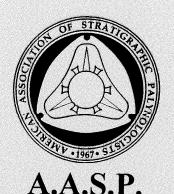


# A.A.S.P. NEWSLETTER

Published Quarterly by the American Association of Stratigraphic Palynologists Inc.

# September, 1999 Volume 32, Number 3

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## American Association of Stratigraphic Palynologists Inc.

The American Association of Stratigraphic Palynologists, Inc. - AASP - was established in 1967 by a group of 31 founding members to promote the science of palynology. Today AASP has a world-wide membership of about 800 and is run by an executive comprising an elected Board of Directors and subsidiary boards and committees. AASP welcomes new members The AASP Foundation publishes the journal Palynology (annually), the AASP Newsletter (quarterly), and the AASP Contributions Series (mostly monographs, issued irregularly), as well as several books and miscellaneous items. AASP organises an Annual Meeting which usually includes a field trip, a business luncheon, social events, and technical sessions where research results are presented on all aspects of palynology.

#### AASP Scientific Medal recipients

Professor William R. Evitt (awarded 1982) Professor William G. Chaloner (awarded 1984) Dr. Lewis E. Stover (awarded 1988)

Dr. Graham Lee Williams (awarded 1996)

Dr. Hans Gocht (awarded 1996)

#### **AASP Honorary Members**

Professor Dr. Alfred Eisenack (elected 1975)
Dr. William S. Hoffmeister (elected 1975)
Professor Leonard R. Wilson (elected 1975)
Professor Knut Faegri (elected 1977)
Professor Charles Downie (elected 1982)
Professor William R. Evitt (elected 1989)
Professor Lucy M. Cranwell (elected 1989)
Dr. Tamara F. Vozzhennikova (elected 1990)
Professor Aureal T. Cross (elected 1991)

AASP Board of Directors Award recipient Robert T. Clarke (awarded 1994)

#### AASP Distinguished Service Award recipients

Robert T. Clarke (awarded 1978)
Norman J. Norton (awarded 1978)
Jack D. Burgess (awarded 1982)
Richard W. Hedlund (awarded 1982)
John A. Clendening (awarded 1987)
Kenneth M. Piel (awarded 1990)
Gordon D. Wood (awarded 1993)
Jan Jansonius (awarded 1995)
D. Colin McGregor (awarded 1995)
John H. Wrenn (awarded 1998)

Awards at each Annual Meeting: Unocal Best Applications Paper Award, Best Student Paper Award, and Best Poster Award.

Student Scholarships to support studies in palynology. Currently up to two scholarships of \$1000 (U.S.) each annually. The qualification of the student, the originality and imagination evident in the proposed project, and the likelihood of significant contribution to the science of palynology are factors that will be weighed in selection of award winners. Previous winners of this award are eligible only if they are pursuing a different degree than the one they were pursuing when they received the previous award. AASP Scholarships are available to all students of palynology in all countries. Students need not be AASP members. Application forms appear in the January issue of the AASP Newsletter. Chairman of the AASP Awards Committee is Owen K. Davis (palynolo@geo.Arizona.EDU).

AASP Membership Application - Membership in AASP is for the calendar year. Dues are \$30.00 U.S. per year for individuals and \$40.00 U.S. per year for institutional members. All members of AASP receive Palynology which is published annually, the AASP Newsletter, which is mailed out four times a year, and an annual Membership Directory.

Dues may be paid up to three years in advance. Overseas AASP Members (Individual or Institutional) who would like to receive their AASP Newsletter and Palynology by air mail, rather than book rate surface mail, need to include the applicable postage surcharge (noted below). Credit card users must pay a \$1.00 U.S. surcharge per transaction.

Air mail surcharge (increased for 1995 and beyond): Europe & South America: \$12.00 U.S. per year. Africa, Asia & Australia: \$15.00 U.S. per year. Credit card surcharge \$1.00 per transaction.



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Volume 32, Number 3 Jan Willem Weegink, Editor

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The AASP Newsletter is published four times annually. Members are encouraged to submit articles, "letters to the editor", technical notes, meetings reports, information about "members in the news", new websites and information about job openings in the industry. Every effort will be made to publish all information received from our membership. Contributions which include photographs should be submitted a week before the deadline.

Deadlines for next issues of the newsletter, are November 15th 1999 and Febuary 15 2000. All information should be sent on computer disks (MS Word for Windows is best) or by email; if possible, send a hard copy. Always send a duplicate typescript of all electronic copy sent for checking. If possible, please illustrate your contribution with art, line drawings, eye-catching logos, black

white photos, colour photos, etc.

We **DO** look forward to contributions from our membership.

PRESIDENTIAL ADDRESS Chris Denison

Two years ago, when I became President-elect, low oil prices had reduced the amount of technical work being done by oil companies, so I was expecting plenty of spare time to fulfil my duties. Since then I have been visiting Indonesia a lot - sometimes I feel like a long distance commuter - with a few weeks in between trips to catch up with everything at the office and at home.

AASP business is mostly conducted by e-mail, but technology problems have sometimes left me without e-mail contact for considerable periods. The Board members have been very tolerant of my long absences and protracted electronic silences.

Most of the hard work needed to keep AASP running is done by a small number of dedicated people. Tom Demchuk is the real workhorse as Secretary/Treasurer. Dave Goodman quietly goes about producing 'Palynology', a major effort. Jan Willem Weegink does a really fine job of producing this Newsletter. Martin Head, Owen Davis, Bob Clarke and Don Benson all work behind the scenes to make things happen. John Wrenn, Ken Piel and Harry Leffingwell put prodigious efforts into raising funds tor CENEX. My thanks to all who have made my job easier.

Teamwork may be over-worked buzzword in the business world, but being on the ground in a producing oil field shows what teamwork is really all about. Oil production is a big engineering enterprise. A plumber's nightmare of pipes, pumps and valves moves huge volumes of water, oil, gas and steam. In comparison, the geological input is relatively small, but crucial. Correct identification of reservoir flow units – the subsurface plumbing – makes a big difference to the investment needed in steel plumbing on the surface. Working out this subsurface plumbing involves a team that combines 3D seismic, formation evaluation, reservoir characterization, and my contribution, reservoir facies architecture. Each team member brings specialized knowledge to the table, but everyone has to have a reasonable understanding of the entire process.

This is where the future lies. Oil companies are investing in bigticket visualization rooms where multiple datasets can be shared and integrated. Isolated specialists, including the few remaining oil industry biostratigraphers, who do not have the necessary geological skill sets, or who can not or will not work in an integrated team, are headed for extinction.

On a lighter note, as I write this, the Savannah Annual Meeting is fast approaching. By the time you read this, we will have had a great time in Savannah, with productive and informative technical

sessions and enjoyable social activities. Fred Rich made it all possible, and after all the work involved in organizing the Annual Meeting, now faces a year with the responsibilities of AASP President.



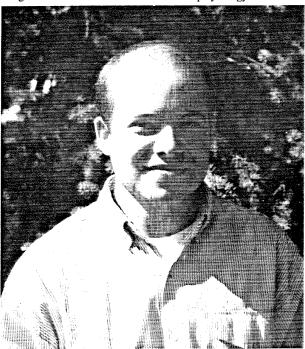




#### 1999 AASP STUDENT SCHOLARSHIPS CRANWELL SMITH AWARD

The AASP Awards Committee congratulates Robert K. Booth, Caroline Davies, and Lindsey Gillson, recipients of 1999 AASP Student Scholarships and of the Cranwell Smith Award. Nineteen applications were received from six nations. These covered a very wide range of topics including Aeropalynology, Quaternary Palynology, and Stratigraphic Palynology.

Booth and Gillson each receive \$1000 from the AASP Scholarship Fund. Davies' award is made separately from the Cranwell Smith Fund, but the pool of applicants and criteria are the same. The awards are based on the qualification of the student, the originality and imagination evident in the proposed project, and the likelihood of significant contribution to the science of palynology.



Robert K. Booth is a PhD student in the Botany Department at the University of Wyoming. Under the supervision of Dr. Stephen T. Jackson, he is studying the development and dynamics of Lake Superior coastal wetlands. Bob received his B.S. in biology at The Pennsylvania State University in 1995, where he was introduced to the field of palynology by Dr. Alfred Traverse. Under the direction of Dr. Fredrick Rich, he earned his M.S. in biology from Georgia Southern University in 1998, where he used the applications of palynology and sedimentology to investigate the depositional history of barrier island sediments in coastal Georgia.

Robert Booth's proposal is entitled "Modern microenvironmental tolerances of testate amoebae and their application to interpreting long-term wetland development."

Interpretation of fossil testate amoebae is presently hindered by the lack of baseline data regarding their modern microenvironmental tolerances (e.g., pH, water level). Bob will conduct a comparative study of microenvironment and testate amoeba assemblages from surface samples along a spatial chronosequence of 60 wetland swales in the Upper Peninsula of Michigan. The data will be used to interpret the vertical changes of fossil testate amoebae in wetland peat cores. This project is part of Bob s dissertation work on the paleoecology of Lake Superior coastal wetlands. Local and regional controls on wetland development will be assessed by comparing regional records of climate change (e.g., lake-level history, pollen records) with the testate amoeba, macrofossil, charcoal, and pollen records from the coastal wetlands.



