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AASP NEWSLETTER
PALYNOLOGY LABORATORY
ANTHROPOLOGY BUILDING
TEXAS A&M UNIVERSITY
COLLEGE STATION, TEXAS 77843-4352

A.A.S.P. NEWSLETTER

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Volume 27, Number 1
J.K. Lentin, Editor

AASP NEWSLETTER EDITOR:

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The AASP NEWSLETTER is published 4 times annually. Members are ENCOURAGED to submit articles, "letters to the editor", technical notes, information about "members in the news" and information about job openings in the industry. Every effort will be made to publish all information received from our membership.

Deadline for the next NEWSLETTER, the second in 1994, is April 15. Please send all information on computer disk in IBM - ASCII or Word Perfect format, if possible, if not - send a typed manuscript. Information which comes via E-mail is also welcome. We look forward to contributions from our membership. The FAX and E-mail numbers for the AASP NEWSLETTER are as follows:

FAX: (403) 262-1629
E-mail: jones@xenlink.cuc.ab.ca

MESSAGE FROM THE PRESIDENT

Palynologists, or paleontologists, or earth scientists, or scientists in general are pessimistic. They are disappointed with funding levels, the job market, and the overall outlook for their field. Life is not rosy. Here is my advice: First you deal with the world as it is, not as you wish it were. Then you work to change it.

The world doesn't owe palynologists a living. We have to prove our value. We have to know why our work is important and demonstrate its worth on a daily basis. We must do our absolute best on our age calls and environmental interpretations and other analyses. We can't just present our data, we have to know what they mean geologically or archaeologically or environmentally. We must be able to talk the language(s) of our audiences.

I recently gave a somewhat humorous talk to a diverse audience of geologists and hydrologists entitled "A paleontologist's view of aquifers and confining units." The first slide was of a field of view of dinocysts. "This is my view of an aquifer," I said. The second slide showed another field of view of more dinocysts. "This is my view of a confining unit." I got some good laughs and then proceeded to discuss cores, outcrops, well clusters, pump tests, and hydrologic models. Our view of the world simply cannot stop at my first two slides.

What can we do to change the world? Have you gone to an elementary school and talked about what you do? I've often been to the schools near Reston and talked

at them. This past year, I went to an elementary school in very rural southeastern Virginia. I gave a presentation to my niece's fifth grade class. Her teacher asked very politely if I could give the same presentation to the other three fifth grade classes -- so nobody would miss out. The kids and the teachers are eager for exposure to science and we can help. Go to the schools that really need you.

Have you written for the general public as well as for other palynologists? Palynologists are very good at talking to and writing for each other. My cousin once asked what I did for a living and I told her. Then she asked if it bothered me that I couldn't explain my job in less than 20 minutes. I got the point.

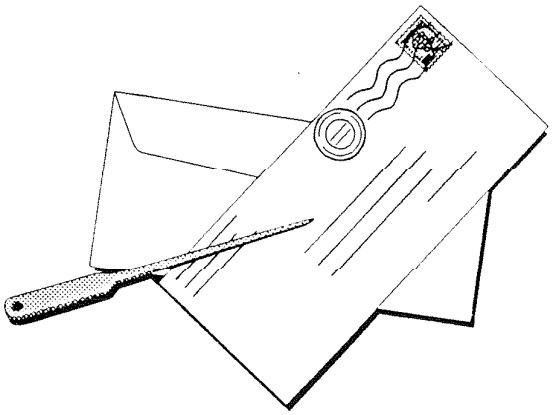
Have you co-authored papers with hydrologists or geophysicists? Have you talked to one this year? this week? Do you listen to them as well as talk?

AASP has worked very hard to establish the Center for Excellence in Palynology. Have you donated equipment or money for it? Have you asked your company to do so?

We can't look back on the "good old days of palynology" and make them come back. But we can look forward and make a difference.

Lucy E. Edwards, President

LETTER TO THE EDITOR



Dear Editor:

Much of the response to presidential messages and other contributions in recent numbers of the AASP Newsletter has been addressed to changing the functions and even the name of the Association as a means of tackling the results of serious lack of employment in paleopalynology, particularly in North America. I believer that the Association already keeps up-to-date very well and I prefer to suggest that there may also be a problem with the quality of the service we have hitherto confidently provided and have expected to be rewarded accordingly. Without belittling the many interesting other applications of palynology, it was no accident that the founders of the Association especially stressed "stratigraphy"; they w right to regard it as the central requirement of palynolo work. The petroleum industry may have been regionally downsized, but while the planet remains such a crowded place the Earth's crust will have to be intensively explored for very many other purposes; the economical way to do this is to locate strata accurately from the start of an operation, and making proper use of the whole fossil content has not been superseded as the unique method. Can we honestly argue that our correlations and zonations represent maximum effort when we have to admit that most are based only on selected elements of an assemblage? Have others detected that our elaborate and fairly ponderous processing has been too costly for the often meagre results? How much is "identified" but not used, and why? I have to confess that for many years I was disappointed with the quality of my own stratigraphic results from studying such large numbers of diverse palynomorphs, all with very numerous characters; I believed that they should have yielded much more valuable information. It is frequently hinted that all would be well, or at least much better, if only those many older relatively innumerate members would learn to use computers properly. Sadly, it is not so simple, I have become convinced that many clever manipulations that have been tried have exhausted the possibilities with the commonly accepted level of input data available from curr procedures. This appears to be true for palynomorphs of all ages and equally for most if not all of microfossils.

My tentative conclusion is that one central reason for our current lack of success is through continuing to use our outdated taxonomic approach, aggregating the "partly known" if at all possible into as few taxa as have been parsimoniously erected; discarding all supposed synonyms; such a procedure has long been known as "lumping". It probably was a fine policy for far-ranging reconnaissance which is what most of us have hitherto been doing; but it is entirely unsuitable and counter-productive in an exploitation phase in which the requirement is to discriminate as fine stratigraphy as the whole data will allow. Consequently for the future I advocate an opposite taxonomic style of plentiful taxa more closely representing the great diversity of nature past, and a controlled arrangement of comparison records. This together with a new "bracket" approach to correlation which can then be progressively refined as new data accrues, is described in detail in my 1989 publication "Fossils as information" (Cambridge University Press), which was designed from a playnologic base. It involves a partial break with ICBN, and some new data-handling and statistical treatment, but nothing seriously impractical.

All right, this letter has become a minor plug; b it is also a serious and entirely sincere suggestion for those who may seek to identify, explain and eventually circumvent the ills that have befallen our subject. I

contend that in general we have now down the main reconnaissance in paleopalynology, and that our new function is to exploit some genuinely useful further development of much finer stratigraphy which can then be sold. Topics such as paleoecology and paleoclimatology are side-issues of great interest, but ultimately stratigraphic precision is the key to the success of all such work. Clinging to the belief that we have already explored everything possible is an understandable reaction, but it is not accurate and is seen by others to be entirely unworthy of further financial backing. We have to initiate and to make the significant changes ourselves; they may be along the lines I have suggested above, but possibly other newer ideas will prove to be better. In an case we all face a major challenge that is not primarily of either economic or of external origin.

