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Conference Reports

International Symposium on Multifaceted Aspects of Tree Ring Analysis

15-19 November, 1999
BSIP, Lucknow, UP, India

Tree rings are recorded in many trees growing in diversified geographical regions due to seasonal activity of cambium. Dating and analyses of tree rings in varied applications categorised under a specialised branch of science-Dendrochronology.

An International Symposium entitled "*Multifaceted aspects of tree ring analysis*" held at the Birbal Sahni Institute of Palaeobotany (BSIP), Lucknow during 15-19 November, 1999, provided platform to discuss recent trends and developments in this emerging discipline. This was sponsored by BSIP. A large number of delegates including 13 from abroad representing Germany, USA, Estonia, Japan, Switzerland, Brazil, Thailand and Republic of Korea attended the symposium. Highlights of this symposium are summarised here.

The papers were presented in 6 technical sessions besides poster presentations. These include: Tree ring and Monsoon Dynamics; Tropical Dendrochronology; Palaeoecology; Tree rings in natural hazards; General Dendrochronology including one special session where invited papers covered both tree ring and its allied branch Ecology.

The first lecture in the special session was by Dieter Eckstein (University of Hamburg Germany). He pointed out the problem of dating tree rings of tropical trees and emphasised special strategies for the development of climatically sensitive tropical tree ring chronologies. The other two lectures in this session were delivered by J.S. Singh (BHU) on the "Ecology of Central Himalaya" and Ashok Sahni (Punjab University) on "Scenario of Palaeoecology during the collision of India-Asia".

In the second session "Tree ring and Monsoon Dynamics", in his keynote address, G.B. Pant (IITM) Pune, stressed on the significance of tree ring data in developing high resolution climate analysis in time scale of annual to inter-annual covering both temporal and spatial aspects. The other papers were on the climatic reconstruction based on several tree ring parameters, i.e. ring width, density of early and late wood, and vessel size from many regions of South East Asia. Brenden Buckley, (Lamont Doherthy Earth Observatory, New York) in his keynote lecture depicted potentiality of tree ring analysis of *Pinus kesiya* and *P. merkusii* for the long climatic reconstruction from north eastern Thailand. On the basis of teleconnections recorded in tree ring indices and the sea surface temperature (SST) of the Bay of Bengal and Indian Ocean he suggested that future study may provide clues to study synoptic scale monsoon variation. Nathsuda Puminjumnong (Thailand) discussed Teak vessel density as an indicator of south-east Asian monsoon temperature and H.P. Borgaonkar (IITM) pointed out the significance of tree ring density parameters over ring width data of Himalayan conifers for the reconstruction of pre-monsoon climate.

Third session dealt with Tropical Dendrochronology where problem and prospects of tree ring analysis from tropical trees were discussed. The theme was focused on India, Laos and Brazil.

In the fourth session "Tree rings in natural hazards", K.F. Kaiser (Switzerland) gave keynote lecture on the application of tree ring data in dating of debris flow. He presented debris flow chronology based on tree ring dating of *Pinus mugo* of the Multetta debris fan, Val Müstair, eastern Swiss Alps. In an another presentation Terutaka Katoh (Japan) discussed the prospects of using tree ring width data of *Cryptomeria japonica* in analysing temporal snowfall variation.

In the fifth Session "Palaeoecology", Kaiser in his another keynote address presented a long record of fine resolution climatic changes during Bölling and Allrøid period of late glacial time based on tree ring proxy data and it was compared to other proxy records derived from marine and ice cores. In other two presentations in this session J.S. Guleria and A. Rajanikanth (BSIP) discussed the significance of tree ring analysis in fossil woods in terms of wood productivity, climatic inference and palaeolatitudinal position of Indian sub-continent.

Session sixth was "General Dendrochronology", Won-Kyu Park (South Korea) in his keynote lecture discussed reconstruction of May precipitation back to AD 1731 of his country based on ring width data of *Pinus densiflora* and pointed out the prospect of extending this record far back by adding data from timbers used in old buildings. In another lecture, Osamu Kobayashi, (Japan) presented data indicating implications of tree rings in climatic reconstruction of Nepal. The last lecture in this session was by Achim Braüning (Germany) who discussed about the reconstruction of seasonal aspects of climate of Tibet using several tree ring parameters and also from several trees like *Pinus*, *Abies* and *Juniperus*. This multi seasonal climatic information would be useful to build up the synoptical weather condition for understanding wind system dynamics and monsoon variability in south-east Asia.