Caroline Davies is currently completing a doctorate in Geography at Arizona State University under the guidance of Dr. Patricia Fall. Caroline earned her Master's degree in Quaternary Sciences in 1992 from the Institute for Quaternary Studies at the University of Maine, Orono. Her thesis research into archaeological site preservation along submerged Maine coastlines was supervised by Drs. David Sanger and Daniel Belknap. She received her Bachelors degree in archaeology from William Smith College in 1989 which was followed by eighteen months of archaeological excavation in Jordan and Iraq.

The title of Ms. Davies dissertation is "Paleoenvironments of the Jordan Plateau." This research focuses on long-term climate change along arid margins in the Middle East. It examines local versus regional issues of boundary area climate conditions and shifting circulation patterns during the Quaternary. This research will identify competing influences of major circulation patterns on vegetation as a reflection of past changes in regional climate on the Jordan Plateau. This work integrates palynostratigraphy, sedimentology, and chronostratigraphy to develop the first climatic reconstructions for upland margins of the An Nafud desert. The sediment core drilling program which produced the first continuous sediment record for the region was supported by a Fulbright

Scholarship and a Research Fellowship from the American Center of Oriental Research. Also, an elevational transect of surface pollen extending from the Dead Sea valley to the Jordan Plateau have been developed as a modern analog for comparison with the fossil pollen record. Climate reconstructions are being developed from sediment cores from several closed-basin playas along a north-south transect which crosses the boundary of two major circulation systems. In examining intra- and inter-regional climatic influences through the Quaternary, this research is attempting to distinguish changing circulation patterns from local hydrological influences.



Lindsey Gillson is currently pursuing a D. Phil. degree in the School of Geography, University of Oxford. She obtained a Degree in Pure and Applied Biology in 1990 from Saint Anne's College, University of Oxford and her MSc degree in Environmental Technology from Imperial College, London, in 1994. From 1995 to 1998 Lindsey worked as a biologist and researcher for the wildlife charity care for the Wild International, where she was responsible for working on issue related to the wildlife trade and CITES (Convention on International Trade in Endangered species). While working for Wild International, she became fascinated by ephant ecology and the controversy over elephant culling and the ivory trade. It was this debate which inspired her Doctoral research: Vegetation Change in Elephant Habitat and its relevance to conservation policy. There is controversy over whether elephants should be culled in order to preserve tree cover, or whether there is a woodland-grassland cycle in elephant habitat, during which tree cover is periodically destroyed, but later regenerates.

The aim of Lindsey Gillson's research is to analyze vegetation change in East African elephant habitat over a three thousand year period. Palynological analyses will be used to reconstruct vegetation history and identify whether a woodland-grassland cycle has taken place. Analysis of stable isotopes (delta 13C) will aid the interpretation of the pollen diagrams, by providing an indication of the relative abundance of C3 and C4 plants. The analysis of the fossil insect assemblage and charcoal analysis will identify the possible impact of elephants and fire as agents of habitat change. The proportion of large scarab beetles in the fossil insect assemblage could be a useful indicator of elephant population density. Charcoal analysis could help to identify the impact of fire. The implications of these findings for elephant conservation policy will be discussed.

- Owen Davis -







OBITUARY: CHARLES DOWNIE (1923 - 1999)
By Bernard Owens and Bill Sarjeant

Members of the Association will be saddened to learn of the death in July 1999 of Charles Downie, one of the pioneers of palynology in Britain.

Charles was a Glaswegian, born in 1923 in the industrial heart of that city. His education was seriously disrupted by naval service during the Second World War. For part of that time, he served on small craft in the Indian Ocean; indeed, he claimed to have visited almost all its islands. However, such was the modest nature of his character that details of this phase of his life still remain vague.

After the war, Charles returned to his home city and enrolled at its University to study geology. He was taught stratigraphy and palaeontology by Leslie R. Moore, then a member of the Glasgow staff. In 1949, Moore was appointed as the 3rd Sorby Professor of Geology at the University of Sheffield. Quickly he set about establishing a research school, with stratigraphy and palynology as major components. Moore had already proved the value of Carboniferous miospores in stratigraphical correlation and was anxious to expand that field.

By this time, Charles had already begun his Ph.D. research, an investigation of the stratigraphy and sedimentology of the Kimmeridge Clay Formation in Dorset. He followed Moore to Sheffield in 1952, when he was appointed as a Lecturer in Geology. His Ph.D. studies continued into those early Sheffield days and it was not until 1955 that the thesis was successfully defended.

Out of interest, Charles tried some of Moore's extraction techniques on his Jurassic samples, recovering both dinoflagellates and what were then called "hystrichospheres". His initial results on the Kimmeridge Clay were reported to the Geological Society of London in 1956 and marked the start to British palynological studies of marine sediments. Earlier workers such as Wetzel, Eisenack and Deflandre had already described much of the morphology and biology of "Xanthidia" or "hystrichospheres" from the European Mesozoic, but it was Downie who was the first to demonstrate their stratigraphic potential in Britain. Moreover, it led to the development of an association with Moore which was to continue through to the latter's retirement and which would lay the foundations for the Palynological Research Laboratory in Sheffield, so soon to attain international renown.

From the outset, Charles made a significant input into the teaching of stratigraphy and palaeontology at Sheffield. After 1959, when Peter Sylvester-Bradley departed to the Chair of Geology at the University of Leicester, Charles's contributions formed the backbone of the major undergraduate courses on these topics. The generations of students whom he taught over the next two decades gratefully remember his lectures for their encyclopaedic content of fact and meticulous blackboard style.

Despite these demands, Charles remained an active and dedicated researcher. In 1957, he initiated a new dimension in research by investigating the morphology and potential stratigraphical application of the "hystrichospheres" in the Lower Palaeozoic. The first results, an account of assemblages from the Shineton Shales of Shropshire, were presented to the Yorkshire Geological Society in 1958. Subsequent investigations included, between 1958 and 1962, successful attempts to recover organic-walled microfossils from the Torridonian Sandstone (late Precambrian) in northwest Scotland. By the early 1960's he was clearly established as a world authority on organic-walled microplankton and was widely consulted.

Linked with the parallel progress made in the field of Palaeozoic miospore studies by his colleagues Herbert Sullivan and Roger Neves, Charles's work caused the Sheffield department to become a major research laboratory by the late 1950's. Charles embarked on the development of a research school, with a succession of postgraduates including William (Bill) Sarjeant, David Wall, Graham Williams, Tony Jenkins, Dick Lister, Tim Potter and Geoff Eaton, all of whom were to go on to successful careers in academe or the petroleum industry. It was clear from the wide range of topics that they investigated --from the Cambrian to the Cainozoic-that whilst Leslie Moore was the visionary of British palynology,

Lewis Stover, Charles Downie and Bill Sarjeant at the second International Conference on Palynology, Utrecht, The Netherlands, 1966

it was Charles who had become the driving force.

Throughout the 1960's and the early 1970's, his main research attention was devoted to the classification of dinoflagellate cyst, a task in which he was ably assisted by Bill Sarjeant and Graham Williams. Numerous publications were generated and a collaboration by Sarjeant and himself with Bill Evitt led to the joint formulation of a "non-Linnean" classification of the acritarchs—the former "hystrichospheres" without demonstrable dinoflagellate affinities. These studies stimulated systematic reviews of many dinoflagellate cyst genera, in landmark publications with Davey, Sarjeant and Williams. In addition, Charles served as co-author of stratigraphical accounts of Jurassic and Tertiary dinoflagellate assemblages, with Lucy Costa, Geoffrey Eaton, Jonathan Bujak and others.

However, it was to the acritarchs that Charles devoted greatest research attention henceforward. Studies, undertaken alone or with co-authors, embraced the early Ordovician Tremadoc sediments, the Silurian Wemlock Shales and the Devonian sediments of Ayrshire. These researches also aided in resolving the age of the Dalradian succession of Scotland, the Manx Slates of the Isle of Man, the Eycott volcanics of the English Lake District and the Chuaria Shales of the Grand Canyon in Arizona. Charles's last major palynological study (1982) was an attempt to correlate the Lower Cambrian acritarch assemblages of Scotland, Norway, Greenland and Canada. The summary account that he wrote of "Acritarchs in British stratigraphy", for a Geological Society of

London Special Paper (1984), was essentially a summation of the researches by his students and himself.

Surprisingly to some, Charles did not devote all of his efforts to teaching and palynology. In 1956 he paid his first visit to Kilimanjaro in Tanzania, to study the East African Volcanic Complex. Further expeditions followed, led jointly by Charles and Peter Wilkinson, and eventually resulted in the publication (1972) of the definitive memoir on the geology of Kilimanjaro.

Charles succeeded Leslie Moore as the Sorby Professor of Geology in Sheffield in 1972, a promotion which, though it failed to dampen his enthusiasm for research, presented him with many new tasks in

teaching and administration. He was a major proponent of the development of the Master's degree course in Palynology at Sheffield which, before his retirement in 1984, had already produced many of the current generation of scientists. Even in retirement, he continued his association with the Sheffield department, also building up a successful consultancy operation with Roger Neves. Charles's achievements were widely recognised, both in Britain and abroad. The University of Glasgow conferred on him the degree of Doctor of Science in recognition of the contribution of his researches to geological knowledge. The Yorkshire Geological Society awarded him the John Phillips Medal in 1980 for distinguished researches micropalaeontology and stratigraphy whilst the Geological Society of London presented him with the Lvell Award. International recognition was reflected by the American Association of Stratigraphic Palynologists making him an Honorary Member in 1982 and upon his retirement, he was honoured in a special issue of the Journal of

Micropalaeontology (1984), which included a biographical article. Charles Downie was one of the most loved and respected of palynologists. His death leaves a void that can never properly be filled.