Norman F. Hughes
Department of Earth Sciences
Downing Street
Cambridge CB2 3EQ
U.K.

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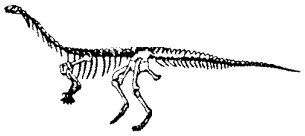
Another note on fossils and the law...



The owner of the most complete skeleton of a *Tyrannosaurus rex* has been charged with taking fossils illegally from US government land. But the company concerned, the Black Hills Institute of Geological Research, says it is innocent.

The company, four of its employees and four other individuals were formally charged late last month. The indictment does not specifically mention "Sue", the *T. rex* skeleton that hit the headlines last year after it was seized by the FBI. The government impounded the skeleton in 1992 during its investigation into the company's practices. The dinosaur was unearthed on Indian land in the Black Hills region of South Dakota in 1990.

The indictment accuses the company of trafficking illegally in a variety of other fossils, including remains of the dinosaurs *Triceratops, Acanthoceras, Edmontosaurus,* and fossil catfish, sharks and turtles. According to the charges, the bones were taken from Indian reservations as well as government property.

A date has not yet been set for the trial. Each of the 39 counts in the indictment carries a potential penalty of 10 years in jail and a fine of $250,000.

NOTICE

Modern Pollen Reference Collection From China

The Institute of Botany of the Chinese Academy of Sciences has made available ca.300 different modern pollen types from different regions of China. The pollen slides may be sealed with wax, or silicon oil or Canada Balsam as you prefer. The price for a slide of each pollen type is 3 US$, each extra slide costs 2 US$. A box for holding the slides costs 20 US$. Package and postage are free. Please indicate clearly what type and how many slides for each type you would like to order. After we have received your order and remittance or cheque, we will dispatch the pollen slides within 30 days. Please make cheque payable to:
Ms. Naiqiu DU, Institute of Botany

[A list of pollen and spore taxa available in this collection is available from Vaughn Bryant at Texas A&M.]

Order Address:

Dr. Qinhua Jiang,
Geology Department
Beijing University
Beijing 100871, P.R. China.

or:

Ms. Naiqiu Du
Paleobotany Section, Institute of Botany
Chinese Academy of Sciences
Ziangshan, Beijing, P.R. China.

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Announcement

The annual mid-year Board of Directors meeting is scheduled for March 26-27, 1994 in Fairfax, Virginia (about equidistant from Washington Dulles and Washington National Airports). The meeting begins at 10 a.m., Saturday. Please contact Lucy Edwards (703- 648-5272) for maps, lodging information, and further details. All interested AASP members are welcome to attend.
Lucy E. Edwards, President

Manuscripts for the next issue of PALYNOLOGY should be sent to:

Dr. David K. Goodman
Arco Alaska Inc.
P.O. Box 100360
Anchorage, Alaska 99501-0360

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MORE

in

94

Do not forget...

1994 AASP MEETING--COLLEGE STATION, TEXAS

SEE NEWSLETTER VOL. 26, NO. 4
FOR

REQUEST FOR SYMPOSIUM PARTICIPANTS

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C I M P

Commission Internationale de Microflore du Paleozoique Symposium on

STRATOTYPES AND STAGES, PALYNOLOGY, PALAEOENVIRONMENTS AND STRATIGRAPHY

6th-10th September, 1994

Centre for Palynological Studies, Department of Earth Sciences, University of Sheffield, England.

Organising Committee: Geoff Clayton, Ken J. Dorning, David W. Jolley, Bernard Owens, Edwin Spinner

Local Secretary: Dr. D. W. Jolley
Centre for Palynological Studies
Department of Earth Sciences
University of Sheffield
Mappin Street
Sheffield S1 3JD
England

Fax: (0742) 739826

FIRST CIRCULAR
AND
PRELIMINARY REGISTRATION

CIMP and the Centre for Palynological Studies organising this joint symposium with particular emphasis on Phanerozoic stages and stratotypes, to reflect the need for discussion on modern palynological work. This should permit a more detailed interpretation and understanding of some European type sections and possible correlation on a world wide basis. During the Symposium meetings of the Acritarch and Chitinozoan subcommissions are planned, reflecting both academic and industrial interests in the Palaeozoic.

Scientists wishing to attend the Symposium may present papers or posters relating to the broad theme of the meeting. During the Symposium short optional field visits will be made which will be held in the laboratories of the Centre for Palynological Studies. Those wishing to attend and present papers are asked to complete the attached preliminary registration form and return to the local secretary by 1st March 1994.

Accommodation:

Accommodation will be based at Tapton Hall of Residence (forum for the 1987 "Boundaries in Palynology" CIMP. University of Sheffield meeting) where the technical sessions and poster demonstrations will be held. The likely cost will be around £40 per day, updated costs will be gi with the second circular.

Papers already offered to the organisers include:

Late Permian Microflora from Turkey; Further Application of Microwave Technology in Palynological Preparation; Acritarch Biostratigraphy of Silurian Depositional Sequences; Early Namurian Microfloras from Northeast England; Palynological Evidence for Early Tertiary Climate Change

Second Circular:
A second circular will be mailed to all those responding during March 1994, and will include details of the programme, costs and a final registration. Provisional registration form is attached to the back of this newsletter.

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A note from Thomas Persson of the Dept of Quaternary Geology, Lund University, indicates that the supply of *Lycopodium* spore tablets is now sold out. The Department is negotiating with a new supplier and they believe that more tablets will be available in several months. The AA NEWSLETTER will let you know when the spore tabl... are available. *[See Vol.25,No.4,p.20 for more information]*

CENTER FOR EXCELLENCE

IN

PALYNOLOGY

LOUISIANA STATE UNIVERSITY

The final agreement between AASP, Inc., the LSU Foundation, and Louisiana State University has been signed.

AASP is now committed to exert its best effort for raising the sum of $1,200,000 to endow two Chairs in Stratigraphic Palynology. John Wrenn is the first and current Director.

Tax-deductible contributions may be made to: Center for Excellence in Palynology, The LSU Foundation, 3960 W. Lakeshore Drive, Baton Rouge, LA Louisiana 70808.

