



# A.A.S.P. NEWSLETTER

---

Published Quarterly by the American Association of Stratigraphic Palynologists Inc.

---

## September 2005 Volume 38, Number 3

---

<b>President's page</b>	<b>-3-</b>
<b>AASP Secretary-Treasurer's Report</b>	<b>-5-</b>
<b>Proposed By-Law Amendment</b>	<b>-5-</b>
<b>Winners AASP Scholarships 2005</b>	<b>-6-</b>
<b>38th Annual Meeting, St Louis</b>	<b>-7-</b>
<b>Best Student Paper and Poster 2005</b>	<b>-9-</b>
<b>News from Australia</b>	<b>-11-</b>
<b>News from Russia</b>	<b>-12-</b>
<b>News from India</b>	<b>-13-</b>
<b>News from Argentina</b>	<b>-13-</b>
<b>New Members and Address Updates</b>	<b>-14-</b>
<b>Postdoctoral/Student Research Opportunities</b>	<b>-15-</b>
<b>Agenda</b>	<b>-16-</b>



# A.A.S.P.

## 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)  
Professor Svein B. Manum (awarded 2002)  
Professor Barrie Dale (awarded 2004)  
Dr. David Wall (awarded 2004)  
Dr. Robin Helby (awarded 2005)

### 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)  
Dr. Robert T. Clarke (awarded 2002)  
Prof. Vaughn Bryant (awarded 2005)  
Prof. Alfred Traverse (awarded 2005)

### AASP Board of Directors Award recipient

Dr. Robert T. Clarke (awarded 1994)

### Teaching medal recipients

Professor Aureal T. Cross (awarded 1999)  
Professor Alfred Traverse (awarded 2001)

### AASP Distinguished Service Award recipients

Dr. Robert T. Clarke (awarded 1978)  
Dr. Norman J. Norton (awarded 1978)  
Dr. Jack D. Burgess (awarded 1982)  
Dr. Richard W. Hedlund (awarded 1982)  
Dr. John A. Clendening (awarded 1987)  
Dr. Kenneth M. Piel (awarded 1990)  
Dr. Gordon D. Wood (awarded 1993)  
Dr. Jan Jansonius (awarded 1995)  
Dr. D. Colin McGregor (awarded 1995)  
Professor John H. Wrenn (awarded 1998)  
Professor Vaughn M. Bryant (awarded 1999)  
Dr. Donald W. Engelhardt (awarded 2000)  
Dr. David T. Pocknall (awarded 2005)  
Dr. David K. Goodman (awarded 2005)  
Prof. Owen K. Davis (awarded 2005)

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

**AASP Student Scholarships** are awarded annually to support studies in palynology. These comprise two scholarships each for **\$1500**, and a third award of **\$1500** may be given as The Cranwell Award. Ordinarily, the scholarships will be offered to beginning graduate students, but advanced undergraduates may also apply. 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 the 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 and these students need not be members of AASP. Application forms are available from the Chairman of the AASP Awards Committee (Paul Strother: [strother@bc.edu](mailto:strother@bc.edu)), or can be downloaded from our website at [www.palynology.org/content/scholar.html](http://www.palynology.org/content/scholar.html). Scholarship applications must be postmarked no later than **March 31**.

**AASP Membership** categories and dues (in US\$ per year) are as follows:

**Individual** (\$45.00), **Student** (\$30.00), **Retired** (\$15.00), and **Institutional** (\$70.00). Dues may be paid up to three years in advance by using credit card (MasterCard, Visa, American Express), check or money order (made payable to AASP Inc.), and must be sent to the Secretary-Treasurer. All members receive the AASP Newsletter (mailed quarterly by hard copy or via email), Membership Directory (mailed



# A.A.S.P. NEWSLETTER

Published Quarterly by the American Association of Stratigraphic Palynologists Inc.

September 2005  
ISSN 0732-6041

Volume 38, Number 3  
Carlos Jaramillo, Editor

## BOARD OF DIRECTORS

President	Robert Cushman
Past President	Martin Head
President elect	Carlos Jaramillo
Secretary/Treasurer	Thomas Demchuk
Managing editor	James Riding
Directors at Large	Peter McLaughlin
	Jörg Pross
	Sophie Warny
	Thomas D. Davies

## AASP NEWSLETTER CORRESPONDENTS

Niels E. Poulsen	Nordic Countries
James B. Riding	United Kingdom
Guy Harrington	United States
Timme Donders	Holland-Belgium
Jörg Pross	Central Europe
Mihai Popa	Eastern Europe
Pi Willumsen-Erica Crouch	Australasia
Mirta Quattrocchio	South America
Naresh Mehrotra	India

## AASP BOOK REVIEW EDITOR

Reed Wicander, [reed.wicander@cmich.edu](mailto:reed.wicander@cmich.edu)

## AASP WEBMASTER

Owen Davis, [webmaster@palynology.org](mailto:webmaster@palynology.org), website: <http://www.palynology.org>

## AASP NEWSLETTER EDITOR

Carlos Jaramillo, [carlos@flmnh.ufl.edu](mailto:carlos@flmnh.ufl.edu), CTPA, Smithsonian Tropical Research Institute, P.O. Box 0843 - 03092 Balboa, Ancón, Panama, Republic of Panamá.

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. Deadline for next issues of the newsletter is DECEMBER 1, 2005. All information should be sent by email. 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.

## PRESIDENT'S PAGE

By Robert Cushman

It was great to see many of you at the AASP meeting in St. Louis. The organizing committee deserves our heartfelt appreciation and congratulations on a job well done. Franca Oboh-Ikuenobe, Reed Wicander, and Paul Strother did a great job putting together the technical sessions and social activities. Special thanks also to Sue Turner and Tammy Mace of UMR for their role in organizing the meeting and their technical help.

We had the opportunity at the St. Louis meeting to recognize the dedicated service and scientific excellence of several AASP members. Owen Davis, David Goodman, and David Pocknall received the AASP Distinguished Service Award. Vaughn Bryant and Alfred Traverse received the AASP Honorary Membership Award. Robin Helby was awarded the AASP Medal for Scientific Excellence. Congratulations to each of you. It is a privilege to belong to an organization whose members exhibit the type of dedicated service and quality science exemplified by those we honored at the St. Louis meeting.