#### NEWS FROM THE UK AND AUSTRALIA By Jim Riding

As of the 11th September 1999, your correspondent started a short-term secondment with the Australian Geological Survey Organisation (AGSO) in Canberra, Australian Capital Territory, Australia. This is to work on the taxonomy of Jurassic dinoflagellate cyst floras from offshore Australia. There are many undescribed species which are useful markers and need to be formally described in order to validate some of the offshore zones in oilfields in such regions as the Timor Sea. The only other palynologist at AGSO is Clinton Foster, who has now largely moved over to management but still finds time to practice the subject, working on Permian and Triassic palynofloras from around the world. I hope to give an overview of palynology in Australia in subsequent Newsletters.

While I am away from BGS, Mike Stephenson is standing in as Treasurer of the British Micropalaeontological Society. AASP members are reminded that the 1999 BMS Annual General Meeting will be held on Wednesday the 17th of November in the Gustave

Tuck Lecture Theatre, University College London. After Society business commencing at 2.00pm, Professors Brian Funnell, John Neale and Bernard Owens will be awarded Honorary Membership of BMS in recognition of their services to the Society. Two talks will be delivered. Firstly Professor Patrick Holligan (School of Ocean and Earth Sciences, Southampton Oceanography Centre) will speak on 'Plankton and the Global Radiation Budget'. This is a brief abstract of the lecture: Planktonic organisms in the surface ocean absorb and scatter solar radiation. Also they contribute significantly to variations in levels of radiatively-active gases in the atmosphere (carbon dioxide, dimethyl sulphide). Recent studies have attempted to quantify these processes in relation to their potential significance for understanding climate change. The results will be discussed with particular reference to the past and present distributions of coccolithophores.

Dr Stephen Lowe (Stratigraphy Network Leader, BP Amoco) will then speak on 'The role and application of high resolution biostratigraphy in the hydrocarbon exploitation of the Cusiana Field, Llanos foothills, Colombia'.

This is a short resume: The Cusiana field is located in the foothills of the Eastern Cordillera in the Colombian Andes. Discovered in 1991, it still remains the largest oil field in Colombia and currently produces over 400,000 barrels of oil per day (bopd). Production is from reservoirs ranging from Late Cretaceous to Eocene age (Guadalupe, Barco and Mirador Fms), deposited in shallow marine to non-marine settings. This presentation describes the role and application of high resolution biostratigraphy (quantitative palynology) in helping to effectively produce and develop these reservoirs. It shows how biostratigraphy is used in unravelling the complex stratigraphy and depositional histories of the different reservoirs (key factors in understanding sandbody connectivity, modelling of shale/barriers/baffles, structural compartments and robust intra reservoir correlation). The presentation also shows how biostratigraphy has often revealed some unique insights into the stratigraphic architecture and production behaviour of the reservoirs and has significantly contributed to building realistic models for reservoir simulation. Finally, the contribution and business impact of "real time" wellsite biosteering of horizontal wells is described. Following the talks, a wine reception with poster presentations will be held in the South Cloisters at UCL. For more information please contact the convenor, Dr James Powell on ajp@dinosystems.co.uk or visit the BMS website at http://www.bmsoc.org.

#### VEGETATION HISTORY AND LAND-USE IN THE LOESS AREA BETWEEN RHINE AND MEUSE FROM THE BRONZE AGE UNTIL THE 18<sup>TH</sup> CENTURY

PhD Thesis by Frans Bunnik Laboratory of Palaeobotany and Palynology, University of Utrecht - Budapestlaan 4, 3584 CD Utrecht, The Netherlands f.p.m.bunnik@bio.uu.nl

Palynological studies of a series of profiles from river valley peat deposits in the German and adjacent Dutch loess districts have provided the basis for reconstructions of vegetation development in this region. The emphasis of the palynological research has focused on tracing the human impact on the natural environment in this area during the last 4,000 years.

Chapter 1 of this study outlines the background and the research trategy of the palynological approach.

in Chapter 2, the methods that were used in this study are discussed. These include,

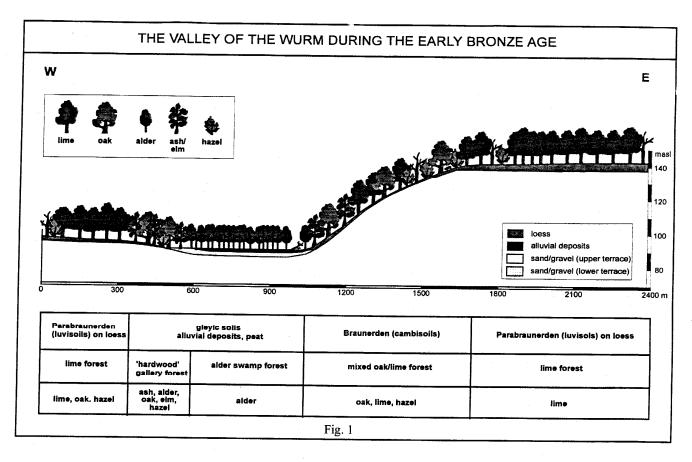
- a short description of the field work that was carried out,
- the chemical treatment of the samples in the laboratory, and
- a discussion of the basis for calculations of the pollen values as percentages of the total amount of pollen types from upland plants (the pollen sum).

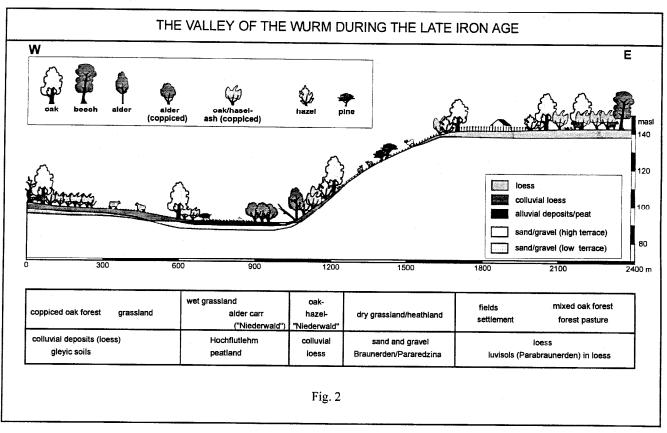
The zonation of the regional pollen diagrams in regional pollen assemblage zones (phases and subphases) and the zonation of the local pollen diagrams in local pollen assemblage zones are also discussed. The biostratigraphic framework, derived from the regional zonation, shows a similar trend in all of the profiles that were studied. The 25 <sup>14</sup>C dates from the profiles in the Jülicher Lößbörde (the German part of the studied area) indicate that the regional pollen zones, phases and subphases are synchronous in all the profiles. As a result, the Jülicher Lößbörde is considered to belong to a Landform Vegetation Unit (LVU) sensu Lichty-Federowich and Ritchie. Furthermore, the biostratigraphic framework is the basis for a chronostratigraphic interpretation.

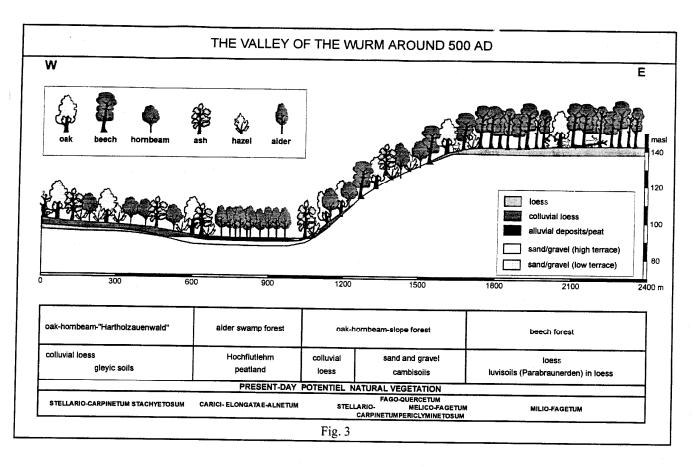
Pollen diagrams previously examined from South-Limburg, which did not have any radiocarbon dates, were recalculated and reinterpreted. This allowed the data from the Dutch loess district to be incorporated into the chronostratigraphy of the Jülicher Lößbörde, and also made it possible to trace whether the Dutch loess district and the Jülicher Lößbörde belong to the same LVU. The pollen diagrams from South-Limburg, like those from the Jülicher Lößbörde, are from valley peat bogs in a loess landscape. The only exception, however, is the profile from Leiffender Ven, which is situated in a part of the area where the soils are formed in Tertiairy deposits of nutrient-poor sands.

