A.A.S.P. NEWSLETTER

Published Quarterly by the American Association of Stratigraphic Palynologists Inc.

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Volume 35, Number 2

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)

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
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)

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

AASP Student Scholarships may be awarded annually to three students in the amount of US$1500. 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 and need not be members of AASP. Application forms appear in the January issue of the AASP Newsletter, are available from the Chairman of the AASP Awards Committee (Fred Rich (frich@gasou.edu)), or can be downloaded from our website at http://www.palynology.org/content/scholar.html.

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 annually), and (with the exception of Retired members) the journal ***Palynology*** that is published annually. Overseas members can receive their Newsletter and ***Palynology*** by airmail, rather than book rate surface mail; an additional surcharge is required in the amount of US$12.00 for Europe & South America, and US15.00 for Africa, Asia & the Pacific region (includes Australia and New Zealand).

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ISSN 0732-6041 **Marloes Kloosterboer van Hoeve, 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 September 1, 2002 and December 1, 2002. All information should be sent on computer disks (prefarably Word-Perfect) or 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 David Pocknall

Integration and cooperation are two words we hear a lot these days and to me they exemplify some of what has been happening with AASP over the past few years. We have long realized that we need to integrate our science of palynology with other disciplines in geology, botany, climate research, and forensics to name but a few and we are beginning to see evidence of this on a regular basis. Our ability to cooperate with our peers in these other areas of research is beginning to show through.

There have been many highlights for me. In 2000 we held our annual meeting with the Geological Society of America and had topical sessions on three different themes. Many were heard to say at that conference that they didn't realize that palynology could be applied to solve so many problems. We have not met again with GSA but my hope is that we endeavor to make this a regular activity on our calendar. In the spirit of cooperation we have become an active participant in the affiliated societies of GSA and should be in a position to learn a great deal from each other as we tackle the issues of digital publishing, conferences, membership, recruiting, sustaining our science, and global databases.

Some of you may not know but we are an active and paid up member of the American Geological Institute, an organization headquartered in Washington DC. They play a role as a public watchdog over geoscience issues and provide strong advocacy in the halls of power in the capital. We had the opportunity to participate in a Leadership Forum 2002: "Improved Effectiveness through Increased Cooperation". I was not able to attend but Ken Piel did on AASP's behalf. Thanks Ken. Some of the topics covered include:

- Challenges facing earth science education (what we see in palynology is also reflected in the broader grouping of geoscience),
- Trends in earth science education,
- Opportunities for collaboration - urges the establishment of a dialogue between geoscience societies and the National Science Foundation,
- Electronic publishing - I have mentioned this in a previous newsletter, and
- Effective Geoscience Outreach.

These topics may sound very US centric but I am sure the same challenges effect other countries and organizations. It would be good to learn if this is so and if not what are they doing right or different. A strong recommendation that Ken

has made is that AASP step forward in a leadership role with AGI and establish a permanent representative. I fully endorse this and would be pleased to hear from anyone who has a strong interest in this type of position. This is not a role that should be filled by the President who changes on a yearly basis - we need some continuity.

To me the epitome of cooperation and integration will be showcased in September when we hold our annual meeting with The Micropaleontological Society (TMS) and the North American Micropaleontology Society (NAMS). The organizers have been working very hard to develop a stimulating technical program and a fun-filled social program. The final announcement for the meeting appears later in this newsletter so fill out the registration form and get it back by 26 July. I have spoken with many of you who are planning to attend and have also heard that at last count there were almost 100 abstracts submitted. It is going to be a great meeting - see you in London in 3 months. In advance I would like to extend a heartfelt thanks to the organizing team made up of representatives from all three societies.

This column provides me the opportunity to recognize members who have been in the news. In particular I would like to mention a former colleague of mine, Dallas Mildenhall of the Institute of Geological and Nuclear Sciences, New Zealand. Dallas together with Vaughn Bryant (Texas A&M) have been the voices in the dark preaching the value of forensic palynology and to this end an article appeared in New Scientist earlier in the year. Vaughn has also published articles in National Geographic over the years. These types of articles are a great way of highlighting the many and varied applications of palynology. Well-done gents and great job of keeping us in the news.

This has been an exciting two years for me as President of AASP and this will be my last opportunity to write in the newsletter as President of the association. As all of you know I held this position for an extra year because David Jarzen who was the President-Elect had to resign from the position. It has been a pleasure to fill the role over this extended term and there have been many benefits, not the least of which I have had to attend additional board meetings, both annual and mid-year! But by far the greatest benefit has been to experience the strength of the organization in terms of technical and individual contributions and the people I have met and corresponded with. We always have strong technical meetings on many stimulating topics but also there is always someone who is prepared to help out the organization. It would be remiss if I did not recognize some of the folks that I have served on the board with over the years that have provided, and in many cases continue to provide, sterling support of our association. I have served under many good Presidents including Fred Rich, Reed Wicander, Chris Denison, Rolf Mathewes, Gordon Wood and Jan Jansonius - I have learnt a lot from you. Throughout my term as President Thomas Demchuk has been the Secretary-Treasurer - you cannot underestimate the amount of work this role entails. On the editorial side Bob Clarke, Dave Goodman, Owen Davis, and Vaughn Bryant provide an absolutely first class product, a proud flag bearer for AASP, and actually manage to sell it too, and Marloes Kloosterboer van Hoeve continues to assemble a classy newsletter. Now all they have to do is put it on CD! When will that be? There are undoubtedly more whom I have worked with and learnt a great deal from and I apologize for leaving you off the list.

The organization of AASP is in good hands. Jim Riding will be the incoming President and in addition to helping to run the London meeting he is also taking over as President. I look forward to spending my final year on the board with Jim at the helm and also hearing his Presidential address at the business luncheon!

Many thanks for your indulgence and I hope we cross paths sometime in the near future.

David Pocknall
June 19, 2002

REPORT OF THE SECRETARY-TREASURER
From the desk of Thomas D. Demchuk
AASP Secretary-Treasurer

Below are my reports of the Secretary and Treasurer, as given at the recent mid-year meeting held in St. Catharines, Ontario on April 21st of this year. If anyone should have any questions or concerns over the material presented below, please feel free to contact me at your leisure.

Secretary's Report
As of April 16th, AASP had a total of 617 members. This included 484 individual members, 30 retired, and 103 institutional members. These are members who had their dues paid through the end of year 2001. This is down from a total number of 714 members reported at the annual meeting in San Antonio. The difference in membership reflects that fact the 41 members were purged from the listing for non-payment of dues since 1999, and 74 members were purged for non-payment since 2000. It also includes 10 resignations, and 2 new members. Of extreme interest, there were 122 members who had not renewed their 2001 membership (i.e. their membership was due as of January 1, 2002). Some of those memberships have been renewed, but there is still a considerable number of members in jeopardy of being purged from the membership listing in the near future. These members will receive this copy of the newsletter, but after this they will only receive a membership renewal notice. The AASP Board has adopted a hard-line that only those members paid in full will continue to receive the newsletter either electronically or via mail. Please check your mailing label, if you still have it nearby, and check to see whether the label says "2001". That means you need to renew as soon as possible. One last membership renewal notification will also be sent to those members who were purged from 1999 and 2000.