In the Poster presentations Seiji Ishibashi (Japan) displayed tree ring data in application of forest management. He

described a new methodology to reconstruct diameter distribution of broad-leaved forest. Vandana Chaudhary (BSIP) discussed tree ring analysis of *Larix griffithiana* from Sikkim and Arunachal Pradesh in reconstructing May temperature. A. Bhattacharyya (BSIP) presented application of tree ring data of *Abies pindrow* in dating the glacial advancements of Dokriani Bamak Glacier, Garhwal Himalaya.

It has been proposed to publish Proceedings of this symposium as a special volume of "The Palaeobotanist".

Since Teak is established as the most potential tree for the dendrochronological studies from the tropical region a field trip was undertaken to Madhya Pradesh to study Teak forests at Delavari and other sites.

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International Conference on Coal Bed Methane: Prospects and Potentialities

3rd December 1999
Calcutta, WB, India

Exploration of Coal Bed Methane (CBM) is a comparatively recent concept and its potentiality and possibility in the present energy scenario have attracted the attention of scientists, technologists and planners round the world. In this context, in India an "*International Conference on Coal Bed Methane: Prospects and Potentialities*" was held on 3rd December, 1999 in Hotel Oberoi, Park Street, Calcutta. The objective was to discuss and interact with the experts in related disciplines of CBM for the source evaluation, exploration and exploitation through various physical, chemical and coal petrological methods in order to generate new data inputs and suggestion for future course of study.

The conference was organised by the Calcutta Regional Chapter of South Asian Association of Economic Geologists (SAAEG) in collaboration with the Geological Survey of India (GSI), Calcutta and Government Engineering College, Raipur (Madhya Pradesh). It was co-sponsored by the following organisations:

Birbal Sahni Institute of Palaeobotany,
Great Eastern Energy Corporation Limited,
Indo-Gulf Fertiliser and Chemical Corporation Limited,
M/S Reliance Industries Limited,
Maharashtra State Electricity Board, and
Oil and Natural Gas Corporation Limited.

The inauguration was followed by the Foundation Lecture of SAAEG by Acharyya on the topic "*Indian coal basins as a source of coal bed methane- prospects and retrospect*" giving a detailed review of most of the Indian coal/lignite basins with respect to their coal bed methane potential. He realised that efforts by various governmental and private agencies may made CBM projects in India commercially viable in none too distant future.

There were three technical sessions. The pre-lunch technical session I, chaired by V.D. Manjrekar, President, SAAEG during which eight papers were presented. Some of the important papers of this session were those by N.D. Mitra (Member Advisory Council, Directorate of Hydrocarbons, New Delhi), Kuldip Chandra (Director, KDM Institute of Petroleum Exploration, Dehradun) and P.S. Sawhney (General Manager, Reliance Industries Limited, Ahmedabad). There were two technical sessions running simultaneously during post-lunch period. The technical session II was chaired by P.S. Sawhney and A. Chowdhary (GSI), whereas technical session III was chaired by N.D. Mitra and M.N. Prasad (Coal India Limited). Six papers were presented in the session II and five papers in session III.

The papers presented dealt mostly with the state-of-the-art on the subject, besides providing some data base already existing and generated during the past years. Geological Survey of India, Oil and Natural Gas Commission, Coal India Limited, Central Mine Planning and Design Institute Limited and Reliance Industries Limited contributed papers under this category. The paper of Chandra presented by James Peters also dealt with the review of the general information gathered as well as generated by the ONGC about the various Indian CBM potential Permian Gondwana coal basins. Sawhney provided a comprehensive account of CBM potential of prospective basins of India in terms of coal characteristics and budgetary point of view. He was of the opinion that, if properly encouraged by the Government, the indigenous CBM would be cheaper than the imported LNG currently being used in India.