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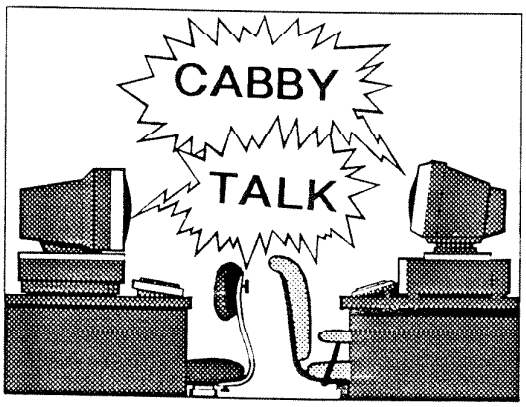


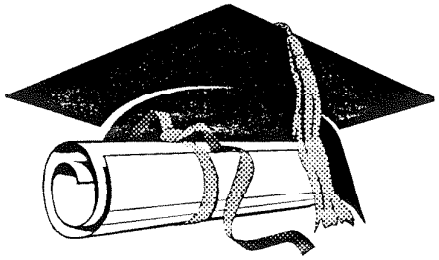
COMPUTERS IN PALYNOLOGY

We urge the AASP membership to submit news and articles on computer application in biostratigraphy to our Newsletter. We are still interested in compiling a database on biostratigraphic software. Please contact any of the Committee members (Michael Farabee, Massoud Jameosanaie, Warren Kovach, Judith Lentin, or Pierre Zippi) if you like to share such information with your colleagues. We are looking forward to hearing from you!

StrataBugs

Information on the new biostratigraphy database system "StrataBugs" arrived after the typing for this issue was finished. The program will be reported in the next issue. The early edition of this software was described in "CABBY TALK" in Vol.25,#2,p.8, under the name STRATS.

THESIS ABSTRACTS



PALYNOSTRATIGRAPHY AND PALEOECOLOGY OF MID-CRETACEOUS FORMATIONS AT DRILLING SITES IN WESTON AND JOHNSON COUNTIES, POWDER RIVER BASIN, WYOMING

by

TERRENCE A. OKUMURA
B.S. Chapman University, 1976
M.S. University of Colorado, 1979

Abstract

Cores from two wells drilled on the flanks of the Powder River Basin, Wyoming, penetrated mid-Cretaceous strata that were sampled for palynomorph content. The Beaver Creek (eastern) well penetrated the mid-Cenomanian Belle Fourche Shale, the upper Cenomanian-lower Turonian Greenhorn Formation, and the lower Turonian-Coniacian Pool Creek, Turner Sandy, and Sage Breaks Members of the Carlile Shale. The Bailey Flats (western) well penetrated the lower, middle, and upper Cenomanian Belle Fourche Member of the Frontier Formation, the upper Turonian Wall Creek Member of the Frontier Formation, and the Sage Breaks Member of the Cody Shale.

A total of 130 marine and nonmarine palynomorph taxa are described and illustrated. Of these, 87 are dinocysts, 7 are acritarchs, 26 are spores, and 10 are pollen. Dinocysts are abundant in both wells except in the upper portions of the Belle Fourche Member of the Frontier Formation where spores dominate. Acritarchs and pollen are minor components of the total palynomorphs in both wells. Two dinocyst biozones are informally defined: The Cenomanian-middle Turonian *Litosphaeridium siphonophorum* zone and the upper Turonian-Coniacian *Chatangiella* zone.

Incremental first and last dinocyst occurrences are described for the Cenomanian-Turonian boundary. Shoreline fluctuation is measured by comparing the relative abundance of the terrigenous palynomorph component against that of the terrigenous palynomorph component against that of the marine component. No correlation was found between dinocyst morphotype and distance to shoreline. Cenomanian and Turonian incursions of warmer southern water masses are defined by dinocysts previously described only from the Tethyan realm, although more species are boreal in affinity. Detrended correspondence analysis was used to define two groups of dinocyst assemblages in each well. In the Bailey Flats well, an assemblage change occurs in the upper Cenomanian. In the Beaver Creek well, an assemblage change occurs between the middle and upper Turonian. The occurrence of four taxa of reworked Upper Paleozoic and Lower Mesozoic nonmarine palynomorphs correlates to incursions of warm southern waters. Triporate pollen in the upper Cenomanian Greenhorn Formation of the Beaver Creek well represents the earliest occurrence of this type of pollen ever reported for the Cretaceous Western Interior of North America.

A thesis submitted to the Faculty of the Graduate School of the University of Colorado in partial fulfilment of the requirement for the degree of Doctor of Philosophy Department of Geological Sciences 1994.

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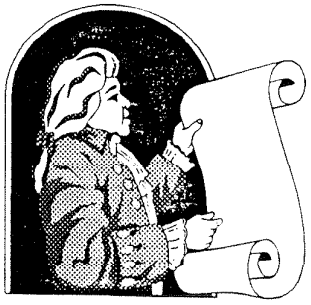

1994

CANDIDATES

FOR

AASP
BOARD OF
DIRECTORS

The nominating committee of the AASP, appointed by the president of the Board of Directors (Don Benson, Chair) has submitted the following slate of candidates:

President-Elect:
Jan Jansonius
Norman J. Norton
Secretary-Treasurer:
David T. Pocknall
Editor:
David K. Goodman
Director-at-Large (2):
Rosemary A. Askin
Thomas D. Demchuk
Gerald L. Waanders
James M. White.

According to Article 7.01 of the AASP Bylaws, the Nominating Committee shall propose no more than two (2) candidates for each Board membership and the names of candidates for the Board as submitted by the Nominati Committee shall be mailed to the membership. T. communication must quote Article 7.03:

> "Additional nominations may be made by any member in good standing by submitting a petition, signed by a least nine (9) other members in good standing, to the Secretary-Treasurer by March 1."

Photographs and biographies of the candidates will be published in the next newsletter.

AASP STUDENT SCHOLARSHIPS

The American Association of Stratigraphic Palynologists is pleased to announce its program of Student Scholarships support studies in palynology. Currently, two su.. scholarships for $300 (US) each may be awarded annually. Ordinarily the scholarships will be awarded to graduate students, but advanced undergraduate students may also apply.

Basis of Awards - 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.

To Apply - Part A of the application form (attached at back of NEWSLETTER) is to be filled out by the student and Part B by the student's faculty supervisor. The faculty supervisor will send both forms together to the address given at the end of Part B. Scholarship applications must be received no later that April 1, and awards will be announced by April 30.

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Errata (plural)
1994 Membership Directory

Del Potter is indeed one of the AASP Founding Members even though his name was omitted from the list in the front the 1994 Directory (page iii). Also, we will attempt to give K. Farley Fleming only one "m" in future references (page i), and Lew Stover's middle initial is "E", not "R". (page iii).

PALYNOLOGY IN THE NEWS

Plants provide clues to dinosaurs' demise

[This article by Jeff Hecht which appeared in the August 21, 1993 issue of ***The New Scientist*** *is an example of Good News that our science needs to produce.]*

"Plant fossils are revealing new data about the mass extinctions at the end of the Cretaceous, 65 million years ago. A number of researchers in the US say that the event that killed creatures such as the dinosaurs must have had a much more complex cause than a period of cold and dark following the impact of an asteroid.