One of the hot topics of conversation at the St. Louis meeting was the decline in membership of AASP since its peak in the early 1980's. I would like to take a few moments and draw some parallels with AASP as an organization and the behavior of populations in natural ecosystems. As populations in nature must adapt to environmental changes to survive, so too must we as an organization adapt to changing social, economic, political, and educational changes to survive.

Many of you are familiar with the adaptation strategies commonly utilized in natural populations. To maximize fitness in a stable environment, it pays to invest resources in long-term development and long life. This is known as K selection. K selection individuals tend to be long-lived, energy efficient, more intelligent and experienced, produce fewer offspring, but provide more parental care and nurture. In an

unstable environment, it is more beneficial to produce as many offspring as quickly as possible. This is known as r selection. R selection individuals tend to be short-lived, energy wasters, less intelligent and experienced, produce many with less care or nurture. By the very nature of our discipline, we as palynologists have tended to follow the K selection strategy. As individuals and as an organization, we tend to behave as K strategists or specialists rather than r strategists or generalists. Walter Russell Mead in his recent book on the history of U.S. foreign policy entitled, *Power, Terror, Peace, and War*, makes the following observation about human behavior, "Generalists are superficially mistaken about a great many subjects; [while] specialists are profoundly mistaken about a few."

What does the changing landscape look like for AASP? As Thomas Demchuk and Jim Riding referred to in their paper at the meeting, the petroleum industry is playing a reduced role in the membership and functioning of AASP (see their abstract entitled, *The recent history of AASP: The past may not be the key to our future*). Fewer palynologists are working in the field of stratigraphic palynology. More palynological research and employment opportunities have developed in the areas of Quaternary, archeological, medical, and forensic palynology. At the college and university level, more and more geology departments are removing paleontology from their geology curriculum. Palynologists in universities, who have retired over the last 10 to 15 years, have not been replaced by other palynologists or paleontologists. Consequently, students interested in studying palynology have fewer educational opportunities than in the past. In addition, fewer palynology professors results in fewer opportunities for those professors to recruit new students from their geology classes.

Looking even deeper into the future, the U.S. Department of Education reported that 82 percent of our country's high school seniors performed below the proficient level on the 2000 National Assessment of Educational Progress science test. Even more disturbing in the report is that the longer students stay in the current educational system the worse they do. According to the 1995 Third International Mathematics and Science Study, U.S. fourth graders ranked second. By 12th grade, they fell to 16th, behind nearly every other industrialized country and ahead of only Cyprus and South Africa. Unless something is done to correct this trend, there will be fewer and fewer qualified students who enter into science programs at the university level. As professional scientists, we need to consider how to address the potential impact of this trend on our various disciplines.

How will AASP respond to the changing needs of our current membership, our future students, and the scientific community at large? It may be time for us as a society to think outside our K selection or specialist box. We have begun to do this with our increased exposure as an associated society with the Geological Society of America and the American Geological Institute. Our exposure to the scientific community at large has also been improved by the recent inclusion of AASP publications in the GeoScience World and BioOne databases, and our potential inclusion in the Science Citation Index. If we are to succeed long term, we will need to continue this generalist behavior and consider reaching out to an even broader community of palynologists, potential students, and scientists in other disciplines. We will need to anticipate the changing political, cultural, educational, and scientific landscape and position ourselves to thrive under changing conditions.

At recent meetings, the Board has often discussed the need to address the declining membership in AASP. However, with the frequent turnover on the Board, it has been difficult to sustain any momentum in addressing this issue. As a result, several of us have volunteered to pursue ways that we can better serve palynologists in general. We will be working together to find ways that we can increase the visibility of AASP to potential students and to palynologists in other disciplines such as archeological, Quaternary, forensic, and medical palynology. We will be looking to many of you, particularly those working outside the focus of stratigraphic palynology, as we pursue solutions for the future. Just as in natural ecosystems, there is no adaptation at the level of the individual. Adaptation occurs only in populations. It will take all of us working together to ensure the future of this great organization. Given our history of creative and dedicated members, I am confident that AASP will continue to thrive as we adapt to an ever-changing landscape.

I am currently putting together an informal email list of members who would like to share ideas on this issue. If you would like to be part of the discussion regarding future opportunities for AASP to serve those outside our traditional boundaries, please contact me at [bcushman@llu.edu](mailto:bcushman@llu.edu) and I will include you on the discussion list. Thank you.

Bob Cushman  
Loma Linda, CA

## FROM THE DESK OF THE AASP SECRETARY-TREASURER

By Thomas D. Demchuk

The following report contains information recently given to the AASP general membership and the Board of Directors at the annual meeting in St. Louis.

### *Secretary's Report*

As of September 1<sup>st</sup>, 2005, AASP membership numbers were at 508 including 372 individual members, 56 retired, and 80 institutional members. I am very sad to report that 68 members were purged from the membership listing for non-payment of 2005 dues. We have recorded 14 new members for the calendar year. The Board is seriously addressing the concern of our declining membership and an action plan should be finalized by the mid-year meeting. A by-law amendment has been proposed which appears elsewhere in this Newsletter. A vote on the amendment will be taken in conjunction with the spring AASP Board election.

### *Treasurer's Report*

As of September 1<sup>st</sup>, 2005, AASP total assets stood at approximately \$67K which is down about \$9K from the same time last year. Several one-time charges associated with publications and awards accounted for this. It is hoped that income from on-line publications will offset some of these losses. Additionally, a proposal has been provisionally approved by the Board to redirect money in the AASP mutual funds and certificates of deposit into other investments to ensure future consistent income. This income will be used for student travel and scholarships, and to further the goals of the Association.

If anyone should have specific questions regarding the reports given above, please feel free to contact me at your leisure.

### *Additional Items*

The 2006 AASP annual meeting will be held in Philadelphia in conjunction with the annual meeting of the Geological Society of America. Several AASP members have come forward to take ownership of topical sessions, however, other interested AASP members who wish to propose integrated palynological sessions for this meeting are urged to do so. Please contact the Secretary-Treasurer with your topical session ideas. The GSA meeting provides an excellent opportunity for all AASP members to see other geological disciplines, and it also gives our Association a wonderful opportunity to showcase palynology to the general geological community. Stay tuned to future issues of the Newsletter, and the website, for

updates on AASP events to be held in Philadelphia.