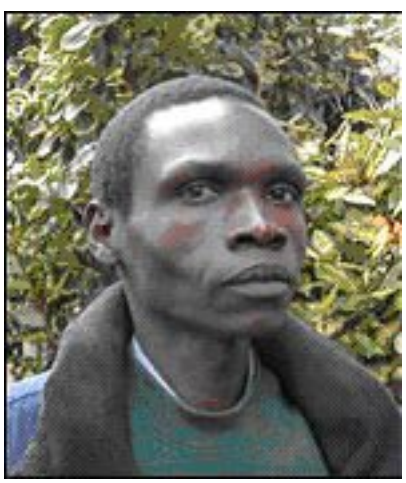
Of significance, 118 members now receive the newsletter electronically, either as an e-mail attachment or download from the AASP website (www.palynology.org). All members are urged to request the newsletter electronically in order to help the Association save money on printing and mailing costs. Many other scientific organizations are moving totally into the electronic age, and imposing an electronic newsletter on their membership. We have been benevolent in this matter, however, I can foresee a time in the near future where all members who provide an e-mail address to the Association will automatically receive the newsletter and other announcements electronically.

Treasurer's Report
As of April 16th, AASP had a total of $63,638.37 in various bank accounts, stocks and other investments. This number is essentially unchanged from the totals announced at the San Antonio meeting. With some memberships renewals expected over the remainder of the year, and more members choosing to receive the newsletter electronically, it is anticipated that expenditures will be offset by income and the bank accounts will not be reduced much more. A close watch will be kept on expenses over the remainder of the year, as well as total income from the increased membership dues, and the Board will revisit the financial issues at the meeting in London.

I wish to thank the Board for their support and encouragement over the past year, and I very much look forward to serving the membership again through 2002 and into 2003.

Respectfully submitted,
Dr. Thomas Demchuk
AASP Secretary-Treasurer

STUDENT SCHOLARSHIP WINNER
The student scholarship winner for this year is Julius Bunny!



Julius Lejju Bunny: I obtained B.Sc Hons in Botany/ Zoology, (1995), Postgraduate Diploma in Education, PGDE (1996) and M.Sc, Botany (1999) at Makerere University, Kampala- Uganda. In 2000 I joined Mbarara University as an Assistant Lecturer in the Department of Biology.

In July 2001, I participated in fieldwork in western Uganda before registering in late September as a Ph.D student in the Department of Geography, Trinity College, Dublin, under the supervision of Professor David Taylor. Research for my Ph.D focuses on the reconstruction of past environments in western Uganda, with a view to providing an environmental context for recently conducted and on going archaeological research. The latter in combination with historical and oral studies, have revealed significant changes in population density, land use and settlement patterns in the study area from 9th to the 18th century. The causes of these changes are currently the subject of much debate, and environmental factors - such as drought and soil degradation - have yet to be ruled out.

My Ph.D research therefore aims to establish the extent to which the marked cultural and socio-economic changes in the study area were environmentally determined. The major part of my research involves analysis of pollen, fungal spores, phytoliths, charcoal and stable elemental carbon isotopic content of AMS radiocarbon dated, short cores of sediment obtained during fieldwork in western Uganda in July 2001. The cores were extracted from wetlands located close to sites of major archaeological interest that were occupied for part of the last 1000 years.

NEWS FROM THE UK
By Jim Riding
May 2002

Apart from publicising the joint AASP-BMS-NAMS meeting at University College London from the 11th and 13th of September 2002, I have no other specific news from the UK this quarter. This conference, on the theme of Exploration Biostratigraphy, is the AASP annual meeting for 2002. Despite the meeting being around this theme, there will also be AASP open sessions on palynology, including one on the palynology of coprolites organised by Owen Davis. Please see the Final Circular for this event elsewhere in this Newsletter. Preparations are well in hand for this conference and we already have a very good scientific program. At the time of writing (late May), I have 21 registrants and the field trip is booking up fast. I would advise you to register early if you wish to go on the field trip. There is currently, however, plenty of accommodation left at Ramsey Hall. This final circular represents the last publicity material for this event. If you have any questions send them to me at jbri@bgs.ac.uk or to Jamie Powell at ajp@dinosystems.co.uk.

ENVIRONMENTAL CHANGES IN THE NORTH ATLANTIC REGION DURING THE LAST DEGLACIATION

by Karin P. Boessenkool (recent address: Isotope geochemistry, Faculty of Earth and Life Sciences, Vrije Universiteit Amsterdam, De Boelelaan 1085, 1081 HV Amsterdam, The Netherlands, phone: *31-20-444 7326, email: boek@geo.vu.nl)

PhD thesis defense on 14 November 2001, Laboratory of Palaeobotany and Palynology, Utrecht University, The Netherlands

General introduction

The alternation of glacials and interglacials is fundamentally modulated by variations in spatial and temporal distribution of solar insolation. However, while rising insolation on the Northern Hemisphere associated with the last deglaciation (~20.000 - 10.000 years ago) was a gradual process, climatic response has been abrupt and step-wise. Oxygen-isotope records retrieved from Greenland ice cores have confirmed that among several deglacial fluctuations of contrasting intensity and duration, the 'Heinrich 1' and Younger Dryas cold events were the most pronounced.

During Heinrich events, armada's of icebergs mainly originating from the Laurentide ice-sheet drifted southeastward, as reflected in records of ice-rafted detritus from over large parts of the North Atlantic Ocean. Heinrich event 1, the most recent of these events, occurred around 16.000 years ago. The Younger Dryas phase implied a temporary return of glacial conditions between 12.000 and 11.000 years ago. Effects of this cooling have been reported across the world.

To place constraints on models of glacial-interglacial climate change and to test the degree to which they are capable of simulating reality, time-series data are required on environmental proxies obtainable from sediments and ice sheets formed during the last deglaciation. At present, the available temporal detail of the glaciochemical records from Greenland ice cores offers a challenge to improve the resolution of relevant physical, chemical and biological data sets from sediments, both oceanic and continental.

Although relevant information has rapidly accumulated over the last decades, no comprehensive model is presently available that satisfactorily explains the mechanisms leading to the irregular pattern of climatic responsiveness to changing insolation. Likely factors to be considered are the complex responses of ice sheets and ocean circulation to orbital forcing, and the amplifying effect of greenhouse forcing imposed by changes in atmospheric levels of carbon dioxide and methane.

