

August, 1994

Volume 27, Number 3

President's Address	1
Summary of 1994 Mid-Year Board of Directors Meeting	2
Notice of AASP Board of Directors Meeting	3
Membership Report	3
1994 AASP Annual Meeting: An update	4
Important 1994 Meeting news	4
Keynote speaker to discuss forensics	5
The future of paleontology	5
American Geological Institute wants you	5
"Official" IX-IPC Brochure distributed	6
KT Palynology at AAPG	7
Opportunity knocks!!	8
Tenured university position in palynology	8
Meet our new correspondents	8
From around the world	9
Palynology in the news	11
Technical reports	12
Thesis abstracts	16
Announcement of Publications	18
Book reviews	19
Fowler's monstrosities	21
Upcoming meetings	21
Reports of meetings and conferences	22
Computers and the information highway	22
Special historical feature	24
Editorial	25
<i>Journal of Micropalaeontology</i> special offer form	26
SEPM Research Conference form	27
Payment of AASP dues	28



AASP NEWSLETTER
AMOCO PRODUCTION COMPANY
P.O. BOX 3092
HOUSTON, TEXAS 77253

Membership Application Form

Please type or clearly print information. The AASP directory file is limited to 5 lines @ 29 characters.

Date: _____

Name:

(First) (Middle) (Last)

Address:

Telephone:

Fax:

Nature of work (graduate student, exploration stratigrapher, etc.)

Send to: Dr David T. Pocknall
AASP Secretary-Treasurer
Amoco Production Company
P.O. Box 3092
Houston, Texas 77253 U.S.A.

Please send \$30.00 U.S. per year
with your application.

Change of Address Form

Date: _____

Listed Name: _____

New Address

Name:

(First) (Middle) (Last)

Address:

Telephone:

Fax:

Send to: Dr David T. Pocknall
AASP Secretary-Treasurer
Amoco Production Company
P.O. Box 3092
Houston, Texas 77253 U.S.A.



A.A.S.P. NEWSLETTER

Published Quarterly by the American Association of Stratigraphic Palynologists Inc.

August, 1994
I.S.S.N. 0732-6041

Volume 27, Number 3
Martin J. Head, Editor

BOARD OF DIRECTORS

President
President Elect
Treasurer
Editor-in-Chief
Past President
Directors at Large:

Lucy. E. Edwards
Reed E. Wicander
David T. Pocknall
David K. Goodman
Robert L. Ravn
Martin B. Farley
Martin J. Head
Joyce Lucas-Clark
R. Farley Fleming

AASP NEWSLETTER CORRESPONDENTS

Niels E. Poulsen
James B. Riding

the Nordic Countries
the United Kingdom

NEW AASP NEWSLETTER EDITOR

Martin J. Head
Department of Geology
University of Toronto
22 Russell Street
Toronto
Canada M5S 3B1

Phone (416) 978-5080
Fax (416) 978-3938
Email: head@mica.geology.utoronto.ca

The AASP NEWSLETTER is published four times annually. Members are ENCOURAGED to submit articles, "letters to the Editor," technical notes, meeting reports, 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 last in 1994, is **OCTOBER 15**. All information should be sent on computer disk (MS Word for the Mac is best, but anything will do) or by e-mail, if possible, or if not—send hard copy. Always include

a duplicate typescript of all electronic copy sent so I can check diacriticals. If possible, please illustrate your contribution with art, line drawings, eye-catching logos, etc. We look forward to contributions from our membership.



PRESIDENT'S ADDRESS

I remember the good old days when summers were peaceful and quiet and the pace was easy. No more. But as President, I'd like to let you know that your organization has been busy, too. Most of the activity is detailed in separate articles in this newsletter. (As President, I do try to delegate).

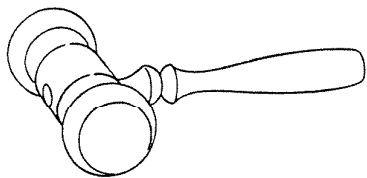
Reed Wicander, your President-Elect, has been busy, preparing the minutes from the mid-year Board of Directors' meeting. His article provides a summary. At the meeting, I turned over everything I had on fund-raising for the LSU Center of Excellence in Palynology to David Pocknall. I am happy to report that he has reactivated a committee to work on this.

Farley Fleming represented AASP to two groups which met in conjunction with the AAPG in Denver. The first, the American Geological Institute (AGI), should be well-known to our membership—we are one of AGI's 27 member societies. The second is more informal, but is of prime importance. The group calls itself the Industry Paleontology Managers Group (IPMG),

and its mission is to preserve and promote paleontology. IPMG invited paleontologists from industry, academia, government, and museums to two discussion sessions. Farley highlighted the Center of Excellence in Palynology. Read further details in Farley's articles.

David Pocknall has put together a pie chart showing the distribution of our members. Note that we truly are an international organization. Those of us with mailing addresses in the United States are a minority. Trust a New Zealander to make two separate categories for Europe and the United Kingdom; together they make up the next largest component. We're well into the 1900's: e-mail and fax machines reduce potential problems caused by distances and time zones. Please, regardless of your address, consider yourself a full participant in our organization: apply for scholarships, volunteer for committees, submit information to the newsletter, run for office. We have a truly international journal. Keep those excellent manuscripts coming.

Lucy E. Edwards, President



SUMMARY OF 1994 MID-YEAR BOARD OF DIRECTORS MEETING

The mid-year Board of Directors meeting was held at the home of President Lucy Edwards in Fairfax, Virginia on March 26, 1994. Present were President Lucy Edwards, President-Elect Reed Wicander, Secretary-Treasurer David Pocknall, and Directors-at-Large Joyce Lucas-Clark, Martin Farley, and Farley Fleming. Past President Robert Ravn, Editor-in-Chief David K. Goodman, and Director-at-Large Martin Head were unable to attend and sent their apologies.

The meeting was called to order at 10:16 a.m. and the agenda for the meeting was accepted unanimously. The minutes from the Board of Directors annual meeting held in Baton Rouge last October were also unanimously accepted after minor typographical corrections were made.

David Pocknall presented the Secretary's report in which he noted that there currently were 947 members of AASP (816 regular members and 131 institutional members), and this represented an increase of four members since the Baton Rouge meeting. David also presented the Treasurer's report and noted AASP had two CDs maturing in August, and that we will continue to offer credit card registration.

Lucy Edwards presented the Managing Editor's report for David Goodman. It was noted that PALYNOLOGY was mailed in 1994, but the date line was 1993. Dave wants to have PALYNOLOGY ready to be passed out at annual meetings so as to avoid the problem of late mailings. Dave also wants to implement an Editorial Board to report to the Managing Editor, which the Board approved.

Lucy Edwards also presented the AASP Foundation Report for Norm Norton in which it was noted that the AASP Foundation gave a \$2,500 unrestricted research grant and donated 10 copies of all AASP publications to CENEX. It was also reported that the Bill Evitt palynology collection was donated to the AASP Foundation which in turn loaned it to CENEX.

Lucy Edwards gave the committee reports for the Baton Rouge meeting (John Wrenn), the upcoming College Station meeting (Vaughn Bryant), the 1995 Ottawa meeting (Sue and Dave Jarzen), and the IX IPC meeting in 1996 (Vaughn Bryant). Short discussions of each report followed.

Martin Farley presented the Education and Short Course Report in which he had some general comments about the short courses and the need to get teachers to present them as well as some ideas for future courses. He also mentioned the possibility about getting our publications list into *Geotimes* and other journals that print such lists. Also brought up was the possibility of sending our publications to such journals as *American Scientist* for review in their book review sections.

Lucy Edwards presented the IFPS report for Vaughn Bryant in which it was noted we have paid our dues to IFPS based on the number of members of AASP and that we are current with our dues.

The U.S. Geological Survey Employee Conduct Code was discussed by Lucy Edwards and she noted that because of it she could not be involved in any fund-raising activities such as for CENEX.

A motion was made and unanimously passed that appropriate incidental expenses directly related to AASP business and approved by the Board for up to a maximum of \$200 per year may be reimbursed by the Secretary-Treasurer with the proper documentation without Board approval. This does not apply to travel related expenses. Amounts greater than \$200 per year must be approved by the Board.

Three requests were presented and approved by the Board for reimbursement of \$300 each for travel expenses to attend the mid-year meeting. Appropriate documentation for expenses will be made to David Pocknall.

Lucy Edwards noted that according to the by-laws of AASP, we are not required to have a mid-year meeting and it was agreed to leave it to the discretion of the president whether to have one or not. This was an informational item only, requiring no action by the Board.

An informational item concerning investments was made to the Board concerning having our CD's mature at various dates and the amount of interest earned on the L. R. Wilson scholarship. No Board action was required.

Another informational item concerned what to do with delinquent members. At the College Station annual meeting, all members not paid for 1992 and before will be purged from the membership roles. No Board action is required at this time.

The final item of business concerned the CENEX Fund-raising Committee. Lucy Edwards gave an update and a short discussion concerning fund-raising followed. The file for the CENEX Fund-raising was given to David Pocknall and he will report back to the Board at the next Board Meeting.

The 1994 mid-year Board of Directors meeting was adjourned

at 6:24 p.m. The complete minutes of the meeting will be available at the next Board Meeting to be held on Tuesday, November 1, 1994 at the Annual AASP Meeting in College Station, Texas.

Reed Wicander, President Elect

NOTICE OF AASP BOARD OF DIRECTORS MEETING

There will be a Board of Directors meeting on Tuesday, November 1, 1994 at 7:00 p.m. at the College Station Hilton and Conference Center. The room has not yet been assigned where the meeting will take place. Check at the Registration Desk. All members of AASP are welcome to attend.

MEMBERSHIP REPORT

As of 1 July 1994 there are 776 members (both individual and institutional) in the Association. This includes 200 members who are paid up through 1993 (and are owing for 1994), 430 through 1994, and 156 who have paid in advance of 1994 (up to 1998 in a few instances). I look forward to receiving dues payments from those of you who have 1993 printed on your mailing label.

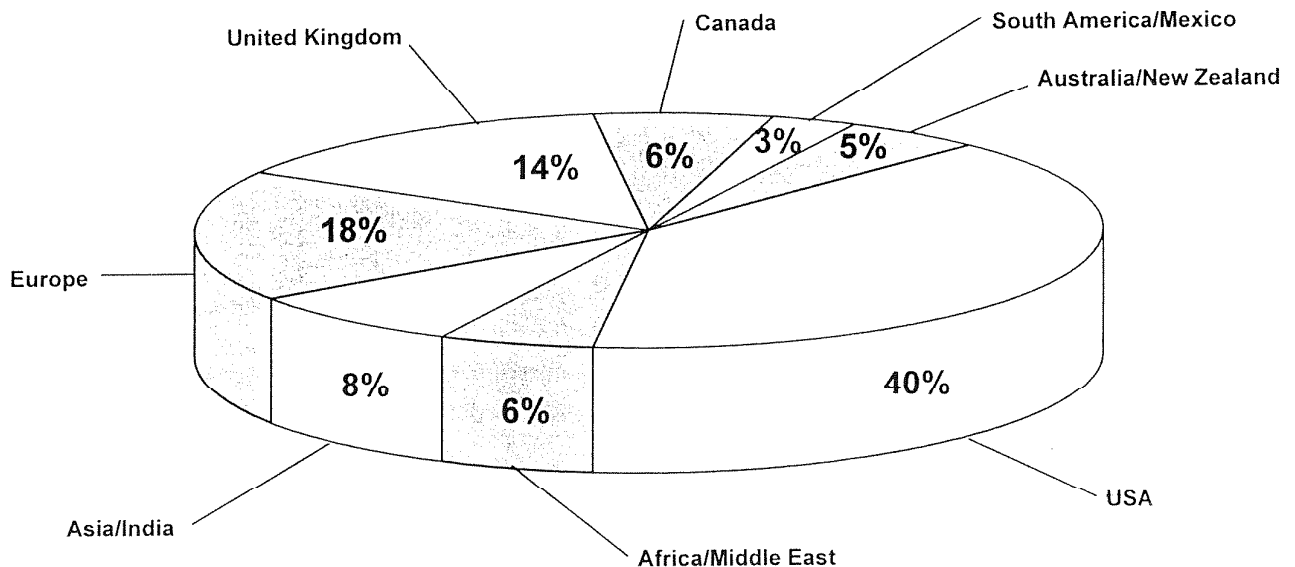
There are in excess of 76 (62 individual, 14 institutional) members who have not paid since 1992. These members are no longer receiving the newsletter. They should have received a letter from Bob Clarke, sent out at the time of the last Newsletter, indicating their financial status; this has had some impact with over 20 members having paid their outstanding dues. Those who have still not paid since 1992 are listed. Some of them we have

lost track of so if you recognize any of the names, work with any of them, or they are friends, then please communicate to them that they should remit their dues to the Secretary-Treasurer post haste.

MITSURU ARAI, ADIL BABIKIR, JOHN H. BECK, NIHAZ BOZDOGAN, MARC B. BRIMBLE, STEPHEN BROWN, CIARA CLARKE, BRENDA L. CLAXTON, CHRISTOPHER COCOZZA, PAUL A. CORNICK, FAITHE DANIEL, PAUL S. DIBBLE, RITA J. DUTTA, KLAUS H. EISERHARDT, LAWRENCE B. FEARN, LEONARD N. FORD, JR., RICHARD N. GALLUCCI, VASANTHY GEORGE, JENNIFER W. GISH, MICHAEL M. GREGORY, DONALD C. HARGROVE, CAROL HOTTON, CHRIS O. HUNT, AWAD B. IBRAHIM, RAMAKANT M. KALGUTKAR, LISA-HENRI M. KIRKLAND, ARTHUR S. KNOX, PHILIP A. LAKE, OLAJIDE LAWAL, EMMA E. LEKEI, ANTHONY LOY, U. MARHEINECKE, NARESH C. MEHROTRA, MICHAEL B. MELIA, F. X. MILLER, LEONARD V. MOORE, S. JACK MORBEY, E. M. V. NAMBU DIRI, KARL R. NEWMAN, MARIANNE V. NIELSEN, JOSEPH M. OHAGEN, SHU OUYANG, JONATHAN T. OVERPECK, VITA PARIENTE, VIVELA S. PERSSON, SABRA L. REID, ROBERT B. SANDERS, GREG A. SMITH, KRISTEND. SOBOLIK, M.D. SPENCER-JONES, JOYCE W. SWANBERG, STAN C. TEERMAN, DR. VIJAYA, KIRK A. WALN, BARRY G. WARNER, JOHN S. WARREN, HELEN K. WATERHOUSE, DAVID P. WATSON, WOLFGANG WILLE, PAUL WINROW, and SUSAN E. WOOD.

The following list of 89 names are members who we have lost track of in the past few years. They have not paid since 1990 or 1991 and have not formally resigned from the Association. If you recognize any of the names, work with any of them, or they are friends, then please communicate to them that we would welcome them back as members.

