Canadian Association of Palynologists
Association Canadienne des Palynologues

NEWSLETTER

Volume 20 Number 2 December 1997

Season's Greetings!

This Newsletter brings sad news that should be of grave concern to all palynologists and earth scientists in Canada - the demise of the Quaternary Palaeoecology Laboratory at the Geological Survey of Canada in Ottawa. The reverberations from this disbanding will echo through Canadian earth science for a long time. I am sure other CAP members will join with me in extending sympathy and good wishes to our colleagues at the GSC who are immediately affected by this cut.

This is the latest in a long series of cuts across the country during the 1990s that has seen science and research severely curtailed. However, in the case of palaeoecology at the GSC, the situation is filled with particular irony. As I am writing these notes, the newspapers and radio are full of reports from the Kyoto meeting on global warming. It is truly astonishing that the Canadian government is sending officials to this meeting while destroying a laboratory and research community that provides some of the basic information on which wise decisions about global warming can be made. Indeed, some politicians are still questioning both the reality of climate fluctuations and the credibility of the science underlying research in this area. I was especially disturbed to note that healthy debate among scientists over the magnitude and frequency, scale and resolution of climate fluctuations was misinterpreted during this meeting, perhaps deliberately, by politicians and the mass media as evidence of the inherent untrustworthiness of science. Such ignorance of the way in which learning works is a sad commentary on the public understanding of science. Perhaps it merely reflects a deep-seated craving for certainty and absolutes in an increasingly confusing world. However, we all have a responsibility to explain our science to the public, by lectures, written articles, presentations, and exhibits. Hence, we may convince others of the value of what we do and its relevance to current problems.

I thank Ian Campbell and the Canadian Forest Service for help in mailing this Newsletter. Thanks also to the contributors to this issue: Thane Anderson, Keith Bennett, Bill Boyd, Ian Campbell, Adolf Ceska, Rob Fensome, Michelle Garneau, Douglas Hallett, Murray Hay, David Jarzen, Suzanne Leroy, Francine McCarthy, Bob Mott, Abigail Pierce-Beck, Stephen Porter, Terry Poulton, Eduard Reinhardt, W. A. S. Sarjeant, John Smol, Alice Telka, Jordi Juan i Tresserras, Rene Vaillancourt, Bob Vance. Thanks to Yves Beaudoin for assistance.

ISSN 1188-3596

This is my last "President's Message" for the *CAP Newsletter*. My term is now up, and our President-Elect Rob Fensome, who has occupied various executive positions in CAP over the years, will be taking over as President. I know I am leaving CAP in good hands.

The last few years have seen a number of changes on the Canadian palynology scene. Perhaps the most significant of these is the positions presently being cut from the Geological Survey of Canada. At the same time, Quaternary palynology is starting to be seen as a significant source of societally-relevant information about past climate changes and possible future vegetation patterns. This is not just an apparent contradiction; it is a fundamental misunderstanding of science on the part of those who control it. At the same time as the GSC is cutting palynologists, the Canadian Forest Service has on the one hand told me to "get out of paleo", and on the other hand, placed increasing emphasis on the importance of paleodata for climate change studies.

But enough whining. Good things have also happened in the last few years. One of these is the launch of *Palaeontologia Electronica*, a new electronic, web-based journal of paleontology (see *CAP Newsletter* 20(1):23-24, 1997). The first issue will be appearing early in the new year, and CAP is recognized as a sponsor of this ground-breaking journal. I am providing French translations for the journal as CAP's contribution, and will continue to do so - unless someone else would like to step forward and take over this role on behalf of CAP. The URL for the journal is http://www-odp.tamu.edu/paleo/index.htm (North America) or http://www.erdw.ethz.ch/~pe/toc.htm (Europe).

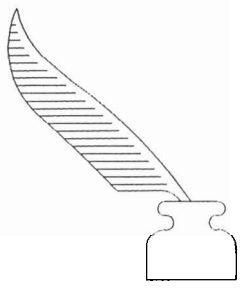
CAP's finances are also now solidly in the black, thanks largely to free mailing of the Newsletter (courtesy of the Canadian Forest Service) and free mailing of *Palynos* (courtesy of Julian Szeicz at Queen's University). This has at least delayed the need for a fee increase.

More changes are in store for the near future. We are currently seeking nominations for the positions of President-Elect (a two year term, followed by automatic promotion to President for two years) and Newsletter Editor. Following tradition, the next President-Elect should be a Quaternary-oriented palynologist. Alwynne Beaudoin has agreed to continue as editor of the excellent Web page, but is resigning from the Editor's position. Alwynne has been the tireless editor of the Newsletter for many years now, and as such has done more work for CAP than anyone else. Alwynne deserves our heartfelt thanks for her efforts over the years; without the Newsletter, there could be no CAP.

One other thing is also needed for the continued existence of CAP: members! Please renew your membership, and sign up new members (students, colleagues, stray cats) at every opportunity.

Ian Campbell
Edmonton, Alberta

TABLE OF CONTENTS



From the bureaucrat's desk

Dues due

If your name appears below, a gentle reminder that your membership subscription became due at the beginning of 1997:

Braman, Garneau, Gunther, Kumar, Rogers, Spooner, Stancliffe, Suneby, Yu

If your name appears below, your membership subscription becomes due at the beginning of 1998:

Apaalse, Bourgeois, Bryant, Chinappa, Clarke, Cumming, Douglas, Ford, Gostlin, Hall, Heinrichs, Helby, Hicock, D. Jarzen, Kalgutkar, Koppelhus, Kurita, Lacourse, Legault, Mcpherson, J. Matthews, McCarthy, Mott, Muller, Parsons, Richard, Ross, Schweger, Sutherland, Szeicz, Van Helden, Wicander, Yansa, USGS Library, University of Toronto Library.