Despite different approaches and opinions with respect to an explanation of step-wise climate changes, North Atlantic oceanography has a key position in most considerations. The deep-water formation in the northern North Atlantic triggers the global thermohaline circulation responsible for global heat transfer and the cycling of nutrients, salt and carbon. The return flow of this 'ocean conveyor belt', which is formed by the Gulf Stream and the North Atlantic Current, consists of warm and saline surface water. This flow regulates heat transport to high latitudes, leading to regional climates that are anomalously warm as compared to the zonal mean. The rate and mode of deep-water formation and heat transport are highly sensitive to changes in salinity and temperature distribution in North Atlantic surface waters. Therefore, in addition to ice-sheet dynamics and palaeoatmospheric chemistry, the detailed reconstruction of the history of these surface conditions and of their direct impact on the climate of adjacent land areas is an important objective for a better understanding of climate change during the last deglaciation.

The climatic history of the North Atlantic region during the last glacial-interglacial transition was strongly influenced by time-transgressive shifts of the North Atlantic Arctic Front (The Arctic Front is the temperature front between warm Atlantic and cold Arctic waters (Jansen, 1992). It approximates the maximum sea-ice extension during severe ice years. Many authors have followed Ruddiman and McIntyre (1981) who used the term 'Polar Front' to refer to the maximum ice-extent. According to Jansen (1992) the 'Polar Front' denotes the boundary of polar water masses (and minimum ice limits) in summer.). With latitudinal shifts of up to 30° between the Iberian margin and East Greenland, changes in the position of this steep temperature gradient between warm Atlantic and cold Arctic waters are most pronounced in the eastern sector of the North Atlantic. Although there is considerable controversy with respect to the exact position of the front during individual deglacial climatic oscillations, both palaeoenvironmental reconstructions and simulation studies with atmospheric general circulation models (AGCMs) confirm the sensitivity of the North Atlantic climate system to changes in the position of the sea-ice margin.

Deglacial changes in North Atlantic sea-surface temperature (SST) associated with shifts in the position of the Arctic Front have affected the temperature, wind, and precipitation regimes along the North Atlantic seaboard. Deglacial precipitation rates are known to be strongly influenced by changes in the North Atlantic SST. Low SSTs and sea-ice cool the maritime air masses, reducing their moisture-bearing capacity. An important clue to deglacial changes in annual precipitation may be provided by analysis of long-term lake-level changes, but direct and accurate interrelation of these records with information on North Atlantic sea-surface conditions is difficult. Furthermore, these records lack evidence for seasonal changes in precipitation.

A potentially important tool for estimating changes in precipitation in western Europe, is the analysis of pollen and spores produced by land plants from marginal marine sedimentary successions. These records contain terrestrial environmental information by reflecting the composition of the regional vegetation on bordering land. This composition is determined primarily by temperature and precipitation. In addition, the concentration of pollen and spores in the sediments holds information on their transport by wind and/or water.

Concurrent analysis of organic-walled cysts of marine dinoflagellates (dinocysts) from the same samples gives insight in coeval sea-surface conditions, including temperature and nutrient availability. Marine dinoflagellates are unicellular (autotrophic and heterotrophic) organisms, which thrive in the upper 100 meters of the surface ocean. Some dinoflagellates have a cyst stage as a part of their life cycle (usually connected to sexual reproduction). Many of these cysts are composed of highly resistant organic compounds and have a great preservation potential in the sedimentary archive.

This thesis is aimed at exploring the potential of marine palynology in the reconstruction of deglacial patterns of SST, marine productivity and precipitation in the eastern North Atlantic domain. Results are integrated in the multidisciplinary research activities related to the last deglaciation.

The presented results emphasise that the terrestrial and marine signals from marginal-marine deposits can be successfully employed in the palaeoenvironmental analysis of deglacial climate change in western Europe. In previous studies of deglacial conditions in western Europe, changes in temperature are usually the principal considered factor, and are still often the only reconstructed component of climate. Recent AGCM simulations have underlined the role of changes in North Atlantic SSTs as well as changes in the direction and intensity of atmospheric circulation as underlying mechanisms of temperature fluctuations on land. Moreover, the pathways of wintertime cyclonic atmospheric depressions from the Atlantic toward Europe are primarily determined by the position of the North Atlantic Arctic Front (Figure 1). The location of these trajectories is essential for the distribution of precipitation over western Europe. Remarkably, therefore, at least in western Europe, long-term patterns of relative changes in precipitation are difficult to detect, and we are still far from a quantification of proxy precipitation records. This thesis at least conceptually addresses this outstanding problem. Comparative analyses of proxy environmental records from the Iberian and Scottish margins confirm model predictions that wintertime cyclones assumed more southern trajectories in response to lowered North Atlantic SSTs. This migration corroborates the concept of a coupling between deglacial shifts in the position of the Arctic Front and changes in seasonal precipitation patterns in western Europe.

It is realised that more marginal-marine sites have to be investigated to confirm, modify or refine the analyses. Yet, the documented environmental records from the Iberian and Scottish margins exemplify that palynological information from marginal-marine sediments may substantially contribute to corroborate the prominent influence of the position of the Arctic Front on atmospheric circulation, winter precipitation and seasonality in the North Atlantic region.

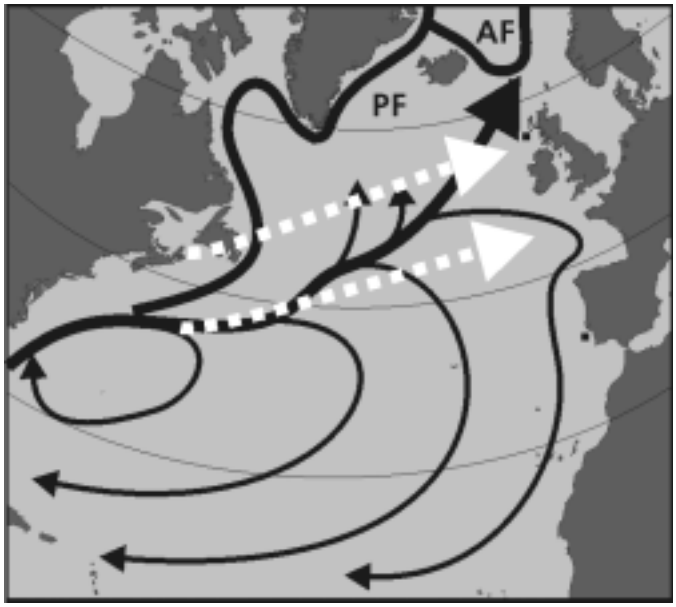


Figure 1. Map of the North Atlantic region, with the location of cores MD95-2006 (Scottish margin) and SO75-6KL (Portuguese margin), and a schematic representation of the main surface ocean circulation and the trajectories of the cyclonic depressions (white arrows); PF: Polar Front; AF: Arctic Front.

Synopsis

The positions of the Polar and Arctic Fronts play a crucial role in the atmospheric circulation patterns over, and the transport of humidity to western Europe. The Polar Front along the southeast Greenland margin denotes the contrasting hydrographical properties of the polar and Atlantic water masses on either side. The remains of planktonic organisms in underlying sediments are expected to reflect these contrasts. In order to be able to recognise the 'signature' of the Polar Front in older sediments, dinocyst associations from surface sediment samples from below the present-day Polar Front were studied in Chapter 1.