WILLIAM J. ABBOTT, RICHARD D. ALEXANDER, JAMES H. ANDERSON, ABDUL R. ASHRAF, TERRY L. BEACH, THOMAS



Location of AASP Members: 1 July 1994

A. BOND, WILLIAM BRAHAM, WAYNE W. BRIDEAUX, CAROL A. BROOK, GEORGE A. BROOK, IAN BROOKS, TIMOTHY G. BURKE, JESS R. BUSHMAN, NICHOLAS BUTLER, ROGER BYRNE, HYUN BYUN, NEAL P. CAMPION, GEM-HENG CHEN, CAROL A. CHMURA, JOHN H. CLARKE, KAREN H. CLARY, JEANNEL DELANOIS, JOSEPH N. DIBENEDETTO, ANDREAS DIMTER, STEVE DIVELEY-WHITE, KENNETH J. DORNING, LISA EVANS, ARMANDO FASOLA, CHRISTOPHER FORCE, LEROY C. FOSTER, ALLEN S. GOTTESFELD, MICHAEL P. GRING, JENNY L. HARDING, HOWARD HARPER, M. L. HEMPHILL, LEN V. HILLS, KAREN G. JENSEN, WILLIAM C. JOHNSON, PHILIP D. JONES, M. V. JORDAN, N. P. JUYAL, GUY KIESER, JOHN W. KING, JERRY W. KISSIRK, INGER LISE KRISTIANSEN, BONNIE E. LAMPLEY, CONSTANTINE A. LAPASHA, ESTELIA LEOPOLD, SILVIA LONA, YOGENDRA K. MATHUR, CAROLE J. MATTHEWS, EPHREM J. MCHANA, MARTHA MIXON, DOREENE MKUU, HISHAM B. MOHAMED, S. G. MOLYNEUX, RALPH A. MORGAN, JEAN-MARC MORON, AMER D. NADER, J. DALE NATIONS, BRENDA K. NATIONS, OLUWAFEMIO JUAWO, MICHAEL W. PENDLETON, N. POTHE DE BALDIS, FRANK W. POTTER, KRISTIN RANGNES, R. S. RAWAT, PATRICIA RIGGINS, LESLIE A. RILEY, ROBERT C. ROMANS, R. BIRUTESALDUKAS, JAISHREE SHARMA, DAVE SHAW, CHRISTOPH STRAUSS, KATHERINE S. TAYLOR, ARCHANA TRIPATHI, ROBERT E. TURNER, RISTO T. TYNNI, I. LOGAN L. URBAN, PIETER VAN GIJZEL, WILLIAM P. S. VENTRESS, WILLIAM C. VINYARD, STEPHEN L. WILLIAMS, PAUL D. B. WILLIAMS, JENNIFER Y. WILSON, FREDERICK H. WINGATE, MARC WORONA, ROBERT P. WRIGHT, and ERWIN ZODROW.

If I have not received anything before 15 October this year they will be purged from the membership list. In fact they should have been before this but Gordon was too kind! The Bylaws of the association state that "when any member of any class shall be in arrears in the payment of dues after January 1 of the current year, their membership may thereupon be terminated by the Board of Directors, if after written notification by the Secretary-Treasurer, the arrearages are not paid within sixty (60) days of the notification." In accordance with this any member who is not paid up through 1 January, 1994 is technically in arrears. Where are our members? The pie-chart is based on a total of 776 (1993 and above). For convenience I have grouped members into eight broad geographic groupings, although members reside in 61 countries.

David Pocknall, Secretary-Treasurer



1994 AASP ANNUAL MEETING: AN UPDATE

As is generally the case with each of our AASP annual meetings,

registration response, and requests to present papers, has thus far been slow. Nevertheless, we are hopeful that during the rest of the summer the number of these requests will increase. If you are considering attending the 1994 Annual Meeting, and have not yet sent us your registration material, or requested time to present your paper, please help us by doing so as soon as possible! We would like to be able to print the meeting abstracts, and finalize all meeting arrangements as soon as possible.

The planned Technical Session on November 2: "Tips and Traps of Palynomorph Sampling, Processing, and Analysis" is filling up nicely with excellent presentations. We believe this symposium will be of interest to all those who attend, and we hope that a special symposium volume containing written papers will be forthcoming as a future edition of the AASP Contributions Series. If you are one of those who has a paper you want considered for this special session, I urge you to contact the co-chair of this symposium, John Wrenn, as soon as possible.

For those planning to attend the annual meeting, I urge you to reserve your rooms as soon as possible at the convention hotel. As mentioned in the last AASP NEWSLETTER, you will need to write, call, or FAX your request for a room to the College Station Hilton Hotel. This will ensure that you receive the reduced convention rate of either \$60 or \$66/night. We have reserved a block of rooms at the hotel at this special rate. However, we will not be able to hold this block of rooms indefinitely for those participants who insist on waiting until the last minute to make their room reservations.

Finally, we are getting better than expected response from participants for our planned AASP Golf Tournament. For those additional members, who think they might want to join us on this fun-filled event, please let me know as soon as possible so we can reserve sufficient tee times for the event on November 1st. Remember, no matter how well (or poorly) you play, we will form teams of equal talents and will present trophies to all participants.

We sincerely hope you will be able to attend this year's annual AASP Meeting. We have worked hard to provide the participants with an exciting meeting and with events you will long remember!

Vaughn M. Bryant, Jr.
John H. Wrenn

IMPORTANT 1994 MEETING NEWS!!!

For those who are planning to attend the 1994 AASP Annual Meeting in College Station, please note:

1. Your ABSTRACTS were due on July 31. As of July 15, I have received one abstract. Please don't put this off until the last minute. We have to retype all the abstracts, print them, and then print them in booklet format. If you didn't make the July deadline (and have a good excuse), go ahead and send me your abstract, even if it is late. I'll try to fit it in the printed program

booklet.

2. Don't forget to reserve your hotel room at the Hilton Hotel, where we are holding the conference. We have obtained exceptionally good rates for those attending the meeting, but you must make your reservation by their deadline (October 1).

3. If you are coming to College Station by air, and are staying at the Hilton, remember that they have a free shuttle bus from the airport to the hotel. All you need to do is call the hotel from the free phone at the airport. You do not need to rent a taxi to get to the hotel.

4. Please send your registration forms as soon as possible. We need to plan our various meeting activities (smoker, luncheon, workshop, etc.). For these, we will need to know how many people will be attending each function.

In short, have pity on your LOCAL MEETING COMMITTEE (of one) ... Please don't put all these things off until the last minute. If you do all of this early, you will earn my eternal gratitude!!

Vaughn M. Bryant, Jr.



KEYNOTE SPEAKER TO DISCUSS FORENSICS

We are very fortunate to have Dr. Dallas C. Mildenhall present the keynote address at the 1994 AASP Annual Meeting. Dr. Mildenhall is currently a palynologist working with the Institute of Geological and Nuclear Sciences in Lower Hutt, New Zealand. Throughout his career Dr. Mildenhall has published widely on many topics in palynology, including a recent co-authored monograph entitled, *Miocene-Pleistocene Spores and Pollen from Central Otago, South Island, New Zealand*.

During the last decade Dr. Mildenhall has pioneered much of the research in the field of forensic palynology, and today he devotes a great portion of his research efforts to solving criminal and civil cases using pollen and spores as forensic tools. He is recognized as the world's leading expert on the use of forensic palynology, and is often asked to be a consultant on cases involving the use of forensic palynology.

Dr. Mildenhall's keynote address at this year's AASP Annual Meeting is entitled "Forensic palynology: case studies from criminal and civil trials in New Zealand." His lecture will focus on the field of forensic palynology, its growing importance as a research technique, and specific examples of how pollen and spores have helped solve important criminal and civil cases.

At the 1994 AASP Workshop Session (Saturday, November 5), Dr. Mildenhall will continue his discussion of forensic palynology with an illustrated lecture on the potential growth of forensic palynology during the next century, and on the types of training needed to enter the field of forensic palynology.

Vaughn M. Bryant, Jr.

THE FUTURE OF PALEONTOLOGY

At the AAPG meeting in Denver this past June, the Industry Paleontology Managers Group (IPMG) held two meetings to discuss the future of paleontology. IPMG is a group of managers from industry concerned about the future of paleontology. They are attempting to develop strategies to brighten that future. The purpose of IPMG is to mitigate the effects of current difficult times on paleontology; the mission of IPMG is to maintain a focus on the value of paleontology and to preserve and promote paleontology. IPMG invited paleontologists from academia, government, industry, and museums to attend and participate in these discussions. Turnout for the two meetings in Denver indicates that many paleontologists are concerned about the future of our discipline—or perhaps they are interested in observing extinction patterns firsthand!

Richard Lane (Amoco), Brian O'Neil (Shell), and Robert Pierce (Amoco) hosted the meetings and acted as moderators for the discussions. A slate of 15 speakers discussed problems and potentials for paleontology. Results of these discussions were summarized into three areas that paleontologists, as a group, need to consider. These are:

- (1) Communication with and education of the public, management, and other paleontologists.
- (2) Training needs for current and future paleontologists.
- (3) Development and standardization of databases, including collection databases, and digital imaging.

Working groups were set up to explore each of these areas. Preliminary results of these working groups and additional discussions are anticipated for the Seattle GSA meeting in October, 1994. Look for IPMG updates in future AASP Newsletters!

Farley Flemming, Director at Large

AMERICAN GEOLOGICAL INSTITUTE WANTS YOU

Along with 26 other societies, AASP is a member society of the American Geological Institute (AGI). AGI's annual Member Society Council and Executive Committee Meeting was held in

Denver, Colorado, on June 13, 1994. The AGI is financially healthy with a net return of \$395,000 on gross revenues of \$3.7 million for 1993. The main message emphasized by Marcus Milling, Executive Director of AGI, is the need for cooperation and participation from member societies.

There are two ways in which AASP can participate in the activities of the AGI. One is by financial contribution, which AASP already does as a Member Society. The other is by participation in AGI activities. Several topics discussed at the AGI meeting that are of interest to AASP members are briefly discussed below.

Program Proposals

In 1994 AGI submitted two major new proposals—one to the Department of Energy (DOE) for \$1.8 million and the other to the National Science Foundation (NSF) for \$3.1 million. The DOE proposal is in support of the National Geoscience Data Repository System Study. This repository would preserve geological data that may be lost or destroyed as a result of the decline in the oil and gas industry in the U.S. AGI has completed a feasibility study and has been encouraged by DOE to submit a plan for establishing the National Geoscience Data Repository System. The NSF proposal is for "Earth Science in the Community (EarthComm)—Understanding Our Environment." EarthComm is designed to provide earth science curricula for grades 7–12. In addition to these proposals already in progress, AGI is interested in developing new proposals for grants, especially in collaboration with member societies.

AGI Nominations for Awards

Each year AGI nominates geoscientists for a suite of prestigious awards. Listed below are brief descriptions of some of the awards for those who might be interested in nominating AASP members.

AGI Medal in Memory of Ian Campbell—This medal is given in recognition of singular performance and in contribution to the profession of geology. Candidates are measured against Ian Campbell's distinguished career, which touched virtually every facet of the geosciences.

AGI Award for Outstanding contribution to Public Understanding of Geology—This award is for contributions that lead to greater public appreciation and understanding of the role of geology in our society. The award is given to a person, institution, or organization in recognition of outstanding contribution to public understanding of geology.

The National Medal of Science—This is awarded by the President of the United States to individuals "deserving of special recognition by reason of their outstanding contributions to knowledge in the physical, biological, mathematical, engineering, or social and behavioral sciences."

The Vannevar Bush Award—This is an award presented by NSF to a person who has made outstanding contribution toward the welfare of humankind and the nation through public service in science and technology.

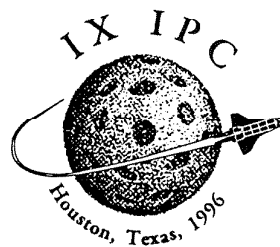
The Alan T. Waterman Award—This is a joint NSF-National Science Board award presented to an outstanding young researcher in any field of science or engineering supported by NSF. To qualify as young, candidates must be 35 years of age or younger, OR be not more than five years beyond receipt of the Ph.D. degree by December 31 of the year in which nominated.

AGI Officers

AGI elects officers for president-elect, secretary, treasurer, and member-at-large. Those eligible for nomination to these offices must be (1) a past and/or current member of the Member Society Council, (2) members of the former AGI Governing Board, or (3) officers of an AGI member society within the past five years. AASP has many members who are eligible to be nominated for an AGI office. Having AASP members as officers in the AGI will help AASP become more involved in the activities of the AGI and thus promote palynology in the geoscience community.

AASP members interested in participating in AGI through any of these activities are encouraged to contact Farley Fleming (telephone: 303-236-5681; email address: ffleming@greenwood.cr.usgs.gov).

Farley Flemming, Director-at-Large



"OFFICIAL" IX-IPC BROCHURE DISTRIBUTED

Enclosed with this issue of AASP Newsletter is the official First Circular for the Ninth International Palynological Congress (IX IPC). You will recognize it as the one printed in green on yellow paper. You may note that it contains more and more correct information than the black-and-white version sent along with the last newsletter. That version of the circular was a draft copy that had been sent for final comments but was inadvertently duplicated and distributed. Please refer to the version enclosed.

If you responded to the earlier version of the first circular, either by regular mail, FAX, or E-mail, your interest has been recorded and you will receive the Second Circular—no need to respond again. If you have not responded, please do so now. The Second Circular (of which there will be only one version!) will be sent **only** to those replying to the first. Plan now to attend IX IPC in 1996.

Doug Nichols
Co-Secretary, IX IPC
dnichols@gdsrvl.cr.usgs.gov

KT PALYNOLOGY AT AAPG

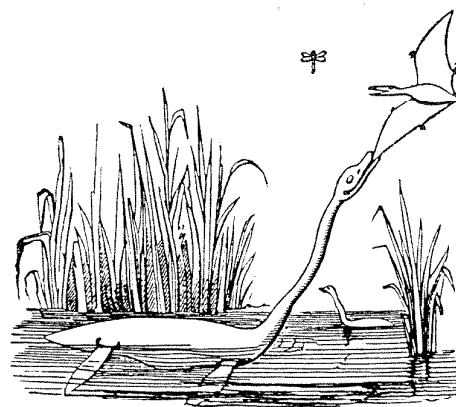
by Stephen R. Jacobson

Palynology sparked at the American Association of Petroleum geologists annual meeting in Denver (June 13–15). A pre-meeting field trip to Cretaceous/Tertiary (KT) boundary sites in the Raton Basin (NE New Mexico) began the show. There, spectacular outcrops elegantly provided first hand evidence of the Cretaceous-ending bolide event. It is remarkable that such an energetic event left a signature so subtle that scientists missed it until the early 1980's, when our field trip leader, Chuck Pillmore and colleagues, began a decade of dramatic data collection: pre-bolide dinosaur (hadrosaur, ceratopsid, and *Tyrannosaurus rex*) trackways, always a few meters below evidence of the bolide from Yucatan (iridium enrichment, "fireball clay," shocked quartz, and glass spherules) and the late Bob Tschudy's post-event "fern-spike." Impressive, more detailed palynology by field trip co-leaders Farley Fleming and Doug Nichols (USGS) significantly clarified points on plant behavior caused by the event.

The second bijou was a four-hour "roundtable" on the KT extinction sponsored by AAPG's Astrogeology Committee and Chevron Corporation. In his introduction, Jeffrey Warner (Chevron Petroleum Technology Co.), program co-narrator (with me) and Chairman of the AAPG Astrogeology Committee, noted that many aspects of the KT event resembled what we see over the last few thousand years: extinctions of large herbivores, predators, and birds; changes in atmospheric gases (e.g., ozone, CO₂); and acid rain. For this reason, said Warner, this particular extinction event is especially important to the public.

The session began with Gene Shoemaker (USGS), field geologist and astronomer, describing the astronomic causes and the physical and chemical aspects of the collision, and Gerta Keller (Princeton), paleontologist and stratigrapher, showing the biostratigraphic record at the ever increasing number of boundary sites around the globe. This set the roundtable for a two hour stratigraphic/astronomic feast. A panel of four peppered the two with questions and, as in a US Presidential TV debate, facts and speculations spiced up the discussions. The panelists were Rosemary Askin (palynologist-stratigrapher, U. California, Riverside), Alan Hildebrand (field geologist-geophysicist, Geological Survey of Canada), Glenn Izett (field geologist-petrologist, USGS) and J. Keith Rigby, Jr. (vertebrate paleontologist, Notre Dame).

All the elements of heated controversy were there. *Ad hominem* and *ad feminam* attacks. "Where did I ever say that?!" Some *ad absurdum* moments, with postulated physical and chemical conditions that would cause total biotic demise despite obvious survivorship (on the panel, for example). The enthusiasm of youth, vanity of provincialism (both geographic and by discipline) and tempered responses of wisdom added flavor to the roundtable. Rosemary Askin asked how physical and chemical effects varied latitudinally, referring to reduced iridium concentrations and less disastrous effects observed in southern high latitudes. Alan Hildebrand, who first recognized the depression at Chicxulub as the probable KT impact crater, discussed impact energy calculations of 10³¹ ergs (energy 1000



times what detonation of all the nuclear devices currently on earth could produce). This is not only enough heat to melt iridium, but enough to vaporize it. Gene Shoemaker told how the impact could have sent bolide ejecta outside the atmosphere. Glenn Izett triggered argument on whether the thin bolide-defining beds represented one or two events, whether the Rocky Mountain end-Cretaceous palynomorph extinctions of Doug Nichols and Farley Fleming [see references below] were regional or global, and Keith Rigby challenged the advocates to rationalize the magnitude of the cause with the reality of the fossil record. Several participants stated that, regardless of impactor size, dust cloud darkness following impact lasts only two to three months. Many plants and at least some photosynthetic algae (dinocysts) can easily survive these conditions.