Finally, AASP has taken possession of coffee mugs emblazoned with the AASP logo. These mugs are great looking, large and sturdy, and every AASP member should have one. They can be purchased for US\$10. Additionally, we have AASP brass/enamel medallions for sale. These are the same medallions that grace the AASP Board of Director's plaques. They make great paperweights, or look good just lying around on your desk or display cabinet. They are for sale for US\$15 each. Simply contact the Secretary-Treasurer for your mug or medallion. Proceeds from these sales go to the AASP scholarship fund.

Respectfully submitted,  
Dr. Thomas D. Demchuk  
AASP Secretary-Treasurer

---

## PROPOSED BY-LAW AMENDMENT

The Board of Directors has approved wording of a proposed by-law amendment to formalize the AASP Awards Committee as a permanent committee of the Association. The proposed new article will read as follows:

Article 6: General

Article 6.06: Permanent Committees

*Article 6.06.e. Awards Committee – The Awards Committee will consist of four members in good standing who are not current corporation officers or officers of the AASP Foundation. The Chair of the Committee will be approved by majority vote of the Board. The Chair will select three other Committee members. Each member of the Committee will serve in his/her position until such time that a member tenders his/her resignation to the Board. At such time, the Chair will select a new Committee member. The Committee will be charged with accepting and reviewing applications for all the awards presented by the corporation, and submitting recommendations for the individual awards to the Board for final approval. The Chair of the Committee has the further responsibility for contacting the President and/or the Secretary-Treasurer to ensure that the individual awards are presented in a proper and timely manner.*

According to the by-laws, proposed amendments must be presented to the general membership and published six (6) months prior to a vote. Please consider this official notification to the general membership of the proposed amendment. This amendment

will appear in future newsletters, and it is anticipated that a vote will take place coincident with the regular AASP Spring Board election.

If anyone in the general membership has any questions or concerns regarding this by-law amendment, please contact a member of the Board of Directors.

Regards,  
Dr. Thomas D. Demchuk  
AASP Secretary-Treasurer

---

## **WINNERS AASP STUDENT SCHOLARSHIPS 2005**

by Fred Rich, AASP Awards Committee

The AASP Awards Committee is pleased to announce the award of two scholarships this year. The committee received 17 proposals, originating from England, the United States, Colombia, Australia, Nigeria, and Spain. After careful deliberation, the Committee decided to offer scholarships to Mr. Shane Brodie, University of Minnesota, and Ms. Susan Richer, University of York. Mr. Brodie's study is entitled "Palynology and Complex Topography: A Study of Reservoir Lake, Montana". Ms. Richer's work is entitled "From Pollen to People: A Palynological Study of High Altitude Settlement Areas in the Southern French Alps".

The Awards Committee extends its congratulations to this year's recipients, and expresses its thanks to all the students who applied this year. The number of applications, and their points of origin continue to indicate that palynology is still a robust science whose workers are found around the world.

I, Fred Rich, am stepping down as Chair of the Awards Committee, and am turning it over to Paul Strother. This Committee serves a valuable and highly visible function within AASP, and it has been a genuine pleasure to work with Owen Davis, Len Eames, Barb Whitney, and the AASP Executive Committee in putting much-needed support in the hands of students who richly deserve it. It has also been a joy to be able to recognize our colleagues with the various forms of acknowledgement that the Awards Committee has available to it. When this committee's work is done each year, someone always ends up happier because of the effort.

With all my best wishes to Paul and the Committee,

Fred Rich

*Susan Richer*

*"From Pollen to People: A Palynological Study of High Altitude Settlement Areas in the Southern French Alps"*

In 2003 I graduated from the University of York, England, with a BSc (Honours) in Archaeology. I then spent the following year studying for my Master of Science in Environmental Archaeology and Palaeo-economy at the University of Sheffield, England. It was during my time at Sheffield, under the direction of Dr Mike Charles and Robert Craigie, that I was able to pursue my interest in palynology and learn the basics of sample preparation, identification and analysis. My Master's thesis was concerned with studying the palynological evidence for Iron Age and Roman occupation/utilisation within an upland moorland in the Peak District National Park, England.



My attention has now turned to other upland areas, such as the Ubaye Valley and the Ecrins National Park, within the Southern French Alps. I have been involved with the Southern French Alps Landscape Project, directed by Dr. Kevin Walsh, for the past four years; and it is in conjunction with this project that I am now examining the palynological evidence for human activity in high-altitude areas (+6500 ft) as the main component of my doctoral studies. The archaeological information for these areas tends to be restricted to periods in which people made a permanent impact upon the landscape (i.e. stone structures) or left small remains of flint scatters. In contrast the palynological evidence will hopefully reveal more ephemeral and transient activity that was occurring through time. I aim to examine pollen from both on- and off-site locations, and from high and lower altitude sites to be able to

gain a better understanding of the utilisation of these extreme settlement areas within a broad spatial and temporal context.

This research will be carried out between the University of York, England, and the Institut Méditerranéen d'Ecologie et de Paléocologie, Marseille, France, under the supervision of Prof. Jacques-Louis de Beaulieu, Dr. Kevin Walsh and Dr. Margaret At-herden.

For further information please visit my website at [www-users.york.ac.uk/~sr506/](http://www-users.york.ac.uk/~sr506/)

*Shane Brodie*

*"Palynology and Complex Topography: A Study of Reservoir Lake, Montana"*

Dear AASP scholarship committee,

I am very honored that the AASP is awarding me this scholarship. At the University of Minnesota, I have been working on the palynological record in two 17-meter sediment cores from Reservoir Lake. Reservoir Lake is located in a cirque in the Beaver-head mountain range in southwest Montana. I am also looking at the charcoal record within the cores and comparing this data to the sparse climate data currently available in the Northern Rockies. I am also taking many light micrographs of the University of Minnesota Herbarium pollen slide collection. I want to publish a website about Northern Rockies pollen types.



At the University of Alaska, I worked on a Quaternary research geodatabase at the Alaska Quaternary Center. I also worked on a project where I took SEM

images of the fine details of Liliaceae pollen morphology in samples gathered from the University of Alaska Herbarium.