Proportional differences are found between the compositions of the dinocyst assemblages on either side of the Polar Front on the southeast Greenland margin. The influence of polar water can be traced in the dinocyst record as high abundances of *Algidasphaeridium? minutum* var. *minutum* and the presence of *Pentapharsodinium dalei*. Atlantic water masses are reflected in the presence of *Operculodinium centrocarpum* and *Selenopemphix quanta*. All samples include taxa from both environments, but the quantitative composition of the cyst assemblages clearly reflects the hydrographical features of the overlying surface water masses.

The accumulation of dinocysts on the southeast Greenland margin is strongly influenced by taphonomical effects. In spite of this, the composition of the cyst assemblages is a good representative of the hydrographical features of the overlying surface water masses. Hence, it is possible to recognise the

distribution of the polar and Atlantic water masses on either side of the Polar Front. During the last glacial cycle, the positions of the Polar and Arctic Fronts shifted several times across the North Atlantic. The results of Chapter 1 demonstrate that quantitative records of dinoflagellate cysts can be a firm basis for the reconstruction of associated changes in the spatial distribution of water masses.

In Chapter 2, the sea-surface temperatures (SSTs) of the North Atlantic Ocean are further explored by analysing the evolution of the - relative to Greenland - highly contrasting conditions along the Iberian margin during the last deglaciation. SST reconstructions are based on planktonic foraminiferal ^{18}O and dinoflagellate cyst records from core SO75-6KL. The SST_{dino} proxy is based on a ratio of the cysts of temperature-sensitive dinoflagellates, and indicates that shifts in the position of the North Atlantic Polar and Arctic Fronts during the last deglaciation led to sudden changes of the SST in the offshore area of Portugal. The data show that the transitions to the two major cooling events, connected to Heinrich event 1 and the Younger Dryas Stadial, occurred within 600 and 400 years, respectively.

The signals of SST change are compared with records of terrestrial palaeo-environmental change on a first-order basis. This is achieved by the concurrent analysis of the pollen/spore records from the same samples of SO75-6KL. It enables a detailed evaluation of the response of the vegetation on land to altered heat and moisture transport from the North Atlantic Ocean toward southwest Europe. The expansion of aridity-tolerant vegetation, as reflected in the pollen record of steppe taxa, occurred within 350 and 180 years from the onset of the cooling events connected to Heinrich event 1 and the Younger Dryas, respectively.

The inception of the warmer interval assigned to the Bølling-Allerød Interstadial shows a less sudden response, probably due to competition or to the lower migration rates for deciduous trees such as *Quercus* compared to most steppe taxa.
The underlying alterations in the coupled marine-terrestrial-atmospheric system that caused the climate change along the southwest European seaboard during the last deglaciation are further investigated in Chapter 3.

Simulation studies with AGCMs demonstrate strong surface westerlies and connected cyclonic activity during Younger Dryas winters in the North Atlantic region. In order to corroborate the concept of intensified cyclonic activity during the Younger Dryas and a concomitant increase in wintertime precipitation in southwestern Europe, the palynological succession from the same marine sediment core (SO75-6KL; western Iberian margin) was further analysed. The pollen/spore records contain additional information on precipitation and transport mode, while the study of the organic remains of marine dinoflagellates from the same samples gives insight in coeval sea-surface conditions, including temperature and nutrient availability.

Concurrent terrestrial and marine environmental signals indicate two phases of prominently increased runoff corresponding to Heinrich event 1 and Younger Dryas. Results indicate that intensified and possibly prolonged wet winter seasons contrasted with intensified anticyclonic summer aridity at these times. Increased wintertime precipitation associated with the Younger Dryas is in harmony with the modeled southward migration of the trajectories of North Atlantic cyclones during this cold event (Figure 2). No atmospheric general circulation models are as yet available for Heinrich events, but a similar relation is conceivable.

The concurrent terrestrial and marine environmental signals inferred from deglacial pollen/spore and dinoflagellate cyst records from the western Iberian margin indicate two phases of increased winter runoff corresponding to Heinrich event 1 and the Younger Dryas. The findings prompted the detailed analysis of a coeval core from the Scottish margin. This region occupies a key position for monitoring mid-latitude effects of the belt of intense westerly surface winds, cyclones and shifts in the position of surface water masses such as the North Atlantic Current.

The results of this investigation are presented in Chapter 4. The Barra Fan (Rockall Trough; NW Scotland margin) contains a detailed sedimentary record of the last deglaciation, including ice-rafted detritus of local origin (British Ice Sheet). It is a key location for the evaluation of the (phase) relationships between local ice-sheet dynamics, climate and ocean circulation. Century-to-millennium-scale palynomorph records of the last deglaciation from core MD95-2006 are presented, including marine and terrestrial elements. The proxy records of SST, marine productivity, erosion and runoff were integrated with available micropaleontological (foraminifera), sedimento-logical and geochemical data. Results confirm increased supply of ice-rafted detritus concurrent with relatively high sea-surface temperatures at the end of the Allerød Interstadial. Furthermore, the SST record based on dinocysts suggests marked cooling of the surface ocean in the Rockall Trough area during the Older Dryas. Marine productivity was low during stadials, and increased markedly during interstadials, when the influence of the North Atlantic Current was more pronounced.

As elaborated above, based on AGCM experiments it may be hypothesised that throughout the last deglaciation, changes in winter precipitation in western Europe are coupled to the pronounced shifts of the Arctic Front in the eastern North Atlantic sector (Chapter 3). In order to corroborate this concept, in Chapter 5 the integrated marine and terrestrial environmental information from the western Iberian margin (Chapter 3) is compared with latitudinally contrasting deglacial records from the northwestern Scottish margin (Chapter 4).