Egostratigraphy battled with reconciliation of global data.

Gerta Keller addressed a blind test by four micropaleontologists who examined the same samples from the El Kef (Tunisia) KT section. The project was to test the data patterns gathered by various foraminiferal workers. The goal was to rationalize data discrepancies, not to interpret them. There is a surprising similarity (but not total congruency) among results. Preparation technique, lumping versus splitting, and species rarity were causes of the relatively minor discrepancies, but the unspoken issue seemed to be how anticipation of results can prejudice data recording.

What was obvious is that we as biostratigraphers must not only identify specimens and know something about their biology and distribution, but must fully understand depositional and post-depositional processes. It was also clear how important it is to have sound sampling strategies, and thorough data acquisition, reporting and display. These are not trivial matters. Palynologists have a lot to contribute to projects on global change. We must make sure that we show our work is careful and complete. With these caveats, palynology can participate on the leading edge of large scale multidisciplinary studies that design global strategies of the future.

Related references

Askin, R.A., 1988. The palynological record across the Cretaceous/Tertiary transition on Seymour Island, Antarctica. In: Feldmann, R.M. and Woodbourne, M.O. eds., *Geology and Paleontology of Seymour Island, Antarctic Peninsula*. *GSA Memoir* 169: 155–162.



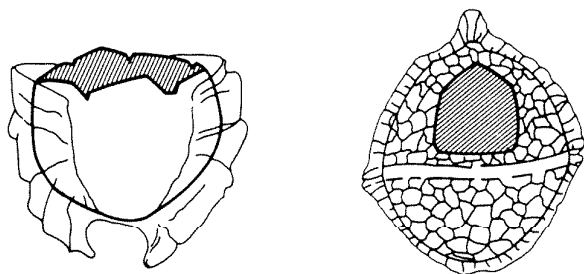
Elliot, D.H., Askin, R.A., Kyte, F.T., and Zinsmeister, W.J., in press. Iridium and dinocysts at the Cretaceous-Tertiary boundary on Seymour Island, Antarctica: Implications for the KT Event. *Geology* (August, 1994).

Fleming, R.F. and Nichols, D.J., 1990. The fern-spore abundance anomaly at the Cretaceous-Tertiary boundary: A regional bioevent in Western North America. In: Kauffman, E.G. and Walliser, O.H. eds. *Extinction events in Earth history*. Lecture Notes in Earth Sciences, 30: 347-349.

Nichols, D.J. and Fleming, R.F., 1990. Plant microfossil record of the terminal Cretaceous event in the western United States and Canada. V.L. Sharpton and P.D. Ward, eds., *Global Catastrophes in Earth history: an interdisciplinary conference on impacts, volcanism and mass mortality*. *GSA Special Paper* 247: 445-455.

Nichols, D.J., Fleming, R.F., and Frederiksen, N.O., 1990. Palynological evidence of effects of the terminal Cretaceous event on terrestrial floras in western North America. In: Kauffman, E.G. and Walliser, O.H. eds., *Extinction events in Earth history*. Lecture Notes in Earth Sciences, 30: 351-364.

Stephen R. Jacobson
Chevron Petroleum Technology Company
Box 446
La Habra, CA 90633



OPPORTUNITY KNOCKS!!

As a result of "downsizing" in the oil & gas industry, many companies have lost the ability to do inhouse research. This occurs at a time when it is more necessary than ever, as we explore in remote areas and need all the technology we can muster. Many companies are leveraging their research dollar by joining industrial associate and consortia organizations. As it happens our AASP-initiated Palynological Research Consortium has an opening for a sponsoring company. This company would join five others (Amoco, Phillips, StatOil, Elf and Norsk Hydro) in support of five on-going palynological research projects by five of the leading palynologist/institutions in the world. Cost of participation for the remaining two years of the five year program is \$20,000/year, which entitles the new participant to the fourth year results on the five projects, as well as all final reports. The final results of these projects will remain proprietary to the sponsoring companies for two years following project

completions. For more information call or Fax Consortium Chairman Dennis Logan at:

Phillips Petroleum Company
Phone (918) 661-8325
Fax (918) 662-2047

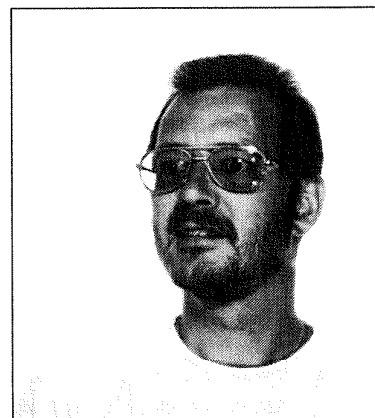
TENURED UNIVERSITY POSITION IN PALYNOLOGY

The Geology Department, University of Oslo, Norway will most likely be advertising a tenured staff position for a micropaleontologist or **Palynologist** in the immediate future (as soon as the papers clear the final committee—possibly already in August/September!). The need is for a petroleum-related palynologist (Mesozoic/Cenozoic) who can help to strengthen research and teaching in biostratigraphy, basin analysis and organic geochemistry. Further information may be obtained from Barrie Dale:

Tel: (22) 854214
Fax: (22) 854215

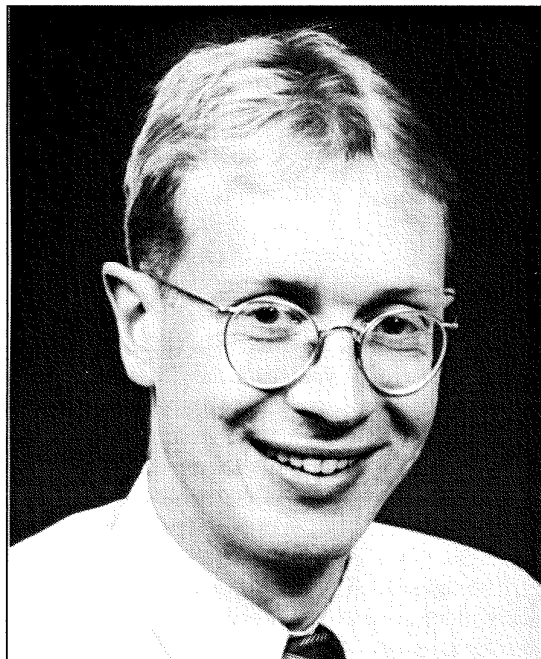
MEET OUR NEW CORRESPONDENTS

About 20 years ago, under the editorship of Dick Hedlund, the AASP Newsletter had a network of correspondents who would submit items from around the world. I have reactivated this system at the suggestion of Judi Lentin. It is a pleasure to introduce Niels Poulsen, correspondent for the Nordic countries, and Jim Riding, correspondent for the United Kingdom.



NIELS E. POULSEN joined the Geological Survey of Denmark (DGU) in 1984 as a palynologist working in research and exploration after receiving his M.S. degree in geology from the University of Copenhagen. During 1988-90 he held a Danish Research Academy-DGU research fellowship to study Jurassic

dinoflagellate cysts from the Danish Sub-basin and for this research he received his doctoral degree from the University of Copenhagen. He is currently employed by the DGU as a senior biostratigrapher, working mainly on Jurassic sequences in the North Sea. His main research interests include biostratigraphy, taxonomy, and paleoecology of Late Triassic to earliest Cretaceous dinoflagellate cysts.



JIM RIDING studied Geology at the University of Leicester, U.K., graduating in 1979. He then undertook the famous Sheffield M.Sc. course in palynology which, at that time, was run by Charles Downie and Roger Neves. Upon completion of the Sheffield course, Jim joined the British Geological Survey (then the Institute of Geological Sciences) at the northern England office in Leeds. At BGS Jim continued studies begun at Sheffield on the Jurassic palynostratigraphy of England, France and Scotland. The Leeds office transferred to Nottingham in early 1984 and Jim expanded his research horizons to the Mesozoic–Cenozoic of the Antarctic Peninsula, Cenozoic–Quaternary successions from offshore Britain and the Mesozoic of Russia.

FROM AROUND THE WORLD



GEOLOGICAL SURVEY OF DENMARK

by Niels E. Poulsen

Pre-Quaternary palynology was initiated at the Geological Survey

of Denmark (DGU) by Finn Bertelsen (Triassic–Early Jurassic spores and pollen) within the former Biostratigraphy Division and was continued with studies of Late Cretaceous–Danian dinoflagellate cysts by Jens Morten Hansen (presently the Vice Director of DGU). In 1983, Claus Heilmann-Clausen (now University of Aarhus) and Torsten Hoelstad began a study of Middle Jurassic–Early Cretaceous dinoflagellate biostratigraphy, as part of a larger basin study at DGU; Niels Poulsen joined this project in 1984. The Jurassic group was supplemented by Eva Koppelhus (now at the Geological Survey of Greenland) in 1986 and Karen Dybkjær in 1990. Poul Schiøler also joined DGU in 1990, working primarily with Late Cretaceous dinoflagellates, and Birgitte Ferri Hjortkjær has recently joined DGU to work on a project concerned with the palynostratigraphy of Paleocene–Early Eocene strata in the Faroe–Shetland area. Neogene–Quaternary dinoflagellate studies have recently been added to the range of palynological activities at DGU by Niels.

Following structural reorganization at DGU in 1990, the Biostratigraphy Division and the Regional Geological and Sedimentological Division were united to form the Stratigraphy Division. Stefan Hultberg has been the manager of this new division since it was created.

Torsten moved to Norway in 1986 to work with the consulting company Stratlab a.s. In 1988 he returned to DGU working with electronic image analysis and palynology and is currently back in Jurassic–Cretaceous palynostratigraphy incorporating graphic correlation techniques.

Niels undertook a Ph.D. thesis study at DGU on Jurassic dinoflagellate cysts and biostratigraphy in the Danish Basin and Poland after his initial work on Middle–Late Jurassic dinoflagellate cysts and palynofacies studies in the Danish North Sea sector. Part of the thesis work was carried out during a 6-month study period at the British Geological Survey. Niels is still chipping away Jurassic–Lower Cretaceous strata in the North Sea and other parts of the world, mainly western Europe. Niels's current research now also involves Neogene–Quaternary dinoflagellate studies.

Karen was awarded a Ph.D. at the University of Aarhus for her work on Lower Jurassic spores and pollen from a series of boreholes in the Danish Basin. The thesis also included detailed palynofacies analysis. During the last four years, she has been working on Jurassic palynology (mainly dinoflagellate cysts) in the Danish sector of the North Sea Central Trough, in close cooperation with sedimentologists and geophysicists. This work has now resulted in a sequence stratigraphic model for the entire Jurassic section.

Poul's work on Late Cretaceous dinoflagellates has been primarily directed towards the establishment of a high-resolution biostratigraphic scheme for the Dan oil field in the Danish North Sea. During this study he profited from a 6-month study period at the Institute of Geology and Nuclear Sciences (IGNS), New Zealand. Poul was awarded a Ph.D. for his work on Late Cretaceous dinoflagellates. Poul recently obtained a two years post-doctoral research grant from the Danish Research Council and will soon go 'down under' again, this time to work in the New Zealand Geological Time Scale Project at the IGNS.

Birgitte joined us after completing a M.S. on Tertiary spores,

pollen and palynofacies from West Greenland and is now working on integrated dinoflagellate cyst and spores and pollen stratigraphy around the eastern border zone of the Faroe Islands, relating the bioevents to sequence stratigraphy.

In addition to their academic work, the DGU palynologists undertake consulting projects for domestic and foreign oil companies—ranging from single well studies to integrated large scale sequence stratigraphical projects. This combination of academic and consulting work has proved beneficial for all parties, and has brought palynological research at DGU into a new era.

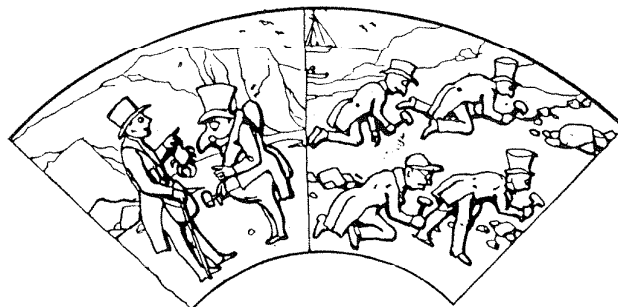
Niels E. Poulsen, Correspondent for Nordic Countries
Geological Survey of Denmark
st005@mmdgu.dgu.min.dk

THE UNITED KINGDOM SCENE

by Jim Riding

The U.K. palynological scene mirrors global trends in that life in the industrial sector is rather uncertain. The major oil companies have either reduced their complement of biostratigraphers or are not replacing staff who retire or resign. These changes have probably been most far reaching at B.P. who have, over the last few years, downsized a large biostratigraphy group to a small handful of individuals. These profound changes are, as I previously mentioned, worldwide in scope, and have affected many other groups of specialists in the hydrocarbon exploration business. We can only hope that, eventually, the pendulum will swing back. Major changes have also affected U.K. service companies this year. Early in 1994, Halliburton Reservoir Description Services in Aberdeen pulled out of biostratigraphy with the resultant loss of several jobs. More recently, the long-established company Paleo Services of Watford ceased trading. From what I hear, it seems that many ex Halliburton and Paleo Services employees are establishing small businesses. So, many of the U.K.'s consultant palynologists are working at home; this has to be good news for the printers of headed stationery and the microscope manufacturers! One of the many results of this upsurge in one-person operations is that employment prospects have never been poorer in living memory. Graduates with M.Sc.'s and Ph.D.'s in palynology may find employment with oil companies as explorationists, but careers in their vocation are extremely difficult to obtain.

Despite the virtual lack of employment positions in palynology, British Universities continue to offer training to M.Sc. and Ph.D. level in the discipline. Jamie Powell has investigated a feature in the British Micropalaeontological Society (BMS) Newsletter entitled "Micropalaeontology in U.K. Universities." In issues 48 to 50 inclusive, Jamie included reports on micropalaeontological activities in 22 British Universities. There are M.Sc. courses in Palynology offered at the University of Wales, Aberystwyth and the University of Sheffield. University College London and the University of Southampton offer M.Sc. courses on micropalaeontology *sensu lato*. It appears that no less than 15 out of 22 universities have



Punch's geologists on a British Association excursion.

ongoing, or recently completed, Ph.D. projects on a palynological theme. These include palynofacies work and Quaternary studies. This activity is encouraging and illustrates how much palynology is contributing to the U.K. research base and graduate training.

The main focus for palynology in the U.K. is the Palynology Group of the BMS. We used to have two groups, palynology (i.e. miospores) and microplankton; these groups merged by mutual consent in 1989. The current officers of the group are David Batten (UCW Aberystwyth) and Duncan McLean (University of Sheffield). David and Duncan organize two one-day meetings each year. The last of these was held at the British Geological Survey, Nottingham on December 8th, 1993. Elsewhere in this Newsletter, there are details of a sale of backparts of the BMS journal (*The Journal of Micropaleontology*). May I commend this opportunity to buy some excellent journals at rock-bottom prices to all AASP members [see order form in this Newsletter]. Part of the reason for doing this is our decision to use the Geological Society Publishing House at Bath to print and distribute the Journal as of Volume 13, part 1, which is due out in August 1994. We have recently published "*Micropalaeontology and Hydrocarbon Exploration in the Middle East*," edited by Mike D. Simmons of B.P. This is a hardback text comprising 16 chapters (418 p.). It is selling very well; I would advise interested parties to buy it pronto, or risk having to wait for the first reprint. The book covers microfossils, including palynomorphs, from the Devonian to the Tertiary of Syria, Oman, Yemen, Abu Dhabi, Iran and Arabia *sensu lato*. The volume was sponsored by B.P. and is an absolute bargain at £55. Orders to Chapman & Hall, Cheriton House, North Way, Andover, Hampshire SP10 5BE, U.K. BMS members can buy the book at a discount of 20%, i.e. £44.