Plant fossils show little evidence of such global climate change at the end of the Cretaceous. In fact, recent studies show that plants were affected differently, depending on their location. Researchers also claim that some plant species were dying off before the end of the Cretaceous.

"Plants are hard to kill," says Kirk Johnson of the Denver Museum of Natural History. Nevertheless, his study of leaf fossils found in North Dakota shows that 85 per cent of plants vanished at the end of the Cretaceous. Fossil pollen reveals an extinction rate of only 30 per cent, but Johnson says this is because the pollen of many species is indistinguishable.

A closer look at pollen seems even to quash the theory of major climate change during the Cretaceous. According to Doug Nichols of the US Geological Survey in Denver, palms and screw pines, two groups easily killed by frost, survived across the Cretaceous-Tertiary boundary as far north as Saskatchewan, in western Canada. So if there was a cold, dark period after an impact, it might have lasted only a few months. As far south as New Mexico, the extinctions occur exactly at the boundary layer, without the graduation from north to south expected for progressive cooling.

Art Sweet of the Geological Survey of Canada, based in Calgary, sees evidence for a gradual die-off of species in the plant community before the end of the Cretaceous. He analyzed pollen from Canada and Montana, and found evidence of a long-term decline in the variety of flowering plants. One particulary large group, the Triprojectates, was wiped out at the end of the Cretaceous. The gymnosperms (such as conifers) which formed the forest canopy also vanished suddenly. Sweet believes that the boundary event, while affecting mainly gymnosperms, was superimposed on a more long-term trend that affected all plants.

The global pattern of extinctions poses another puzzle. Extinction rates are high in western North America, where most work has been done. However, Johnson says that New Zealand suffered far fewer extinctions. He says only 1 to 2 per cent of pollinating species seem to have vanished.

Such a pattern hints that the asteroid impact may have come at the start of the growing season in the northern hemisphere, says Johnson. Southern plants could survive months of darkness better because they were entering a dormant period, but northern plants would have lost a whole growing season." The New Scientist/August 21, 1993

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CENEX

CENTER FOR EXCELLENCE IN PALYNOLOGY

PROGRESS OF CENEX

[This report on the progress of CENEX was presented by John Wrenn at the AASP annual meeting, October 1993]

Since arriving at LSU on January 11, 1993 to establish the Center For Excellence In Palynology (CENEX) my efforts have been directed toward:

1. Raising funds for the operation of CENEX,
2. Building a palynology processing laboratory,
3. Organizing three professional meetings,
4. CENEX administrative matters,
5. Teaching, and
6. Efforts to benefit the entire Department of Geology and Geophysics.

A more detailed overview of these efforts is provided below, under the six headings listed above.

1. Raising funds for the operation of CENEX, by:

   A) Writing grant proposals to raise moneys for research, travel funds for participants of the Pliocene Symposium and the AASP Meeting, Post-Doctoral positions and graduate student Research Assistantships. Three of the proposals have been funded, garnering approximately $17,000. Five additional proposals, totalling $1,013,665, and

under consideration by the granting agencies or are in final development for submission.

All of these proposals, except the travel grants, are for interdisciplinary projects and some involve or could lead to interdepartmental research. It is the Intent of CENEX to build research bridges wherever possible within the University and with other national and international institutions.

B) Conducting projects on speculation.
In an effort to raise moneys to support graduate student Research Assistantships, Post-Doctoral Fellowships and research within CENEX, I will analyze 60 samples from the Mississippi Delta (for the Louisiana State Geological Survey) and 100 samples from the Mahakam Delta (for the Coastal Studies Institute; processing provided by UNOCAL). The purpose of analyzing these samples is to demonstrate the utility of palynology for environmental discrimination in modern sediments. These examinations will be done for the cost of sample processing only.

If the Louisiana State Geological Survey and the Coastal Studies Institute conclude that palynology will help in their delta studies then it is possible that funds for palynological research will be included in future phases of their work. The funds I seek here are primarily for student support and lab operations.

c) Although CENEX was not involved, a presentation was made to the Texaco Foundation in September, 1992 concerning their support of the Endowed Chair in Palynology. Their decision has not been made yet.

Fund raising efforts for the Endowed Chair were dealt a sever blow during August, 1992 when Dr. Ken Piel left UNOCAL. Ken was doing all the fund raising himself and a replacement has yet to be names by AASP; This will be a topic of discussion at the AASP meeting at the end of the month.

2) Building a palynology processing laboratory,

A) Preliminary floor plans are under development for the CENEX palynological processing laboratory.

B) I have continued soliciting surplus laboratory equipment from oil companies. More than $122,000 worth of laboratory equipment has been acquired to date. Currently I am negotiating the acquisition of more than $250,000 worth of additional laboratory and computer equipment.

3) Organizing three professional meeting

A) With the help of Dr. G. F. Hart, I have been organizing the 26th Annual Meeting of the American Association of Stratigraphic Palynologists, Inc. AASP). This national mee is attracting over one hundred scientists from countries to confer on palynology, climatic change, biostratigraphy, sequences stratigraphy, etc. Two short courses, two field trips and two symposia are being held during the meeting.

B) I am co-organizing the "Palynology, Climate and Sequence Stratigraphy of the Pliocene Symposium". Dr. Jean Pierre Suc (Vice-President of the International Federation of Palynological Societies; Universite de Montpellier, Laboratory de Palynologie, Montepellier, France) and I are convening this International Symposium dedicated to all aspects of the Pliocene geology on October 27-28, 1993. It is being held in conjunction with the AASP Annual Meeting.

C) I organized the logistics for the "Third Meeting of the International Group on Palynological Organic Matter Classification". Dr. Maria Antonieta Lorente (President of the Venezuelan Geological Society) is chairing this group who will meet to confer at LUMCON (October 29-November 1) immediately after the AASP Annual Meeting.

4. CENEX administrative matters

A) Part of my administrative duties include administering the $100,000 per annum Industrial Palynological Consortium. The purpose of the consortium is to fund palynologic research and is supported by Amoco Production Company, Phillips Oil Company, UNOCAL, Norsk Hydro Produksjon A.S., Elf-Aquitaine, and StatOil. For the administrative service provided by CENEX, the Palynology Consortium contributes a $5,000 graduate student fellowship to the Department of Geology and Geophysics annually.

B) With the help of George F. Hart, Department Staff and particularly special funds from Vice-Chancellor Jim Coleman, we have begun building the CENEX library to house the significant collections of palynologic research literature that have been given to CENEX. Dr. Ken Piel has donated a very extensive, completely cataloged and indexed reprint collection to the library. 75 boxes were required to ship the library to CENEX. The valuable collection of research literature is ready to use. Ken completely indexed and cataloged collection before donating it. (Thank you, Ken.)

