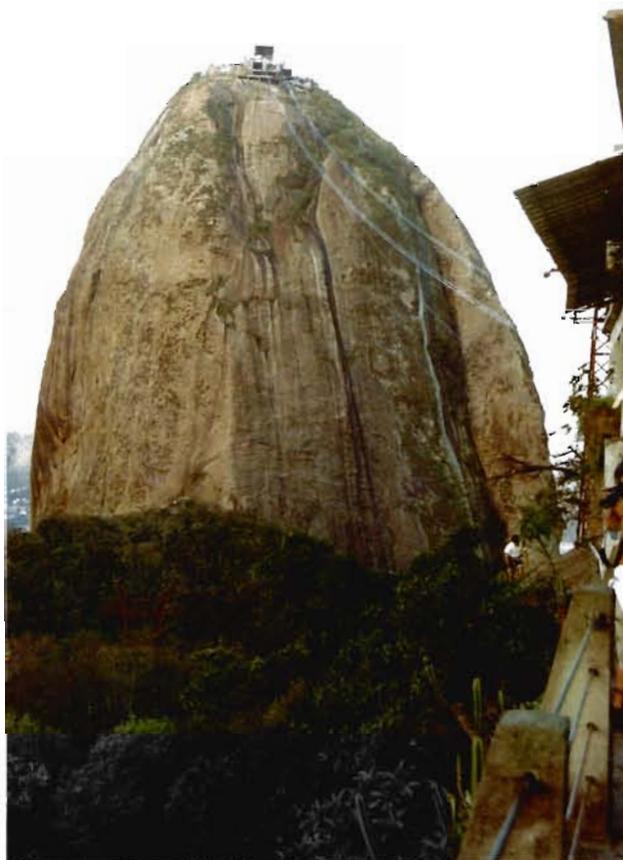


Fig. 2—Sugar loaf Granite Tor at Rio de Janeiro, Brazil (560 Ma)

number 5438) were selected for poster presentation in an afternoon session as poster followed by selective papers as oral presentation the next day in a forenoon session. Posters provided a good opportunity for discussion to new comers and experts alike. Besides these sessions, field conferences were an added opportunity. Pre and Post congress short courses, Pre-during and Post Congress workshops and Pre-During and Post Congress Field trips to various localities were also organised.

It is estimated that more than 4000 geoscientists participated in the Geological Congress. The President of the 31 IGC Prof Umberto Giuseppe Cordani in his lecture, "The Role of Geology for a sustainable society" emphasized the planning and judicious usage of the natural wealth. Considering the large population of China, India and Brazil he stressed that these developing nations need to think over the water management, energy sources and proper distribution of the natural resources among the masses. Dr. Andras Szollosi-Nagy of UNESCO, echoed similar views in his lecture on "Water resources for the next century: a Crisis ahead?" In India we too need to plan a strategy for the natural water resources management.

Preserving the Global Stratotype Section and Point (GSSP) and complete continuous section at various localities for the future are paramount to the present generation. In this connection a presentations on August 7th afternoon were noticeable under the Special Symposia entitled "Geological Heritage UNESCO's World List" and envisaged "Geoparks Programme". It was a matter of concern to note that all the deliberations were either from Europe or South America except a presentation on a Malaysian initiative (Kormoo, I. Geological Heritage and conservation: the Malaysian initiative). Asia, the biggest continent, with various important geological features was almost non-represented. In India, some of the notable preservable sites are Archaean stromatolite localities in Dharwar Craton, Cretaceous dinosaurs egg localities in Gujarat & Madhya Pradesh, the Deccan intertrappean flora of Madhya Pradesh which require the attention of the Indian Government, world geological community & UNESCO. Similarly a session on 'Geological Hazards and Natural disasters' was an aptly convened session in view of recent natural disasters and as a mankind our failure to meet the challenge and inadequate crisis management strategy.