Forthcoming BMS meetings include our 1994 AGM at University College London on 16th November. Our guest speakers, will be Dick Aldridge (Leicester) and Jürgen Thürow (UCL) who will give talks on condont paleobiology and the mid-Cretaceous anoxic event respectively. Next year is the Societies' Silver Jubilee and we aim to hold some special events to celebrate the 25th anniversary of the BMS.

J.B. Riding, U.K. Correspondent
British Geological Survey
Keyworth, Nottingham, England

UNIVERSITY OF WALES, ABERYSTWYTH, PALYNOLOGICAL RESEARCH CENTRE

by David J. Batten

(from: *The British Micropalaeontologist*—Number 50, Spring 1994; submitted by Jim Riding)

Following the review of teaching and research in Earth Sciences at British universities during 1987 and 1988, the Institute of Earth Studies (IES) was established at the University of Wales, Aberystwyth. Its aims are to promote interdisciplinary teaching and research in Earth and Environmental sciences. The Palynological Research Centre (PRC) came into being at the beginning of 1990 in order to create, along with the existing Micro- and Macro-paleontology groups, a major center of paleontological endeavor at Aberystwyth. A new M.Sc. course in Palynology was instituted to complement the separate, well-established M.Sc. program in Micropaleontology, and the first students were enrolled in October 1990.

Personnel primarily concerned with palynology in the IES are Professor David J. Batten, Dr. Henry F. Lamb, Dr. Bruce A. Tocher and Mrs. Lorraine Morrison (technical support). Their current research interests, and those of their students, postdoctoral associates and visiting colleagues include the palynology of Quaternary lacustrine deposits, particularly in North and East Africa; the palynological record of human impact on the environment in Wales, Ireland, Scotland and Turkey; palynological applications to interpretations of Mesozoic–Cenozoic stratigraphy, depositional environments, floral provinces and climate, with emphasis on Canada, Europe, North Africa and South America; palynofacies, sequence stratigraphy, organic maturation and occurrences of hydrocarbons, especially in N.W. European Jurassic and Cretaceous successions; morphology of Mesozoic spores and pollen grains, with emphasis on ultrastructure and its taxonomic value; quantitative and computing methods in palynology; and environmental significance of cysts of dinoflagellates in the oceans, past and present.

Several projects within these research areas have been well-funded by the NERC and other grant-giving bodies, and the oil industry. It is anticipated that emphasis will increasingly be placed on studies that have a bearing on biodiversity and current environmental problems.

General enquiries may be made in writing to any of the teaching staff noted above, or by telephone (Batten: 0970-622573; Lamb: 0970-622597; Tocher: 0970-622659) or Fax: 0970-622659.

David J. Batten
Palynological Research Centre
Institute of Earth Studies
University of Wales, Aberystwyth
Dyfed SY3 3D, Wales, U.K.



PALYNOLOGY IN THE NEWS

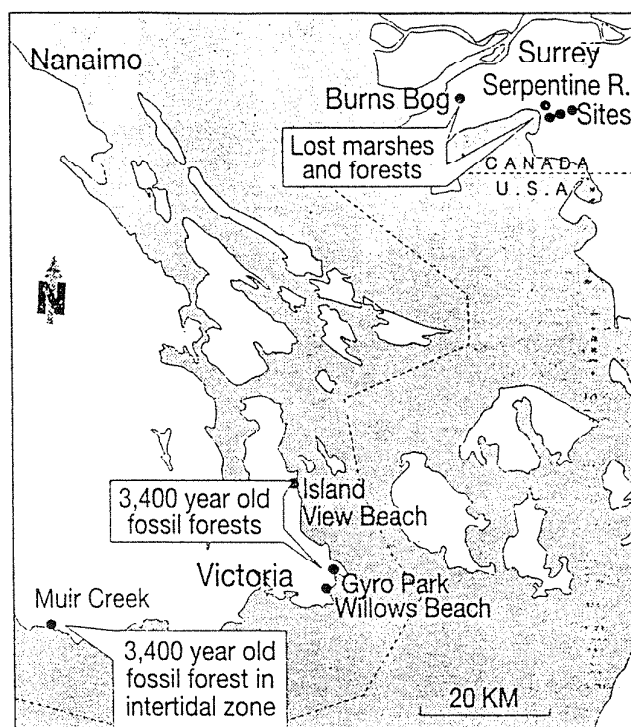
This article, reprinted from The Vancouver Sun, Thursday, May 5, 1994, p. B5, describes the award-winning research (Unocal Best Applications Paper for 1993) of Rolf Mathewes and John Clague. A more detailed account of this research, which is largely based on pollen analysis, has recently appeared as: "Detection of large prehistoric earthquakes in the Pacific Northwest by microfossil analysis" by Mathewes, R.W. and Clague, J.C., 1994, published in Science, 264: 688–691.

HUGE QUAKES SHOOK REGION CENTURIES AGO—EVIDENCE OF ANCIENT UPHEAVALS FOUND

by Margaret Munro (Vancouver Sun Science Reporter)

As Rolf Mathewes and John Clague stroll through the wildlife refuge near the Serpentine River, they're oblivious to the great blue herons and diving ducks. They're here to marvel at strange streaks of mud in the banks of the marsh—streaks that are all that remain of landscapes destroyed by giant quakes that have slammed southern B.C. in the past. Mathewes, of Simon Fraser University, and Clague, of the Geological Survey of Canada, have made a high science of finding evidence of prehistoric disasters.

They say the streaks near the Serpentine River, coupled with similar evidence from Vancouver Island and Burns Bog, attest to the fact that southern B.C. was hit by enormous quakes 3,400 and 2,000 years ago. Mathewes and Clague, whose findings are reported in the current edition of the U.S. journal *Science*, have documented how a forest at the mouth of Muir Creek on South Vancouver Island dropped and became part of the inter-tidal



zone. They've found salt-water lagoons that suddenly became fresh-water marshes. And they have found ancient forests—such as the one that graced the Serpentine River valley 2,000 years ago—compressed into streaks of peat buried in mud. “This one is remarkably well preserved,” says Clague, as he and Mathewes climb down a slippery bank in the Serpentine marsh off Highway 99A. They dig into the bank about a meter below the tide line to show a visitor a dark streak of peat about 30 centimeters thick. While the significance is lost on the uneducated eye, the peaty layer speaks volumes to Clague and Mathewes. The seeds, pollen, roots and well-preserved pieces of spruce they have found in the peat show that a forest suddenly disappeared about 2,000 years ago, give or take a few decades.

The scientists recreate the 2,000-year-old quake. “You’d have been standing here with forest land around you and all of a sudden the earth starts shaking violently,” says Mathewes. “Then water comes pouring in from the west,” he says, motioning toward nearby Boundary Bay. “The sand volcanos started erupting,” adds Clague, referring to the one to two-meter-high geysers that form on the surface when subsoils liquefy and spout out of the ground during earthquakes. “Mud would start oozing out of the ground,” Clague continues. “And when it was all over you’d have been up to your shins in mud.” “It would have been quite instantaneous.”

The forest died and a salt-water lagoon took its place, explains Clague, jabbing at a muddy layer on top of the peat that contains salt-water algae and other evidence of inundation from the sea.

A second, deeper layer of peat dates back about 3,400 years to a time when the Serpentine River was a salty lagoon, complete with stickleback fish. It also vanished suddenly and the area was transformed into a freshwater marsh. Again, the scientists believe a giant quake was responsible, in this case lifting the landscape enough to prevent the in-flow of seawater.

Mathewes and Clague’s work is part of a continuing effort to size up the earthquake threat to B.C. Their colleagues at the Geological Survey of Canada are measuring the pressures now building underground and say it is a matter of time before the pressure is released in the form of a giant quake that could cause massive damage along the coast.

Mathewes and Clague have also been scouring Indian legends for evidence of the past quakes. They’ve found several that speak of past quakes, although some details—including one reference to whales being thrown into the forest by tidal waves—seem a bit embellished, says Clague.

At Muir Creek, east of Victoria, the fossilized forest found in the inter-tidal zone dates back about 3,400 years. (The scientists believe the forested land subsided during the quake and sea water rushed in, killing the trees.) Wood found buried near Gyro Park east of Victoria dates to the same period, as do buried sediments in the Serpentine River and Burns Bog areas, which indicate the land on the mainland rose slightly during the quake.



TECHNICAL REPORTS

DGW

ON PALYNOLOGICAL PREPARATION TECHNIQUE

by Yvonne Desezar and Niels E. Poulsen

1. *Note on modification for: Poulsen, N.E., Gudmundsson, L., Hansen, J.M. and Husfeldt, Y., 1990: Palynological preparation techniques, a new maceration tank-method and other modifications. Geological Survey of Denmark, Series C 10, 24 pp.*—During the years that this maceration-tank preparation method has been used, attempts have been made to reduce the cost of processing and at the same time protect the environment by more efficient waste disposal. The amount of hydrofluoric acid use for standard processing of samples has now been reduced to half the originally proposed amount without any reduction in processing speed or quality. In fact, the processing speed has improved slightly.

On page 7, in the description of “Removal of silicates” it was stated that ten liters of cold 40% hydrofluoric acid (commercial grade) should be used in the processing of the samples. However, only five liters is actually needed. Experiments with further dilution of the hydrofluoric acid, gave incomplete solution of several samples. In addition, by a further dilution, the boiling point of hydrofluoric acid, will be lowered even more.

Firstly, five liters of water is placed in the tank. Then, five liters of cold 40% hydrofluoric acid is delivered to the tank as described in the original text.

The samples are then left in the hydrofluoric acid, normally for a period of a week, although only five days may be needed for the removal of silicates.

During the washing process that follows, the time taken to wash samples clean of hydrofluoric acid has been reduced, so that the overall sample processing time has been reduced slightly.

2. *Removal of oil in drill cutting samples.*—Crude oil or drill mud containing oil can often cause problems in palynological preparation. The oil can be removed using organic solvents such as di-chlor-methane. However, this method is time consuming, it can only be used for small amount of samples, and worst of all, organic solvents are very injurious to health.

Using the tank-method (Poulsen et al, 1990), the first step in the palynological preparation may be removal of carbonates using a household washing machine. As described in Poulsen et al. (1990), each sample is packed in a piece of filter cloth, but instead of citric acid, a normal household washing powder is added. A total of 30–40 samples are placed in the washing machine, washing powder is added as for normal clothes-washing, and are given a normal machine wash at 500 Celsius. Hereafter the carbonates are removed by adding citric acid (powder) instead of washing powder, and the samples are washed at 700 Celsius. The samples are given one last machine wash with washing powder.

After treatment in the maceration tank with hydrofluoric acid as described in Poulsen et al. (1990) and removal of silica fluorides in the washing machine, the samples are once again washed with washing powder in the washing machine.

In our experience, this method results in cleaner and better preserved fossils than other methods. The method is cheap, the cost of 'chemicals' is low, and a large number of samples can be prepared with reduced labor time. Perhaps most important this method is less injurious to health than methods using organic solvents.

3. *Improvement of oxidation technique.*—Using concentrated nitric acid for oxidation following the method described in Poulsen et al. (1990), the effect of the oxidation is improved by adding a small amount of hydrochloric acid (4%–20%). After the oxidation period, the sample is washed clean with water on a acid-proof filter (10–20 µm).

The hydrochloric acid aids the oxidation process, helping to dissolve amorphous matter and giving the resultant sample a cleaner appearance.

Yvonne Desezar and Niels E. Poulsen
Geological Survey of Denmark (DGU)
Thoravej 8, DK-2400 Copenhagen NV, Denmark
st005@mmdgu.dgu.min.dk



A METHOD FOR IDENTIFYING FOSSIL SPORES AND POLLEN GRAINS

by Yusheng Liu, Reinhard Zetter and David Ferguson

The president of AASP, Dr.L.E. Edwards, expressed uncompromisingly her opinion about the prospect of palynology: "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!" (see AASP Newsletter, Vol. 27, No.1). What is the difference really like? In our opinion, one aspect is to develop an extensive database using modern equipment (e.g. SEM and TEM) to carefully compare fossil and living pollen grains so that correct identifications can be reached.

The first scanning electron microscopes were constructed as early as the end of the 1930's and they have provided a greater impetus to palynology than any other technical development during the history of the subject (Blackmore, 1992). But unfortunately, recent studies indicate some persistent problems in identifying spores and pollen grains, particularly dispersed fossil ones. Distributions of fossil taxa considered "widespread" may be artifacts of misidentification. For instance, fossils (micro- and mega-remains) of *Cathaya*, one of the coniferous genera now endemic to the mountainous areas of S.W. China, are

quite often recorded in the Tertiary of Europe, but in China no fossil are known. Consequently, this may suggest that the genus originated somewhere in Europe and then migrated to China during climatic deterioration elsewhere. A nice phytogeographical story! The explanation is almost the same as that of *Cycas* (Arnold, 1947; discussion in Liu, 1992). The story seems, however, to not be true. Recently, we found some *Cathaya* pollen fossils from the Miocene of Zhejiang Province, Eastern China. Having looked into some Chinese references, we must now report that *Cathaya* pollen is also common in the Tertiary of China! The main problem possibly stems from wrong identification. Generally, *Cathaya* pollen grains have been long confused with *Pinus* Haploxylon-Type and *Podocarpus* under the light microscope and even under SEM (see Molli, 1984). Actually, they are not difficult to distinguish from each other under LM (Liu, Zetter, Ferguson and Guo, in prep.). If SEM is used, there is definitely no problem. Under SEM, the micromorphology of the *Cathaya* pollen surface shows many small spines and channels (Plate 1, fig. 9), whereas that of *Podocarpus* is almost psilate (Plate 1, fig. 6) and that of *Pinus* Haploxylon-Type is granulate. The more astonishing thing is that in North America some pollen grains occur that are very similar to *Cathaya* (see Frederiksen, 1980, p.34, 35, plate 4, figs. 17, 18; Gray, 1985, plate 5, figs.4–6). Of course, verification is necessary. Our work on the historical phytogeography of *Cathaya* is ongoing.

The above example shows the importance of correct identification in palynology, but undoubtedly the outcome depends on the tools and methods used. The published literature describes a number of new methods for using SEM or TEM to simply and quickly observe single spores, pollen grains or dinoflagellate cysts (see literature cited in Daghljan, 1982). Certainly, these methods have their particular advantages. But we introduce here another method which we use daily (see details in Zetter, 1989). The method is quite simple. A hair mounted on a needle facilitates manipulation of single particles, which are always in glycerin. For SEM observation, we use the needle to transfer particles, one by one or group by group, from glycerin to a stub or different stubs on which a little absolute ethanol has been applied. This removes glycerin from the surface of the grains, rendering them very clean (Plates 1 and 2). Because the particles are always in glycerin, it is not difficult to change their direction (distal and proximal views) for LM photography. Wall structure can be further elucidated by using the needle to break the whole grains. Furthermore, using our method makes it possible to observe the same grain under LM and SEM (see Plates 1–2). Hence, we believe this method serves the identification process effectively by providing high quality views of grains studied, thereby allowing their accurate comparison with living counterparts.