Reprint collections of Drs. William R. Evitt (formerly of Stanford University) and George

F. Hart await cataloging and indexing. The acquisition of other reprint collections are under discussion.

5) Teaching

A) I have been seeking graduate students. Over one dozen requests have been received from scholars world-wide, who wish to pursue a Ph. D. degree or conduct Post-Doctoral research at CENEX. Of course, all need financial support. I have corresponded or spoken on the phone with these individuals and am trying to find support for a number or them.

B) I helped teach Biostratigraphy during the Spring Semester and am teaching Historical Geology this semester. Drs. B. Sen Gupta, J.E. Hazel and I will be developing a much needed Introductory Micropaleontology course during the Spring Semester (1994). We intend to offer this course in the Fall of 1994.

6) Efforts to benefit the entire Department.

A) Supervision of Ms. Cathy Duncan, computer support person for the Department of Geology and Geophysics, was added to my responsibilities during the Fall semester. My goal is to provide Cathy with the tools and training that are needed for her to support the emerging distributed computing environment that the Department is moving towards. She will continue her traditional support of the main frame computing environment as well.

Cathy and I will be working to promote the use of electronic mail for intra-office communication. Using a computer to distribute memos and notices will save time and money.

B) I have been gathering information and participating in discussions on the acquisition of a film recorder to be shared via the network by the staffs of the Geography Department, Coastal Studies Institute, the Graphics Group and the Department of Geology and Geophysics. This piece of equipment will greatly enhance the quality of our presentation graphics and yield savings of time and money in their preparation. The film recorder will permit the faculty to produce simple graphics and allow the Graphics Group to concentrate on producing more interesting and demanding tasks.

FUTURE PLANS FOR CENEX

1. Build the Palynological Processing Laboratory

Building the Processing Laboratory is the most important task to be pursued during the Spring Semester. Donated equipment is beginning to pile up. We must get the laboratory assembled and working as soon as possible. I will need a laboratory for the students when they start to arrive to study palynology. One or more students and/or Post-Docs should be here by next fall, if not sooner. Building the lab is critical.

2. Develop palynology courses.

These will be offered to students who have taken Introductory Micropaleontology and for Ph. D. students. In addition, short courses emphasizing the value and use of palynology in oil exploration and biostratigraphy need to be developed and marketed, particularly to all companies. Multimedia presentations on CD-ROMs could be an effective way to spread this knowledge - perhaps with the help of the AAPG.

3) Expand contacts with industrial laboratories and operational offices.

John H. Wrenn
Director
Center for Excellence in Palynology

NEW

LOGO

ANNOUNCED

IX IPC LOGO

The Ninth International Palynological Congress will be held in Houston, Texas, in June 1996. The logo, shown above, incorporates themes appropriate for the meeting. Houston is well known as the home of the NASA Johnson Space Center, and an anticipated IPC event will be a visit to that facility. Therefore, space exploration, and specifically the Shuttle, is an aspect of the logo design. The dominant form in the design is a pollen grain of *Salsola pestifer* (Russian thistle), a species of the family Chenopodiaceae. In fact, it could be the pollen of just about any species of the Chenopodiaceae, or of the Amaranthaceae as well. *Salsola pestifer* is common in North America (some would

call it a pest of agriculture). The chenopods include about 1400 species of halophytes in North America and other parts of the world and are present in salt marshes of the Texas coast; the amaranths include about 850 species of world-wide distribution and local species are known as a Native American food source. Pantoporate pollen morphology like that of the logo grain has been around since Cretaceous time. The resemblance of such pollen to certain astronomical bodies is just another example of the fractal scale-independence of nature.

The logo was conceived by Doug Nichols and created via the magic of computer technology primarily by Pat Holroyd, an associate of Doug's at USGS.

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DINOFLAGELLATES

ATTACK

NASA WORKERS

Florida Red Ride May Be Cause Of NASA Workers' Coughing Fits

CAPE CANAVERAL, Fla. Dec. 6 (UPI) Wracked by coughing fits, dozens of space shuttle workers are donning protective masks to cope with an irritating mist moving south along the Florida coast.

At least a dozen workers reported to the Kennedy Space Center infirmary Friday for treatment of coughing, itchy eyes and scratchy throats.

Department of Natural Resources officials say the irritant is red tide, a natural toxin that breaks up in the surf and is carried in the air like dust.

The employees are now wearing "fiber masks" said Dr. Wycliffe Hoffler, deputy director of the NASA bio-medical office at the Space Center. "Any type of filtration relieves the symptoms."

Hoffler said the symptoms appear to be caused by red ride but said NASA is testing its own air and water samples.

[This report is not completely accurate - at least most palynologists know that "red tide" is not a toxin. Blooms of Dinoflagellates produce red tides and often also produce toxins in the water.]

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Dr. R. Farley Fleming, US Geological Survey, has been appointed as the AASP representative on the American Geological Institute Member Society Council

UNOCAL/AASP BEST APPLICATIONS PAPER AWARD

At the 26th Annual AASP Meeting in Baton Rouge, we heard papers presenting a broad array of palynological applications. After tallying the point totals, two papers tied for what the judging committee felt were not only outstanding but also unique applications of palynology in addressing a scientific problem. This year Unocal will donate $1000 for the AASP Best Applications Paper Award, to be shared as a $500 award each, for the following papers: (1) *Entomopalynological techniques used in the search for migratory and feeding habits of adult corn earworm, celery looper, and cabbage looper moths*, by Vaughn M. Bryant, Jr., Peter D. Lingren, Michael W. Pendleton, and Gretchen Jones; and (2) *Microfossil analysis for detecting prehistoric earthquakes*, by Rolf W. Mathewes. The award is to be used to help defray expenses incurred in presenting their paper at a national, regional, sectional, or other appropriate scientific meeting, with the intent of promoting the science of palynology.

The award was originally intended to recognize palynological applications in solving primarily geologic/stratigraphic problems. Because palynology is such a unique, all-encompassing discipline, covering terrestrial to marine fossil groups from the Proterozoic to the Quaternary, as well as modern counterparts, it is difficult not to consider all aspects of palynology for recognition of applications. The award is given for the paper presenting a palynological application that the judging committee considers to be an outstanding contribution, not simply the best for any particular meeting.

Judging categories include (1) presentation style (23%); (2) visual aids (27%); and (3) content, organization, and impact (50%). The judging committee this year consisted of Roger Witmer (*Chairman*; Unocal), Reed Wicander (Central Michigan University), and Maria Lorente (Maraven, Venezuela). Unocal looks forward to presenting this award again next year at College Station, Texas. Congratulations to this year's winners!