I have decided to make my Master's degree a terminal degree (at this point) and to teach middle school science and high school geoscience courses. I will be using some of the scholarship funds to contribute to middle school science programs this summer. I hope to bring my broad training as an earth scientist and as a teacher to help underprivileged, struggling students in urban schools in Minneapolis. This is a population I am familiar with since I also come from an underprivileged background. I hope to make science accessible to students by relating concepts in geoscience and biogeography to an urban environment.

---

### **38<sup>TH</sup> ANNUAL MEETING, ST. LOUIS, MISSOURI**

By Francisca Oboh-Ikuenobe

Sixty-six participants and several guests from 11 countries convened for the 38<sup>th</sup> annual meeting of the AASP at the Radisson Hotel and Suites Downtown in St. Louis, Missouri from September 18 to 21. The meeting was co-sponsored by the University of Missouri-Rolla, BP, ConocoPhillips, ExxonMobil, Statoil ASA, and Missouri Botanical Garden. Thirty oral presentations and 18 posters were submitted for the meeting. The first event was a pre-meeting field trip to Eocene clay pits in Tennessee on Saturday, September 17, which was led by Terry Lott of the Florida Museum of Natural History, Gainesville. The outgoing AASP board of directors meeting was also held in the hotel on Saturday. On Sunday, Bob Berri who is an independent consultant in St. Louis led a second pre-meeting field trip to the St. Louis area Paleozoic sedimentary rocks from 9:00 am until 4:00 pm. Everything ran smoothly until the bus broke down on the way back to the hotel — in front of an Irish pub! Needless to say, participants over 21 years old were quite happy to sample some beverages before the formal an icebreaker at the hotel from 6:00 to 8:00 pm.

The technical program began on Monday, September 19 with a symposium entitled "Palynology and Plant Phylogeny" convened by Paul Strother. Two excellent keynote addresses by Charles Wellman (Sheffield University) and Michael Zavada (Providence College) discussed the palynological evidence for the origin and early evolution of land plants, and the origin of angiosperms, respectively. During the general technical session after lunch, there were presentations on

diverse topics. The day's events concluded with a formal one-hour poster session, although the posters stayed up until Wednesday afternoon.



Joyce Lucas-Clark & Jim Riding

Tuesday's events began with a "Paleozoic Microplankton (Phytopal)" symposium convened by Richard Aldridge, Gary Mullens and Reed Wicander, followed by a general technical session after lunch. At 3:00 pm, participants and their guests boarded buses for a short trip to the Missouri Botanical Garden. The first task was the annual meeting group photograph superbly coordinated by Vaughn Bryant. The Garden visit lasted for two hours under warm and beautiful skies. At 7:00 pm 61 participants and guests met at the hotel lobby for a five-minute walk to the rotating Top of the Riverfront Restaurant at the Millennium Hotel to attend the conference dinner. The gathering lasted until 10:00 pm. We all had a good time eating and taking in the beautiful views of St. Louis and environs, including the Gateway Arch, Mississippi River, Anheuser Busch Brewery, and Busch Stadium.

The third symposium of the meeting was held on Wednesday morning. The CAP/AASP sponsored symposium entitled "What Happens to Pollen: The trip from Anther to Microscopic Slide" was convened by Catherine Yansa and Vaughn Bryant. The symposium was followed by a short technical session before the business luncheon, which was attended free by all student participants courtesy of ExxonMobil.

Several special awards were handed out during the business luncheon. The Distinguished Service Award recipients were Dr. David T. Pocknall, Prof. Owen K. Davis, and Dr. David K. Goodman. The AASP Honorary Membership was awarded to Prof. Vaughn Bryant and Prof. Alfred Traverse. Dr. Robin Helby was the recipient of the AASP Medal for Scientific Excellence. Drs. Helby and Goodman could not attend the

meeting, but David. Pocknall and Jim Riding read their acceptance speeches, respectively. The L.R. Wilson Best Student Paper Award went to Hernan Antolinez (University of Missouri-Rolla) for his paper co-authored with Francisca Oboh-Ikuenobe entitled "Refinement of Early Paleogene Biostratigraphy in West Africa Using Dinoflagellate Cysts from Nigeria and ODP Hole 959D (Leg 159)." Rebecca Tedford and John Wrenn (Louisiana State University) won the Best Poster Award for "An investigation into Phytolith Types and Frequencies in Surface Soil Samples from Catahoula Lake, Louisiana." Nine past presidents attending the business luncheon were recognized. The business luncheon was followed by the incoming AASP board of directors meeting, and CAP meeting. On Thursday, September 22, there was an all-day post-meeting field trip to the pre-historic Cahokia Mounds in Collinsville, Illinois, and the Onondaga Cave in Leasburg, Missouri.



Al Traverse

The conveners of the annual meeting (Francisca Oboh-Ikuenobe, Reed Wicander, Paul Strother) would like to extend our gratitude to all the sponsors, symposium conveners, session chairs, and speakers who adhered strictly to their allotted time slots. Special thanks also to Sue Turner and Tammy Mace of the University of Missouri-Rolla's Distance and Continuing Education Office for helping with the organization of the meeting.





David Pocknall & Thomas Demchuk



Martin Head & Jim Riding



Post-meeting field trip to Cahokia Mounds and the Onondaga Cave

---

### **BEST STUDENT PAPER AND BEST POSTER AWARDS, AASP ST. LOUIS MEETING 2005**

The Awards Committee is pleased to announce the results of evaluations of student talks and posters that were presented at the St. Louis meeting.

The L.R. Wilson Best Student Paper Award went to Hernan Antolinez (University of Missouri-Rolla) for his paper co-authored with Francisca Oboh-Ikuenobe entitled "Refinement of Early Paleogene Biostratigraphy in West Africa Using Dinoflagellate Cysts from Nigeria and ODP Hole 959D (Leg 159)". Rebecca Tedford and John Wrenn (Louisiana State University) won the

Best Poster Award for "An investigation into Phytolith Types and Frequencies in Surface Soil Samples from Catahoula Lake, Louisiana".