IGC discusses the latest developments in various fields of Geological Sciences and opens new vistas of research. The main emphasis of the congress was on the "The Role of Geology for a sustainable society" and "The Role of Earth Sciences in providing clean Energy for 10 Billion Humans". India is facing a daunting challenge of its population and management of geological resources to properly distribute them among the masses. We lack the sufficient petroleum energy, good quality coal and some strategic minerals. Though we have plenty of water resources but most of it is underutilized

and causing havoc. The lessons learnt in the sessions of "Geological hazards and Natural disasters" were equally applicable on India.

On 11 August, a speaker Claude Allegre (Minister of Education of France) spoke on "The Earth Sciences: Central Role in the 21st Century". He emphasized the role of environmental studies, city planning, GIS, Waste management etc. In his visionary lecture he enumerated six revolutionary developments in geology that took place during the last fifty years. Three conceptual revolutions related to the unity of the Earth (plate tectonics, planetary exploration and environmental problems including global changes) and three technical revolutions which aided the quantification of geological processes (computer—images; satellites—global observations; mass spectrometry—dating). In continuation Chinese Minister of Land and Resources, Tian Fengshan spoke on 'The significance of the Geosciences in the sustainable development of China'. People's involvement and judicious use of the natural resources was his message for sustainable development of China. It equally applies to India.

New dimensions of study in Palaeobiology and biostratigraphy in the field of Devonian, Permian and Cretaceous age strata are worth pursuing. Origin of Land plants, Ferns and Angiosperm plants are some of the important topics of palaeobotany which are being vigorously pursued. The palaeontology has played an important role in the field of refinement of geological time scale. It was emphasized in the session on "Contributions of Paleontology to Biospheric Evolution and Temporal Subdivisions of the Precambrian" that the evolutionary stages of the biological realms could be helpful in division of enormous time span of Neoproterozoic. On the basis of these, a biostratigraphic scale has been proposed for the Neoproterozoic sequences. Papers by Altermann W. on "Precambrian stromatolites of South Africa, their morphology, microstructure and associated sediments: A new approach to stromatolite classification and facies analysis"; and "Imaging of Precambrian microfossils by Atomic Force Microscopy (AFM)" are new attempts which will be helpful in future studies. "A new discovery of Calcareous Algae in Riphean sediments of Eastern Siberia" by Terleav is new evidence that traces the antiquity of biomineralization in Neoproterozoic.

Some of the papers reported new ideas (which unfortunately could not be presented) include: model proposed by Bruce Runnegar in his paper, "Neoproterozoic Environmental perturbations drove the Cambrian explosion" suggests 1. Pelleting of organic matter by planktic, microscopic, metazoans, 2. Greatly enhanced rates of sulfate reduction 3. Organic matter could not be efficiently recycled, 4. Rapid and significant increase in the Oxygen content of the atmosphere. Steiner *et al.* presented a paper wherein they have suggested the early Cambrian Vendotaenids as macroscopic

colonies of chemotrophic bacteria. Earlier these macroscopic algae were considered as brown algae.

It was decided to bring out the proceedings of this session in an international Journal 'The Palaeobotanist'.

The present scenario in the geological world is fast changing and requires the geological organizations to adapt to the changes in technologies, training & investments. In the new millennium, geology would have to address the new issues: Earth System Process, Climate, Early Earth, Biogeology, Water geology, Natural disasters and Earth's Surface and subsurface. There is no alternative but to adhere to the changes occurring in the society and keep pace with changing demands of the people.

In a significant move Italian delegation won the votes of the delegates for the venue of the next IGC to be held in Florence in 2004. The theme will be "From Mediterranean area towards a geological renaissance: geology, natural hazards and cultural heritage". Many delegates raised serious concerns about the huge efforts put into the preparation of the bids by several countries for hosting the next conference and ultimately only one country is selected & others are disappointed. In this situation it was agreed that a regional rotation selection procedure be devised and regions would be selected to host congress and the countries of the region would decide venue. Hopefully the IGC Council for future venue selection would accept it.

In the plenary session of International Lithosphere Programme, Prof Anshu K Sinha, Director, BSIP, Lucknow, was unanimously elected to be the Chairman, Committee of National representatives, for five years in the Bureau of ILP.