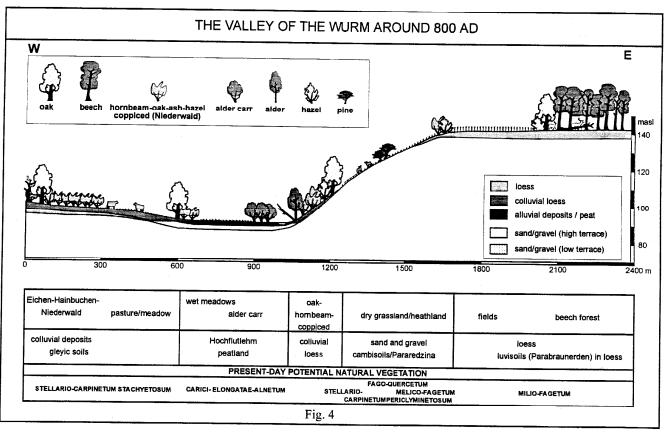
The diagrams of regional pollen assemblage zones from the Dutch loess district show similar trends as those from the German loess area, and we have concluded that the Dutch loess district is part of the same Landform Vegetation Unit. This permits the Dutch loess district to be easily linked with the regional pollen and chronostratigraphic framework of the Jülicher Lößbörde. In contrast, the pollen diagram from the Leiffender Ven shows different regional pollen assemblage zones, characterized by higher values of pollen from oak and birch. This part of the region therefore belongs to a different LVU. However, the proximity of the Dutch loess district (the profile is taken only a few kilometers from the loess covered soils) is reflected in the pollen assemblage zones, and this allows synchronization of the regional pollen zones from the Leiffender Ven profile with those from the loess district.

In Chapter 3, the geological setting of the area, the geomorphology of the valleys, soils, land use and climate are examined. Furthermore, the so-called Potential Natural Vegetation (PNV), which is the vegetation cover of the landscape that would occur naturally in the absence of human activity, is discussed. It is considered that in the absence of any human impact the entire area would be covered by broad-leafed forests. In the valleys, alderdominated swamp forests (CARICI ELONGATEA-ALNETUM) would occupy the lower parts of the valley floors, while in the forests, which are outside the alder swamp forest, hornbeam (Carpinus betulus) has played an important role since Roman times. The position of the hornbeam in the various forest-communities is discussed at length. In the gallery forests on damp soils adjacent to the alder swamp forests, hornbeam would be a natural constituent of the "Eichen-Hainbuchen-Hartholzauenwald"- communities (STELLARIO-CARPINETUM STACHYETOSUM). However, the oakhornbeam-forest on the slopes (STELLARIO-CARPINETUM PERICLYMENETOSUM), where at present-day hornbeam plays an important role, is assumed to be an anthropogenic forest community. The trees in these woodlands undergo regular felling (Niederwaldwirtschaft). This practice favours the growth of hornbeam and hasel (Corylus avellana) while beech (Fagus









sylvatica) is suppressed. Under natural conditions, beech would most likely become an important tree species in the forests on the slopes in the present-day, as it is on the loess plateaus.

A prominent feature in pollen diagrams from valleys with steep slopes is the occurrence of large quantities of pine pollen in deposits spanning the Iron Age. This is considered to be a reflection of natural pine stands on the steep slopes, where cutting of trees and grazing had caused erosion of the loess cover, resulting in exposure of the underlying nutrient-poor sands and gravels.

The palynological results show that the forests of the time, prior to the immigration of beech, were dominated by lime (*Tilia cordata*). In **Chapter 4**, the regional vegetation history of the Jülicher Lößbörde in relation to land-use since the Bronze Age is traced. This chapter is based on pollen analyses of 6 profiles in the Jülicher Lößbörde area and 25 radiocarbon dates, which has resulted in a detailed pollen-stratigraphic and chrono-stratigraphic framework for the loess district.

In Chapter 5, the regional vegetation history of a single valley, the Elsbach, is given. This history is based on pollen analyses of several profiles taken from sediments in the valley and from well-structures. The research was carried out in close cooperation with archeological excavations in the valley. The local vegetation history (the development of the wetland vegetation) of this valley will be the subject of the thesis of W.-D. Becker, which aims to combine pollen and macro-fossil records of the same cores (Becker in prep.). The entire valley has been extensively mined by a lignite mining company. It is most likely that the regional pollen stratigraphy of the Elsbach profiles can be linked with the regional pollen stratigraphy of the Jülicher Lößbörde given in Chapter 4. The chronology of the regional pollen zones are established on the basis of 28 AMS-dates.

The vegetation history of the Dutch loess district is discussed in Chapter 6, and it appears that the vegetation history is rather similar to that of the German loess area. Differences in the regional pollen assemblage zones, which include generally lower values for the non arboreal pollen (NAP), are interpreted as being a result of different geomorphologies of the valleys in Limburg. The steeper slopes and marked relief of these valleys made the landscape less suitable for large scale arable fields. The relatively dense forest cover of the area today is also a consequence of the prominent relief of the area, particularly in the eastern parts of South-Limburg.

The history and development of the wetland vegetation of profiles from the Jülicher Lößbörde area are described in Chapter 7. For a realistic interpretation of the wetland vegetation history in this area, it is essential to recognize various vegetation types in the succession ranging from natural alder swamp forests to pastures and meadows. Analyses of surface samples is the most accurate way of defining pollen assemblages for the different communities involved. However, such an approach is not feasible because the present-day wetland vegetation has been changed considerably by human impact. Nevertheless, it is possible to palynologically define the various wetland communities in the transition from a natural alder swamp forest to anthropo-zoogenic wet grassland communities of pastures and meadows. This definition is based on the knowledge of the ecological tolerances of plant taxa, pollen production and the dispersal capacities of pollen of the various plant species.

It is remarkable that the major changes in the wetland vegetation occur approximately simultaneously in all of the valleys in the loess landscape. The reason for this synchroneity is that the changes are coeval with the various cultural phases. The wetland vegetation is directly influenced by human impact, such as the cutting of the alder forest, grazing and mowing, and is also

indirectly modified by changes in the hydrology. These hydrological changes are caused by tree felling on the slopes that resulted in an increased run-off and deposition of colluvial sediments onto the valley floor.

Extremely high percentages of alder pollen are recognized during Early Medieval Times, and are the highest values of alder pollen recorded in the Holocene.. These high alder pollen values indicate a large expansion of natural alder swamp forests in the valleys during the post-Roman period of minimum human impact. This expansion may have been triggered by high ground water levels, which were caused by the blocking of rivulets as a result of massive deposition of colluvia during the Iron Age and Roman periods. An alternative possibility is a shift towards wetter climatic conditions during the Early Medieval Times (this time), as has been suggested by several authors.

The reflection of the high population density during the High Medieval Period (from 1,000 AD) is recorded in the local pollen diagrams by increasing values of Cyperaceae pollen (to maximum values) and by very low values of alder pollen. This indicates that even the wettest and poorest soils were now being used as meadows, and were dominated by Cyperaceae (Streuwiesen).

#### A short description of the vegetation in the various phases:

#### Phases A and B1 (1,950-1,000 BC): Figure 1

In the Early and Middle Bronze Age the landscape was almost completely forested. Alder swamp forests occurred on the alluvial plains and the flood plain forests, along with ash and oak, while some elm occurred in the transition from flood plain to the slopes. Mixed oak forests were present on the slopes where the loess cover was relatively thin and the soils were somewhat acid, while vast lime forests occurred on the loess plateaus. There is little or no evidence of human impact on the vegetation, which is in good agreement with the archeological record.

#### Phase B2 (1,000 - 700 BC)

In the late Bronze Age, the period of the urnenvelder culture (1,100 - 750 BC), the first major anthropogenic disturbances (since the Neolithic) occurred. The lime forests were opened up for agriculture and cattle grazing. In this period beech immigrated into the area.

#### Phases C and D1 (700 BC - 220 AD): Figure 2

In the Early Iron Age, the swamp forests on the valley floors were cut and replaced by grassland. The area of the fields expanded and the slopes were deforested and heavily grazed, which lead to erosion and deposition of colluvial loess onto the valley floors. On the steeper slopes the loess cover disappeared and gravels and sands of Pleistocene and Tertiary river deposits were exposed. On this nutrient-poor acid substrate a nutrient-poor grass vegetation and pine stands expanded.

A remarkable set of features are recorded in the pollen diagrams of Boslar around the time of the birth of Christ: a short but conspicuous forest regeneration of upland forest and of the alder swamp forest on the valley floor, an expansion of the pine stands on the upper parts of the slopes on the dry acid soils, and a reduction of fields and grasslands. This phenomenon is most likely a reflection of the destruction of the population (the tribe of the Eburones) by Julius Caesar during his conquest of the region in 53 BC.

The Roman colonization of the area after the establishment of the Rhine as the border of the Roman Empire (the *limes*) at ca. 50 AD, lead to the construction of numerous Roman agricultural units, villae rusticae on the fertile loess soils. This Roman period is documented in the pollen diagrams by the highest values of cereal pollen (only cleistogamic species were cultivated, mainly *Triticum* 

spelta) and by the introduction of sweet chestnut (Castanea sativa) and walnut (Juglans regia). Extremely high values of pollen of grasses (Poaceae) indicate the expansion of hay meadows in the Roman period.

Phase D2 (220 - 415 AD):

The heigh days of the 'Pax Romana' lasted until the middle of the 3rd century AD, when the Franks started to invade the area from the right side of the Rhine. This was facilitated by the political and economic decline of the Roman Empire and a reduction of the Rhine legions since ca. 220 AD. In this period hornbeam (Carpinus betulus) expanded in the area.