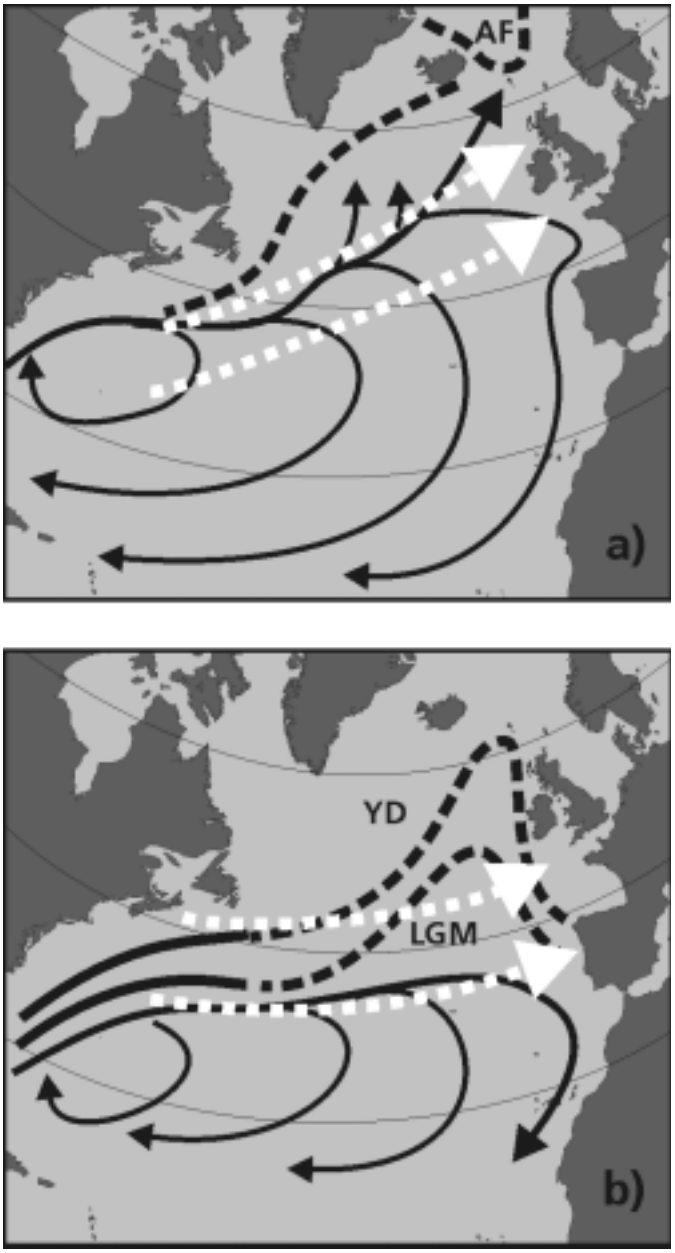


Figure 2. Schematic representation of ocean surface circulation and the trajectories of the cyclonic depressions (white arrows) in the North Atlantic region during warm (a) and cold (b) phases of the last deglaciation. AF: Arctic Front; LGM: last glacial maximum; YD: Younger Dryas.

In western Iberia the two cold deglacial phases (Heinrich event 1; Younger Dryas) were characterised by a pronounced increase of seasonality in comparison to warm phases (Bølling-Allerød; Holocene). During both phases intensified and possibly prolonged wet winter seasons contrasted with enhanced summer aridity. In contrast to the situation in southwestern Europe, both winter and summer precipitation rates in Scotland were most prominent during the warm deglacial phases. Winter snowfall during Heinrich event 1 and Younger Dryas was apparently high enough to facilitate ice-sheet growth in Scotland. Similar to Iberia, summertime precipitation in Scotland may have been relatively low during these cool pulses. The comparative analyses confirm model predictions that cyclones assumed more southern trajectories in response to lowered North Atlantic SSTs, promoting wetter winter conditions on the Iberian Peninsula. Because the maximum sea-ice limit approximates the North Atlantic Arctic Front, this migration corroborates the concept of a coupling between deglacial shifts in the position of the Arctic Front and changes in precipitation in western Europe.

There are still some copies of this PhD thesis available. To obtain one of them, send your request to Marjolein Mullen, Lab. of Palaeobotany & Palynology, Utrecht University, Budapestlaan 4, 3583 JL Utrecht, The Netherlands (M.Mullen@bio.uu.nl)

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THE AASP PRIMARY RECORDS PROGRAM

The American Association of Stratigraphic Palynologists (AASP) has begun to collect information on the development of the field of palynology; particularly in North America and Europe, and particularly associated with AASP. Our intention is to interview those who have helped to shape palynology during the early 20th century, and who have now reached senior or retired status. The AASP Board has so far identified 28 potential interviewees. Three have already been contacted, and have provided valuable information including publications on the history of palynology, written biographies, and taped interviews.

AASP would appreciate both suggestions of people who they should invite to be interviewed, and also volunteers to act as interviewers for interviewees living in their vicinity. Please contact Owen Davis (email address below) for further information, including the current list of people who AASP has already identified as potential interviewees, because of their key contribution to the development of palynology in North America and Europe. Examples of interview questions that have been found useful, and the kinds of information that have been obtained, also are available.

Our goal is to make this information freely available to the scientific community, and to summarize some of the information in an upcoming article in Palynology.

Here are excerpts provided from Cal Heusser's autobiography

> "My interest in plant science began in 1945 during WWII. I had been a chemistry major when entering military service but the lure of plants and field work became far more attractive for study when I returned to Rutgers University after the war. In the course of completing undergraduate work, I had the good fortune to come in contact with Murray Buell, who had come from North Carolina State to the Department of Botany at Rutgers. Murray was friendly, unassuming, and accessible.."
>
> "Murray generated my initial interest in paleoecology. I did an MS thesis having to do with the 'History of an estuarine bog at Secaucus, New Jersey' (Heusser, 1949). Plant fossil macroremains, the focus of the work, traced sea-level change and progressive demise of a freshwater whitecedar bog. Although Murray had become active working with fossil pollen (Buell, 1945), I did not involve myself with palynology until later, when I went to Oregon State in Corvallis, Oregon to work for a PhD.."
>
> "Unfortunately for me, Henry Hansen, with whom I had come to study, became Dean of the Graduate School the year I arrived. Because he was busy with administrative work, I was much on my own. I would major in botany, but because my thesis was to be in palynology, there was need to minor in geology, which meant picking up necessary credits in earth science courses. I chose, 'Pollen Profiles from Southeastern Alaska' for a dissertation. This decision came about upon my joining the American Geographical Society's Juneau Icefield Research Project in Southeastern Alaska as plant ecologist. During 1950 and 1951, the project enabled me to collect cores for the thesis from muskegs not only about Juneau but also about Ketchikan, Wrangell, Petersburg, and Sitka."

Owen Davis, Palynolo@geo.arizona.edu

COMPUTER STUFF

* **AASP Palynological CD ROM**

The American Association of Stratigraphic Palynologists asks for your help in preparing a CD ROM to be used in K-12 education and recruiting - serving both as an attractive introduction to the many aspects of palynology and as a source of material for teachers of biological and earth sciences. The objective is to have an eye-catching format that will both stimulate the imagination and interest of viewers and at the same time be informative. AASP is planning to make this material available on the Internet and distribute these CD's at conferences. AASP will retain the copyright to this material, but make it available free of charge for promotional and recruiting (to our discipline!) purposes.

Here is your opportunity to contribute to this effort.

We are asking members to provide images from your presentations and publications that highlight and illustrate the various aspects of palynology: flowers shedding pollen; floral anatomy; bees; pollen images of extant and extinct pollen, spores, acritarchs, dinoflagellates; chitinozoa; drill rigs; hand-operated coring; airborne pollen collectors; pollen-processing laboratories; people sitting at microscopes; pollen collections; pretty pollen diagrams; famous palynologists — anything that could help us prepare the CD ROM.