Anshu K Sinha and Mukund Sharma
Birbal Sahni Institute of Palaeobotany,
53 University Road,
Lucknow 226 007,
India

X Meeting of Palaeobotanists and Palynologists, (XRPP Reunião De Paleobotânicos E Palinólogos)

11-16 December 2000
Sao Paulo, Brazil.

The 10th meeting of palaeobotanists and palynologists (XRPP Reunião De Paleobotânicos E Palinólogos) was held at Department of Geosciences, University of Guarulhos (UnG) Guarulhos, São Paulo, Brazil during 11- 16 December 2000 to honour Dr Diana Mussa who is currently working on Devonian floras of Brazil. The meet was organized by Laboratório de Geociências, Universidade Guarulhos, Praça Tereza Cristina, 01 - Guarulhos, SP, Brazil.

Scientists from seven countries, namely Argentina, Australia, Brazil, France, India, UK and USA participated in

the meet. Deliberations dealt with micro- and mega- floras/ fauna, phytostратigraphy, palynostratigraphy and palaeoenvironment of Palaeozoic, Mesozoic, Tertiary and Quaternary periods of Australia, South America, Antarctica and India. Besides, presentations included talks on importance of palynofacies as a tool in petroleum research, plant fossils and oil exploration in the new millennium and application of palynological methods in petroleum geology.

Scientific sessions were divided into 5 Technical Sessions, 3 Round Table Discussions from invited speakers and 1 poster session. Besides these, there was a short course on Precambrian classical microfloras. The short course gave an opportunity to view petrographic thin sections and several of the classical Precambrian microfloras (Gunflint, Bitter Springs, Skillogalee, Chuar) plus some Brazilian microfossils, including Mesoproterozoic acritarchs and Neoproterozoic vase-shaped microfossils. An introductory overview of Precambrian, fossils and evolutionary events was given by Thomas Fairchild.

More than fifty oral presentations were made during the course of the meeting. A wealth of new data on microfossils from Rio Bonito Formation of Permian, palynological data from Itarare Subgroup (Permian) and from Late Quaternary, megafossil elements related to Ginkgophyta from Rio Bonito Formation, Gondwanan elements from Tubarao Group, Rio Bonito, Rio Do Rasto and Irati formations of Gondwana Sequence and megafossils from Santana Formation of Middle Aptian Age of Brazil were presented in the technical sessions.

In the Round Table Discussions, presentations by invited speakers included following topics: Phytogeographic Patterns: Recent and past distributions of the plants and their environmental implications; Phytostратigraphy of the Glossopteris flora and; Palynostratigraphy of the Mesozoic sequences applied to petroleum systems: Methods of study of high resolution and perspectives.

An interesting presentation was made on Permian phytostратigraphy of Australia and East Antarctica by Stephen McCloughlin which included stratigraphic correlation between the two countries (contiguous landmasses in the Permian) using a combination of phytostратigraphic indices and tectonically influenced marker beds. Accordingly, application of the East Gondwanan phytostратigraphic scheme to other parts of the Gondwana will need to take into account some diachroneity in the vegetational change across the supercontinent produced by the progressive rotation of the landmass across the Permian pole and a poleward shift of semi arid environments through the Permian, culminating in the Early Triassic "coal gap".

In another presentation by David Dilcher, interesting plant and animal fossils from the Santana Formation (Middle Aptian) were reported. The fauna and flora included well known invertebrates, vertebrates like fish (first report), ichnofossils associated with palynomorphs and megafossils like *Schizoneura*, *Isoetes*, ferns with roots and trichomes, Gnetales

like *Ephedra* and *Welwitschia* (first report), latter with germinated seedling and first leaves but without roots.

Distribution, structural trends and stratigraphic correlation of Indian Gondwana megaspores was discussed (Rajni Tewari). Megaspores were found to be both structurally more complex and quantitatively more prevalent as compared to their respective megafossils. It was concluded that the quantitative superiority and qualitative complexity of megaspores over megafossils is probably due to their stupendous production, resistance, structural adaptability and evolutionary necessity. Presence of megaspores similar to those of Gondwana of India were reported from East Antarctica by Stephen McCloughlin.