Rebecca Tedford, Ph D student, LSU, Advisor: John H. Wrenn. *A multi-proxy approach to investigating paleoenvironmental changes recorded in sediments from Catahoula Lake, Louisiana during the latest Holocene.*

Research interests:

Catahoula Lake, located in Rapides and LaSalle Parishes, is the largest natural freshwater lake in Louisiana. The lake is ~19.3 km long with water levels that fluctuate annually from being all but dry

to 3-6 meters deep. These unique characteristics and location make it a good candidate in the lower Mississippi alluvial valley to contain a complete sedimentary record of climate change and its' associated anthropogenic affects.

The goal of my doctoral research is to analyze changes in vegetational patterns associated with climate fluctuations during the latest Holocene by utilizing various plant microfossils, namely phytoliths and pollen. For those of you who are unfamiliar with phytoliths, they are microscopic opaline silica deposits that form within plant cell walls. These biosiliceous bodies are of particular importance because morphologically distinct phytoliths can be used as proxies to indicate the presence of plants and associated plant communities in the fossil record. These plant signatures can then be used to interpret environmental conditions in and around the lakebed at the time of deposition. As part of my research I would also like to address questions concerning the advent and extent of agricultural or land use practices related to anthropological change around Catahoula Lake.

#### Educational Goals:

Currently I work at the LSU-Museum of Natural Science as a Curatorial Assistant in Education where I am in charge of children's outreach programs that focus on introducing kids to various natural science subjects. Upon completion of my degree I intend on continuing my career addressing geological and archaeological problems utilizing phytoliths and palynological data. My primary goal is to combine my research interests and educational outreach by working as a museum educator and outreach coordinator.

Hernan Antolinez, Ms studentt, UMR, Advisor; Francisca Oboh-Ikuenobe. *Refinement of Early Paleogene Biostratigraphy in West Africa Using Dinoflagellate Cysts from Nigeria and ODP Hole 959D (Leg 159)*

Thirty-four samples from the Upper Paleocene to Lower Eocene interval of Alo-1 well in Anambra State, Nigeria, and 13 samples from ODP Hole 959D (Leg 159) in the Côte d'Ivoire-Ghana Transform Margin were analyzed for their dinocyst contents. Dinocyst recovery is very good to moderate, and the specimens are commonly well preserved.

Five informal zones (A to E) were identified in this study. Zone A is the stratigraphically oldest and is characterized by the consistent occurrence of *Areoligera senonensis*, *Areoligera coronata*, *Palaeocystodinium bulliforme*, and *Hafniasphaera septata*.



*Fibrocysta* group

Characteristic of Zone B is the occurrence of *Damasadinium* cf. *D. heterospinosum* in combination with abundant *Fibrocysta/Lanternosphaeridium* spp., and *Cordosphaeridium* spp. The dinocyst assemblages in zone C are characterized by the co-occurrence of abundant *Apectodinium* spp., and *Adnatosphaeridium* spp. Zone D consists of common occurrence of *Glaphyrocysta ordinata*, *Glaphyrocysta divaricata*, *Polysphaeridium subtile*, *Spiniferites microceras*, and *Adnatosphaeridium* spp. Finally, Zone E is characterized by the occurrence of *Homotriblium abbreviatum*, *Homotriblium* cf. *H. oceanicum*, and *H. pallidum*. Dinocyst zones A to D are present in the Alo-1 well, while only zones A, D and E were identified in Hole 959D. The presence of some stratigraphically significant dinocysts species indicates a middle to Late Danian age for Zone A, a Thanetian age for Zone B and a Late Thanetian age for zone C. On the other hand, published calcareous nannofossil data from the Early Paleogene interval of Hole 959D indicate a latest Thanetian to earliest Eocene age for Zone D and an Ypresian age for Zone E. Dinocyst data confirm these ages for zones D and E. Our results indicate that the Upper Paleocene to Lower Eocene stratigraphic section is complete in Alo-1 well, while much of the Paleocene and the Paleocene-Eocene boundary are not preserved in Hole 959D.

## NEWS FROM AUSTRALIA

By Eric Monteil ([Eric.Monteil@ga.gov.au](mailto:Eric.Monteil@ga.gov.au))

Kath Grey's magnum opus entitled 'Ediacaran palynology of Australia' has just been published as Memoir 31 of the Association of Australasian Palaeontologists and is a product of the Virtual Centre of Economic Micropalaeontology & Palynology (VCEMP). At 439 pages it is a monumental tome and will set the standard for Proterozoic palynostratigraphy for years to come. This work is a study of 71 acritarchs taxa in more than 900 samples from 20 coreholes and 10 surface sections in the Adelaide Rift Complex and the Centralian Superbasin. It provides a detailed taxonomic treatment of the spheroidal as well as the diverse acanthomorph acritarchs and includes 26 new species and 6 new genera. Five assemblage zones, which are demonstrably independent of lithology, can be recognised across the Adelaide Rift Complex and most of the Centralian Superbasin. Some taxa resemble species from probably coeval successions in China, Siberia and northern Europe, suggesting that the proposed zonation scheme may have global application. The rapid increase in abundance, size, morphological complexity and taxonomic diversity coincides with a short-lived negative Carbon isotope excursion that approximates to the Acraman impact layer. This is followed by a marked positive excursion that corresponds to the acanthomorph diversification.

This volume is available from:

The Business Manager  
Geological Society of Australia  
706 Thakral House  
301 George Street  
Sydney NSW 2000  
AUSTRALIA  
Tel: (+61 2) 9290 2194  
Fax: (+61 2) 9290 2198

E-mail: [sue@gsa.org.au](mailto:sue@gsa.org.au)

This volume can be purchased on-line at the following URL address: [www.gsa.org.au](http://www.gsa.org.au) (go to Bookshop).

Australia	A\$	141.00
Overseas	A\$	150.00

Prices include postage, Australian prices also includes GST

I was last month on a business trip in Perth when John Backhouse and his wife, Liz, invited me to a dinner with Kath Grey. It was my first meeting with Kath Grey and instantaneously I felt Kath to be a very enthusiastic and passionate person. Kath has worked on a variety of fossil groups, including stromatolites,

brachiopods, diatoms and palynomorphs, and has developed considerable expertise in biostratigraphic and palaeoenvironmental interpretation. She holds a position of Specialist Palaeontologist and is basically interested in anything that could help her to date and correlate the Proterozoic. For a long time she had two main passions, palynology and stromatolites. Recently, she developed a third one, more surprising, for Formula 1! I must say that I was amazed when during the course of our conversation about different species and genera she started to talk to me about details of teams, engines and drivers engaged in this year world championship. Should we expect soon a "Michelindinium" or "Bridgestonecysta" genus?