Mitra while presenting "*A few thoughts on CBM prospects in India*" realised that though a wealth of data have been generated on coal geology, quality and resources in India, no adequate information is available on CBM reservoir characteristics of Indian coal and lignite basins. According to him, synergistically combining the geological controls two 'sweet spots'- Parbatpur-Mahal in Jharia and Gomia-Saram in East Bokaro basin are most suited in the Damoder Valley coal belt for CBM production. He also suggested that assimilation of R & D data on Australian coal basins would benefit the CBM exploitation in Gondwana coalfields of India.

The paper by R.C. Milici (USGS, Reston) on CBM assessment in central and northern parts of the Appalachian

Basin was presented by Mitra (in session I). A paper by Mohit Banerjee and Tom Gill (Great Eastern Energy Corporation Ltd.) on '*CBM industry*' explained the methods of methane exploitation utilizing some modified techniques during drilling. D.D. Sharma (Reliance Industries Ltd.) reviewed the present state-of-the-art of CBM and suggested the significance of remote sensing, high resolution aeromagnetic and seismic data interpretation in delineating natural fracture zones in coal beds, an important parameter for assessing CBM production. P. Kumar demonstrated the out come of the project "*Mine related CBM: recovery and utilization in India*" taken-up by CMPDIL for implementation in Sudamdih and Moonidih collieries in Jharia Coalfield to enable and demonstrate the recovery and utilization of methane from an operating coal mine.

Most of the papers presented at the conference did use coal rank for collating their other data (permeability, cleat pattern, etc.) for assessing CBM potential of respective coal basins. However, only two papers using detailed coal petrographic study for the assessment of CBM were presented by us. The first (by AS & BDS) was on Kanhan Valley coals from Satpura Gondwana Basin, where western part of the valley (Nandan-Tandsi sector) was found to be potential for CBM. The second one (by BKM) dealt specifically with the influence of petrographic composition and rank of Indian coals in the assessment of CBM. Another paper by S.G. Chaudhuri (CFRI, Dhanbad) highlighted, after reviewing the international literature on the subject, to calculate the theoretical methane content of some of the Indian coals by using formulae (developed by Kim) based on available reflectance (rank) data. A.K. Varma (ISM, Dhanbad) presented the petrographic investigations alongwith cleat pattern of some coal seams in Jharia Coalfield for CBM.

It was realised that systematic data on gas absorption, emission and desorption of Indian coals in general are lacking. The existing data base on factors affecting CBM content in coal, viz. quality, rank, porosity, permeability, reservoir pressure, etc. is still inadequate and we lack proper understanding of CBM reservoir fundamentals. It was clearly brought by the papers presented at the conference that the Jharia and East Bokaro coalfields in Damodar Basin are most promising for the present context. Some of the Indian lignite deposits in Tamil Nadu, Gujarat and Rajasthan are now been considered suitable for CBM exploration. However, certain Permian Lower Gondwana coal basins normally considered potential for CBM exploration (Son-Mahanadi and Wardha-Godavari, besides certain coalfields of Damodar Basin), according to Mitra, may not prove to be of much consequence in future.

It was observed by us that everyone did talk about the significance of using coal petrographic study in the assessment of CBM, yet in practice it has been used sporadically and that too only for the determination of coal rank.

In the Panel Discussion, it was observed that a fruitful beginning has been made through this conference and a more concerted effort should be made in future.

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10th National Conference on Aerobiology and its applications

20-22nd December1999
Vishakhapatnam, AP, India

The 10th National Conference on Aerobiology and its applications was held at the Department of Botany, Andhra University, Visakhapatnam during 20-22nd December, 1999. The focal theme of the meet was "Dissemination of the Air pollutants". The conference was dedicated to Late Prof T. Sree Ramulu who initiated studies on Aerobiology in Andhra University, Visakhapatnam. A large number of delegates have attended the conference drawn from different parts of Andhra Pradesh, Assam, Bihar, Delhi, Himachal Pradesh, Jammu & Kashmir, Kerala, Karnataka, Maharashtra, Madhya Pradesh, Manipur, Tamil Nadu, Uttar Pradesh and West Bengal. Seven Technical sessions were held and each technical session was followed by lead lectures and general presentations. The focal themes of the technical sessions are:

1. Allergy & Immunology, house dust mites and allergy, 2. Fungal aerosols-working environments, 3. Fungal aerosols-outdoor environments, 4. Epidemiology of crop diseases, 5. Meteorology & aerial transport of pollutants, 6. Pollen in the aerial environment and its impact on human health and 7. Pollen as carriers of genes and their flow from anther to stigma.