Some other important findings were: on phytostratigraphical and phytogeographical significance of the occurrence of the fertile glossopterids in Permian strata of Arabian plate (Jean Broutin); palynofacies as a tool of the petroleum research (Rodolfo Dino); plant fossils and oil exploration in the new millennium (Mary E Dettmann) and palynological methods: some innovative examples and their application to petroleum geology (Mitsuru Arai).

Among other interesting presentations was a paper on phytoplankton blooms in which a conceptual overview and their importance to stratigraphy and paleoecology was discussed (Shimabukuro, S and Arai M). It was concluded that fossil blooms provide vital insights for the understanding of ancient catastrophic events related to mass mortality of some fossil groups (e.g. ichthyofauna and molluscan fauna). Moreover, the reconstitution of biological and sedimentary histories can contribute to the understanding of the origin of petroleum source rock. In yet another paper by Mitsuru Arai which dealt with application of palynological methods in petroleum geology it was suggested that palynostratigraphy is a very reliable tool for oil exploration. Nevertheless, attention should be given to taxonomic improvements and the qualitative treatment of the data. Besides creativity is required to improve palynostratigraphy.

Besides, 22 posters were displayed in a separate session which dealt with taphonomic details, floral changes, geological setting and biostratigraphy of megafossils and microfossils from different horizons of Palaeozoic, Mesozoic, Tertiary and Quaternary of mainly Brazil. A poster was also displayed on "Permian phytostratigraphy in Africa based on glossopterid fructifications" by John Anderson.

Besides providing an update information on general flora of various Gondwana countries like South America, Africa, Antarctica, India and Australia, the meet also created awareness about the important work being conducted by the Commission Internationale de Microflora du Palaeozoique (CIMP) which supports various groups engaged in solving problems on palynology, taxonomy and stratigraphy in the Palaeozoic. The Permo-Carboniferous Northern Gondwanan Palynostratigraphy Working Group is attempting to develop:

A palynostratigraphy which will form the basis for the biostratigraphic subdivision of the Northern Gondwana Permo-Carboniferous region for which there is no other biostratigraphy; more accurate palaeogeographical and palaeophytogeographical reconstruction for the Arabian, South American and Pakistani regions; assessment of the effects of palaeoclimatic change during the Permo-Carboniferous deglaciation interval; Improved palaeogeographical modelling of Arabian and South American Permo-Carboniferous hydrocarbon provinces which may lead to better assessment of prospectivity.

The meet additionally provided information on detailed qualitative and quantitative data of palynofloras from cores, side-wall cores and/or cuttings in closely sampled sections which is now proving to yield finer biostratigraphic resolution and provides better sequence stratigraphic control. It was emphasized that the plant megafossils have increasingly important application in reservoir engineering, field evaluation and development, ultimately proving invaluable and cost effective in oil exploration. Plant fossils and plant microfossils in particular, not only provide ever increasing biostratigraphic resolution, identification of source rock potential and thermal maturation but are also invaluable in constraining sedimentological and environmental interpretations.

Report of similar megaspores from East Antarctica as recorded from Gondwana of India may be further helpful in correlating the microflora (specially megaspores) of the two Gondwana countries.

Rajni Tewari

Birbal Sahni Institute of Palaeobotany,
53 University Road,
Lucknow 226 007,
India.

**National Seminar on Coastal Evolution,
Processes and products: XVII Annual
Convention of Indian Association of
Sedimentologists**
17-20 October 2000
Kochi, India

A galaxy of scientists, sedimentologists and other geoscientists from all over India converged on a common platform with their views and previews on the current trends, concepts and techniques necessary for our coastal management. The seminar was organised at Cochin University of Science and Technology, Kochi, Kerala and was focussed on the evolutionary nature of the coastal system in terms of various processes, control mechanisms and related problems. Economic minerals as placer deposits along the coastal areas,

one of the immense coastal resources was also the focus of discussion.

A lucid keynote address revolved around physical and biogenic structures of intertidal flats of the east coast of India. The presentation was focussed on shallow marine to inner estuarine region. A two day seminar included papers related to 1. Coastal processes, 2. Coastal environment 3. Sedimentology, depositional environment, lithofacies changes and palaeoclimate 4. Stratigraphy, palaeontology and palynology 5. Geochemistry: modern and ancient 6. Strata bound mineral deposits, beach placers, coal and clay 7. Remote sensing and groundwater.