---Roger J. Witmer, Unocal

TYPE COLLECTION

THE AMERICAN ASSOCIATION OF STRATIGRAPHIC PALYNOLOGISTS-CARNEGIE MUSEUM OF NATURAL HISTORY PALYNOMORPH TYPE COLLECTION

A permanent Palynomorph Type Collection (PTC) has now been officially established jointly by the American Association of Stratigraphic Palynologists (AASP) and the Carnegie Museum of Natural History (CMNH) in order to provide a permanent repository for palynological type specimens and related materials. The collection is maintained in the Section of Paleobotany at CMNH in Pittsburgh, Pennsylvania. AASP and CMNH urge that this repository become an established collection for type specimens now residing in personal, university, and corporate collections, and for any types established in the future. Unless existing type materials are deposited in a permanent repository, they may ultimately be lost to science. The 1988 International Code of Botanical Nomenclature (ICBN) states that "For the name of a new species or infraspecific taxon published on or after 1 Jan. 1990 whose type is a specimen or unpublished illustration, the herbarium or institution in which the type is conserved must be specified."

WHAT TO SUBMIT

CMNH will accept only two kinds of specimens for inclusion in the PTC. These are: (1) nomenclatural types -- holotypes, isotypes, syntypes, paratypes, lectotypes, and neotypes as defined by the applicable version of the ICBN, and (2) specimens that have been illustrated in scientific publications. Voucher maceration residues of type or illustrated materials may be submitted, but unmacerated rock samples will not be accepted.

All palynological specimens must be mounted on clean, high-quality, permanent glass slides. Slides must be properly labelled with: (1) taxon name, (2) author's name, and (3) specimen or sample number. The slides must be accompanied by: (1) a description of the preparation techniques, (2) a description of the mounting media and any sealants used on the coverslips, (3) England Finder coordinates for each type specimen and/or published specimen, (4) a detailed description of the geographic location and stratigraphic position of the sample from which each specimen was recovered (including annotated maps, if available), and (5) an original copy of the relevant publication that contains the description of each nomenclatural type or, in the case of published specimens, a copy of the publication containing the illustration of each specimen. Specimens mounted in special media, such as for scanning electron microscope analysis or in liquid media, may require special handling; contact CMNH before submitting such materials.

Voucher maceration residues that produced the type specimens or published specimens may also be submitted, but are not required. Maceration residues should be stored in sealed glass vials labelled with the necessary information and provided with a description of the storage medium.

HOW TO SUBMIT

All materials to be submitted to the PTC at CMNH should be sent to:

Dr. Mary Dawson
Section of Paleobotany
The Carnegie Museum of Natural History
4400 Forbes Avenue
Pittsburgh, Pennsylvania 15213, USA.

Materials received by CMNH will be acknowledged and then evaluated as to their suitability for the permanent collections. In the case of unusual materials, outside reviewers may be consulted as to the appropriateness of the submitted specimens for the collection. Unsuitable materials (i.e., materials that do not meet the criteria under WHAT TO SUBMIT) will be returned. Once accepted into the collection, all type materials will be permanently accessioned and become the property of CMNH.

Individuals wishing to note in their original publications that their new type specimens or new published specimens have been deposited in the PTC at CMNH should contact CMNH prior to manuscript preparation.

ACCESS TO THE COLLECTION

Access to the collection will be granted to qualified individuals who have a demonstrated need (e.g., research) to examine nomenclatural types or published specimens. Type materials are not lent nor removed outside of CMNH, because the safety of type specimens is paramount. Scientists desiring access to the collection should contact the Section of Paleobotany in advance to arrange a mutually acceptable appointment. Every effort will be made to accommodate all reasonable requests.

Individuals desiring access to voucher maceration residues must submit a proposal describing the proposed research and its significance. Proposals will be reviewed with others from the professional community to verify the significance of the information to be gained by the utilization of the limited materials. Final determination will be made by the Director of CMNH in consultation with staff curators and outside reviewers. New slides or scanning electron microscope mounts made from voucher maceration residues remain the property of CMNH and must be returned to the PTC at the conclusion of the loan.

Doug Nichols
Farley Fleming
James E. King

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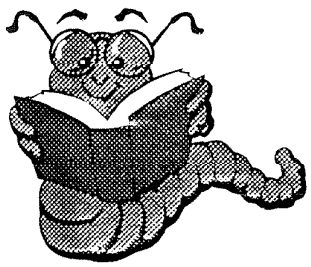

BOOK REVIEWS

Book Review Editor - Reed Wicander
Department of Geology
Central Michigan University
Mt. Pleasant, Michigan 48859

Palynology of Arid Lands. Aharon Horowitz. 1992. Elsevier, Amsterdam. 568 pages. $168.00

Since the early 1900s, more than 90% of all Quaternary-age pollen analyses have come from sediments with well-preserved fossil pollen such as peat bogs or related type deposits; furthermore, until the 1960s, many palynologists considered sediments from deserts and other arid-like environments a waste of processing and analysis time.

Horowitz's new book on arid lands is an attempt to change our minds about the potentials for recovering fossil pollen data from arid environments. He admits that although arid land sediments pose many special problems for sampling, processing, and recovering fossil pollen for analyses, they are, nevertheless, worthy of our attention and analysis.

To date, Horowitz's book is the most thorough coverage written on the subject of fossil palynomorph sampling, processing, and recovery from arid environments. Thirty years earlier, Paul S. Martin of the University of Arizona wrote a new classic monograph called the Last 10,000 Years. During the 1960s his book served as a "wake-up call" to archaeologists, geologists, ecologists, and palynologists, and demonstrated that deposits collected from highly alkaline arroyo soils, from arid land archaeological sites, from playa lakes, and from desert surface transects should be examined and utilized for interpretive purposes. It was the pioneering efforts of Martin and some of his graduate students that encouraged others to rethink their attitudes about fossil pollen recovery from arid lands, and go on to develop new techniques to conquer the special palynological problems created by these type of analyses. One of these other people is Aharon Horowitz, who has spent more than 25 years as a palynologist trying to solve some of the sampling, processing, and interpretive problems created by arid land sediments.

Palynology of Arid Lands is an expensive book to purchase, averaging about 40 cents per printed page. Nevertheless, it is a book most of us should own as a handy reference. It is divided into 11 chapters covering a host of narrow topics such as sampling, extraction, identification, and interpretation to broader questions related to vegetational reconstructions, special problems of archaeological sites, and the constraints and precautions that one should heed when examining pre-to-late Cenozoic pollen records from arid lands. Also included is an extensive bibliography, a reference index to authors cited, and a subject index.