References Cited

- Arnold, C.A., 1947. *An Introduction to Paleobotany*. McGraw-Hill Book Company, Inc., New York and London, 433 p.
- Blackmore, S., 1992. Scanning electron microscopy in palynology. In: Milsson, S. and Praglowski, J., (eds.), *Erdtman's Handbook of*

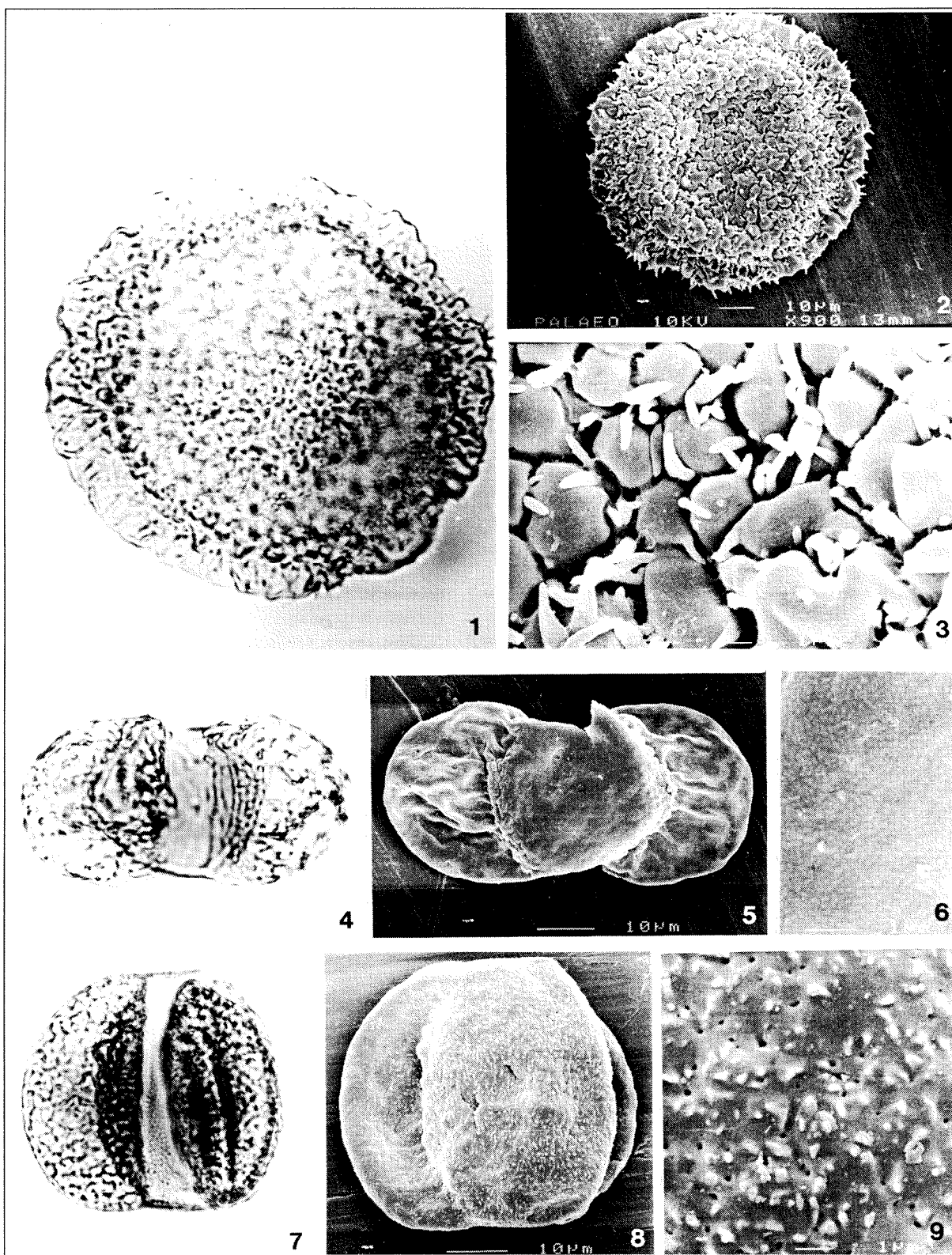


PLATE 1.—All specimens are from the Xiananshan Formation (provisionally Miocene) of the Shengxian and Ninghai counties, Zhejiang Province, East China. Figs. 2, 3, 5, 6, 8 and 9 are SEM photos; Figs. 1, 4 and 7 are LM photos at 800x. Figs. 1–3 all depict the same specimen of *Tsuga* sp. Figs. 4–6 all depict the same specimen of *Podocarpus* sp. Fig. 6. shows high magnification of corpus, with psilate surface. Figs. 7–9 all depict the same specimen of *Cathaya* sp. Fig. 9 shows high magnification of corpus, with spines and channels present on the surface.

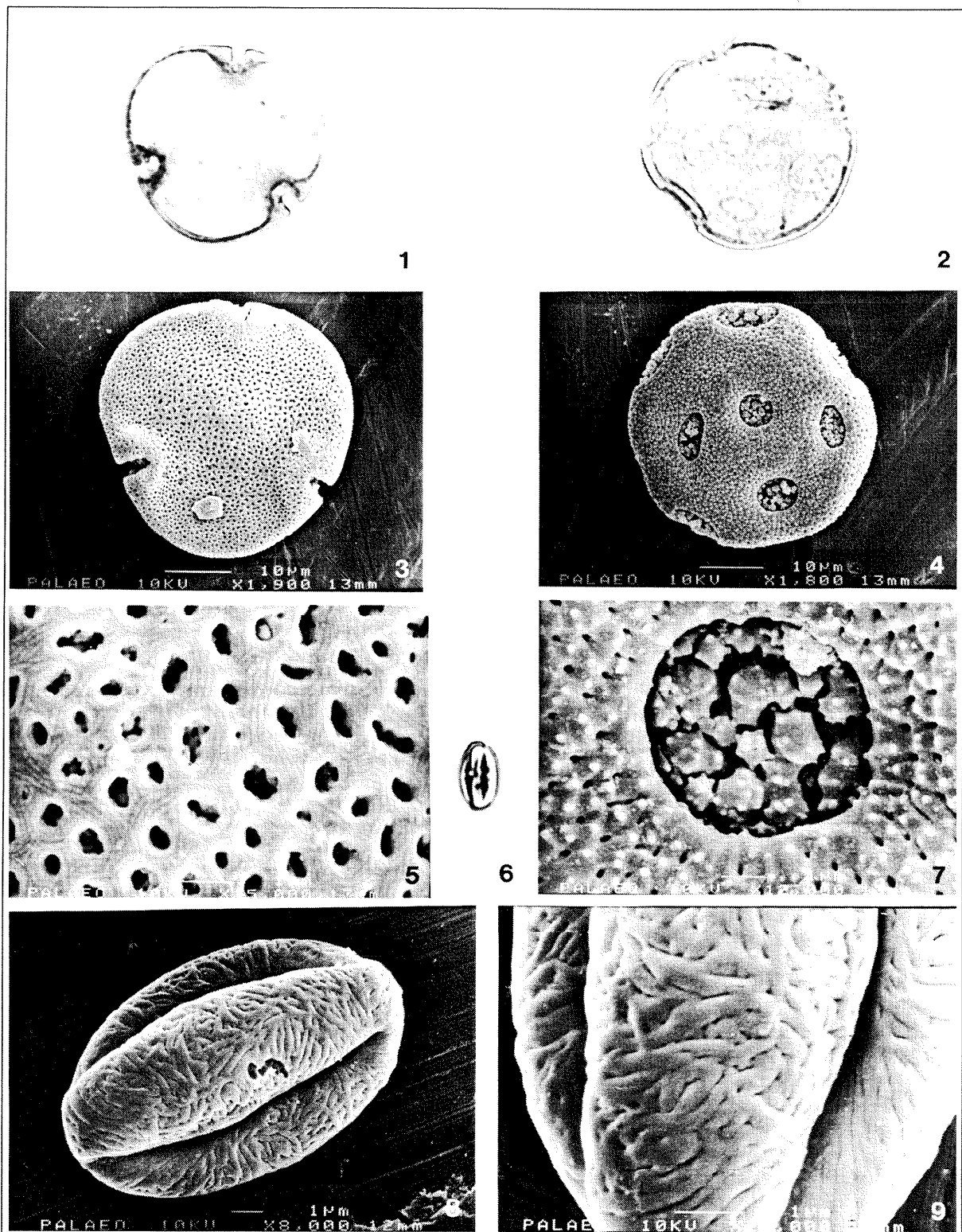


PLATE 2.—All specimens are from the Xiananshan Formation (provisionally Miocene) of the Shengxian and Ninghai counties, Zhejiang Province, East China. Figs. 3, 4, 5 and 7–9 are SEM photos; Figs. 1, 2 and 6 are LM photos at 800x. Figs. 1, 3 and 5 all depict the same specimen of *Tilia* sp. Figs. 2, 4 and 7 all depict the same specimen of *Liquidambar* sp. Figs. 6, 8 and 9 all depict the same specimen of *Fagaceae* sp.

Palynology, 2nd edition, pp. 403–431, Munksgaard, Copenhagen.

Daghlian, C.P., 1982. A simple method for combined light scanning and transmission electron microscope observation of single pollen grains from dispersed pollen samples. *Pollen et Spores*, 24(3/4): 537–545.

Frederiksen, N.O., 1980. Sporomorphs from the Jackson Group (Upper Eocene) and adjacent strata of Mississippi and western Alabama. *U.S. Geological Survey Professional Paper* 1084, 75 p.

Gray, J., 1985. Interpretation of co-occurring megafossils and pollen: a comparative study with *Clarkia* as an example. In: Smiley, C.J. (ed.), *Late Cenozoic History of the Pacific Northwest*, pp. 185–244, San Francisco, California, U.S.A.

Liu, Y.S., 1992. First discovery of *Cycas* fossil pinnae in N.E. China with comments on phylogeny and historical phytogeography of *Cycas*. Ph.D. Thesis (Part I), Nanjing Institute of Geology & Palaeontology, Chinese Academy of Sciences, China, 133 pages with 39 plates.

Liu, Y.S., Zetter, R., Ferguson, D.K. and Guo, S.X., (in prep.). A Miocene Pollen flora from Zhejiang Province, Eastern China.

Mohr, B., 1984. Die Mikroflora der obermiozänen bis unterpliozänen Deckschichten der rheinischen Braunkohle. *Palaeontographica Abt. B*, 191: 29–133.

Zetter, R., 1989. Methodik und Bedeutung einer routinemäßig kombinierter Lichtmikroskopischen und rasterelektronenmikroskopischen Untersuchung fossiler Mikroflora. *Cour. Forsch.-Inst. Senckenberg*, 109: 41–50. Frankfurt am Main.

Yusheng Liu, Reinhard Zetter, and David Ferguson
Institute of Palaeontology
University of Vienna
Universitaetsstr. 7/2
A-1010 VIENNA, Austria
YLI@pal.univie.ac.at
Fax: 0043-1-4020533

THESIS ABSTRACTS

RECONSTITUTION PALÉOÉCOLOGIQUE D'UNE
TORBIÈRE EN POSITION LITTORALE SUR LA RIVE
SUD DE L'ESTUAIRE DU SAINT-LAURENT, ISLE-
VERTE, QUÉBEC, CANADA*
Ph.D. thesis by M. Garneau

A peat bog located at the edge of a coastal marsh on the south shore of the St. Lawrence maritime estuary (48°00'N, 69°22'W) was selected for study. The development of the peat bog is associated with the recent emersion of the coastal area following the last St. Lawrence transgressive episode around 3000 BP. Three cores were collected through the peat sequence and underlying clay. The base of the clay unit records the beginning of the sedimentation at approximately 2000 BP (marine shells: 1990 +/- 70 BP; UQ-560). The paleoecological zonation of this

unit corresponds to that associated with the modern coast and reveals no major sea level fluctuation during this period of aggradation. Around 500 BP, the intertidal salt marsh changed into a freshwater marsh followed by the development of the peat bog observed on the modern surface. Local microtopographic conditions favoured this development.

Changes in palynomorphs and plant macrofossil assemblages through the peat sequences indicate deterioration of drainage conditions between 400 and 200 BP. These changes caused the opening of the forest cover which led to the formation of a *Typha latifolia* swamp. Rhizopods such as *Amphitrema flavum* and *Assulina muscorum*, as well as copepods, reveal the presence of ponds or stagnant water on the surface at this time. This transformation was caused, presumably, by a local change in surface drainage conditions that may in turn, be associated with regional climatic changes. For instance, an increase in precipitation may have influenced the delicate equilibrium of the peatland ecosystem. Although the Holocene history is incompletely known, it is possible that there was a slight rise of sea level associated with climatic deterioration. Due to the effects of hydrostatic pressure, a rise in sea level may have caused a rise in the water table level without direct submergence of the peat bog site. The assumption of climate deterioration is also supported by such indirect evidence in the region as the abandonment of coastal sites by native peoples and more signs of ice drift processes in lowlying marshes along the estuary.

As shown in this study, detailed palaeoecological analysis allows detection of local changes associated with allochthonous factors that can modify the autogenous dynamism of an ecosystem. Therefore, correspondence between topographical sequences and time sequences is not necessarily direct and depends on interpretation of a combination of different factors as registered in the three cores of the Isle-Verte peat bog.

*Ph.D. thesis, Hugo de Vries Laboratory, University of Amsterdam, Amsterdam, The Netherlands, 218 p., 22 plates. (1993)

Michelle Garneau
Geological Survey of Canada
2700 Einstein, C.P. 7500
Sainte-Foy, Québec, Canada, G1V 4C7

STUDIES ON THE CELL WALL OF DINOFLAGELLATE
RESTING CYSTS: Morphological Development,
Ultrastructure, and Chemical Composition*
Ph.D. thesis by John P. Kokinos

This thesis presents a series of investigations on the specialized cell covering of a dormant stage (the resting cyst) in the life cycle of the marine dinoflagellate *Lingulodinium polyedra*. These cell walls, along with those of resting cysts formed by many other dinoflagellate species, are resistant to degradation and persist in the depositional environment. Selective preservation of these materials has created a rich dinoflagellate fossil record (extending back ~225 million years) which has shown great utility in biostratigraphic applications. By elucidating the nature of resting cyst walls and directly observing their development in

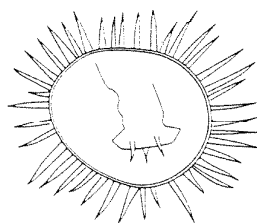
laboratory cultures, the research presented here addresses several long-standing questions regarding both the paleontology and biology of dinoflagellates.

Although resting cyst formation has been reported in other extant species, this thesis documents for the first time the morphological development of resting cysts having “fossilizable”, morphologically complex cell walls. In laboratory cultures of *L. polyedra*, resting cyst formation is an extremely rapid phenomenon; the transition from thecate, actively swimming planozygote to spine-bearing, morphologically mature hypnozygote occurs within 10–20 minutes. The basic mechanism consists of dramatic cell expansion resulting from the widening of an interstice between the planozygotic cytoplasm and a balloon-like membrane external to the theca. Key morphological events in the development of the distinctive *L. polyedra* resting cyst cell covering occur within this interstice. These include early dissociation and outward migration of the theca, formation of the resistant endophragm, and growth of spines from globules on the surface of the cytoplasm. The level of morphological maturity attained by the encysting cell depends primarily on how much development occurs before rupture of the expanding outer membrane. If rupture is premature, a wide variation of resting cyst morphology may occur, particularly with respect to the size, number, and distribution of processes.

The direct observation of these developmental events has shed much light on several issues regarding resting cyst morphogenesis. First, growth of *L. polyedra* resting cyst spines is clearly centrifugal (i.e. growing radially outward). Although not necessarily representative of spine growth in all species, this mode of formation provides a useful preliminary framework for interpreting some of the “histrichosphaerid” morphologies present in the fossil record. Second, in this species at least, the theca plays no direct role in influencing the morphology of spines. Finally, considerable variation in spine morphology is possible within one biologically-defined species. This last point has considerable significance for cyst-based taxonomy, and strongly suggests that several of the fossil morphotypes traditionally designated as separate species of *Lingulodinium* are, in fact, synonymous.

Ultrastructural examination of *L. polyedra* cysts formed in laboratory culture has shown, for the first time, the fine structure of the cell walls enclosing a living, paleontologically-significant resting cyst. Unfortunately, difficulties associated with fixation and infiltration of these thick-walled structures precluded an in-depth investigation of the ultrastructural dynamics underlying the morphological development described above. Preliminary results, however, confirm earlier speculation that only the outermost wall of the *L. polyedra* resting cyst is normally preserved in the fossil record. This outer wall (including spines) appears constructed of closely appressed structural units, an ultrastructural style apparently widespread among species related to *L. polyedra*.