Critical reviews on the evolution of the coastal land with its varied geomorphology and the problem of formation of seasonal sand bars in a shallow marine environment were the focus of the first day of the seminar. The dynamic forces and nature of depositional trends in the sediment transport pattern in the shallow marine environment of the southwest coast of India were discussed. Such a situation hinders most fishing operations. To solve the problem of erosion or accretion along the coastal region, implications of small scale changes in beach morphology, wave and longshore currents were also discussed. Generally, this behaviour is regarded mainly due to its physical settings apart from the annual cyclic changes in the wind and wave regime.

Contribution on palaeosurfaces and Gondwana sedimentation in eastern India threw light on whether the Gondwana Basins are true active rift (pull apart basins) or rather passive ensialic grabens. Barrier islands in late Proterozoic intracratonic basins with detailed account of lower Vindhyan Jiran Formation was also discussed.

Palaeoenvironment and climatic significance of fossil woods from an island off the coast of Bhavnagar, Gujrat and fossil leaf impressions from Kasauli sediments of Himanchal Pradesh were other interesting contributions. Other contributions include recent development on the palynological studies of the Supra-Barakar sediments in south Rewa Basin MP.

Besides, the author discussed the potentials of multi-proxy data in analysing estuarine depositional environment taking an example of Holocene sediments from the Pichavaram Estuary, Tamil Nadu.

Among the five contestants T. M Balakrishnan of National Institute of Oceanography, Dona Paula, Goa won the 'Young Sedimentologists Award' given by 'The Indian Association of Sedimentologists' for his works related to Lithogenic and associated elemental fluxes in the Arabian sea and some palaeomonsoonal implications.

The third and fourth day of the Seminar comprised of field discussions that included a journey from Ernakulam, Cochin to Kanyakumari. Seawall at Chellanum, fort Kochi which is one of the earliest sea-walls built to protect the back

shore from wave erosion action was visited. Since 1870 more than 2 km of width of land was eroded in this area.

The Indian Rare Earth's mineral separation plant at Koilthottam (16 km North of Quilon) was also visited. This was established in 1970 to process the black sand placers from Chavara-Kayakulam belt of 22 km length. Ilmenite, zircon, sillimanite, rutile, monazite, garnet etc. are separated here taking into account the physical properties of the minerals. The Papanasam beach, Varkala is south of Quilon, and had lend its name to the Tertiary sedimentary series exposed in the coastal cliff at the Papanasam beach. The Warkalli Series is considered to be equivalents of the Cuddalore Sandstone Series of Tamil Nadu. Other sites visited include Badlands of Muttom, Kanyakumari District and sandstone body at Kovalam, near Kanyakumari. Here, sedimentary structures, bioturbation features and the geometry of the sandstone body are signatures helpful in reconstructing the depositional environment. This sandstone body is covered with aeolian sands, but excellent exposures are seen in pits cemented sandstone which is cut and air-dried to make bricks.

Anjum Farooqui

Birbal Sahni Institute of Palaeobotany,
53 University Road,
Lucknow 226 007,
India.

Geoenvironmental studies : Indian Scenario

9-10 November 2000

Jhansi, India

Two days workshop on "Geoenvironmental studies : Indian Scenario" was organised in Department of Geology, Bundelkhand University, Jhansi on November 9-10, 2000. The workshop was sponsored by Commission for Scientific and Technical Terminology, New Delhi; Council of Scientific and Industrial Research, New Delhi and Bundelkhand University, Jhansi. Bundelkhand region is very rich in mineral resources but unfortunately it is facing problems of water scarcity and geoenvironmental degradation due to mining and industry. The theme related to geological sciences include petrology, structure, watershed management, exploration and exploitation of mineral resources and geoenvironment. The workshop was organised to exchange the ideas about how geological processes and natural hazards influence the human activities and to trace the possible remedial measures for various types of natural hazards.