Phase E (415 - 650 AD): Figure 3

This phase is characterized by an almost complete regeneration of the forests, firstly by hazel and oak, and then by beech and hornbeam. This is recorded in all the pollen diagrams of the area by a simultaneous reduction of the total non arboreal pollen (NAP), which follows the collapse of the Rhine *limes* in 415 AD. The wet meadows on the alluvial plains were once more colonized by natural alder swamp forests.

Phase F (650 - 975 AD): Figure 4

The Merowingian and Karolingian period is characterized by a renewed expansion of fields, where rye now is an important cereal. Concurrently, beech forests and oak-hornbeam forests (the potential natural vegetation) became an important element of the vegetation cover of the area. The beech forests were highly appreciated by the Frank elite as hunting grounds and were consequently protected by law from deforestation. The hornbeam-oak forests were most likely used as coppiced woodland, as were the remnants of the alder carrs in the valleys.

Phases G and H (975 - 1420 AD)

In High Medieval Times the landscape became almost completely deforested. Rye was the most important cereal and buckweat (Fagopyrum esculentum) was cultivated on the poorer soils from he second half of the 13th century. Heath land underwent maximum expansion on the acid slopes in the 13th and 14th century AD, while meadows and pastures covered the valley floors. Phases I and J (1420-17..AD)

In this period the pollen diagrams indicate a small-scale regeneration of the upland forest and a reduction of the heath land in the 15<sup>th</sup> century AD. In the second half of the 16<sup>th</sup> century, a conspicuous rise in the values of pine pollen reflects the plantation of pine in the area.

#### BOOKS, REPRINTS, ANNOUNCEMENTS

## NEW PUBLICATION FROM THE GEOLOGICAL ASSOCIATION OF CANADA

LATE CRETACEOUS AND CENOZOIC HISTORY OF NORTH AMERICAN VEGETATION (NORTH OF MEXICO) - Alan Graham, Kent State University (Oxford University Press - November 1998 384 pp.; 171 illus. 511342-X)

This book is a unique and integrated account of the history of North American vegetation and paleoenvironments over the past 70 million years. It includes discussions of the modern plant communities, causal factors for environmental change, biotic response, and methodologies. The history reveals a North American vegetation that is vast, immensely complex, and dynamic. Contents:

Setting the goal--the modern vegetation of North America

- Cause and effect--factors influencing the composition and distribution of North American plant formations through late Cretaceous and Cenozoic time
- 3. Context
- 4. Methods, principles, strengths, and limitations
- 5. Late Cretaceous through Early Eocene North American vegetational history
- 6. Middle Eocene through Early Miocene North American vegetational history
- Middle Eocene through Pliocene North American vegetational history
- 8. Quaternary North American vegetational history
- 9. The origins of North American biogeographic affinities

PALEO SCENE - a series of papers on paleontology reprinted from Geoscience Canada - Geoscience Canada reprint series 7 - Ed. G.S. Nowlan.

This book deals with the diverse applications of paleontology in earth sciences and presents an overview of the paleontological scene. It is a valuable compendium of papers that will be useful for those needing to know more about paleontological principles and applications. The soft-covered, spiral bound, 308 page book contains a series of articles on paleontology that originally appeared in the scientific journal Geoscience Canada. The articles were written for the non-specialist with an emphasis on useful illustrations and practical examples. It is eminently suitable as a supporting text for paleontology courses and has been produced in an inexpensive format to make it readily accessible to students of earth sciences.

#### **CONTENTS**

- ▲ Introduction. Paleontology: Ancient and Modern Godfrey S. Nowlan
- ▲ Species in Paleontology Richard C. Fox
- ▲ Physical and Biological Constraints on the Pattern of Vertebrate Evolution Robert L. Carroll
- ▲ Dual Biostratigraphy: Zones and Biofacies Rolf Ludvigsen, Stephen R. Westrop, Brian R. Pratt, Pamela A. Tuffnell and Graham A. Young
- ▲ Darwinian Evolution and Developmental Biology: A Brief Review of Current Ideas Lars E. Fåhraeus
- ▲ Geochemistry of Recent Marine Invertebrates Joan O. Morrison and Uwe Brand
- ▲ Biogeochemistry of Fossil Marine Invertebrates Uwe Brand and Joan O. Morrison
- ▲ Precambrian Biostratigraphy Hans Hofmann
- ▲ Biostatistics in Paleontology Brian Jones
- ▲ Taphonomic Processes: Information Loss and Information Gain Mark V. H. Wilson
- ▲ Paleoecology: Paleoecosystems, Paleocommunities Paul Copper
- ▲ Paleobiogeography and Plate Tectonics Paul L. Smith
- ▲ Benthic Macrofossils as Paleoenvironmental Indicators in Marine Siliciclastic Facies Ron K. Pickerill and Pat J. Brenchley
- ▲ Paleopathology of Vertebrates: Insights to Lifestyle and Health in the Geological Record Bruce M. Rothschild and Darren Tanke
- ▲ Organisms and Carbonate Substrates in Marine Environments Paul Copper
- ▲ Paleozoic Biostratigraphy Alfred C. Lenz, Jisuo Jin, Alexander D. McCracken, John Utting and Stephen R. Westrop
- ▲ Sequence Stratigraphy and Chronostratigraphy: Problems of Definition and Precision in Correlation, and Their Implications for Global Eustacy Andrew D. Miall

- ▲ Footprints in the Sands of Time. Vertebrate Footprints and the Interpretation of Past Environments William A.S. Sarjeant
- ▲ Future Trends in Research on the Ancient Biosphere Godfrey S. Nowlan

Available from: Geological Association of Canada, Publications Department G222, Department of Earth Sciences, Memorial University of Newfoundland, St. John's, Newfoundland A1B 3X5 Phone (709) 737-7660, Fax (709) 737-2532,

gac@sparky2.esd.mun.ca / http://www.esd.mun.ca/~gac

Price: \$29.00 CAN for members of the Geological Association of Canada (Canadian addresses), \$29.00 US for GAC members elsewhere); \$58 CAN for for non-members in Canada, \$58 US for non-members elsewhere.

## OFF-PRINTS AND PALYNOLOGY VOLUMES OF THE MEDEDELINGEN RGD

As of September 1, 1997 the Geological Survey of the Netherlands became part of the Dutch TNO-organisation and is now known as the 'Netherlands Institute of Applied Geoscience-National Geological Survey'. Subsequently the well-known Haarlem office moved to Utrecht in June 1999 and a major reduction of the famous Heerlen library collection took place. At both occasions many off-prints and a number of palynology volumes of the Mededelingen RGD were saved. These are available, free of charge, upon request. If you are interested in obtaining a list of titles, please contact:

Dr. G.F.W. Herngreen, NITG-TNO, P.O. Box 80015, 3508 TA Utrecht, fax +-30-2564505 / email g.herngreen@nitg.tno.nl

#### ANNOUNCING

The Digital Atlas of The USA 2000 CD-ROM

- all the data layers compiled by the USGS as part of their National Atlas of USA project http://www.nationalatlas.gov/Plus Elevation and Geology.
- casy to use Windows software.
- all the raw data from the USGS (over 500 MB of data).
- animation software showing plate tectonic movements (TimeTrek)
- access to a wealth of internet resources on the world's natural history.

See more and download demo:

http://www.cdvision.com/

http://www.usatlas.net

http://www.usnationalatlas.com

**ICZN** 

The new and considerably revised Fourth Edition of the Code was published last week; there are some notes about it on the Commission's Website (www.iczn.org).

The cost is 40 or \$65, but discounts are offered to individual members of a scientific society, to members of the American or European Associations for Zoological Nomenclature or to students, buying one copy for personal use. Institutions or booksellers buying 5 or more copies are also offered a discount. For Airmail, please add 2 or 3. Full details are on the Commission's Website.

Copies can be ordered by e-mail from:

London - iczn@nhm.ac.uk - you can pay in sterling by credit card (Visa or MasterCard only), giving number and expiry date, or by sterling or dollar cheque payable to "ICZN"; or Waskington - smithd@nmnh.si.edu - payment by dollar check (not credit card).

Fossil Vertebrates of Arabia - After several years of gestation this 600 page book, edited by Peter J Whybrow and Andrew Hill, can be viewed at the Yale University Press stand at the Denver SVP and GSA meetings. It brings together for the first time the results of research on Arabian continental vertebrates discovered in the United Arab Emirates, the Sultanate of Oman and the Republic of Yemen. The contributions, by 50 authors, are divided into six parts. The first provides a history of The Natural History Museum/Yale University Abu Dhabi Miocene Project, and the second describes the local geology and stratigraphy. Part III details studies on the Late Miocene invertebrates, fish, reptiles and mammals from the Emirate of Abu Dhabi, including several new species. Part IV reviews taphonomy, carbon isotopes, ancient Arabian environments, and the earliest evidence of Homo in the region. Part V links research findings in Arabia to others in Africa and Asia, and the final section looks at Arabia in the larger context of Old World Tertiary faunas and the world's Tertiary oceans.

Yale University Press is a non-profit academic publisher.