As a palynologist who studied under Paul S. Martin, and who has also spent most of my career working with pollen records from arid lands, I found many points in Horowitz's book with which I can agree. Nevertheless, there are a few points with which I disagree. One of the nice aspects of the book is that Horowitz has tried to discuss many different

points of view, whether he agrees with them or not, pertaining to basic questions such as: how to sample arid land sediments correctly, how to extract fragile palynomorphs that may be badly decayed without destroying them, and how to interpret the resulting data. There are, however, some topics I would consider essential that are omitted from his discussion.

In the United States, one major focus of current fossil pollen research in arid lands is trying to determine the interpretive importance of pollen influx, pollen concentration, and the ratio of identifiable vs. indeterminate pollen per unit volume (or weight) of sediment. Horowitz admits that he is more concerned with what "is" still identifiable in an arid land sample than he is in knowing how many palynomorphs, or which taxa may have once been present before they deteriorated, or how many grains are no longer recognizable as anything more than just a palynomorph of some indeterminate type. My major research thrust, and that of others working in the United States, has focused more on trying to understand the elements that cause pollen destruction in arid land sediments. Our efforts center on trying to determine what the total palynomorph assemblage of an arid land sediment may have been at the time of deposition, and how the palynomorph assemblage has changed in composition through time. We believe that knowing "only" what palynomorphs remain in a deposit is only part of the needed answer. We feel that, to interpret our fossil data correctly, we must first gain an understanding of how many palynomorphs and how many different taxa may have been deposited originally. In a recent article, Dr. Stephen Hall and I noted that in one large study of fossil pollen from arid land sediments we found that 70% of deposited pollen "disappears" between the time it is deposited and the time it becomes preserved and that 60% of the individual pollen types could no longer be found in the buried deposits. I question the validity of trying to interpret a fossil record based on only 30% of the original palynomorph assemblage and 40% of the originally deposited pollen taxa.

Perhaps it is the many problems of trying to extract and identify fossil pollen records from arid land deposits that has created several distinct "schools" of though as to how one should interpret "what is left" of the fossil record. These same problems also create different views about how one should extract palynomorphs safely from arid land sediments. Horowitz believes in using only minimal extraction techniques and then counting "dirty" slides. As he says on page 172, "Counting such slides is in a way a matter of getting used to." I believe that one can sometimes make more counting errors trying to find and identify palynomorphs on a "dirty" slide than they might if the slide were cleaner. However, I would agree with Horowitz that extreme care must be exercised during extraction or one might "process" away many of the fragile and badly deteriorated grains in an arid land deposit.

In spite of some of my basic complaints and disagreements about some of Horowitz's ideas expressed in the book, I respect his views and can appreciate the effort and long hours that went into the writing of this book.

The benefits of the book, its overall usefulness as a reference source, and the wide range of subjects covered by the book make it a useful addition to one's library; even at 40 cents per printed page!

Reviewed by:
Vaughn M. Bryant, Jr.

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COMING EVENTS

1994

May 16-18: **G.A.C./M.A.C. Joint Annual Meeting.** Waterloo, Ontario. Details: Alan V. Morgan, Department of Earth Sciences, University of Waterloo, Waterloo, Ontario. N2L 3Gl. Tel: (529) 885-1211, Ex. 3231, FAX: (519) 746-2543.

June 12-15: **American Association of Petroleum Geologists Annual Meeting.** Denver, Colorado. Details: AAPG Meetings, Box 979, Tulsa, Oklahoma 74101, USA. Tel: (918) 584-2555, FAX: (518) 584-0469.

September: **4th European Palaeobotanical-Palynological Congress.** Heerlen, The Netherlands. Details: Dr. G.F.W. Herngreen, c/o Geological Survey, P.O. Box 157, 2000 AD, Haarlem, The Netherlands.

September 6-10: **CIMP 1994 Conference "Stratotypes and Stages, Palynology, Palaeoenvironments and Stratigraphy".** Sheffield, England. Details: Dr. D.W.Joffey, The University of Sheffield, Earth Sciences, Mappin Street, Sheffield S1 3JD, England. Tel: (0742) 768-555. FAX: (0742) 824-207.

October 24-27: **Geological Society of America Coal Geology Division Symposium at GSA Annual Meeting.** Seattle, Washington. Details: Dr. Thomas Demchuk, Amoco Production Company, PO Box 3092, Houston, Texas 77253, USA. Tel: (713) 366-2993, FAX: (713) 366-2404.

ANNOUNCEMENT

"Origin of Compositional Characteristics in Tertiary Coals: Paleoecology, Paleobotany and Palynology

This half-day symposium will focus on the controls of compositional aspects of Tertiary age coals. Specifically, it will examine coal from a botanical perspective rather than from the more standard maceral approach. By doing this, it is hoped to gain a better understanding of what actually controls the often wide-ranging character of different Tertiary coal beds. The symposium will emphasize using pollen as well as the identification of plant material in the coal itself to help reconstruct paleoecology and further the understanding of degradational processes active in the ancient mire system.

The keynote speaker for the symposium will be P.D. Moore who will speak on aspects of modern mire environments in relation to understanding variations seen in Tertiary coal beds. Another key presentation will be given by D.J. Nichols who will speak on the use of Tertiary palynofloral assemblages in reconstructing the vegetational components of paleowetlands. Other speakers on palynology will include R.F. Fleming, W. Reigel, D.J. McIntyre, and A. Kershaw. Several other speakers from around the world will emphasize various paleobotanical and petrographic aspects as they relate to reconstructing mire paleoenvironments and associated degradational processes. They include J. Esterle, R. Sykes, L.V. Hills, W. Schneider, J. Dehmer, and P.D. Warwick. The proceedings from this symposium will be published as a special volume of the *International Journal of Coal Geology.*

The convenors of the symposium, T.D. Demchuk, T.A. Moore and J.C. Shearer hope you are able to attend this meeting and make this symposium a great success.

November 2-4: **American Association of Stratigraphic Palynologists, Annual Meeting.** College Station, Texas. Deta[illegible] Prof. Vaughn M. Bryant, Jr., Te[illegible] A&M University, Department of Anthropology, College Station, Texas 77843-4352. Tel: (409) 845-9334/5242, Fax: (409) 845-4070.

November 15-17: **Oklahoma Geological Survey, Workshop and Field Trip.** Geology and Resources of the Eastern Frontal Belt, Ouachita Mountains, and Southeastern Arkoma Basin, Oklahoma. Poteau, Oklahoma. Details: Neil H. Suneson, Oklahoma Geological Survey, 100 E. Boyd St. Norman, Oklahoma 73019, USA. Tel: (405) 325-3031, FAX: (405) 325-7069.

1995

March 5-8: **American Association of Petroleum Geologists Annual Meetings.** Houston, Texas. Details: AAPG Meetings, Box 979, Tulsa, Oklahoma 74101, USA. Tel: (918) 584-2555, FAX: (918) 584-0469.