Kathleen Grey is from Blackpool (Lancashire, UK). She studied Palynology at the University of Sheffield from where she holds a B.Sc. and a M.Sc under the supervision of Drs. Neves and Downie. Her first M.Sc subject was the Devonian spores of the Pinsky Gill Beds near Langholm, Southern England. By August 1969 she had collected all the samples she needed and in November of the same year Sullivan and Marshall published what was supposed to be her M.Sc! Tough times! Future great names of Palynology, among them J. Bujak, G. Clayton, G. Dolby, K. Dorning, Rex Harland, Judith Lentin, D. Lister, S. Rasul and J. Utting, were already doing their Ph.D. projects when Kath was working on her second M.Sc. subject, and basically when all these people had found jobs, there were no more jobs available in Europe. Tough times again.

Kath started to look further afield, including Australia. In 1971 she joined the Geological Survey of Western Australia in Perth as a Project Geologist, initially working in the Editing Section. However, 6 months later she was transferred to the Palaeontology Section where she shared an office with John Backhouse for over 20 years. Soon she asked to go in the field but was answered with “women don’t go into the bush”. When she asked why, she was told that it was because there are no trees in the bush! However, people eventually started to wake up to themselves and in 1975 she began undertaking field geology. Kath started her Ph.D. part time in 1991 at Macquarie University (Sydney, NSW) and completed it in 1998. Over the next five years, in her rare spare time, she beat it into shape for publication.



After our dinner, the following day I visited Kath at work and had the great pleasure to see most of these wonderful Ediacaran taxa under the microscope. For a palynologist versed in Mesozoic palynology, these forms are all very big, between 100 and 300um, and never smaller than 80 um. All are beautiful and may exhibit very complex morphology. My two favourites? The first one, *Pennatosphaeridium chrysanthemoides* for its beauty. All specimens are golden in colour and bear multistranded processes with randomly curled

tips. And the second one, *Schizofusa risoria*, for its uniqueness. This acritarch species, christened ‘the Cheshire Cat’ by a colleague of Kath’s, ranges from a full-sized acritarch to a residual form that consists only of the lips, which resemble a grinning mouth.

As I said earlier, Kath is mad about stromatolites as well, and is a very well known and respected expert. A couple of years ago a Discovery Channel crew visited her, and after a very busy day where they asked her to extract most of her collection for viewing, the producer asked to go to her home for some shots. She was quite surprised when he wanted to make a sequence of her at rest at home, surrounded by stromatolites while reading a book about stromatolites. She had to retrieve all her specimens from the house and the garden for the take. But even then her day was not over. Next, the producer wanted to take a sequence of her in bed.... dreaming about stromatolites! As she politely but firmly refused, the producer responded: “But Kath I didn’t even ask you to get undressed!”

As you can imagine I had really a great time with Kath. She is a wonderful person, who lives a love story devoted to science and is always available for a student or a visitor. She will always find time to receive you. Read her book on the Ediacaran palynology of Australia and you won’t be disappointed. If your journey brings you to Perth don’t hesitate to give her a ring and arrange a visit. Though very busy (she has produced about 200 internal reports, published over 50 papers and currently has 22 others in preparation!) she will gladly guide you in a wonderful journey back in time to about 560 Ma ago.

---

## NEWS FROM RUSSIA

Book just released

*Late Cretaceous (Turonian) Flora of Southern Negev, Israel.* Authors: V. Krassilov, Z. Lewy, E. Nevo & N. Silantieva

Publication date: May 2005

Cover, table of contents and sample pages at [www.pensoft.net/newreleases/12377.html](http://www.pensoft.net/newreleases/12377.html)

ISBN 9546422290, Pensoft Publishers, Sofia-Moscow, 165x240, description of 46 new species, 120 color and 30 b/w photos, maps, bibliography, index. In English. Hardcover, 252 pp. Price EURO 67.90.

Paleofloristic discoveries cast new light on plant evolution. They are also pertinent to tectonic, paleo-

geographic and paleoclimatic reconstructions. As a result of extensive collecting in the Arava Valley south of the Dead Sea, the Late Cretaceous (Turonian) flora of southern Negev currently appears to be the most representative for this age in the Gondwana Realm. The book presents a comprehensive analysis of a regional paleoflora from several points of view. Starting with a detailed description of the work previously done on the site, the authors extend their analyses to the tectonic and paleogeographic framework and the regional settings of the localities. Further analyses of the paleocommunities ^ mangroves, marshes, palm growth, aquatic and inland vegetation ^ are based on a detailed taxonomic study of the plant fossils. Most of the 46 species described in the book are new to botanical systematics; more than half of them are assigned to new genera. Systematic descriptions are illustrated by more than 120 color and 30 black/white photos. Detailed descriptions of species and communities recognized in the Turonian of southern Negev may serve as the basis for further studies in morphological evolution of flowering plants, as well as in climatic and paleogeographic reconstructions. The book is addressed to specialists in the fields of plant phylogeny, paleoecology and paleoclimatology. It is indispensable for any library collecting surveys on these subjects.

Ordering at [orders@pensoft.net](mailto:orders@pensoft.net), subject=order for Late Cretaceous (Turonian) Flora ID=12377, fax +359-2-9674071, phone +359-2-9674070. Online ordering at [www.pensoft.net/notes/12377.stm](http://www.pensoft.net/notes/12377.stm) > [www.pensoft.net/notes/12377.stm](http://www.pensoft.net/notes/12377.stm)

---

### NEWS FROM INDIA

By Naresh C. Mehrotra ([nareshmehrotra@indiatimes.com](mailto:nareshmehrotra@indiatimes.com))

Birbal Sahni Institute of Palaeobotany is organizing a National Conference on "Challenges in Indian Palaeobiology – Current Status, Recent Developments and Future Directions" during 15-16 November 2005 as part of the Diamond Jubilee Celebrations of the Institute. Some of the important themes of the Conference are: Applied Palaeobiology in Fossil Fuel Research, Interface of Palaeobiology with other disciplines, Integrated approaches to Palaeobiology and Sedimentology, Teaching and Research in Palaeobiology and Popularization of Palaeobiology and role of Academic Societies.