#### VARIOUS ANNOUNCEMENTS

I am pleased to announce that the University of Arizona and Dr. Pierre Zippi have made all 2093 of the data files of the Deep Sea Drilling Program at

http://gco.arizona.edu/dsdp/

These can be downloaded individually as .txt files, or the entire dataset is available from NOAA on CD-ROM

- Owen Davis -

The updated version of the GSA Geological Time Scale is out. It can be found at: <a href="http://www.geosociety.org/pubs/index.htm">http://www.geosociety.org/pubs/index.htm</a>

#### ADDRESS CORRECTION

Patrice Brenac - BRENAC STRATIGRAPHY INTERNATIONAL, Rhosili, 133 Peulwys lane, Old Colwyn-COLWYN BAY, LL29 8YF, North Wales, UK

Tel/Fax: (44) 01492 513662 E.Mail: parb@netcomuk.co.uk

UCMP has available for research use a large collection of microfossil slides and sample residues from oil wells and some well cores, primarily from California. A partial listing of wells, organized by state and county, is at: http://www.ucmp.berkeley.edu/collections/micros/countylist.html. The largest separate collections are:

- Arco/Richfield collection: More than 20,000 faunal slides of foraminifera and over 2,000,000 unpicked sample residues from over 13,000 oil wells, primarily in California.
- Texaco collection: over 60,000 faunal slides of foraminifera plus vials of unpicked sample residues, primarily from California oil wells.
- a collection of California invertebrate fossils in well cores donated by Chevron

Data logs and computer data files are available for many of the wells. For more information contact:

Karen L. Wetmore, Museum of Paleontology, 1101 Valley Life Sciences Bldg., University of California, Berkeley, CA 94720-4780 Tel (510) 642-0203 / (510) 643-2559 / fax (510) 642-1822 karenw@ucmp1.berkeley.edu

Dr. Gretchen Jones and her colleagues at the United States Department of Agriculture have made a wonderful poster of

modern pollen types (The Light Micrograph Pollen Identification Reference Poster). The poster was designed to be used as a quick identification guide to some of the more common pollen types found in the southern United States. The poster is 3 feet wide and 5 feet long. It shows photographs of 116 different pollen taxa. The represented taxa show 17 different types of pollen grain aperturation.

What the AASP Foundation needs to know at this time is whether or not you would purchase one of these posters if we printed them and offered them for sale. The initial investment for paper and printing will cost AASP nearly \$1,000. If there are enough people who indicate a willingness to buy a copy, then AASP will invest in the production of at least 50 posters. If AASP can then sell all 50 copies for \$30 each, we would recover our printing and paper costs and we could also pay for mailing tubes and shipping costs.

If you want a pollen poster please reply by email to me at the address below. If you have questions about the poster, or want to know more about the pollen taxa represented, you may contact Dr. Jones or me (g-jones@tamu.edu; vbryant@tamu.edu) by email. We will go into production of the poster as soon as we have a commitment from enough members to ensure that we can recover our printing and paper costs.

- Vaughn M. Bryant, Jr. - Secretary, AASP Foundation

MEETINGS AND AGENDA Grazie al CAP website

BRITISH MICROPALAEONTOLOGICAL. SOCIETY ANNUAL GENERAL MEETING 17 November 1999 Gustave Tuck Lecture Theatre, University College London. After Society business at 2.00pm (Professors Brian Funnell, John Neale and Bernard Owens will be awarded Honorary Membership n recognition of their services to the Society) two talks will be delivered. BMS members and non-members are welcome to attend. Professor Patrick Holligan (Head of the School of Ocean and Earth Science, Southampton Oceanography Centre): 'Plankton and the Global Radiation Budget'. Planktonic organisms in the surface ocean absorb and scatter solar radiation. Also they contribute significantly to variations in levels of radiatively-active gases in the atmosphere (carbon dioxide, dimethyl sulphide). Recent studies have attempted to quantify these processes in relation to their potential significance for understanding climate change. The results will be discussed with particular reference to the past and present distributions of coccolithophores.

Dr Stephen Lowe (Stratigraphy Network Leader, BP Amoco): 'The role and application of high resolution biostratigraphy in the hydrocarbon exploitation of the Cusiana Field, Llanos foothills, Colombia. Cusiana field is located in the foothills of the Eastern Cordillera in the Colombian Andes. Discovered in 1991, it still remains the largest oil field in Colombia and currently produces over 400,000 barrels of oil per day (bopd). Production is from reservoirs ranging >from Late Cretaceous to Eocene age (Guadalupe, Barco and Mirador Fms), deposited in shallow marine to non-marine settings. This presentation describes the role and application of high resolution biostratigraphy (quantitative palynology) in helping to effectively produce and develop these reservoirs. It shows how biostratigraphy is used in unravelling the complex stratigraphy and depositional histories of the different reservoirs (key factors in understanding sandbody connectivity, modelling of shale/barriers/baffles, structural compartments and bust intra reservoir correlation). The presentation also shows how

Jiostratigraphy has often revealed some unique insights into the stratigraphic architecture and production behaviour of the reservoirs and has significantly contributed to building realistic models for reservoir simulation. Finally, the contribution and business impact of "real time" wellsite biosteering of horizontal wells is described.

Following the talks, a wine reception with poster presentations will be held in the South Cloisters at UCL. If you (students especially) wish to contribute a poster on any micropalaeontological topic, please contact Jamie Powell.

Convenor: Dr James Powell, BMS Secretary, Dinosystems, 105 Albert Road, Richmond upon Thames, Surrey TW10 6DJ, England, UK

Tel: +44 (0)181-948 6443; Fax: +44 (0)181-940 5917,

E-mail: ajp@dinosystems.co.uk).

British Micropalaeontological Society http://www.bmsoc.org

GSA - The Geological Society of America, Rocky Mountain Section will hold its meeting 16-18 April, 2000 in Missoula, Montana: Information concerning registration, lodging, and the meeting program will be provided in the final announcement in GSA Today, and as part of the Rocky Mountain Section Abstracts with Programs. General questions may be addressed to Don Hyndman, General Chair, (406)243-2241, email dhyndman@sclway.umt.cdu

Symposia and Field trips of interest of paleontologists are planned: Critical geologic intervals: Mass extinctions and Recoveries, and Biotic Changes. This symposium will focus on mass extinctions and the recoveries of life following mass extinctions. Topics will focus on plants, vertebrates and invertebrates with a special emphasis on the Rocky Mountain region. However presentations on topics outside this region also are welcome.

Please contact George Stanley if you are interested in contributing to this symposium.

George Stanley, (406)243-5693, fossil@selway.umt.edu. Dept. of Geology, Univ. of Montana, Missoula, MT 59812-1019 Post-meeting field trip: The Mississippian Lodgepole Formation, Little Belt Mountains, central Montana: Carbonate cycles and Waulsortian Mounds: Two days. George Stanley, Univ. of Montana and Randy Burke, (701)224-3682, North Dakota Geological Survey, Bismark, ND 58505-0840 This two-day field trip will afford participants the opportunity to examine some previously undescribed Mississippian Waulsortian mounds and related fossils and carbonate rocks of the

Mississippian of central Montana. Space is limited. If interested, please contact George Stanley for more details on this

Registration details will be found on the GSA Web site www.geosociety.org/meetings/00. Preregistration by mail will be handled by the Geological Society of America Meetings Department, P.O. Box 9140, Boulder, CO 80301-9140.NAPC -The Museum of Paleontology at the University of California, Berkeley, will host the seventh North American Paleontology Convention from June 26 to July 1, 2001. Preliminary information is available at:

#### http://www.ucmp.berkeley.edu/napc/NAPC2001.html

The meeting will be held on the Clark Kerr Campus of UC Berkeley, which provides fine inexpensive conference lodging and food. We recommend that all participants stay there, for much comraderie and information exchange happens when everyone is together.

Included with this announcement is a call for proposals for theme sessions, workshops and field trips (pre- and post-meeting). While NAPC has traditionally focused on North American paleontology, contributions from scientists anywhere in the world are welcome, if they relate to North American or general paleontology.

NAPC-2001 is sponsored by the Association of North American Paleontology Societies (American Association of Stratigraphic Palynologists, the Cushman Foundation, the North American Micropaleontology Section, Patrick S. Herendeen, Paleobotany Section, Botanical Society of America, Paleontological Division of the Geological Association of Canada, Paleontological Research Institution, Paleontological Society, Paleontology in the 21st Century, Pander Society, SEPM, Sociedad Paleontologia exicana, Society of Vertebrate Paleontology) and the Museum of Paleontology, UC Berkeley.

GSA - The Northeastern Section of the Geological Society of America will hold its Spring 2000 meeting March 13-15 at Rutgers University in New Brunswick, New Jersey.

The Paleontological Society will host the following theme session at the NEGSA meeting:

"Taphonomy: Case studies in the history of fossils, from death until discovery".

Submissions to this broadly construed theme could focus on any aspect of taphonomy (including plants, vertebrates or invertebrates, molecules, etc...). For more information about the theme session, contact the session conveners: Cindy Fisher, cfisher@wcupa.edu or Christopher McRoberts, mcroberts@cortland.edu.