August 28-September 2: **XIII International Congress on Carboniferous-Permian.** Kraków, Poland. Details: Prof. dr. hab. Sonia Dybova-Jachowicz, Państwowy Instytut Geologiczny, Oddzial Górnoslaski, 1 Królowej Jadwigi, 41-200 Sosnowiec, Poland. Tel: 48 32, 66 20 36 (38), FAX: 48 32, 66 55 22.

October 10-14: **28th Annual Meeting of the American Association of Stratigraphic Palynologists.** Ottawa, Ontario, Canada. Symposia, Technical Sessions, Posters, Field Trip. Details: Ms. Susan A. Jarzen, Canadian Museum of Nature, P.O. Box 3443, Station "D", Ottawa, Ontario, Canada K1P 6P4, FAX: (613) 954-4724.

1996

June 22-29: **9th International Palynological Congress.** Houston, Texas. Symposia, Technical Sessions, Posters, Field Trips. Details: Prof. Vaughn M. Bry[illegible] Jr., Texas A & M University, College Station, Te[illegible] 77843-4352. Tel. (409) 845-5242. Fax: (409) 845-4070

LAST MINUTE NOTES...

The chief bean counter of the AASP - **Dr. David Pocknall (Treasurer)** has some new numbers for us. His telephone and fax numbers have changed since the last address book came out. Please note the following changes:

Tele: (713) 366-5399
FAX: (713) 366-7576
E-mail: dtpocknall@hou.amoco.com

Dr. B.S. Venkatachala, formerly the director of the Birbal Sahni Institute of Paleobotany, has recently been awarded the position of Emeritus Scientist by the council of Scientific and Industrial Research. His new address is as follows:

Wadia Institute of Himalayan Geology
33, Gen. Mahadeo Singh Road
Dehra Dun 248 001, India

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FROM THE EDITOR

My husband (Peter Jones) just telephoned me from the Island of Biak (in Indonesia). He bet me that I couldn't find the island on a map, because it is so tiny. Armed with a magnifying glass and the National Geographic Atlas of the world - I proved, yet again, that the world really is a small place. I found the Island, naturally. Peter is on his way to teach a course in Jakarta. This turns my attention to the problems of palynology in the very young sediments which produce oil and gas in Indonesia. I read one consultants (1993) report (whose authorship shall remain nameless) which stated **"palynology is of no use in Neogene sediments"**. This summary came from one of the best known biostratigraphic consulting companies in the world. Palynology in Neogene sediments may be more difficult, may take longer, but it is extremely valuable. Wake up and smell the coffee my friends - sell the science.

I was very startled to notice that in the last NEWSLETTER, the icon above the Message From The President is a man - our president is a woman. Not a single person noted my blunder and wrote about it. I am very surprised. This indicates to me that our dear readers are not particularly observant, don't care, or are simply too busy to waste time on such trivia. I prefer to believe the latter.

The icon selected to represent our president illustrates a calm, cool in-charge lady who is unruffled by life. The icon was drawn by someone who does not understand life or know our president. Imagine, if you will, being President of the AASP, a senior scientist with the United States Geological Survey and the mother of a new baby. You will notice from her "message" that she also has taken the time to give "somewhat humorous talks" in an effort to reach-out. If Lucy Edwards can take the time to reach-out - so can you.

Every member of this association of palynologist (notice I left out the "American" and the "Stratigraphic") can help spread the paly-truth. Vaughn Bryant at Texas A&M is a fine example of a palynological evangelist, writing letters and articles for newspapers and speaking on radio. In Calgary we recently heard him on a radio talk show - all the way from Texas.

The AASP NEWSLETTER will happily note any publicity you are able to bring to the science. Note the value of Tom Demchuk's efforts to put together a symposium which highlights the value of palynology at the Geological Society of America Annual Meeting [see Coming Events]. What a showcase! Palynologists talking to palynologists is fun, but talking to other geologists, botanists, archeologists etc., spreads the wisdom. Please think about how you may sell your science and then act. Reach-out.

COMMISSION INTERNATION DE MICROFLORE DU PALEOZOIQUE
Stages and Stratotypes. Palynology, Palaeoenvironments and Stratigraphy.

Provisional Registration and Request for Second Circular

Name: _____ Title: _____
Forenames Family Name

Address:

Telephone No.:

Fax No:

I wish to attend the symposium	YES	NO
It is likely that I shall be accompanied by ___persons		
I/we require accommodation in Tapton Hall of Residence	YES	NO
I am interested in attending the field excursion	YES	NO
I wish to offer a paper(s)	YES	NO
Provisional title of paper:		
I wish to offer a poster(s)	YES	NO
Provisional Title:		

PLEASE RETURN THIS FORM TO THE LOCAL SECRETARY:

Dr. D.W. Jolley
Centre for Palynological Studies
Department of Earth Sciences
University of Sheffield
Mappin Street
Sheffield S1 3JD
England
Fax: (0742) 739826

Part A - Application for A.A.S.P. Student Scholarship

Student's name:

Address:

Universities or other institutions attended (earliest listed first). Include the institution that you will be attending during tenure of the scholarship, the degree you will be seeking, and the anticipated completion date:

Institution	Degree	Beginning Date	Completion Date

Project supervisor:

What is your background in palynology?

Professional experience:

Previous awards or honors:

Summary of institutional or other support for your project (specify whether granted or applied for):

Title of proposed investigation:

Summary of the investigation (250 words or less, on an attached sheet); include objectives, why you selected this problem and its significance, and how you plan to approach and carry out the investigation.

I agree that the recommendation I am requesting from my faculty supervisor will be held in confidence by officials of my institution, and I hereby waive any rights I may have to examine it.

yes _____ no _____

Date: _____ Applicant's signature: _____

Part B - Endorsement by Faculty Supervisor

1. Ranking of the applicant versus other students you have known who are pursuing the same degree:

   lower 50% ___ upper 50% ___ upper 25% ___ upper 10% ___ upper 5% ___

2. Did the idea for the project originate from student? yes ____ no ____

3. Can you verify the student's statements as to other awards, honors, or financial aid received or applied for? yes ____ no ____ Comments:

4. Please provide a brief summary (100 words or less, on an attached sheet) or your assessment of the applicant's project and his or her potential to attain the objectives. Among other traits, please comment on the student's native intellectual ability, ability to express her(him)self, perseverance, imagination and the probable creativity, and the value of the project.

Faculty supervisor's name:

Signature: _____ Date:_____

Position: _____ Institution:_____

Address: _____

_____

Please return Parts A and B to:

Merrell A. Miller
Amoco Production Company
P.O. Box 3092
Houston, TX 77253-3092
Phone: 713/366-3919
FAX: 713/366-2404