The deliberations held in five technical sessions: Natural Hazards and Mitigation; Mining and Environmental Security; Mass movement; Hydroresources problem and management; Quaternary Geology, Human Survival and Environment.

A paper presented by Prabhakar Awasthi dealt with the rules of the prediction and prevention of the Earthquakes by atomic genetic engineering. 'Landslide hazard zonation in a part of Garhwal Himalaya' and 'Impacts of landslides on tourism in Garhwal region' were other interesting contributions.

AK Biefani, Dehradun, presented an account of 'Natural Hazard in Himalayan region and their mitigation'. He briefly sketched the havoc of hazards such as seismic, land slides, mass washing, snow avalanches, cloud burst, flood, etc. He emphasized that these hazards are putting tremendous strain not only on financial resources of the state or individuals but also creating a psychological impact on mind of public. An integrated planning was suggested by him in order to tackle such problems in larger interest of public. 'Forest fire: a threat to Himalayan ecosystem' and 'Soil erosion control through agroforestry' were the important issues of discussion during the workshop. A paper, "A palynological record of mangrove vegetation at Chandrapur, Chilka Lake, India" presented the results of fine resolution palynostratigraphy of a 3 m deep sediment profile. It highlighted the significance of palaeomangroves in unfolding the fluctuations in the sea margin, transgressive and regressive facies, depositional environment, etc. The significant bio-and-climatic events of last two millennia were also highlighted.

Papers dealing with unplanned mining activities, crushing of stones, oil refinery, acid rainfall, air pollution, excessive water discharge, unplanned growth and proliferation of non-engineered constructions, deforestation etc. were presented and discussed. The natural disasters like earthquake, flood, fire, volcano, cyclone, mass movement and different kinds of pollutions were also the topics of discussion.

Asha Khandelwal

Birbal Sahni Institute of Palaeobotany,
53 University Road,
Lucknow 226 007,
India.

National Symposium on Recent Advances in Geology and Resource Potential of the Kachchh Basin

21st-23rd December 2000

Varanasi, U.P., India

National Symposium on "Recent Advances in Geology and Resource Potential of the Kachchh Basin" was held at Geology Department, Banaras Hindu University (BHU) during Dec., 21-23rd, 2000. This symposium was a tribute by BHU, being the pioneer Indian University, which initiated independent geological investigation in Kachchh Basin as early as 1927, to geoscientists who had toiled hard in the dry and

tough terrain of Kachchh in the quest of unravelling its geological past.

The conference was organised by BHU and sponsored by various organisations viz., Oil & Natural Gas Corporation Ltd., Dehradun; All India Council for Technical Education, New Delhi; M/S Excel Industries, Mumbai; Council of Scientific and Industrial Research, New Delhi; Central Ground Water Board, Faridabad; M/S Ashapura Minechem Ltd., Bhuj; M/S RJGL Charitable Trust, Mumbai; Mineral Exploration Corporation Ltd., Nagpur and M/S Gimpex Ltd., Bhuj.

The symposium was started on 21st December, with a presidential address by SS Mehr on "Role of active tectonism in evolution of Kachchh Landscape". He emphasised that information on active tectonics can be sought by studying seismicity including the spatio-temporal distribution of earthquakes and the orientation, amount and extent of fault during particular earthquake. Therefore, in-depth study to know its precise causes and pattern of this active tectonism and associated phenomenon of seismicity should be carried out in future.

Later two keynote addresses were delivered, one by SK Biswas on "Kachchh Basin : Geology and Evolution" which dealt with evolutionary history of Kachchh pericratonic rift basin in relation to the initiation of rifting, break up of Eastern Gondwana, sedimentation cycles and tectonic events viz., Indian-Asian plate collision and accompanying volcanism since Late Triassic to Recent time. The other keynote address was delivered by SV Deshpande on "Palaeogeographic and Tectonic evolution of Kachchh Basin, Western India". He indicated sequential evolution of Kachchh Basin through time from existence of Gondwana supercontinent to most recent neo-tectonism and the data represented in the form of palaeogeographic and palaeotectonic maps at the end of Jurassic, Cretaceous, Eocene and Miocene.