Abstracts are due November 29, and should be submitted to:

Kenneth G. Miller, Technical Program Chairperson, Department of Geological Sciences, Wright Labs, Rutgers University, 610 Taylor road, Piscataway, NJ 08854-8066

Further information about the meeting can be found at the following web page:

http://www-rci.rutgers.edu/~geolweb/negsa.html

## Topical Session Convenors Wanted - AASP Meeting 2000 Reno In Conjunction with GSA

AASP is seeking volunteers to organize Topical Sessions for the joint AASP-GSA Annual meeting next fall in Reno, Nevada. At this meeting, AASP will use it Associated Society status with GSA to hold it's technical sessions and other business meeting activities at their meeting. However, in order to make this venture a huge success, we need a few good volunteers to organize sessions of interest to the geological community at large that will be part of this larger GSA meeting. Topical Sessions normally consist of 12-15 papers (usually half-day, 15 minute format), half of which are invited and half volunteered. Under GSA's new format, Topical Sessions replace the old Symposium format. Topical Session chairs are responsible for ensuring invited speakers submit their abstracts on time, and are further responsible for reviewing volunteered abstracts. They will also chair the session, ensuring speaker's keep on time. Convenors are encouraged to organize topical sessions in conjunction with other GSA Associates Societies, or organize a topical session highlighting solely the palynological sciences. The deadline for submission of Topical Sessions will come shortly after this fall's GSA meeting at the end of October.

At the Reno meeting AASP will still have it's business luncheon, and AASP members are strongly encouraged to participate in the many GSA activities. There will be numerous fieldtrips, icebreakers, and alumni activities. As well, AASP will set up a booth in the exhibits hall to showcase AASP and Foundation's activities and publications. As an Associated Society, AASP members will pay the reduced AASP registration fees.

If you have any suggestions and/or comments concerning the meeting in Reno, please contact Thomas Demchuk (thomas.d.demchuk@usa.conoco.com), Paul Strother (strother@bc.edu) or Fred Rich (frich@gasou.edu). Please help make Reno 2000 a great success!

The VII International Symposium on Mesozoic Terrestial Ecosystems was held in Buenos Aires, Argentina from September 26 to October 1 1999. The next Symposium will be held in Cape Town, South Africa in 4 years time. I would be glad to help if anyone would like any information about this past Symposium just held in Buenos Aires.

Yamila Gurovich, Museo de Ciencias Naturales, "Bernardino Rivadavia". Argentina ygurovich@hotmail.com www.paleonet.com.ar

#### AGENDA 1999

© October 25-28 1999. Geological Society of America, Annual Meeting.

Denver, Colorado, U.S.A. Theme: "Crossing Divides". Details: General Co-chairs - Mary J. Kraus (Tel: (303) 492-7251, Fax: (303) 492-2606, E-mail: <a href="mailto:kraus@spot.colorado.edu">kraus@spot.colorado.edu</a>) and David Budd (Tel: (303) 492-3988, Fax: (303) 492-2606, E-mail: <a href="mailto:budd@spot.colorado.edu">budd@spot.colorado.edu</a>), Department of Geosciences, Campus Box 250, University of Colorado, Boulder, Colorado, CO 80309-0250, USA

October 26-30 1999. AASP 1999 Annual Meeting.

Savannah, Georgia. Details: Frederick J. Rich, Department of Geology and Geography, Georgia Southern University, Statesboro, Georgia 30460-8149, USA, E-mail: <a href="mailto:frich@gasou.edu">frich@gasou.edu</a>

Website: AASP Web site

The CAP Annual General Meeting for 1999 will be held during this conference.

November 11-14 1999. 32nd Annual Chacmool Conference.

Calgary, Alberta, Canada. Theme: "Indigenous People and Archaeology: Honouring the Past, Discussing the Present, Building for the Future". Details: 1999 Chacmool Conference, Department of Archaeology, University of Calgary, Calgary, Alberta, T2N 1N4, Canada. Tel: (403) 220-7120, E-mail: <a href="mailto:chacmool@ucalgary.ca">chacmool@ucalgary.ca</a> Website:

 $\underline{http://www.ucalgary.ca/UofC/faculties/SS/ARKY/chacmool.html}$ 

#### AGENDA 2000

Date: TBA. Canadian Paleontology Conference

Antigonish, Nova Scotia, Canada

🖙 Date: June 2000. 17th International Radiocarbon Conference

Near Jerusalem, Israel

Website: http://www.radiocarbon.co.il/

March 27 - 31 2000. INQUA - Commission for the Holocene Meeting: Environmental Changes During the Holocene; Correlations Between Temperate and Semiarid Regions.

Seville, Spain. Details: Secretary of the Meeting: Ana I. Porras, Departamento de Geografia Fisica, Facultad de Geografia e Historia c/Maria de Padilla, sn., Universidad de Sevilla, Spain, Tel: +34 954.551.377 Fax: +34 954.556.988, E-mail: aipor@cica.es Environmental conditions during the last 10,000 years have been increasingly governed by the human factor and in some regions the climate controlled geodynamics have been altered. Geomorphic responses to climatic fluctuations and episodes vary spatially and temporally. We would like to shelter a forum for discussing the significance of climatic and antropic impulses: High spatial variability of the paleoenvironmental processes in small areas is a major topic. This meeting of the Commission is intended to bring together new research conceptions from worldwide researchers.

Website: http://www.ku-eichstaett.de/MGF/geo/inqua1.htm

May 29 - June 2 2000. GEOCANADA 2000

Joint meeting of Canada's major geoscience societies, including the Geological Association of Canada (GAC), the Mineralogical Association of Canada (MAC), the Canadian Society of Petroleum

Geologists (CSPG), the Canadian Society of Exploration Geophysicists (CSEG), the Canadian Well Logging Society (COOLS) and others. Will feaure a CAP-sponsored symposium on Palynology and Micropaleontology in Canadian Geoscience: New Frontiers and Applications University of Calgary, Alberta. Details: Dr Grant Mossop, Geological Survey of Canada, 3303-33rd Street N.W., Calgary, Alberta, T2L 2A7, Canada. Tel: (403) 292-7049, Fax: (403) 292-5377, E-mail: mossop@gsc.nrcan.gc.ca

ss May 29 - June 3 2000. Canadian Association of Geographers (CAG) Annual Meeting

Brock University, St Catharines, Ontario. Details: Hugh Gayler (hjgayler@spartan.ac.brocku.ca)

## Super June 24-30 2000. 10th International Palynological Congress (IPC)

Nanjing, China. Details: Secretary of the Organizing Committee for 10th International Palynological Conference, Nanjing Institute of Geology and Palaeontology, Academia Sinica, 39 East Beijing Road, Nanjing, 210008, People's Republic of China

Electronic version of first circular, with registration form, available at: <a href="http://members.spree.com/sip/spore/index.htm">http://members.spree.com/sip/spore/index.htm</a>
Information on International Palynological Congresses is available at <a href="http://geo.arizona.edu/palynology/ifps.html">http://geo.arizona.edu/palynology/ifps.html</a>

www. July 10-14 2000. 8th International Symposium on Pollination Mosonmagyaróvár, Hungary. Theme: "Pollination: integrator of crops and native plant systems" Details: Prof. P. Benedek, Zoology Department, Faculty of Agricultural Sciences, Pannon University of Agricultural Sciences, H-9201 Mosonmagyaróvár, Vár 4. Hungary Fax: 36(96)215-931, E-mail: benedek@movar.pate.hu

""July 12-14 2000. 5th International Ancient DNA Conference Manchester, England, U.K. Details: Terry Brown adna5@bi.umist.ac.uk

International Organization of Paleobotany (IOPC IV - 2000)

Qinhuangdao, Hebei, China. Details: Prof. Lujun Liu, Secretary-General of IOPC-VI Organising Committee, Nanjing Institute of Geology and Palaentology, Academia Sinica, 39 East Beijing Road, Nanjing 210008, PR China, Tel.: +86-25-6637 208, Fax: +86-25-3357 026 E-mail: paleobot@public1.ptt.is.cn

August 6-17 2000. 31st International Geological Congress

Rio de Janeiro, Brazil. Theme: "Geology and Sustainable Development: Challenges for the Third Millennium". Details: Secretariat Bureau, Av. Pasteur, 404 - Casa Brazil 2000 - Urca, Rio de Janeiro - RJ - Brazil, CEP 22.290-240. Tel: 55 21 295 5847, Fax: 55 21 295 8094, E-mail: 31igc@31igc.org

us week of August 20 2000. 8th International Symposium on Paleolimnology

Queen's University, Kingston, Ontario, Canada. Details from coorganizers John P. Smol (smolj@biology.quecnsu.ca) and Brian Cumming (cummingb@biology.queensu.ca, Paleoecological Environmental Assessment and Research Lab (PEARL), Department of Biology, Queen's University, Kingston, Ontario, K7L 3N6, Canada

Details will also appear at the PEARL website at <a href="http://darwin.biology.queensu.ca/~pearl/">http://darwin.biology.queensu.ca/~pearl/</a>

Mountain Lakes and Streams: Indicators of a Changing World Innsbruck, Tyrol, Austria. Details: University of Innsbruck, stitute of Zoology and Limnology, Technikerstr. 25, A-6020 Innsbruck, Austria. E-mail: <a href="http://zoologv.uibk.ac.at/congress">http://zoologv.uibk.ac.at/congress</a>

November 13-16 2000. Geological Society of America, Annual Meeting.