Here's an alphabetical list of potential topics. For those followed by "+" we have already received some material, but if it wasn't from you, send more! Also, please feel free to add to this list and send images and descriptive text. Your authorship will be acknowledged on any image you provide, unless you specify otherwise. Thanks in advance for your help. It is with your help that this project will succeed.

- aeroallergy
- archeological palynology +
- coal & petroleum palynology
- forensic palynology +

- honey palynology +
- modern pictures of pollen +
- pollen-based climate reconstruction
- pollen dispersal
- pollen systematics
- pollen taphonomy/preservation
- pollination ecology - pollinators
- pre-Quaternary stratigraphic palynology, acritarcs, dinos, spores
- Quaternary stratigraphic palynology, climate change, fire frequency, plant migration

Send (mail or email) your contributions and creations to Sharma Gaponoff, Chevrontexaco Ept Co., 6001 Bollinger Canyon Road, San Ramon, Ca 94583-0746, Tel. (925) 842-3808, Fax. (925) 842-2076, SLGaponoff@chevrontexaco.com
or to Owen Davis, palynolo@geo.arizona.edu, or to Vaughn Bryant, vbryant@neo.tamu.edu

*** News from www.palynology.org**
AASP is pleased to announce that it is now possible to search past issues of PALYNOLOGY and the AASP issues of Geoscience and Man by Author, Title, and Keywords. http://www.palynology.org/content/Palynology/

PALYNOLOGY accepts manuscripts on all aspects of palynology. http://www.palynology.org/content/Palynology/astyle.html

Owen Davis, editor@palynology.org, http://www.palynology.org/

AGENDA

2002

July 15-18. Quaternary climatic changes and environmental crises in the Mediterranean region, Madrid, Spain. Further information Ana Vadeolmillos Rodriguez, climatic.changes@uah.es or see http://www2.uah.es/qchange2002

August 29 - September 2, 6th European Palaeobotany - Palynology Conference, Athens, Greece. Details: Prof. D. Evangelos Velitzelos, Organizing Committee, 6th European Palaeobotany-Palynology Conference, Department of Historical Geology-Palaeontology, Faculty of Geology, University of Athens, Panepistimioupolis, Zografou, 157 84 Athens, Greece. Tel./Fax: +30-1-7274162, E-mail: velitzel@geol.uoa.gr

Aug. 31- Sept. 4, 2002 "Emerging Concepts in Organic Petrology and Organic Geochemistry". Canadian Society for Coal Science and Organic Petrology (CSCOP)- The Society for Organic Petrology (TSOP), Joint Annual Meeting, Banff, Alberta, Canada. Information: Dr. Martin Fowler,
Geological Survey of Canada, 3303-33rd Street NW, Calgary, Alberta T2L 2A7 Canada; Phone: (403) 292-7038; Fax: (403) 292-7159; E-mail: Mfowler@nrcan.gc.ca; Further details: www.cscop-tsop2002.com.

1-6 September 2002, Vienna, Austria, The Third International Congress "Environmental Micropaleontology, Microbiology and Meiobenthology". Contact: Dr. Irena Motnenko, Technical Director and Treasurer, Osorno Enterprices, Inc. Suite 301, 162-2025 Corydon Avenue, Winnipeg MB R3P 0N5, Canada Phone: +1 (204) 488-1538, Fax: +1 (204) 488-1566, E-mail: congress@isemmm.org

September 2-7, Environmental Catastrophes and Recovery in the Holocene: Brunel University, 2002. The central theme of this conference is the inter-disciplinary investigation of past geological and environmental catastrophes, and their impact on our society. This conference will involve not only the Quaternary community but also biologists, archaeologists, historians and economists. See for more information: http://www.brunel.ac.uk/depts/geo/Catastrophes/

September 5-7, CIMP Symposium and Workshops, Lille, France. Details: Thomas Servais (thomas.servais@univ-lille1.fr) or Ludovic Stricanne (ludovic.stricanne@univ-lille1.fr), University of Lille

September 11-13, joint meetings of the American Association of Stratigraphic Palynologists (AASP), the British Micropalaeontological Society (BMS) and the North American Micropaleontology Section of SEPM (NAMS) AASP-BMS-NAMS at the University College London
!!!!!SEE THE LAST PAGES OF THIS NEWSLETTER FOR MORE INFORMATION ON THIS MEETING!!!!!

25-27th September 2002 XIV Simposio de Palinología de la APLE, Salamanca (Spain). The XIV Symposium of the Spanish Association of Palynologist (APLE) will take place in Salamanca (Spain). For details contact: Rosario Rivas-Carballo, Dept. Geologia (Paleontologia), Facultad de Ciencias, Universidad de Salamanca, E-37008, Salamanca (Spain), e-mail: crivas@usal.es, or visit the website http://aple.usal.es

2003

March 29 - April 2, 3rd International Limnogeology Congress, Tucson, Arizona. The organizing committee at the University of Arizona invites all interested participants to submit proposals for theme sessions and field trips. A first circular, describing the meeting venue and general plans for the Congress will be circulated by mailings and electronically later in 2001. Contacts: Theme session proposals should be sent to Andrew Cohen, general chair of the Congress. Dept. of Geosciences, University of Arizona, Tucson, AZ 85721. Tel: 1-520-621-4691. Fax: 1-520-621-2672. E-Mail: acohen@geo.arizona.edu. Field trip proposals should be sent to David Dettman, field trip coordinator for the Congress. E-Mail: dettman@geo.arizona.edu. For further information concerning housing and registration, please contact Noah Lopez. E-Mail: noahl@u.arizona.edu

November 2-5, 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

2004

July, 4-9, 2004., 11th International Palynological Congress (***IPC***) in Granada, Spain. Website http://www.ugr.es/local/bioveg, or contact palacio@pcgr.org.

August 20-28, 2004, the 32nd session of the International Geological Congress. “From the Mediterranean Area Toward a Global Geological Renaissance” Geology, Natural Hazards and Cultural Heritage, in Florence, Italy. See http://www.32igc.org or contact Chiara Manetti, Dipartimento di Scienze della Terra, Via La Pira, 4 - 50121 Firenze - ITALY, Phone/Fax: +39-055-2382146, E-mail: casaitalia@geo.unifi.it

FINAL CIRCULAR:
JOINT MEETING OF
AASP-BMS-NAMS
11TH-13TH SEPTEMBER 2002
UNIVERSITY COLLEGE LONDON

This is the final circular for the American Association of Stratigraphic Palynologists (AASP), the British Micropalaeontological Society (BMS) and the North American Micropaleontology Section (NAMS) of SEPM joint meeting in September 2002 at University College London, UK

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The theme of this international meeting will be 'recent developments in applied biostratigraphy' based on four principal themes:

* Sequence biostratigraphy
* Deep-water exploration
* Reservoir/Development studies
* Outcrop analogue studies

There will also be an open session with the emphasis on post-Palaeozoic palynology including a symposium on the palynology of coprolites. The scientific program has not yet been finalised.