The editorial board of the Institute's Journal 'The Palaeobotanist' has been reorganized to include Carlos Jaramillo, AASP Newsletter Editor and Cheng-Sen Li, Professor in the Institute of Botany, Beijing, China

as the two new editors from outside India and myself as the Chief Editor. Manuscripts on all aspects of Palaeobotany and Palynology are most welcome.

A new route for the migration of Chinese elements into the Northeast Himalayas through Tibet and Kashmir has been suggested on the basis of the megafossil and palynological evidences occurring therein. (Mehrotra, R.C., Liu, Xiu-Qun, Li Cheng-Sen, Wang, Yu-Fei & Chauhan, M.S., 2005. *Rev. Palaeobot. Palynol.*, 135: 145-163).

Pollen analysis from a sedimentary soil profile at 3.5 m below MSL from Pichavaram Estuary and adjoining areas, east coast of India, indicates palaeostrandline 18 km inland from present day shoreline around 5670 ± 120 yrs B.P. Mangrove degradation was maximum during 1700 – 1100 yrs B.P., attributed to climatic change and hydroisostatic adjustments. (Farooqui A.: 2005) Climatic and sea level fluctuations since 5670 yrs B.P. inducing ecological complexity and its impact on plant diversity: a palynological record from SE coast India (*Jour. Geol Soc. India, Spl. Vol. IGCP 464*).

---

### NEWS FROM ARGENTINA

by Mirta Quattrocchio ([mquattro@criba.edu.ar](mailto:mquattro@criba.edu.ar))

The XIII Simposio Argentino de Paleobotánica y Palinología (22 to 25/5/2006) will be held at Bahía Blanca, Argentina. We are welcoming all people interested in fossil plants & palynology as well as those scientists interested to plant biology and geology.

Abstracts should be submitted by 15 February 2006. Late submissions may not be included in the abstract volume and program. More information at [www.xiiisimposio.uns.edu.ar](http://www.xiiisimposio.uns.edu.ar)



XII Simposio Argentino de Paleobotánica y Palinología, Buenos Aires 2003

## NEW MEMBERS AND ADDRESS UPDATES

### ***New Members***

FETOURI, MUSTAFA  
RUE DU PRE DE LA HAYE 40  
OUPEYE, BELGIUM 4680  
TEL. +32 48 60333687  
FAX. +32 42 648443  
[ghoumapub@hotmail.com](mailto:ghoumapub@hotmail.com)

GEOLOGY LIBRARY EAST (URBANA)  
223 NATURAL HISTORY BUILDING  
UNIVERSITY OF ILLINOIS  
1301 W GREEN STREET  
URBANA, IL 61801-2938  
EBSCO SUBSCRIPTION SERVICES

KLINE, DOUGLAS J.  
8707 WEST FLOYD DRIVE  
LAKEWOOD, CO 80227  
TEL. (303) 984-1753  
[dougkline@neujahrgorman.com](mailto:dougkline@neujahrgorman.com)

KRZYSZTOF, DEMBICZ  
ul. NOWY SWIAT 66/5  
WARSAW, POLAND  
TEL. +48 609632190  
[edur@o2.pl](mailto:edur@o2.pl)

NURSE, ANDREA  
16 MASTERMAN DRIVE  
AVON, MAINE 04966  
TEL. (207) 639-4496  
[andrea.nurse@umit.maine.edu](mailto:andrea.nurse@umit.maine.edu)

RICHER, SUSAN  
BADGER COTTAGE  
HUGGATE, YORK  
UNITED KINGDOM YO42 1YB  
TEL. +44 1377 288 296  
[suzi\\_richer@hotmail.com](mailto:suzi_richer@hotmail.com)

ROBINSON, GUY S.  
441 EAST FORDHAM ROAD  
BRONX, NY 10458  
TEL. (718) 817-3674  
[grobinsom@fordham.edu](mailto:grobinsom@fordham.edu)

STEFANOVA, IVANKA  
UNIVERSITY OF MINNESOTA  
PILLSBURY HALL  
310 PILLSBURY DRIVE  
MINNEAPOLIS, MN 55455  
TEL. (612) 624-4514  
FAX. (612) 625-3819

[stefa014@umn.edu](mailto:stefa014@umn.edu)

VALERIO, RUBENS  
AV. ELMIRA M MOREIRA 455  
JACAREI  
S. PAULO, BRAZIL 12306-5002  
TEL. 55-12-3958-2002  
FAX. 55-12-3958-5110  
[info@periodicals.com.br](mailto:info@periodicals.com.br)

### ***Reinstatements***

BIAGGI, ROBERTO E.  
UNIVERSIDAD ADVENTISTA DEL PLATA  
25 DE MAYO 99  
LIBERTADOR SAN MARTIN  
ENTRE RIOS 03103  
ARGENTINA  
TEL. (54343) 491-0010  
FAX. (54343) 491-0300  
[biaggire@lsmartin.com.ar](mailto:biaggire@lsmartin.com.ar)

### ***Address Updates***

HEAD, MARTIN J.  
DEPT. OF EARTH SCIENCES  
BROCK UNIVERSITY  
500 GLENRIDGE AVENUE  
ST. CATHARINES, ONTARIO  
CANADA L2S 3A1  
TEL. (905) 688-5550  
FAX. (905) 682-9020  
[mjhead@brocku.ca](mailto:mjhead@brocku.ca)

HJELMROOS-KOSKI, MERVİ  
INSTAAR  
CAMPUS BOX 450  
UNIVERSITY OF COLORADO  
BOULDER, CO 80309-0450  
TEL. (303) 492-5158  
FAX. (801) 409-3187  
[Mervi.Hjelmroos-koski@colorado.edu](mailto:Mervi.Hjelmroos-koski@colorado.edu)

HOROWITZ, AHARON  
173 HEBRON ROAD  
JERUSALEM 93430  
ISRAEL  
TEL. +972 2 671 1352  
FAX. +972 2 672 2281  
[haharon@post.tau.ac.il](mailto:haharon@post.tau.ac.il)