The resistant cell walls of *L. polyedra* resting cysts were isolated from laboratory cultures and chemically characterized by an extensive array of analytical techniques. Both thermal (pyrolysis) and chemical (CuO oxidation) dissociation of this material yielded suites of products consistent with a macromolecular substance composed significantly of aromatic



Cyst of *L. machaerophorum*

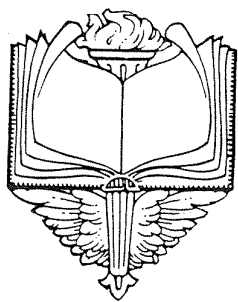
components. In addition, the relative abundance of carboxylated phenols among resting cyst CuO oxidation products indicated that aromatic structural units in the dinoflagellate material may be largely carbon-carbon linked, probably directly through aromatic nuclei. Such a “condensed” arrangement may be, in part, responsible for the remarkable resistance of the dinoflagellate resting cyst wall biopolymer. Overall, the aromatic signature of *L. polyedra* resting cyst wall material can be clearly distinguished from that of both pollen wall “sporopollenin” and classical lignin.

Although some short chain carboxylic acids are generated during CuO oxidation, there is little evidence obtained by dissociation techniques to suggest the significant presence of extended polymethylenic elements in this macromolecular substance. As a result, the dinoflagellate material appears fundamentally different from the highly aliphatic “algaenans” recently identified in the cell wall of several chlorophyte species. Interestingly, pyrolysis (Py-GC/MS) of resting cyst wall material produced an abundance of prist-1-ene, strongly suggesting the presence of bound tocopherols which may play an important structural role in the resistant cell wall biopolymer. Lipid analysis of *L. polyedra* culture extract revealed a series of even carbon numbered fatty acids (C₁₄–C₂₄), as well as sterols (including dinosterol and cholesterol), and a full suite of tocopherols. These compounds are present during construction of the resistant outer wall of the resting cyst, and could function as precursors to the resting cyst wall biopolymer. Another possibility, given the strong aromaticity predicted by the results of pyrolysis and CuO oxidation, is some contribution by aromatic amino acids in an analogous fashion to lignin biosynthesis.

The extensive chemical characterization of the outermost cell wall of *L. polyedra* resting cysts reported in this thesis provides the first rigorous analysis of “fossilizable” biopolymer(s) produced by an extant dinoflagellate. Furthermore, these analyses represent an unprecedented level of chemical characterization of a resistant algal cell wall biopolymer, and clearly demonstrate the unique nature of the *L. polyedra* resting cyst wall. As a result, this work provides the first chemical data to justify the term “dinosporin”, previously proposed to distinguish the highly resistant material comprising dinoflagellate resting cyst walls from other resistant cell wall biopolymers.

*Ph.D. Thesis, Massachusetts Institute of Technology/Woods Hole Oceanographic Institution. WHOI-94-10. 222 pages, 28 figures, 11 tables, 5 plates (1994).

John P. Kokinos
Biology Department
Woods Hole Oceanographic Institution



ANNOUNCEMENT OF PUBLICATIONS

Late Quaternary Studies in Beringia and Beyond, 1950–1993: An Annotated Bibliography by Alwynne B. Beaudoin and Frances D. Reintjes, 1994. Archaeological Survey Occasional Paper No. 35. Provincial Museum of Alberta, Alberta Community Development, Edmonton, Alberta, viii + 386 pp.

This annotated bibliography is designed as a research tool for Quaternarists interested in Beringia and adjacent areas. Beringia comprises the northern hemisphere region centered on Siberia and Alaska–Yukon and bounded by the Lena River to the west and the Mackenzie River to the east. Other areas covered in this volume include western Siberia between the Lena and Yenisey Rivers, northeastern China, northern Korea and Japan. It also covers the portion of the northern Pacific Ocean and offshore continental shelf that would have been terrestrial during the Late Pleistocene full-glacial. The bibliography includes references to research papers, books, monographs, short notes, theses, conference abstracts, conference reports, popular articles, and commentaries, published between 1950–1993. The citations deal with surficial geology, glacial history, climate history, paleontology, archaeology, and paleoenvironments in Beringia between about 50,000 and 10,000 yr BP. References include abstracts, where available. The bibliography comprises 1001 citations, annotated by topic, geographic area and library location, and accompanied by a comprehensive index. This bibliography has been compiled as part of Provincial Museum of Alberta's "Bridge of the Black Dragon Project."

Also still available:

Annotated Bibliography: Late Quaternary Studies In Alberta's Western Corridor by Alwynne B. Beaudoin, (1989). Archaeological Survey of Alberta Manuscript Series No. 15. Alberta Culture and Multiculturalism, Edmonton, Alberta. xvii + 362 pp.

This annotated bibliography includes papers, short notes, theses, conference abstracts and maps published between 1950–1988. The citations deal with surficial geology, glacial history, paleontology and paleoenvironments in the Western Corridor of Alberta between roughly 30,000 to 6,000 yr BP. Coverage concentrates on the Eastern Slopes and adjacent areas but

citations dealing with the rest of Alberta and parts of southern Saskatchewan and northeastern British Columbia are also included. The bibliography comprises about 650 citations.

These publications can be ordered from: The Museum Shop, c/o The Provincial Museum of Alberta, 12845–102nd Avenue, Edmonton, Alberta, T5N 0M6, Canada, Tel: (403) 453-9146, FAX: (403) 454-6629. Paper No. 35 costs \$14.95 (CAN); Manuscript Series No. 15 costs \$10 (CAN). Shipping and handling is \$3 for first item, \$1 for each additional item. Within Canada, payment should be made in Canadian funds. For orders from outside Canada, please remit payment in US funds. Canadian residents, please add 7% GST to total (cost plus shipping and handling). Payment may be made by cheque or money order, payable to "Friends of the Provincial Museum of Alberta Society." Credit card (Visa or Mastercard) orders will be accepted by phone.

Alwynne B. Beaudoin
Archaeological Survey
Provincial Museum of Alberta
Edmonton, Alberta
abeaudoi@gpu.srv.ualberta.ca

Pollen of wet evergreen forests of the Western Ghats, India by C. Tissot, H. Chikhi, and T.S. Nayar, 1994. The French Institute, Pondicherry, 133 p., 75 plates, ISSN 0971-3107.

According to the publishers, this is an essential reference book for any palynologist dealing with the tropics around the world as well as with the Upper Cretaceous and Tertiary periods. It includes 162 species belonging to 46 families, each one selected as a reliably identifiable marker of wet evergreen forests. The 75 plates carry over 1,300 light and 140 scanning electron micrographs of pollen grains.

Copies may be ordered at the price of FF120, US\$20, or Indian Rs 400, including postage, from: The Librarian, French Institute, P.B. 33, Pondicherry 605 001, India.

Pollen grains of Canadian honey plants by C.W. Crompton and W.A. Wojtas. Canada Communication Group—Publishing, Ottawa; 236 pages, 376 light microscopy and 148 scanning electron photomicrographs. Paperbound. 15 x 23 cm.

Many countries pay premium prices for honey from specific nectar sources. The Canadian honey industry can now turn to this authoritative reference for accurate pollen grain analysis. With light microscopy and scanning electron microscopy, specialists can now accurately identify the pollen grains of 188 nectar-producing plants in Canada. Scientific descriptions, identification keys, and several hundred photomicrographs ensure the accurate identification of pollen grains found in honey. Information is also provided on the distribution and ecology of Canadian honey plants.

The introduction reviews the general importance of pollen

grains and pollinators in fertilizing flowers. Techniques and methods of preparing honey samples in order to study pollen grains are explained. A comprehensive bibliography of more than 100 citations is provided, for the use both of experts and novices.

Available from: Canada Communication Group—Publishing, Catalogue No. A53-1892-1993E. Price in Canada: CAN\$39.95 (plus add 7% GST; plus \$5.40 p&p); Outside Canada: US\$51.95 plus p&p. Send orders to: Canada Communication Group—Publishing, Ottawa, Canada K1A 0S9; phone: (819) 956-4800; Fax: (819) 994-1498. Visa/Mastercard accepted.

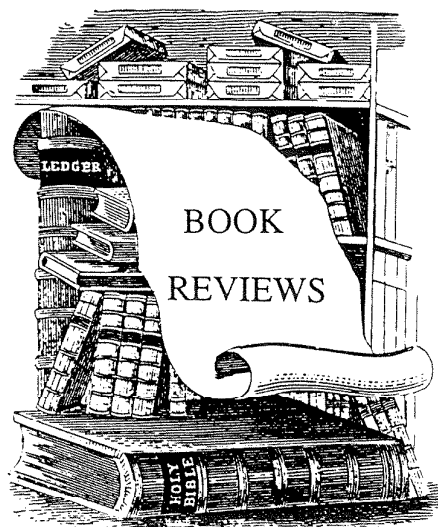
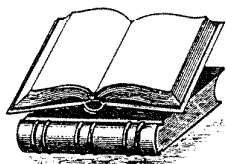
Pollen Grains of New Zealand Dicotyledonous Plants by N T Moar. Manaaki Whenua Press, Lincoln, New Zealand; 200 pages, 71 photographic plates, glossary of terms, index with family names and synonyms included, case bound. ISBN 0-478-04300-X. Book specifications: 18 x 24.7 cm.

This long-awaited Atlas brings together for the first time descriptions and illustrations for the most important and numerous group of New Zealand's indigenous flowering plants—the Dicotyledons. According to the publishers, it is an invaluable reference for all those involved and interested in pollen analysis. The book is structured to aid the identification process. Taxonomic keys to different pollen types quickly narrow down the range of possible options to genus level. The detailed species descriptions and notes then enable more precise identification.

A total of 71 full-page plates, each with around 15 light microscope or scanning electron microscope photographs, show particularly important features of the pollen grains. Some plates include views of grains from different angles to help identify individual species.

Author of the book, Dr. Neville Moar, is New Zealand's foremost expert on the identification of native pollen grains. He was raised in the Manawaru and in 1947 joined Botany Division, DSIR. Quaternary botany was his major interest and a major contribution was to describe the basic patterns of vegetation during the last 120,000 years in Canterbury and Westland. This involved him in significant collaborative research which furthered understanding of late Quaternary events in Westland. His reputation as a skilled palynologist meant he was regularly asked to identify pollen, especially by the honey industry. Since retiring in 1987, he has maintained an interest in palynology as a Research Associate of Manaaki Whenua—Landcare Research, a New Zealand Crown Research Institute based in Lincoln.

Copies may be ordered at the price of US\$60.00 incl. p&p (or NZ\$60.00 incl. p&p and GST if purchased in New Zealand) from: Manaaki Whenua Press, P.O. Box 40, Lincoln 8152, New Zealand, Fax: +64 (3) 325 2027.



SHORT REVIEWS OF GEOLOGICAL SOCIETY OF AMERICA SPECIAL PAPERS RECENTLY RECEIVED

by
Reed Wicander, AASP Book Review Editor

Early Sedimentary Evolution of the Michigan Basin by P. Catacosinos & P. A. Daniels, Jr. (Eds.), 1991. Geological Society of America Special Paper 256. Geological Society of America 3300 Penrose Place, P.O. Box 9140, Boulder Colorado 80301. 248 pages. \$40.00.

This special paper contains 11 papers devoted to the Michigan Basin. As stated in the Preface, the main purpose of this volume is to provide an update on the understanding of the geology of the Michigan Basin, and provide easier access to the voluminous stratigraphy of the basin. The volume contains a blend of reviews and original research concerning the sedimentary history of the Michigan Basin. As such, the chapters are primarily stratigraphically oriented, and provide the reader with a wealth of stratigraphic information for this classic and important oil-producing basin.

The opening chapter on "Thermal maturity of the Michigan Basin" by K. R. Cercone and H. N. Pollack will be of particular interest to those involved in organic maturity of basins. The authors discuss the various heat-flow hypotheses that have been proposed and then propose an alternative theory for the thermal history of the basin. Chapter 3 on "Stratigraphy of Middle Proterozoic to Middle Ordovician formations of the Michigan Basin" by P. A. Catacosinos and P. A. Daniels, Jr. discusses the Precambrian sedimentary rocks as well as summarizing and providing new regional interpretation of the basin's early Paleozoic stratigraphy and evolution.

The dolomitization and diagenesis of Trenton and Black River Formations as well as the interrelation between hydrocarbon migration and mineralization of these formations is discussed in the fourth chapter written by J. M. Budai and J. L. Wilson. Three

chapters cover the Silurian reefs and evaporites of the basin, and these are followed by two chapters concerning the Upper Devonian biostratigraphy and geologic history of the basin, both written by R. C. Gutschick and C. A. Sandberg. The Mississippian stratigraphy, sedimentology, and economic geology are covered in chapter 10 and the volume concludes with a paper on the "Geological and geophysical evaluation of the region around Saginaw Bay, Michigan (central Michigan Basin) with image processing techniques" by J. D. Herman, R. K. Vincent, and B. Drake.

This volume will be of great use to those that work in the Michigan Basin, teach, or need to know more about this classic basin. It is a good compendium of what is currently known about the evolutionary history of the basin and its stratigraphy.

Tectonic setting of faulted Tertiary strata associated with the Catalina core complex in southern Arizona by W. R. Dickinson, 1991. Geological Society of America Special Paper 264. Geological Society of America, 3300 Penrose Place, P.O. Box 9140, Boulder Colorado 80301. 114 pages. \$38.75.

This special paper presents an overview of the stratigraphy, tectonics, and structural relationships of the mid-Tertiary sedimentary rocks of the Catalina core complex and San Pedro trough exposed in southern Arizona. As the author states in the Introduction, "The impetus for study of the mid-Tertiary strata was a desire to constrain tectonic models for the evolution of Cordilleran metamorphic core complexes."

Dickinson initially provides an overview of the pre-Laramide orogeny stratigraphy and relationships in the area, followed by a discussion of the stratigraphy and structural relations of the rocks associated with the Laramide orogeny. This is done to provide the groundwork to show how these events affected or were related to the post-Laramide structural evolution of the area. The regional Tertiary tectonomagmatic history of the Cordillera between Mexico and Canada is then discussed in a fair amount of detail, followed by another detailed account of the Catalina core complex and the timing of tectonic denudation in the area. Lastly, alternate structural models are presented for extensional detachment fault systems.

The last half of the book covers the Mid-Tertiary sedimentary sequences deposited during the structural evolution of the Catalina core complex in the southern Arizona region. This section includes detailed descriptions, correlations, analysis, and stratigraphic relationships of the various sedimentary units in the area. A very complete references cited section and geologic map complete this volume.

Geology of the Point Sur-Lopez Point region, Coast Ranges, California: A part of the Southern California allochthon by C. A. Hall, Jr., 1991. Geological Society of America Special Paper 266. Geological Society of America, 3300 Penrose Place, P.O. Box 9140, Boulder Colorado 80301. 44 pages. \$17.50.

This short, but detailed volume examines the geology of the

Point Sur-Lopez Point region and delineates the Southern California allochthon, a structural feature that includes, but is larger than, Salinia (a terrane defined as "the region of the California Coast Ranges north of the Big Pine fault, west of the San Andreas fault, and east the Sur, Nacimiento, and Rinconada faults"). The Southern California allochthon extends from Point Arena in northwestern California, to the Chocolate Mountains of the Mojave Desert in southeastern California, and comprises the upper plate of the Sur thrust (part of a megathrust system). It includes pre-Cretaceous igneous and metamorphic rocks of the Sur Complex, and unconformably overlying the Sur Complex, an essentially uninterrupted sequence of Upper Cretaceous through Eocene clastic rocks representing fore-arc basin deposits.

Based on geologic mapping of the Point Sur-Lopez Point region and other geologic research and mapping in the central Coast Ranges and southern California, Hall proposes that the Southern California allochthon was in eastern California and Arizona during the Late Cretaceous and was then thrust at least 180 km westward or northwestward during the early Paleogene. The Southern California allochthon was then broken apart and moved along the San Andreas fault system during the middle Miocene to early Pliocene, rotated clockwise with crustal blocks of the Transverse Ranges, and shortened during the early Pliocene to Holocene. The driving mechanism for the movement of the Southern California allochthon is thought to be oblique subduction, accompanied by tectonic erosion of the bottom of the allochthon.

The existence of a Southern California allochthon eliminates the need for a proto-San Andreas fault, hundreds of kilometers of left lateral strike slip movement along the Nacimiento fault, and the introduction of exotic terranes to explain many of the displaced blocks in the area. In fact, erosion of the underside of the Southern California allochthon could account for part of the missing Salinia, a large part of the Great Valley sequence fore-arc basin, and some of the missing granitic rocks in the Southern California allochthon.