Some of the important contributions made in the deliberations include "Fungal spores in Intramural environments - a potential health hazard" (B.P.R. Vittal) which dealt with inhalation of certain types of airborne fungal spores and other constituents of the air-spora in indoor environment such as dwellings, work places and occupational environments. They have been identified as important causes of some respiratory disorders. Stored products constitute one of the principal sources of fungal spores in door and occupational environments. In addition, being potential allergens, the spores of fungi contain various toxins and inhalation of fungal spores particularly those that produce mycotoxins result in immunological disregulation with potential neurological effects. Fungal volatiles are known to effect health by causing nasal irritation and feelings of stuffness.

Another informative presentation was on "Clinical application of the Acrobiology in the diagnosis and management of respiratory allergy" (A. B. Singh). The role of pollen and fungal spores in causing allergy and they are major source of morbidity among atopic population was discussed. Respiratory system is the direct largest organ or aeroallergens taken by inhalation. This results in immediate hypersensitivity disorders causing clinical symptom of the allergic rhinitis, asthma, atropic dermatitis and Urticaria etc. From medical especially clinical point of view it is important to know the details of occurrence and seasonality of the aeroallergens. In outdoor environment, peak season for fungal spores in India is July-September when temperature and humidity are comparatively high, although they are present in air throughout the year. The aerobilogical data can be gainfully exploited by allergologists for effective diagnosis and treatment of allergic patients and devising avoidance strategies Contribution on "Spores and pollen as the reliable ecological indicators" (M. R. Rao & A. Rajanikanth) enumerated various ecological groups of palynofloral assemblages indicating habitat differentiation. The tolerance of the species and nature of the physical environment are considered important palaeoecological indicators. Spore-pollen structures being botanical entities, genetically controlled and fairly constant for taxonomic unit indicate environment preference of plants. Some of the ecological groups include freshwater (*Pediastrum, Potamogeton*), freshwater swamp and water edge (*Lygodium, Ceratopteris, Typha, Cyperus*), lowland (*Caesalpinia, Acacia*), Montane (*Podocarpus, Pinus, Picea, Alnus, Betula*), Mangrove (*Nypa, Rhizophora, Avecennia*) and sandy beach (*Pandanus, Borassus, Cocos*). This data judged in conjuction with total assemblage in a particular deposit. Another contribution on "Biodeterioration of pollen and spores: Scanning Electron microscopic study" (Asha Khandelwal) discussed damp air-spora screened under Scanning Microscope which include a large number of biodegraded pollen grains and spores. The microbes closely allied to bacteria or fungi. The inhabiting microbes grow at the expense of pollen cytoplasm and damage the sporoderm. It is envisaged that the infected pollen and spores might be acting as air-carrier for the pathogens to help them in dispersal. Thus, when these aerobiopollutants are inhaled, it may lead to complicated health problems as the chances of infection are doubled.

On the whole the scientific deliberations of the conference were meticulously planned and conducted. In addition to the conference P. H. Gregory Award Contest for the research students was also organised and three prizes first, second and third were awarded for the best research work presented in the conference.

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Joint Annual Conference of Indian Archaeological Society, Indian Society for Prehistoric & Quaternary Studies and Indian History & Culture Society

27th-30th December, 1999
Pune, Maharashtra, India.

The Joint Annual Conference of three societies namely Indian Archaeological Society, Indian Society for Prehistoric & Quaternary Studies and Indian History & Culture Society, was held at the Deccan College Post-Graduate and Research Institute, Pune, Maharashtra, to mark the momentous occasion of the Diamond Jubilee Year (1939-1999) of this internationally renowned and premier organization for the archaeological studies in India, from December 27th to 30th, 1999. The conference was organized with an objective to assess the metamorphosis with an overall and comprehensive look at archaeology and archaeologists, what archaeology tells us about the past and the vast spectrum of human experience, coinciding with broad slices across prehistoric and historic times. The place for holding conference in archaeology was indeed novel to have witnessed a glorious era in Indian Archaeology, where Late Professor H.D. Sankalia developed from scratch the Department of Archaeology into a premier Archaeological Research Centre in South Asia and one of the best in the world, and where his spirit still continues to survive to inspire generations of Indian and foreign students of archaeology.