This meeting is aimed at encouraging trans-Atlantic exchange of ideas to seed new research initiatives. In particular, we aim to encourage an integrated multidisciplinary approach in both the academic and industrial realms. There is no taxonomic or geographical restriction on contributions. Posters have been invited on any micropalaeontological, nannopalaeontological, palynological or biostratigraphical theme.

A post-meeting field excursion will visit the Cretaceous succession of the Isle of Wight led by Drs Iain Prince, Bruce Tocher (Statoil, Norway) and Ian Jarvis (University of Kingston) on September 13th to 15th. See the registration form and separate text for details.

A workshop on the biostratigraphy and sequence stratigraphy of the Gulf of Mexico will be held at University College London on Saturday 14th September led by Garry Jones (Unocal) and Brian O'Neill (Shell).

The conference conveners are:

A. James Powell (Dinosystems): Contact Convener
Chris Denison (ChevronTexaco): representing AASP
Tom Dignes (Exxon/Mobil): representing NAMS
Alan R. Lord (UCL): Local Secretary
Susan Matthews (UCL): Local Support
Rachel Preece (ChevronTexaco): representing BMS
James B. Riding (British Geological Survey): Treasurer

GENERAL

All registrants will be sent joining instructions, travel details, maps etc. by email before the conference. This information will also be placed on the respective society websites. The University College London website is: www.ucl.ac.uk. The most useful page for visitors is: www.ucl.ac.uk/UCL-Info/AboutUCL/wherweare.html. This page includes maps.
The first event will be the icebreaker, a reception with drinks and nibbles, which will be held in the South Cloisters (ground floor) at University College London, Gower Street, London WC1E 6BT on the evening of Tuesday 10th September 2002 from 7.30pm onwards. Delegates will be able to register at the icebreaker. Registration will also be possible prior to the first technical session on Wednesday 11th September. All oral presentations will take place in Lecture Theatre 1, Cruciform Building, University College London on Gower Street.

Posters will be displayed in the refreshments area in the South Cloisters.

Please note that the two AASP Board meetings will be held at UCL on the evenings of 11th September and 13th September.

REGISTRATION FORM

This is the registration form for the AASP-BMS-NAMS Meeting at University College London, UK. Please fill in the appropriate blanks below, and submit your form to the address below. Please do not submit your details by Email or Fax. The conveners all hope you enjoy contributing to the meeting, and take advantage of the attractions that London has to offer. Registration deadline is 26th July 2002.

1 REGISTRATION: (all costs are in GB£)

AASP, BMS and NAMS Members:	£90
Student AASP, BMS and NAMS Members:	£30
Non-members of AASP, BMS and NAMS:	£150
*AASP Business Luncheon (13th September 2002)	£20

Total:_____

*Please note that delegates are most welcome to attend this event if they are not AASP members.
The registration cost includes: Registration Packet, Abstracts and Program Volume, Icebreaker, coffees/teas etc. and the Social Evening.

I am a member of:
AASP:_____
BMS:_____
NAMS:_____

I am a student:_____
Supervisor's countersignature:_____

2 ACCOMMODATION

Accommodation has been arranged at one of University College London's student facilities, Ramsey Hall of Residence, 20 Maple Street, London W1P 5GB (tel. +44 (0)20 7387 4537). The Hall is located close to Tottenham Court Road and is a five minute walk from the main University College London campus on Gower Street. It comprises single occupancy bed

and breakfast accommodation at £23.75 per night for the three nights of 10th to 12th September 2002. Therefore, three nights bed and breakfast will be £71.25. Please note that, because of returning students, we cannot offer accommodation here for the night of 13th September and beyond. Accommodation will be allocated on demand on a first-come-first-served basis. Delegates will, of course, be free to stay in nearby hotels, but are responsible for their own booking. Delegates wishing to select their own accommodation may be interested to peruse: www.londontouristboard.com. You should select hotels in the Bloomsbury area. A list of geographically suitable hotels will be placed on the society's websites.

I wish to reserve a room in Ramsey Hall for:
10th September @ £23.75:_____
11th September @ £23.75:_____
12th September @ £23.75:_____
TOTAL: _____

3 SOCIAL EVENT ON THE EVENING OF THURSDAY 12TH OF SEPTEMBER

Because of the lack of sponsorship funding earlier in 2002, we reluctantly had to abandon the London Eye/Royal Festival Hall social evening. However, in its place we have booked the headquarters of the Geological Society, Burlington House, Piccadilly, London W1J 0BG (opposite the famous Fortnum & Masons store). On the evening of September 12th there will be a lecture by Martin Farley (University of North Carolina at Pembroke): "Forging a path for biostratigraphy" followed by a reception in the Lower Library. Delegates will be able to tour the historic building and see exhibits including William Smith's first geological map. Attendance of this event is included in the registration fee, however additional tickets may be purchased at £9.95.

4 ISLE OF WIGHT FIELDTRIP

Drs Iain Prince, Bruce Tocher (Statoil) and Ian Jarvis (University of Kingston) will lead a fieldtrip to the Isle of Wight to examine the Cretaceous succession. More details are given in the separate text on this. The field party will depart London after lunch on Friday 13th of September and return to central London on the late afternoon/evening of Sunday 15th September. Please note that non-UK participants are strongly advised to book their return flights for Monday 16th September because we cannot guarantee a specific time by which you will be returned to central London.
The cost of the fieldtrip is £250 per person assuming each person occupies a double room. If you are prepared to share a room, the price is £210 per person. 28 places are available on a first-come-first-served basis. The cost of this fieldtrip includes a guidebook, all travel costs to and from the Isle of Wight, two nights bed and breakfast accommodation, two evening meals, two packed lunches and a cream tea.

I wish to attend the Isle of Wight fieldtrip and will take a double room (£250):_____
I wish to attend the Isle of Wight fieldtrip and will share a double room (£210):_____

5 GULF OF MEXICO WORKSHOP - SATURDAY 14TH SEPTEMBER

Drs Garry Jones of Unocal, Sugar Land, Texas and Brian J. O'Neill of Shell International Exploration and Production Incorporated, New Orleans, Louisiana have kindly offered to run a seminar style workshop/short course on 'Applied Biostratigraphy in the Petroleum Industry with Special Reference to Gulf of Mexico Deep Water Exploration and Development' on Saturday 14th September at University College London. This will be an informal workshop including paper exercises with modern seismic and biologs using IPS which all delegates are welcome to attend up to a maximum of 25 on a first-come-first-served basis. There is no separate charge for this workshop and neither formal catering nor accomodation has been arranged by the conference organisers. A seminar room has been arranged at UCL. Delegates wishing to attend this event should register with Garry Jones (garry.jones@unocal.com) and Brian O.Neill (boneill@shell.com).