This volume is divided into seven major sections: Introduction, Geology of the Point Sur-Lopez Point Area, Faults of the Central Coast Ranges, Late Paleogene-Neogene Geologic History, Southern California Allochthon, Discussion, and Summary and Conclusions, as well as an extensive references cited section and two pocket plate maps. For those with an interest in California geology, this would be an excellent addition to one's reference library.

Eastern North American Mesozoic magmatism by J. H. Puffer & P. C. Ragland (Eds.), 1992. Geological Society of America Special Paper 268. Geological Society of America 3300 Penrose Place, P.O. Box 9140, Boulder Colorado 80301. 406 pages. \$78.00.

As stated in the preface, this volume represents the "state of the art" on Mesozoic magmatism in eastern North America as of 1991. It contains an impressive 21 articles divided into three regions. Six chapters cover Coastal New England and Atlantic Canadian magmatism, 15 chapters are devoted to Eastern North American tholeiitic magmatism, and one chapter covers the

White Mountain magmatism of New England.

This volume is for those people that want to know more than was covered in their historical geology course about the Mesozoic magmatism that occurred along the east coast of North America when Pangaea broke apart. Each of the four magmatic episodes that occurred during the Mesozoic is described. The first episode occurred during the Triassic and was confined mainly to coastal New England. The second episode occurred during the Late Triassic–Early Jurassic and involved both intrusion and extrusion of magma along rift-related and perhaps transform-related structures along the margin of the Appalachian Mountains. The third episode involved mainly granitic intrusions in the White Mountains of New England during the Early Jurassic, while the final Mesozoic episode occurred along a linear belt throughout New England and Quebec and involved the intrusion of thousands of dikes during the Late Jurassic and Early Cretaceous. Each of these episodes is covered by one or more articles in this volume.

Reed Wicander, President Elect and AASP Book Review Editor
Department of Geology
Central Michigan University
Mt. Pleasant, Michigan 48859



FOWLER'S MONSTROSITIES

The delightful comments below are from that well-known English lexicographer and grammarian of the late nineteenth–early twentieth century, H.W. Fowler.

“**miocene**. A typical example of monstrosities with which scientific men in want of a label for something, and indifferent to all beyond their own province, defile the language. The elements of the word are Greek, but not the way they are put together, nor the meaning demanded of the compound. See **HYBRIDS AND MALFORMATIONS** s.f.” [From: H.W. Fowler, 1926; *A Dictionary of Modern English Usage*. Second Edition, 1965, Oxford University Press, Oxford & New York, p. 366. Contributed by Judith K. Lentin.]

“**pleistocene, pliocene, miocene**, are regrettable **BARBARISMS**. It is worth while to mention this, not because the words themselves can now be either ended or mended, but in the hope that men of science may remember their duties to the language—duties much less simple than they are apt to suppose.” [From: H.W. Fowler, 1926; *A Dictionary of Modern English Usage*. Second Edition, 1965, Oxford University Press, Oxford & New York, p. 455.]



BRITISH MICROPALAEONTOLOGICAL SOCIETY, 1994 ANNUAL GENERAL MEETING

The 1994 BMS Annual Meeting will be held in the Anatomy Lecture Theatre, University College London, Gower Street, London at 2.00 p.m. on Wednesday 16th November. Following Society business (officer's reports and the presentation of the Simon Petroleum Technology Stratigraphy Prize), two guest lectures will be presented: “Conodont palaeobiology: elements, apparatuses, animals and affinities” by Dr. Richard J. Aldridge (University of Leicester); and “The last sighs of Pangea: faunistic, geochemical and sedimentary evidence in the Mid-Cretaceous marine realm” by Dr. Jürgen Thürow (University College London). A wine reception for members will be held in the Rock Room, Department of Geological Sciences following the lectures. Local Secretary: Dr. Paul R. Bown

Submitted by J.B. Riding (BMS Secretary)

GRAPHIC CORRELATION AND THE COMPOSITE STANDARD: THE METHOD AND ITS APPLICATION

An SEPM Research Conference

Preliminary Announcement and Call for Papers

The conference will be held November 27–December 2, 1994 at the Houstonian Hotel and Convention Center, Houston, Texas. The Organizers are **H. Richard Lane** (Amoco Production Co.) and **Gregg Blake** (UNOCAL), Norman MacLeod (Natural History Museum, London).

Graphic correlation (also known as Shaw's method) has been used to solve stratigraphic problems in a wide variety of geologic contexts for over 30 years. Today, it is the most widely used method of quantitative stratigraphic correlation. However, despite its impressive record, graphic correlation remains one of the most controversial and under-utilized tools for chronostratigraphic inference. This research conference will examine long-standing concepts of graphic correlation and

development of composite standard sequences in light of the demand for high-resolution stratigraphic correlations. Primary goals include: i) providing an authoritative account of the graphic correlation/composite standard method, ii) evaluating the importance of graphic correlation as a means of establishing high-resolution stratigraphic correlations, and iii) summarizing recent methodological advances that greatly expand graphic correlation's precision and accuracy. Conferees will participate in and/or contribute to a varied program detailing both methods and applications of the graphic correlation approach. Opportunities will also be provided to examine current software packages and engage in direct data analysis under the guidance of experienced practitioners. Finally, a field trip to the Cretaceous strata of Texas is planned in order to emphasize the detailed understanding of field relationships that can be gained through application of graphic correlation concepts.

Total cost of the conference, including registration, hotel accommodations for the three days of the conference, continental breakfast and lunch each day of the conference, and Sunday night ice-breaker will be approximately \$500.00 per person. Field trip registration, including two nights lodging in Belton, Texas and a Barbecue Banquet, will be approximately \$200.00 per person. An official SEPM announcement with finalized costs will be mailed to you in a few weeks. This preliminary announcement is intended to make members of the geologic community with a known interest in graphic correlation aware of the conference and encourage them to contribute presentations. The conference will be limited to a total of 120 participants and the field trip limited to 40 persons. Therefore, interested parties should plan to reserve their places early.

If you or any of your colleagues, students, etc. are interested in attending the conference, please fill out the form at the back of this Newsletter and mail it to H.R. Lane, Co-organizer: SEPM Graphic Correlation Conference, Amoco Production Co., P.O. Box 3092, Houston, TX 77253-3092 [(713) 366-2843 [phone], (713) 366-2404 [fax]]. Questions about the technical program should be directed to J.A. Stein or J.H. Gamber, Technical Session Coordinators, Amoco Production Co., P.O. Box 3092, Houston, TX 77253-3092 (same phone and FAX numbers), or to any of the organizers.

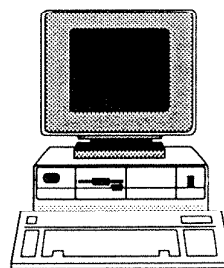
REPORTS OF MEETINGS AND CONFERENCES

OPENING OF THE EUROPEAN POLLEN DATABASE

According to an announcement earlier in the year, a "Past Vegetation and Climate From Pollen Databases" workshop was due to be held in Arles, France, on 3-5 March 1994. Although I have no official report, the workshop apparently marked the official opening of the European Pollen Database, which is supported by the CEC-ENVIRONMENT program, and the

launching of a pan-European network for a common pollen database supported by the CEC-COPERNICUS Program (PECO). The European Pollen Database advisory and executive committees, database managers and contributors were to assemble in Arles to present research projects and examples of pollen databases. Over 400 sites are currently available in the database. For more information about contributing to the European Pollen Database contact:

EPD, Centre Universitaire d'Arles,
Place de la République,
F-13200 Arles, FRANCE,
TEL: +33-90961818 FAX: +33-91939868;
E-MAIL: EUPARL@FRMOP11.BITNET



COMPUTERS AND THE INFORMATION HIGHWAY

CANADIAN GEOSCIENCE INFO GOES ON-LINE

by Florin Neumann

The bibliographical catalogue of the Canadian Geoscience Information Centre (CGIC) is now available on-line as the On-Line Public Access Catalogue (OPAC) of the Canadian Geological Survey. The catalogue covers references in to over 550,000 volumes, over 6,000 maps, and other material (negatives, prints, slides) pertaining to all areas of geosciences, including palynology, available at the CGIC or at the Québec Geoscience Centre.

The software is menu-driven, relatively fast, well implemented, and very easy to use: the user is guided by on-screen directions at every step. To access OPAC over Internet telnet to geoinfo.gsc.emr.ca (VT100 terminal emulation) and login as opac. If you do not have a local Internet service provider, indirect Internet connection is available through the Ottawa Freenet at (613) 564-3600 in the Science, Engineering and Technical Group > Geological Survey of Canada > The NRCan Gopher. Two lines are also available for direct link to OPAC at (613) 947-5700 (terminal emulation VT100; modem settings are full duplex, no parity, 1 stop bit, 8 data bits; maximum speed is 9600 baud).

More information is available from CGIC, 601 Booth St, Ottawa, Ontario, Canada K1A 0E8, e-mail: library@gsc.emr.ca, phone (613) 996-3919, fax (613) 943-8742.

BIOLOGICAL ABSTRACTS ON CD

by Florin Neumann

Bibliographic databases on CD-ROMs are coming into more and more common use—for those of us lucky enough to be affiliated with institutions which can afford them. GEOREF, the electronic bibliographic database of the American Geological Institute, is already well known; but not many palynologists know that another CD-ROM database, Biological Abstracts on CD (BA on CD), may also be of some interest.

Started in 1990 and updated quarterly since then, BA on CD is the equivalent of the printed Biological Abstracts, which is produced by BIOSIS, an abstracting/indexing service for biological and biomedical research literature. Although palynology is somewhat peripheral to the focus of BA on CD, papers published in journals such as *Palaeontographica* Abt. B, *Palynology*, or *Review of Palaeobotany and Palynology* (BA on CD does not cover books or conference proceedings) are referenced therein.

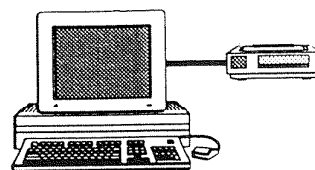
BA on CD uses SilverPlatter software, available either in PC or in Macintosh version. Each reference includes author name(s), year, title, translated title, journal, an English abstract, keywords, and other information. The procedures for searching, browsing, printing, and downloading are fairly simple and similar to the equivalent procedures in GEOREF.

Downloading references and importing them in bibliographic databases such as ProCite, EndNote, or PaperBase is much easier than in GEOREF, because BA on CD uses a common, consistent format throughout. However, the legal niceties of downloading and using on one's own personal computer references from CD-ROM databases, such as BA on CD, are at present rather blurry. The current policy of BIOSIS is to allow free temporary storage of downloaded references, and to request a fee of \$0.39 per record (with a minimum fee of \$195) for permanent storage. As defined by BIOSIS, temporary storage means the downloaded records are going to be stored for less than one month on a medium different from the CD-ROM they came on, anything longer than one month being considered permanent storage.

A subscription to BA on CD costs between \$7,000 and \$10,000—so it is definitely not something for the lone consultant! For more information you can write to BIOSIS, 2100 Arch St, Philadelphia PA 19103-1399, or call 1-800-748-246747 (US and Canada), 05-25-382297 (EC), or 215-587-2016 (worldwide).

If you want to download and use on your own computer records from BA on CD, and you are using a Macintosh and a database that can read tab-separated data (e.g. FileMaker), or a bibliographic database that can import data in the ProCite format (e.g. EndNote), and you want a little how-to file to help things along, then send e-mail to florin@quartz.geology.utoronto.ca, or send a floppy and a stamped self-addressed envelope to Florin Neumann

Florin Neumann
Dept. of Geology
University of Toronto
22 Russell St, Toronto, Ont., M5S 3B1, Canada



“LISTSERVERS” AND INFORMATION SUPERHIGHWAY

by Martin. J. Head

Listservers are automated mailing lists programmed to receive e-mail messages and then pass them on, by e-mail, to all subscribers of the list. Prompted by an article on listservers by Alwynne Beaudoin (Canadian Association of Palynologists (CAP) Newsletter, 17(1) p. 15), I decided to try QUATERNARY, a listserver organized by Dave Liverman (Newfoundland Geological Survey) for all those interested in the Quaternary sciences (which of course includes palynology). Messages include announcements about meetings, job vacancies, new publications, requests for help in locating references, discussions of research ideas, and short articles. Some items evidently “do the rounds” because a QUATERNARY article on LOUIS AGASSIZ (reproduced in this Newsletter) originated as a feature of DARWIN-L, a listserver for professionals in the historical sciences.

Some listservers and how to subscribe to them

To subscribe to QUATERNARY, send the following message to:

listserv@morgan.ucs.mun.ca

subscribe quaternary your-name

You should receive acknowledgement of your subscription. To get off the list send the message:

signoff quaternary

to the same address. Messages to the list should be sent to:

quaternary@morgan.ucs.mun.ca

Contact the listowner, Dave Liverman, if you have any problems with the list. He can be reached at: dgl@zeppo.geosurv.gov.nf.ca or: liverman@morgan.ucs.mun.ca

The listserver DARWIN-L is an international network discussion group for professionals in the historical sciences. It includes the feature Today in the Historical Sciences (e.g. the item on LOUIS AGASSIZ) For more information about Darwin-L send the two-word message INFO DARWIN-L to:

listserv@ukanaix.cc.ukans.edu,

or:

gopher@rjohara.uncg.edu (152.13.44.19).

The POLLEN-SWEDEN list is primarily intended as a means of dissemination for the pollen reports prepared by the Palynological Laboratory of the Swedish Museum of Natural History. Regular reports, initially restricted to the Stockholm region, will be sent to list members. The reports are written for the general public and are intended to be useful, for example, to someone

contemplating a visit to Stockholm.

The list is also open as a forum for free discussion of anything of interest in palynological work. The list is not moderated and the names of list members will be provided on request by the list host.

To subscribe, send a message to mailserv@nrm.se with the first non-blank line containing the text: SUBSCRIBE POLLEN-SWEDEN. Your subscription will be acknowledged with a more detailed text about the list and its host service. If you experience any difficulty in accessing this service please contact the listowner: postmaster@nrm.se

MISSOURI BOTANICAL GARDEN (MBG) announces its new World Wide Web server. According to Alan V. Tucker (tucker@MOBOT.MOBOT.ORG) in a QUATERNARY listserver announcement, the site includes a tour of the Garden, a brief history lesson, the Flora of North America project, information about educational programs, a gateway to other biological Web sites, and access to the MBG database. Over 600,000 WAIS-indexed records reside in the taxonomic database, accessible to any Web or gopher user. Visit the Missouri Botanical Garden Web at:

<http://straylight.tamu.edu/MoBot/welcome.html>

You can reach the dataset through the Web, or through gopher (mobot.org). Send comments to Alan Tucker (tucker@mobot.org).

SPECIAL HISTORICAL FEATURE: LOUIS AGASSIZ as a Teacher

The following item, while not a palynological story, is as relevant a lesson to the palynologist as it was to its entomological narrator! Read and see what I mean. The item is taken from Today in the Historical Sciences, a feature of DARWIN-L (SEE ABOVE).

1807: JEAN LOUIS RODOLPHE AGASSIZ is born at Motier-en-Vully, Switzerland. As a young naturalist in Europe, Agassiz will do foundational work in paleontology and historical geology, and in his "Etudes sur les glaciers" (Neuchatel, 1840) he will present the first comprehensive theory of the Ice Age. Following his emigration to the United States in 1846 he will establish the Museum of Comparative Zoology at Harvard University, and later contribute to the founding of the United States National Academy of Sciences. Agassiz's skill as a teacher will become the stuff of legend, and many years after his death the rhetorician Lane Cooper will publish a collection of reminiscences by his students, "Louis Agassiz as a Teacher" (Ithaca, 1945), which will include a classic account of the professor's technique, originally written by Samuel Scudder in 1874:

It was more than fifteen years ago [from 1874] that I entered the laboratory of Professor Agassiz, and told him I had enrolled my name in the Scientific School as a student of natural history. He asked me a few questions about my object in coming, my antecedents generally, the mode in which I afterwards proposed to use the knowledge I might acquire, and, finally, whether I wished to study any special branch. To the latter I replied that, while I wished to be well grounded in all departments of zoology, I purposed to devote myself specially to

insects.