The conference was inaugurated in the forenoon of Dec. 27, 1999 by Professor S.C. Gupte, President, Deccan College Post-Graduate & Research Institute and Former Vice Chancellor, University of Pune. The function was presided over by Dr S.P. Gupta, Chairman, Indian Archaeological Society, New Delhi. Following the inaugural address, Prof T.C. Sharma, who devoted more than 35 years to the cause of archaeology in north–eastern states, delivered Presidential Address of the Indian Archaeological Society on the "Place of Assam in the History and Archaeology of India"; Dr K.N. Dikshit delivered the Presidential Address of Indian Society for Prehistoric & Quaternary Studies on the subject of "Indian Prehistory with special reference to Kashmir Neolithic", and Dr Mani P Kamerkar of the Indian History & Culture Society on "Child Education in India in historical perspective". On the same day in afternoon session, paying homage to the universally recognized scholarship of Professor Sankalia in world archaeologically community, Dr S.P. Gupta presented "Professor H.D. Sankalia Memorial Lecture" on "Harappan Studies in the next century". Forsaking aside the Western views, a cumulative account of archaeological excavations, radiocarbon dating, anthropological data, evolutionary cultural sequences and the geographical territories of Harappan empire merited in Dr Gupta's lecture to convince the by and large scholars, that the picture of the Indus Civilization calls for a

complete revision of Ancient Indian history. What puzzled the learned gathering was that the maximum concentration of Harappan sites were on the dried up courses of Ghaggar-Hakra river, ancient Saraswati of Vedic times which was lifeline of this civilization. Dr Gupta proposed the renaming of Indus Civilization, as "Saraswati" or "Indus-Saraswati" Civilization. In his views, shared by many other renowned archaeologists, it is both a revaluation and revolution and our history needs to be rewritten. It was an indigenous development, about 5,000 years ago. Forbidding the views of only 2-3 scholars, the overwhelming majority of renowned archaeologists in an open session on "Indus Civilization" or "Saraswati-Sindhu Civilization?" proposed on a forum of archaeologists to change the name as "Saraswati-Sindhu Civilization". One of the participants (KSS) felt privileged to have passed on to the organizers of session a copy of Age Old paper of Professor Birbal Sahni (Current Science 5(1) : 57-61, 1936) and to notice that they were overwhelmed after realizing that the conclusions they have arrived at after 63 years, were found rooted in the visionary of a great palaeobotanist, in his statement "So far as I know, these have not yet been described, but their dating would obviously be of the greatest interest in view of recent speculations concurring the distribution of that archaic but highly developed Indian Civilization to which the probably unduly restricted name of the Indus Civilization has been applied".

In a conventional programme of the conference, to encourage the young archaeologists in the age group of 30-40 years, 4 competitors presented their work to win Prof H.D. Sankalia Young Archaeologist and Dr Malti Nagar Ethnoarchaeology awards. Winners were awarded. The number of papers presented on Dec. 28 and 29, 2000 at the seminars were fairly large. In order to save time and give opportunity to every one, parallel sessions were organized. A number of scholars presented their papers on Harappan Civilization, Prehistoric to Early historic cultures in different regions of India, Iconography, Linguistics, Quaternary, Palaeoenvironment, Ethnoarchaeology, Geomorphological studies, Faunal and Floral remains, Tool Technology, Palaeodietary and a variety of other subsidiary and cognate subjects. One of the leading Harappan archaeologist Dr R.S. Bisht in his discourse on Dholavira excavations, now in salty marshes of the Runn of Kutch, almost opened a new book on a surprising exuberance that expresses itself in elaborate stone architecture of a Harappan city, giant water reservoirs and a board inlaid with large Harappan script- probably the world's first hoarding. Presentations by a leading scholar of the Deccan College Dr Vasant Shinde on the terminology and origin of Harappans, and that by Dr Malti Shindge on the affinities of Harappan language with Sanskrit, deserved admiration. Lectures by Drs S.N. Rajaguru, M.D. Kajale, B.C. Deotare, Hema Achythan, P. Rajendran, P. Vijaya Prakash, among several others, enlightened on the geoarchaeological approaches to the playas of Rajasthan, Black Cotton soils in the Deccan Uplands, Holocene Colluvial Episodes and Godavari Delta Environment, and gave indubitably new insights in the subject of Holocene studies. Diffusion of rice cultivation in the Early Harappan agricultural traits from its homestead in Ganga Valley, brought to light by the work of K.S. Saraswat at BSIP, also led to the radical departure in the existing knowledge on agricultural development of ancient north–western India.