HOS, DIRK P.  
29B MONUMENT STREET  
MOSMAN PARK  
WESTERN AUSTRALIA 6012  
AUSTRALIA

TEL. +61 8 63890014  
[dhos@iscbiostrat.com](mailto:dhos@iscbiostrat.com)

JAKEMAN, MARCUS  
PETROSTRAT LTD.  
TYLDESLEY HOUSE  
48 CLARENCE HOUSE  
LLANDUDNO LL30 1TW  
WALES, UNITED KINGDOM  
TEL. +44 (0) 1492 870050  
FAX. +44 (0) 1492 870050  
[marcus@petrostrat.com](mailto:marcus@petrostrat.com)

JONES, GRETCHEN  
USDA, APMRU  
2771 F&B RD  
COLLEGE STATION, TX 77845  
TEL. (979) 260-9509  
FAX. (979) 260-9386  
[g-jones@tamu.edu](mailto:g-jones@tamu.edu)

PEETERS, JACQUES  
ST. VICTORIAAN 20  
2211 RP NOORWIJKERHOUT  
THE NETHERLANDS  
TEL. +31 (0)6 2397 3880  
[jwmpeeters@tiscali.nl](mailto:jwmpeeters@tiscali.nl)

PRINCE, IAIN  
STATOIL  
ST-FH FORUS  
STAVANGER  
NORWAY 4035  
TEL. +47 51 99 22 50  
FAX. +47 51 99 65 50  
[prince@statoil.com](mailto:prince@statoil.com)

RILEY, LESLIE A.  
50 STAFFORD ROAD  
BLOXWICH, WALSALL  
WEST MIDLANDS WS3 3NL  
UNITED KINGDOM  
TEL. (44) 01922 403326  
FAX. (44) 01922 403326  
[lesriley@gotadsl.co.uk](mailto:lesriley@gotadsl.co.uk)

TOCHER, BRUCE A,  
STATOIL ASA  
FORNHAGEN D3  
GRENSEVEIEN 21  
4035 STAVANGER  
NORWAY,  
TEL. (0047) 48147506  
FAX. 51-80-65-50  
[bruce@statoil.com](mailto:bruce@statoil.com)

## POSTDOCTORAL/STUDENT RESEARCH OPPORTUNITIES

### *Research Fellow in Palynology*

A postgraduate in Botany/ Ecology/ Life Sciences is required to carry out field, lab and microscopic studies in the ISRO-GBP funded project in collaboration with NRSA: "MODERN POLLEN ANALYSIS IN EASTERN GHATS FOR RECONSTRUCTION OF PALEOVEGETATION AND CLIMATE" at the French Institute of Pondicherry.

Candidates must have working knowledge of computers - Windows OS: MS Office - Word, Excel and Power Point. Those with prior exposure to or training in palynology and in basic statistical analysis and data treatments will be given preference; knowledge of pollen morphology and/or popular statistical packages used in ecology and/or packages used in Palynology - TILIA, GPALWIN etc., will count as additional qualifications. The project involves extensive fieldwork in forest areas. Candidates who have submitted their Ph.D may also apply. Fellowship commensurate with experience and skills.

Employer: French Institute of Pondicherry  
more info: [www.ifpindia.org/training.html](http://www.ifpindia.org/training.html)

### *Project Associate in Palynology*

A postgraduate in Botany/Ecology is required to carry out field, lab and microscopic studies in the ISRO-GBP funded project: "Reconstruction of palaeomonsoonal changes using sedimentary records from man made tanks in southern India" at the French Institute of Pondicherry.

Candidates must have a working knowledge of computers. Those with prior exposure to or training in palynology will be given preference. Candidates will be allowed to register for a PhD.

more info: [www.ifpindia.org/training.html](http://www.ifpindia.org/training.html)



## AGENDA

2006

**April 2-6, 7th Simpósio do Cretáceo/Brazil - 1th Simpósio do Terciário do Brasil in Serra Negra, Brazil.**

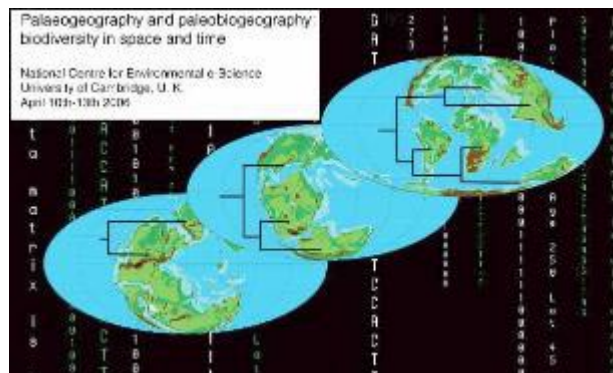
[www.rc.unesp.br/igce/simpcret/simpcretaceo.html](http://www.rc.unesp.br/igce/simpcret/simpcretaceo.html)



**April 10-13, Palaeogeography and Palaeobiogeography: Biodiversity in Space and Time at the University of Cambridge**

[www.biogeography.org](http://www.biogeography.org)

This meeting aims to broaden scientific understanding of the evolution of Earth's biodiversity at a range of spatial and temporal scales by facilitating collaboration among palaeogeographers, palaeobiogeographers, and modern day geographers and biogeographers. The meeting will consist of a day of talks from invited speakers, four workshops, and poster sessions.



The meeting will take place at the Centre for Mathematical Sciences, University of Cambridge. Registration will be announced soon and more information can be found on the IBS website (<http://www.biogeography.org/>), NIEES website (<http://www.niees.ac.uk/>) and at UCL Earth Sciences

website (<http://www.es.ucl.ac.uk/research/events/Palaeo-April2006/Biogeographymeeting.html>)

In the meantime, the organizers may be contacted directly at:

Dr. Paul Upchurch ([p.upchurch@ucl.ac.uk](mailto:p.upchurch@ucl.ac.uk))

Dr. Alistair McGowan ([a.mcgowan@nhm.ac.uk](mailto:a.mcgowan@nhm.ac.uk))

Claire Slater ([c.slater@nhm.ac.uk](mailto:c.slater@nhm.ac.uk))