During these three days scientific celebrations, a few papers provided new vistas of research on "Palaeohistological studies of Dinosaurian fossils from Mesozoic rock of Kachchh and their implications on the Extinction of Dinosaurs in Kachchh with reference to K/T Events at Anjar" by ZG Ghevariya, C Srikarni and DM Shringarpure. The palaeohistological studies of the skin suggested normal skin from comparatively younger horizon of Rahioli as compared to the pathologic condition samples from the boundary site, where the melanocyte pigments are greatly reduced which could have made the contemporary dinosaurs very prone to the fatal and catastrophic cosmic radiation. These palaeopathologic conditions and their bearing on extinction has been discussed. They also investigated fossil dinosaurs from Patcham Formation exposed in Chhapri Bet, Narveri and Nir Wandh along the northern fringe of Patcham Island and their ecological setting and palaeoclimatic scenario. Another interesting paper was by ZG Ghevariya, DM Shringarpure, C Srikarni & NY

Bhatt on "Evidences of meteoritic impact in Mainland Kachchh, Gujarat, Western India".

A valuable contribution was made by Asit K Guha & Gopikrishna on "Tertiary Bryozoa from Western Kachchh, Gujarat : A preliminary note on their diversity, taphonomy and palaeoecology". Five types of taphonomic associations of bryozoan fossils i.e. with algal colonies, saddled foraminifera, bivalve shells, high-spined gastropod shells and fossil barnacles can be distinguished in the Tertiary sequence of Kachchh and the palaeoecological interpretations have been suggested.

The paper on "Some palm remains from the Cretaceous/Tertiary Boundary (KTB) area exposed at Anjar, District Kachchh" by D Bonde & KPN Kumaran indicated its wider distribution in Kachchh, Maharashtra, Kerala and Tamil Nadu in the past from Cretaceous to Miocene Period and now it is restricted in Sunderbans and Andamans in the Indian subcontinent.

The paper on "Palaeopalynology of Kachchh I: Mesozoic Megaspores" (by BN Jana) indicated the megaspore diversity during Early Cretaceous in Kachchh Basin. The contribution on "Depositional environment and palynomorph from the lignite mines of Kachchh" by JP Mandal suggested that the evergreen forest was growing in humid tropical climate during Early Eocene in the vicinity of Panandhro mine area and the lignite deposition was autochthonous. The investigation on "Mesozoic Megaflora of Kachchh Basin and its palaeoecological interpretation" (by J Banerji) indicated that the total Mesozoic assemblage of Kachchh Mainland Basin is represented by four different micro-communities viz., swampy coastal heathland community, freshwater/lagoonal moist community, mesophytic inland community and upland xerophytic forest community of lush tropical vegetation.

Another interesting contribution was made by JS Guleria on "Endogenous fungi in silicified fossil wood of Kachchh, Gujarat" and recognised the affinity of these fungi with Basidiomycetes. A paper on "Mesozoic Nannofossil from Jura Dome, Kachchh" (by Jyotsna Rai) dealt with the taxonomy, biozonation and endemism of nannofossils. A significant contribution on "Palaeoecology and taxonomy of the Tertiary coralline algae from south western Kachchh" by Amit K Ghosh indicated the importance of coralline algae in palaeoecology and palaeobathymetry and suggested moderate to slightly high-energy reef frame work during the time of deposition of sediments and these algae prefers to grow at shallow (bathyal level of 20-40 m) open shelf environment.

The symposium ended with the valedictory session on 23rd December afternoon with a resolution that this type of symposium especially on Kachchh Basin will be organised once in five year and this responsibility is entrusted to the Geology Department of Banaras Hindu University. Multidisciplinary approach on the study of Kachchh Basin should be undertaken viz., neotectonic evolution, seismic study, magnetostratigraphy, radiometric dating, exploration of kaolenite, K/T Boundary and dinosaur extinction in addition to biostratigraphy and sequence stratigraphy. Kachchh Basin is a model basin for the student of geology and efforts be made to preserve Kachchh Basin as a Geological Heritage Museum or National Geological Park.

Jayasri Banerji

Birbal Sahni Institute of Palaeobotany,
53 University Road,
Lucknow 226 007,
India.