Holding a special seminar by the Deccan College on "The significance of site formation processes research in Indian Archaeology", was in all substantially an important event of the conference. In this seminar on 30.12.2000, all the pioneer researches conducted by the Deccan College from the times of Prof Sankalia till the present, were presented in 17 valuable papers, dealing in depth the physical processes of site formations, in the central and western India. Prof V.N. Misra elaborated at length the sequential growth of archaeological, geomorphological and palaeoenvironmental data. In some other papers, e.g., Vasant Shinde, Shanti Pappu, K. Paddayya, etc., discussions and interpretations were made with geological and geographical background, which is a must for any worthwhile understanding of the lithic industries so intimately connected with the nature of terrain. A few papers were concerned with methodology, to know the manner in which the data are obtained and interpreted. A few reports on faunal remains not only contained data on the origins and locale of domestication, but also the facts that the earliest domestication was established at Adamgarh (5000 BC) and Bagor (4500 BC) in central and western India.

The conference made not only a welcome addition to scholarship, but also provided a valuable direction to undertake archaeological researches in integrated manner, in view of the increasing scientific facilities. We take opportunity to thank the organizers of conference at Pune, who helped us put tribute from BSIP to Professor Sankalia. It is unlikely that India will produce another archaeologist of his dedication and versatility.

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XVII Indian Colloquium on Micropalaeontology and Indian Stratigraphy,

27th-29th January 2000
Ujjain, MP, India

A three-day colloquium on Micropalaeontology and Indian Stratigraphy was held from 27th to 29th Jan. 2000, at School of studies in Geology, Vikram University Ujjain, M.P.

Deliberations dealt with Proterozoic, Palaeozoic, Mesozoic and Cenozoic fauna, Recent faunal analysis, Palynology and Palaeoclimate, Sequence Stratigraphy, boundary problems, application of remote sensing and information technology in hydrocarbon and uranium exploration, current developments in Micropalaeontology and Stratigraphy.

Scientific sessions were divided into 16 technical sessions and 5 invited talks. Some of the informative presentations on palynology include :

"Modern and Early-Holocene pollen data from Priyadarshini Lake, Antarctica" one of the invited talks by Chhaya Sharma reporting the high concentration of moss and algal spores in addition to a very few pollen taxa of Poaceae, Chenopodicaceae, Amaranthaceae, Asteraceae and *Larix*. It was suggested that except the grass pollen, all other pollen taxa encountered have probably been transported from other distant areas probably S. America as only two taxa viz. *Deschampia antarctica* (Poaceae) and *Colobanthus quitensis* (Caryophyllaceae) have so far been recorded from Antarctica continent.

Another invited talk was focused on Palaeo-monsoon reconstruction on the basis of recent foraminifera by Rajeev Nigam of NIO, Goa. The other important contributions was made by N.C. Mehrotra of ONGC, Dehradun. It was on recent development in studies of Palynostratigraphy and Palaeoenvironment in Eocene-basal oligocene sediments with main emphasis on hydrocarbon prospects in the area south east of Bombay High. Biostratigraphy has been build up in the area south east of Bombay High on the basis of eighteen globally recognised dinoflagellate biochonohorizons alongwith significant calcareous nannoplankton occurrences at certain levels.