6 PAYMENT SUMMARY

I	Registration (see above):	_____
II	Additional Icebreaker tickets (£8.50):	_____
III	AASP Business Luncheon @ £20 (13th September 2002):	_____
IV	Additional tickets for the AASP Business Luncheon @ £20:	_____
V	Accommodation at Ramsey Hall (see above):	_____
VI	Additional Abstracts/Programme volume @ £7.00:	_____
VII	Additional social evening tickets @£9.95:	_____
VIII	Isle of Wight fieldtrip - double room @ £250:	_____
IX	Isle of Wight fieldtrip - will share a double room @ £210:	_____

TOTAL: _____

Personal Information:
Name: _____
Address: _____
_____
_____
_____
Tel: _____
Fax: _____
Email: _____

Payments by cheque (made payable to the British Micropalaeontological Society please) or credit card, both in GB£:

Credit Card Information:
Visa: _____
MasterCard: _____
Credit Card Number: _____
Expiry date: _____
Name on card:_____
Signature:_____

Send completed registration forms by 26th July 2002 to:
Dr James B. Riding, British Geological Survey, Keyworth, Nottingham NG12 5GG, UK.
For more information contact: jbri@bgs.ac.uk

Joint AASP-BMS-NAMS Meeting on Exploration Biostratigraphy
Field Trip: The Cretaceous of the Isle of Wight

Leaders : Iain Prince1, Ian Jarvis2 and Bruce Tocher1
1Statoil, Forushagen, Forus, 4035, NORWAY.
2School of Earth Sciences and Geography, CEESR, Kingston University, Penrhyn Road, Kingston upon Thames, Surrey KT1 2EE, UK.

Itinerary :

FRIDAY 13TH SEPTEMBER 2002
Depart conference venue (University College London) c.13.00h. in one or two minibuses. Arrive Isle of Wight, staying in a hotel in Ryde (evening meal in hotel). If you are willing to share a hotel room, this will help the organisers (a block of 23 rooms have been reserved).
(Please note the field trip must leave early Friday afternoon due to traffic conditions. If we leave at 17.00h, we would miss the ferry crossing).

SATURDAY 14TH SEPTEMBER 2002
Sandown to Culver Cliff: examine the Barremian to Turonian interval (i.e. Wealden, Lower Greensand, Gault, Upper Greensand, Lower and Middle Chalk up to Chalk Rock).
St. Catherines Point: examine the Albian-Cenomanian interval (i.e. Upper Greensand, Glauconitic Marl and Lower Chalk). Also a chance to collect ammonites from fallen blocks on the beach. Packed lunch will be provided; evening meal at the hotel.

SUNDAY 15TH SEPTEMBER 2002
Whitecliff Bay: examine the Turonian/Coniacian boundary to the Upper Campanian (i.e. Middle and Upper Chalk).
Depart c. 15.00h, arriving central London during the evening. The arrival time depends on traffic conditions.

We very strongly suggest that participants with flights arrange these for Monday 16th, and book hotel accommodation for the evening of Sunday the 15th. Traffic into Central London is particularly bad on Sunday evenings and we can not guarantee our return time.

The field trip will concentrate on sedimentology and biostratigraphy (palynology and micropalaeontology) and will include discussion of depositional and palaeoceanographic models based on our current understanding/knowledge. For those interested in the Tertiary, Day 2 involves walking past the classic Palaeocene-Eocene (Reading Formation, London Clay, Bracklesham Group) section at Whitecliff Bay. While no formal talks will be given on the Tertiary, it will be possible for individuals to remain and examine this section while others continued on to study the Chalk. Guidebooks will be provided in detail for the Cretaceous and in general for the Tertiary.

Good walking shoes/boots and waterproofs will be essential, as we will be away from the vehicles for long periods.
Please note that the number of places is restricted to 28.

To register for the trip, fill out the registration form accordingly. For more information, please contact the Field Trip convenor, Iain Prince on: IPRI@statoil.com, with copy to jbri@bgs.ac.uk. Iain Prince and Jim Riding will compile an email mailing list and you will be kept fully informed.

JOINT MEETING OF AASP-TMS-NAMS
11TH-13TH SEPTEMBER 2002
UNIVERSITY COLLEGE LONDON

Full programme of 80 presentations with sessions on

EXPLORATION BIOSTRATIGRAPHY

Including:

- *Forging a path for biostratigraphy*: M. Farley (University of North Carolina at Pembroke)
- *Data integration: key to robust reservoir models*: C. Denison & R. Preece (ChevronTexaco)
- *Janice Field: palynostratigraphic & geological setting*: L. Riley & P. Ware (Kerr McGee)
- *Biostratigraphic impact on Orme Lange Gas Field*: M. Charnock (Norsk Hydro) et al.
- *Morphostratigraphy of Maureen Formation, Fleming Field*: E. Monteil (ex BG Group)
- *Forties Field: applications of biostratigraphy to mature field*: G. Williams & S. Payne (BP)
- *Mungo Field: bugs, dose of salts & reservoir development*: S. Payne (BP) et al.
- *Early Eocene Hasdrubal Field, offshore Tunisia*: H. Bailey et al. & A. Racey (BG Group)
- *Sequence biostratigraphy Haima Supergroup, Oman*: S. Molyneux, P. Osterloff (PDO) et al.
- *Devonian maturity studies in Bolivia*: J. Marshall, A. Racey (BG Group) et al.
- *Glacigenic Al Khlata Formation, Oman*: R. Penney & P. Osterloff (PDO)
- *Permian palynology & isotopes, Oman*: M. Stephenson, M. Leng & P. Osterloff (PDO)
- *Ravenscar Group: Middle Jurassic analogue*: N. Butler & M. Charnock (Norsk Hydro) et al.
- *Early Cretaceous palynology, North Slope Alaska*: R. Davey (Robertson Research Int.).
- *Cretaceous biostratigraphy of Fiqa Formation, Oman*: S. Packer, P. Osterloff (PDO) et al.
- *Late Cretaceous depositional environments, Norwegian Sea*: P. Milner (BP Norge) et al.
- *Mid Norway Late Cretaceous sequences*: M. Charnock (Norsk Hydro) & S. Crittenden
- *Palynofacies of Gurpi Formation, Iran*: E. Ghasemi-Nejad & M. Hadi Hobbi (Tehran Univ.)
- *Paleogene palynology of Llanos Foothills, Colombia*: C. Jaramillo et al. (Ecopetrol).
- *Sequence boundaries in Mackenzie Delta region*: M. Parsons & G. Norris (Toronto Univ.)
- *Miocene biotic signals, Central Sumatra Basin*: C. Denison (ChevronTexaco) et al.
- *Neogene sea level changes of Niger Delta*: R. Morley & O. Ulu (ChevronTexaco)
- *Neogene ancient shelf margins, northern Gulf of Mexico*: G. Jones (Unocal) et al.
- *Upper Neogene sequence biostratigraphy, Trinidad*: L. de Verteuil (Latinum) et al.

For full programme and registration details visit TMS website (www.tmsoc.org) or contact TMS Secretary, Jamie Powell (ajp@dinosystems.co.uk)