"When do you wish to begin?" he asked.

"Now," I replied.

This seemed to please him, and with an energetic "Very well!" he reached from a shelf a huge jar of specimens in yellow alcohol.

"Take this fish," said he, "and look at it; we call it a haemulon; by and by I will ask you what you have seen."

With that he left me, but in a moment returned with explicit instructions as to the care of the object entrusted to me.

"No man is fit to be a naturalist," said he, "who does not know how to take care of specimens."

I was to keep the fish before me in a tin tray, and occasionally moisten the surface with alcohol from the jar, always taking care to replace the stopper tightly. Those were not the days of ground-glass stoppers and elegantly shaped exhibition jars; all the old students will recall the huge besmeared corks, half eaten by insects, and begrimed with cellar dust. Entomology was a cleaner science than ichthyology, but the example of the Professor, who had unhesitatingly plunged to the bottom of the jar to produce the fish, was infectious; and though this alcohol has "a very ancient and fishlike smell," I really dared not show any aversion within these sacred precincts, and treated the alcohol as though it were pure water. Still I was conscious of a passing feeling of disappointment, for gazing at a fish did not commend itself to an ardent entomologist. My friends at home, too, were annoyed, when they discovered that no amount of eau-de-Cologne would drown the perfume which haunted me like a shadow.

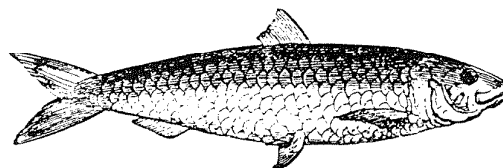
In ten minutes I had seen all that could be seen in that fish, and started in search of the Professor—who had, however, left the Museum; and when I returned, after lingering over some of the odd animals stored in the upper apartment, my specimen was dry all over. I dashed the fluid over the fish as if to resuscitate the beast from a fainting-fit, and looked with anxiety for a return of the normal sloppy appearance. This little excitement over, nothing was to be done but to return to a steadfast gaze at my mute companion. Half an hour passed—an hour—another hour—; the fish began to look loathsome. I turned it over and around; looked it in the face—ghastly; from behind, beneath, above, sideways, at three-quarter' view—just as ghastly. I was in despair; at an early hour I concluded that lunch was necessary; so with infinite relief, the fish was carefully replaced in the jar, and for an hour I was free.

On my return, I learned that Professor Agassiz had been at the Museum, but had gone, and would not return for several hours. My fellow-students were too busy to be disturbed by continued conversation. Slowly I drew forth that hideous fish, and with a deep feeling of desperation again looked at it. I might not use a magnifying-glass; instruments of all kinds were interdicted. My two hands, my two eyes, and the fish: it seemed a most limited field. I pushed my finger down its throat to feel how sharp the teeth were. I began to count the scales in the different rows, until I was convinced that that was nonsense. At last a happy thought struck me—I would draw the fish; and now with surprise I began to discover new features in the creature. Just then the Professor returned.

"That is right," said he: "a pencil is one of the best of eyes. I am glad to notice, too, that you keep your specimen wet, and your bottle corked."

With these encouraging words, he added:

"Well, what is it like?"



He listened attentively to my brief rehearsal of the structure of parts whose names were still unknown to me: the fringed gill-arches and movable operculum; the pores of the head, fleshy lips and lidless eyes; the lateral line, the spinous fins and forked tail; the compressed and arched body. When I had finished, he waited as if expecting more, and then, with an air of disappointment:

"You have not looked very carefully; why," he continued more earnestly, "you haven't even seen one of the most conspicuous features of the animal, which is as plainly before your eyes as the fish itself; look again, look again!" and he left me to my misery.

I was piqued; I was mortified. Still more of that wretched fish! But now I set myself to my task with a will, and discovered one new thing after another, until I saw how just the Professor's criticism had been. The afternoon passed quickly; and when, toward its close, the Professor inquired:

"Do you see it yet?"

"No," I replied, "I am certain I do not, but I see how little I saw before."

"That is next best," said he, earnestly, "but I won't hear you now; put away your fish and go home; perhaps you will be ready with a better answer in the morning. I will examine you before you look at the fish."

This was disconcerting. Not only must I think of my fish all night, studying, without the object before me, what this unknown but most visible feature might be; but also, without reviewing my new discoveries, I must give an exact account of them the next day. I had a bad memory; so I walked home by Charles River in a distracted state, with my two perplexities.

The cordial greeting from the Professor the next morning was reassuring; here was a man who seemed to be quite as anxious as I that I should see for myself what he saw.

"Do you perhaps mean," I asked, "that the fish has symmetrical sides with paired organs?"

His thoroughly pleased "Of course! of course!" repaid the wakeful hours of the previous night. After he had discoursed most happily and enthusiastically—as he always did—upon the importance of this point, I ventured to ask what I should do next.

"Oh, look at your fish!" he said, and left me again to my own devices. In a little more than an hour he returned, and heard my new catalogue.

"That is good, that is good!" he repeated; "but that is not all; go on"; and so for three long days he placed that fish before my eyes, forbidding me to look at anything else, or to use any artificial aid. "Look, look, look," was his repeated injunction.

This was the best entomological lesson I ever had—a lesson whose influence has extended to the details of every subsequent study; a legacy the Professor has left to me, as he has left it to many others, of inestimable value, which we could not buy, with which we cannot part.

A year afterward, some of us were amusing ourselves with chalking outlandish beasts on the Museum blackboard. We drew prancing starfishes; frogs in mortal combat; hydra-headed worms; stately crawfishes, standing on their tails, bearing aloft umbrellas; and grotesque fishes with gaping mouths and staring eyes. The Professor came in shortly after, and was as amused as any at our experiments. He looked at the fishes.

"Haemulons, every one of them," he said: "Mr. Scudder drew them."

True; and to this day, if I attempt a fish, I can draw nothing but haemulons.

The fourth day, a second fish of the same group was placed beside the first, and I was bidden to point out the resemblances and differences between the two; another and another followed, until the entire family lay before me, and a whole legion of jars covered the table and surrounding shelves; the odor had become a pleasant perfume; and even now, the sight of an old, six-inch, worm-eaten cork brings fragrant

memories.

The whole group of haemulons was thus brought in review; and, whether engaged upon the dissection of the internal organs, the preparation and examination of the bony framework, or the description of the various parts, Agassiz's training in the method of observing facts and their orderly arrangement was ever accompanied by the urgent exhortation not to be content with them.

"Facts are stupid things," he would say, "until brought into connection with some general law."

At the end of eight months, it was almost with reluctance that I left these friends and turned to insects; but what I had gained by this outside experience has been of greater value than the years of later investigation in my favorite groups.



EDITORIAL

Is the above woodcut an allegorical representation of two dinoflagellates? Each has a flagellum in the requisite position (one lateral and one transverse). Is it not easy to imagine these individuals in whirling motion? Farfetched?—perhaps. Still, the woodcut (of "flagellants," dated 1493, probably German), contributed by my future mother-in-law, medievalist scholar Margot King, illustrates the teamwork spirit that is the essence of any newsletter. As your new AASP Newsletter editor, it is gratifying to receive so many interesting contributions—please keep them coming, and remember, your articles likely will be read, or at least skimmed, by nearly a thousand palynologists worldwide.

You will see on pages 8 and 9 that I have reactivated a system of foreign correspondents charged with the responsibility of reporting news of their region to the AASP Newsletter. Niels Poulsen and Jim Riding have kindly agreed to be correspondents for the Nordic countries and the U.K. respectively. Their contributed items can be found in this Newsletter. I need volunteers for other parts of the globe. If you think you are up to it, please drop me a line.

Finally, after using what I had assumed to be the innocuous words "Miocene" and "Pliocene" for many years, I have been humbled by the erudite protestations of H.W. Fowler (see page 21). I would be grateful to anyone with classical training who can tell me how these words should properly be formed!



**SPECIAL OFFER TO AASP MEMBERS:
SALE OF BACKPARTS OF VOLUMES 1 TO 12 OF
THE JOURNAL OF MICROPALAEONTOLOGY**

The British Micropalaeontological Society (BMS) currently holds large stocks of backparts of Volumes 1 to 12 of *The Journal of Micropalaeontology*. BMS is therefore holding an unrepeatable sale of this stock. The Journal is one of the leading titles in this area and palynomorphs are well represented. AASP members, non-members and institutions may purchase backparts for US\$5 each (US\$100 the set) **inclusive** of surface mail postage. Payments of US orders (in US\$) should be routed to Prof. R. F. Lundin and order forms to J. B. Riding (see below). Non-US AASP members should order parts at £2.20 each (£44 the set) for UK members (£3.00 each, £60 the set, for the rest of the world) **including surface mail postage** from J. B. Riding at the address below.

Please indicate the parts you require in the left hand column below; a cross/tick will indicate one copy. Should you wish to order multiple copies, please clearly indicate the number you require. If a particular part becomes out of stock, and has been pre-paid, clients will be reimbursed. Pre-payment is welcome, but clients are advised to request an invoice in order to avoid over- or under-payments. The number of papers on palynology, the total number of papers and number of pages are indicated in the right-hand column below. Volume 3, Part 2 is a special issue to honour Professor Charles Downie. Volume 4, Part 1, on the Palynostratigraphy of northeastern Libya, unfortunately is out of print.

_____	Vol. 1	(July 1982)	6/17 palynology papers, 153pp.
_____	Vol. 2	(July 1983)	3/14 palynology papers, 117pp.
_____	Vol. 3, Pt. 1	(March 1984)	5/13 palynology papers, 82pp.
_____	Vol. 3, Pt. 2	(September 1984)	12/12 palynology papers, 128pp.
_____	Vol. 4, Pt. 2	(August 1985)	2/13 palynology papers, 187pp.
_____	Vol. 5, Part 1	(April 1986)	2/14 palynology papers, 114pp.
_____	Vol. 5, Pt. 2	(December 1986)	4/11 palynology papers, 106pp.
_____	Vol. 6, Pt. 1	(May 1987)	2/12 palynology papers, 116pp.
_____	Vol. 6, Pt. 2	(November 1987)	3/10 palynology papers, 121pp.
_____	Vol. 7, Pt. 1	(May 1988)	2/13 palynology papers, 109pp.
_____	Vol. 7, Pt. 2	(December 1988)	2/9 palynology papers, 138pp.
_____	Vol. 8, Pt. 1	(June 1989)	2/13 palynology papers, 130pp.
_____	Vol. 8, Pt. 2	(December 1989)	0/10 palynology papers, 117pp.
_____	Vol. 9, Pt. 1	(May 1990)	2/10 palynology papers, 114pp.
_____	Vol. 9, Pt. 2	(March 1991 for 1990)	1/17 palynology papers, 141pp.
_____	Vol. 10, Pt. 1	(August 1991)	3/15 palynology papers, 114pp.
_____	Vol. 10, Pt. 2	(December 1991)	3/12 palynology papers, 120pp.
_____	Vol. 11, Pt. 1	(June 1992)	2/11 palynology papers, 105pp.
_____	Vol. 11, Pt. 2	(December 1992)	1/15 palynology papers, 137pp.
_____	Vol. 12, Pt. 1	(August 1993)	2/13 palynology papers, 139pp.
_____	Vol. 12, Pt. 2	(December 1993)	2/10 palynology papers, 114pp.

I wish to order the above indicated parts @ US\$5 each/or the entire set @ US\$100*, inclusive of surface mail postage (* delete as applicable). [For Airmail each part is US\$10 (US\$200 the set); state clearly that this is required].

**Please invoice me, or:

**I have sent remittance (in \$US) of \$US_____ to Prof. R. F. Lundin, P.O. Box 871404, Department of Geology, Arizona State University, Tempe, Arizona 85287-1404, USA. All cheques to be made payable to "British Micropalaeontological Society".

(** delete as applicable)

I do/do not*** require a receipt (***delete as applicable).

Please return the completed form (xerox copies are acceptable) to: Dr. J. B. Riding, British Geological Survey, Keyworth, Nottingham NG12 5GG, UK. (Enquiries: tel. + 44 (0) 602 363447, fax: + 44 (0) 602 363200).

An SEPM Research Conference

Preliminary Announcement and Call for Papers

The conference will be held November 27 – December 2, 1994 at the Houstonian Hotel and Convention Center, Houston, Texas. The Organizers are **H. Richard Lane** (Amoco Production Co.) and **Gregg Blake** (UNOCAL), Norman MacLeod (Natural History Museum, London). See details on page 21 and 22 of this Newsletter for further details.

Total cost of the conference, including registration, hotel accommodations for the three days of the conference, continental breakfast and lunch each day of the conference, and Sunday night ice-breaker will be approximately \$500.00 per person. Field trip registration, including two nights lodging in Belton, Texas and a Barbecue Banquet, will be approximately \$200.00 per person. An official SEPM announcement with finalized costs will be mailed to you in a few weeks. This preliminary announcement is intended to make members of the geologic community with a known interest in graphic correlation aware of the conference and encourage them to contribute presentations. The conference will be limited to a total of 120 participants and the field trip limited to 40 persons. Therefore, interested parties should plan to reserve their places early.

If you or any of your colleagues, students, etc. are interested in attending the conference, please fill out the form at the back of this Newsletter and mail it to H.R. Lane, Co-organizer: SEPM Graphic Correlation Conference, Amoco Production Co., P.O. Box 3092, Houston, TX 77253-3092 {(713) 366-2843 [phone], (713) 366-2404 [fax]}. Questions about the technical program should be directed to I.A. Stein or J.H. Gamber, Technical Session Coordinators, Amoco Production Co., P.O. Box 3092, Houston, TX 77253-3092 (same phone and FAX numbers), or to any of the organizers.

Graphic Correlation and the Composite Standard:
The Method and Its Application

An SEPM Research Conference

Name: _____

Address: _____

Phone No: _____ E-mail: _____

I would like to present a paper/poster in a technical session: ☐ Yes ☐ No

Preliminary Title: _____

I would like to attend the Cretaceous field trip: ☐ Yes ☐ No

Please mail to: H.R. Lane
Co-organizer, SEPM Graphic Correlation Conference
Amoco Production Co.
P.O. Box 3092
Houston, TX 77253-3092
(713) 366-2843 (phone)
(713) 366-2404 (FAX)

PAYMENT OF AASP DUES

DUES MAY BE PAID UP TO THREE YEARS IN ADVANCE. OVERSEAS AASP MEMBERS (INDIVIDUAL OR INSTITUTIONAL) WHO WOULD LIKE TO RECEIVE THEIR NEWSLETTER AND PALYNOLOGY BY AIR MAIL, RATHER THAN SURFACE MAIL, NEED TO INCLUDE THE APPLICABLE POSTAGE SURCHARGE (NOTED BELOW). CREDIT CARD USERS MUST PAY A \$1.00 U.S. SURCHARGE PER-TRANSACTION.

Dues	Enclosed
Individual dues: \$30.00 U.S./yr	\$ _____
Institution dues: \$40.00 U.S./yr	\$ _____
 Air Mail Surcharge	
Europe & South America: \$ 9.00 U.S./yr	\$ _____
Africa, Asia & Australia: \$12.00 U.S./yr	\$ _____
 Credit Card Surcharge (\$1.00 per-transaction)	\$ _____
 Contribution to the AASP Student Scholarship Fund	\$ _____
 Total enclosed U.S.	\$ _____

CREDIT CARD PAYMENTS ALL INFORMATION MUST BE COMPLETED

☐ MASTERCARD ☐ VISA

Credit card number: _____ Expiration Date: _____

Signature: _____

Send dues, surcharges (if applicable) and Student Scholarship contributions, with this form, to:

Dr David T. Pocknall
AASP Secretary-Treasurer
Amoco Production Company
P.O. Box 3092
Houston, Texas 77253 U.S.A.

BE SURE YOUR NAME IS ON YOUR CHEQUE OR INTERNATIONAL MONEY ORDER

Your cancelled cheque is your receipt. If you need a written receipt, advise the Secretary-Treasurer when you pay your dues.

All drafts should be payable through a U.S. based bank.

Name: _____

Address: _____

City & State: _____

Country: _____ Zip: _____