Among the other presentations "Palynology in the quest of Uranium" was also an interesting paper where relationship of Uranium and palynodebris found in close association within the tertiary sedimentary rocks were discussed to identify the various types of palynodefacies which could have arrested the Uranium.

Results of palynological investigations on the newly discovered Gondwana sediments in the sub-surface of Cauvery basin were presented by Bijai Prasad of ONGC, Dehradun. The palynoflora of PB well from a shale sequence shows dominance of monosaccates viz. *Parasaccites, Plicatipollenites, Divarisaccus* etc. This resembles Draksharma Argillite palynoflora of K.G. Basin and Chingelput palynoflora of Palar Basin and is equated with upper Talchir palynoflora. Sakmarian age has been suggested. Marginal to shallow marine depositional environment has been interpreted on the basis of occurrence of Leiosphaerids in the palynoassemblage.

An account of Triassic-Jurassic dinoflagellate cysts in Krishna-Godavari Basin and their biostratigraphic significance was presented by H.S. Aswal and N.C. Mehrotra of ONGC, Dehradun. They inferred that the Middle Triassic sediments in the basin are represented by Anisian-Earliest Ladinian and Late Triassic-Early Jurassic by Rhaetian-Sinemurian sediments. Absence of Ladinian-Norian and Late Sinenurian-Early Oxfordian is attributed to two major hiatus, one at the top of Ladinian and another at the top of Early Sinemurian.

There were some interesting papers on tectonics. One was India-Asia collision along Shyok suture : Palaeontological evidence. Karakoram is geologically a significant terrain. A number of foraminiferal taxa, bryozoans, corals and an alga *Sapinogoporella* sp. were reported from Hundiri Formation in Hore section and indicated Aptian-Albian age for this unit, which was previously designated Jurassic-Eocene in age. Faunal similarity between Hundiri Formation of Shyok Valley and limestone of Khalsi and Dras in Ladakh ; Burzil Pass, Drosh and Yasin areas of Kohistan. Aptian-Albian Limestone of the Xigaze succession exposed in Tibet and Orbitoline bearing rocks in Irrawaddy Valley, upper Burma was discussed in detail as this is significant in understanding palaeoecological and palaeogeographical evolution of the region during Aptian-Albian time. They suggested that India-Asia collision took place along Shyok Suture after the deposition of Hundiri Formation in terminal part of Albian times (97 My) and supported two sutures in Ladakh region- the Shyok suture to the north and the Indus suture to the south.

Another interesting and informative invited talk was presented by A.B. Roy of Mohanlal Sukhadia University of Udaipur. It was related with understanding of the nature and evolution of the Precambrain crust from very early formed continental nucleus or island to assembly and breakup of supercontinents into smaller fragments and subsequent reassembly into newer configuration. The concept of 'Rhodinia' having totally different frame work from the commonly known Pangea supercontinent was also discussed.

Among the Hydrocarbon related papers : "Basinal configuration and stratigraphic records during Mesozoic period in Cambay Basin : a gateway to future Hydrocarbon province" was interesting. The authors suggested that the southern Mesozoic sub-basins deserves special attention in view of their inferred hydrocarbon prospectivity and needs to be evaluated

on priority for exploration of Mesozoic petroleum system. They analysed existing geoscientific data pertaining to pre-tertiary period and depicted the Mesozoic basinal model in the light of adjoining regional and geologically equivalent global basins.

Hydrocarbon related another presentation suggests good to moderate potential for hydrocarbon generation in Panna Formation on the basis of source rock evaluation studies in the area south east of Bombay High.

Palynological analysis of bore core GC-17 from Krishnavaram area, Chintalpudi sub-basin has revealed presence of Mesozoic palynoflora in a lithologically designated Lower Gondwana sediments (Barren Measures and Kamthi Formation) on the basis of presence of *Classopollis, Araucariacites, Cicatricosisporites, Rajmahalispora, Callialasporites, Coptospora, Microcachrydites* etc. The presence of non-marine Jurassic in sub-surface of Chintalpudi sub-basin is significant since on surface it is represented by Kota Formation in Godavari Graben. Two palynoassemblages belonging to Middle Triassic and Early Jurassic have been identified in this bore-core.

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