Reno, Nevada, U.S.A. Conference theme: "Crossing Divides". Details: GSA HQ, Box 9140, 3300 Penrose Place, Boulder, Colorado 80301, U.S.A. Tel: (303) 447-2020, X133, E-mail: meetings@geosociety.org

AGENDA 2001

Date: TBA. GAC Meeting

St John's

■ Date: TBA. CANQUA Meeting

Whitehorse, Yukon Territory, Canada (proposed).

Table TBA. Canadian Paleontology Conference

London, Ontario, Canada

us May 29 - June 2 2001. Canadian Association of Geographers (CAG) Annual Meeting

McGill University, Concordial University and Université de Montréal, Montreal, Canada. A joint event arranged by the three Montreal universities in celebration of the 50th anniversary of the founding of the CAG. Details: Tim Moore (moore@felix.geog.mcgill.ca), Patricia Thornton (thorpat@vax2.concordia.ca), André Roy (royandre@ere.umontreal.ca)

res November 5-8 2001. Geological Society of America, Annual Meeting.

Boston, Massachusetts, U.S.A. Details: GSA HQ, Box 9140, 3300 Penrose Place, Boulder, Colorado 80301, U.S.A. Tel: (303) 447-2020, X133, E-mail: <a href="mailto:meetings@geosociety.org">meetings@geosociety.org</a>

AGENDA 2002

Date: TBA. GAC Meeting

Saskatoon, Saskatchewan

 $\mathbf{m}$  October 28-31 2002. Geological Society of America, Annual Meeting.

Denver, Colorado, U.S.A. Details: GSA HQ, Box 9140, 3300 Penrose Place, Boulder, Colorado 80301, U.S.A. Tel: (303) 447-2020, X133, E-mail: <a href="mailto:meetings@geosociety.org">meetings@geosociety.org</a>

AGENDA 2003

■ Date: TBA. CANQUA Meeting

Halifax, Nova Scotia, Canada (proposed).

November 2-5 2003. Geological Society of America, Annual Meeting.

Seattle, Washington, U.S.A. Details: GSA HQ, Box 9140, 3300 Penrose Place, Boulder, Colorado 80301, U.S.A. Tel: (303) 447-2020, X133, E-mail: meetings@geosociety.org

HISTORY OF THE IPC LOGOS By Owen Davis



Dr. Zhu, Haicheng and the Organizing Committee for IPC 10 have come up with a great logo, which includes the pollen grain of

Metasequoia glyptostroboides. The edifice at the lower foreground is Nanjing's famous Zhonghuamen gate, in the city's southern wall The logo symbolizes the host city Nanjing, China's unique flora, and China's importance to the global fossil record. It is now my favorite IPC logo.

With Past President Jim Canright's help I have obtained images of the previous IPC logos, and prepared this summary of their histories. Four of the first seven IPC logos are variations on the trilete theme.



The IPC 1 (Tucson) logo is a drawing by Robert Potonié of *Reinchospora*. This drawing also graced the cover of the "Catalog of Pollen and Spores," and became its registered trademark. Gerhard Kremp (the Organizer of IPC 1) may have selected this drawing by his mentor because *Reinchospora* was the first photomicrograph of a spore ever published -- in 1884 by Paulus F. Reinsch. It was later (1944) named by James Schopf in his honor (Traverse, 1988).



The logo for the second (Utrecht) IPC's was selected by F. P. Jonker. In includes a trilete spore over the sunburst of the University of Utrecht logo. This is a very fitting combination, given that institution's unparalleled longstanding support for palynological research. That loyalty appears to have been reciprocated, because it remains to this day on the logo of the Utrecht Laboratory of Palacobotany and Palynology. You can see an animated version of the sunburst on their web page at http://www.bio.uu.nl/~palaeo/glossary/glos-int.htm



Elena Zaklinskaya selected the logo for IPC 3 (Novosibirsk). It features a diploxylon pine grain symbolic of the former USSR's vast boreal forests. The logo's shape and format are a stylish departure from the simpler and more symmetrical forms of most of

the other logos. It reads (not surprisingly) International Palynological Conference (encircling), Novosibirsk (center).



The style of the logo for IPC 4 (Lucknow) resembles that of IPC 3, but it is very "Mod" and "1970's" looking. It includes a trilete spore and echinate monocolpate grain, surrounded by psychedelic text. D.C. Bhardwaj selected it, but I'd like to know who the artist was, perhaps someone on the organizing committee? Hopefully, someone at the Birbal Sahni Institute remembers who the artist was, and will enlighten me.



The artist for the IPC 5 (Cambridge) logo also is anonymous, but Jim Canright (1979) notes that it is a stylized *Appendicisporites* spore, known from the Albian through Maestrichtian, and symbolic of the extensive British Cretaceous sedimentary record (Latin *creta*, chalk, being the root for "Cretaceous"). Norman Hughes, a Cretaceous palynologist, chaired the IPC 5 organizing committee.



The IPC 6 (Calgary) logo includes a gear-cog-ornamented trilete spore (symbolic of Canada's industrial might?) that is reminiscent of the logo Gerhard Kremp used on the cover of his *Palynodata* series. I imagine this is modeled after *Densosporites*, in keeping with Kremp's affinity for the late Paleozoic. The spore is floating (like the sun) above a "mountain range" symbolizing Calgary's proximity to the picturesque Canadian Rocky Mountains.



The IPC 7 (Brisbane) logo, "Is a stylized version of *Proteacidites pachypolis* Cookson & Pike... It was chosen by the PPAA and the Organizing Committee as a form identifiably Australasian in character and in recognition of Cookson's pioneering palynological work. The dark central area represents the polar 'thickening(s)' characteristic of the species (Mary Dettman, 1985)."



IPC 8 (Aix-en-Provence) was held just after the fall of the Berlin Wall and the end of the cold war. The olive branch is an appropriate symbol of the world peace that followed, and the olive pollen itself is suggestive of the vegetation and culture of the Mediterranean region where the congress was held. The Latin binomial reminds one of the *Linnaeus* and the role of palynology in plant taxonomy.



The IPC 9 (Houston) logo was the creation of Doug Nichols and a graphic artist at the Denver USGS office. The chenopod pollen grain (from Wodehouse) resembles a meteor-pocked asteroid, encircled by the NASA space shuttle. The latter is suggestive of the NASA Space Center at Houston, Texas, where the conference was held.

That brings me back to the logo for IPC 10. Like the better-nown Ginkgo biloba (which is being used as a logo by The Paleobotanical Congress for its Chinese meeting), the dawn redwood (Metasequoia glyptostoroboides) is a "living fossil" whose foliage is common in late-Cretaceous through Pleistocene sediments of the Northern Hemisphere, particularly in the early-Tertiary of the Arctic. However, in the early 20th century, its entire population consisted of just a few thousand trees in the Sichuan, Hubei, and Hunan provinces of China. By 1948, seeds from a single grove along the Yangtze River had produced 1500 seedlings in Europe and the USA. These populations are of very low genetic diversity, and are therefore of low fertility. Thanks to the recent cooperation of Chinese botanists, new genetic stock has been introduced to the USA and European populations.

There is a much more romantic version of this history, involving enlightened monks and a single living tree, but it is laid to rest at http://www.airnet.net/redwood/rwmeta.html.

The pollen of *Metasequoia glyptostroboides* is similar to that of the other taxodiaceous grains (Taxodiaceae and Cupressaceae are combined in recent floras, even though their pollen is distinct). The grain is about 30  $\mu$ m in diameter and somewhat thickened on the anti-papillate 2/3 of the grain.

FROM THE DESK OF THE AASP SECRETARY - TREASURER

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A.J. Powell is a palynologist and a director of Millennia Ltd, Alton Hampshire, UK.

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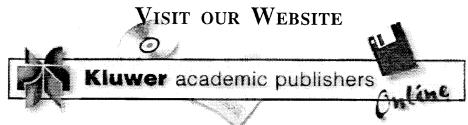
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## NEW AASP FOUNDATION PUBLICATION

# The Pliocene: Time of Change

edited by:

John H. Wrenn, Jean-Pierre Suc and Suzanne A. G. Leroy

#### **PREFACE**

The American Association of Stratigraphic Palynologists, Inc. (AASP), held its 26th Annual Meeting on October 23-29, 1993 at Louisiana State University, Baton Rouge, Louisiana, USA. During that meeting, a symposium entitled "Palynology, Climate and Sequence Stratigraphy of the Pliocene" was organized to bring together researchers from around the world who are studying the geological record of the Pliocene. Contributions from North America, Europe and several other important geographical areas, as well as from a range of disciplines, were presented at this symposium. It was, therefore, possible to hold cross-disciplinary and trans-border discussions. Understanding the chronology of Pliocene geological, biostratigraphical, sea level and climatic events, and their potential use as analogs for future climate change, were the key purposes of the symposium. Most of the papers contained in this volume were presented at the symposium. Pliocene research is now entering a phase of change in perspective and approach. The results of Pliocene research are becoming increasingly relevant to the problems of the present. This is because research is now focusing on events that occurred over time spans comparable to those of direct interest to society. The application and development of methods that until now have been used most often in Quaternary and even in Holocene studies only, opens unexplored lines of research. In this volume, several papers will show hat numerous climatic fluctuations characterize the Pliocene, a time of change.

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# The Pliocene: Time of Change

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