Dues payment

Please note that CAP membership dues are CAN$10 per year, payable annually or up to three years in advance. Please make cheques payable to "CAP". Following a reminder notice, lapsed members are removed from the CAP mailing list after one year. See also the Membership Form on p. 40. Funds should be sent to the Secretary/Treasurer:

Francine M. G. McCarthy
CAP Secretary/Treasurer
Department of Earth Sciences, Brock University
St. Catherines, Ontario, L2S 3A1, Canada
Tel: (905) 688-5550 ext. 4286
FAX: (905) 682-9020
E-mail: francine@craton.geol.brocku.ca

MINUTES OF THE CANADIAN ASSOCIATION OF PALYNOLOGISTS ANNUAL GENERAL MEETING

Thursday, September 18 1997, 3:20 p.m.
Swope Center, Woods Hole Oceanographic Institute, Woods Hole, Massachussetts

Present: Rob Fensome (President-Elect), Kevin Gostlin, Jan Jansonius, Andrew MacRae, Rolf Mathewes, Francine McCarthy (Secretary-Treasurer; Recording Secretary)

1. Opening

The president-elect, Rob Fensome, called the meeting to order at 3:23 p.m. The meeting agenda and ancillary documents were distributed.

2. Minutes of the 1996-Annual General Meeting

The 1996 AGM was held at the Marriott Hotel in Houston, Texas in conjunction with the Joint IPC/AASP Meeting. The minutes were tabled and accepted (moved, Jan Jansonius, seconded Rolf Mathewes).

3. President's Report

The President, Ian Campbell, was not present at the meeting, but his report was tabled and duly accepted. His report is reproduced below:

I think the really big news this year is the termination of palaeoecology at the GSC. I would love to suggest that CAP investigate the possibility of taking over the pollen database function, but I think this is neither realistic with our resources nor necessary given the NAPD and other databases already out there. Will the demise of paleoecology at the GSC have broader implications for CAP and palynology in Canada? I expect so, but I also hope they won't be too severe. There is nothing much we can do about it anyway, except perhaps to write to federal minister Ron Goodale and indicate the disastrous consequences we all feel this shortsightedness is likely to entail, I am all for it. Alwynne has announced she will be stepping down as Newsletter Editor after 3 more issues. Alwynne has done a fine job for a great many years, and deserves the Association's deepest thanks. Alwynne has also proposed that the Newsletter Editor and Web Page

Editor functions be split, and I fully agree. I propose that the process to facilitate this change be started right away so that the necessary by-laws are in place when Alwynne resigns as Newsletter Editor. CAP is now an official sponsor of the new electronic journal *Paleontologica Electronica*. This is being handled by myself providing them with translation services. The first actual issue has yet to appear. The Association seems generally healthy enough. I have a long list of people I hope to contact in the near future to remind them of the benefits of membership.

Respectfully submitted,
Ian Campbell

4. Secretary-Treasurer's Report

i) Membership Report

Francine McCarthy reported that as of September 13 1997, CAP had a healthy total of 69 members in good standing, of which 51 were full members, 15 associate members, and 3 institutional. This number is probably slightly low, since it is expected that several long-standing members who have lapsed will eventually send in their dues. The increase of 17 members over the total of 52 reported at the last AGM may be due to increased exposure via the Web.

ii) Financial Report

Francine reported that the balance in the CAP account was $1549.04, which is an increase of $369.00 over the balance at the last AGM. Over the last fiscal year, however, our expenses exceeded our revenue by $51.00. As can be seen in the accompanying financial statement, our major expenditures are production costs for the two issues of the newsletter. Both issues were substantial this year, and it might be possible to save a bit of money without lowering the quality which we've come to expect from Alwynne Beaudoin's capable editorship. Andrew MacRae suggested publishing the newsletter electronically, but continuing to provide hard copies for those unable to access the internet. This option would cut down on production costs (depending on the number of people who opted for the electonic format), however we do not pay mailing costs, which are handled through Ian Campbell's office. Another substantial expenditure is the annual fee which we pay the IFPS, at $1.50 US/ full member. Jan Jansonius suggested that we look into this to ensure that CAP members who also belong to other palynological societies (e.g., AASP) are not paying this fee twice. Francine reported that we paid dues only for full members of CAP, not associate members. The only other routine fee is to the Registry of Joint Stock Companies, which more than doubled this year to $25.00.

iii) Auditor's Report

Jan Jansonius agreed on short notice to act as auditor and has officially signed a statment that the Association's books are in good order. This audited statment is included as part of these minutes on p. .

The secretary-treasurer's report was accepted (moved, Rolf Mathewes, seconded Jan Jansonius)

5. Review of dues structure

Because of the shortfall in this year's revenues, a short discussion was held over the dues structure. There was general agreement that no changes should be made to the dues structure until all possible cost-saving measures had been considered and implemented.

6. Newsletter and Website Report

Alwynne Beaudoin was unable to be present, thus her report was tabled and duly accepted. A brief discussion followed, and it was unanimously agreed that a separate position of Website Manager should be created. The President and President Elect will look into this when they review the CAP bylaws. It was moved that we commend Alwynne for the exemplary job she has done over the past several years as Newsletter Editor and Website Manager. Her report is reproduced below:

The *CAP Newsletter* continues in a strong position with plenty of interesting articles submitted and two substantial issues in the last year. I thank all contributors to recent issues. I urge other CAP members to consider submitting items on palynological topics to the Newsletter. Among items that would be of interest are conference announcements, reports from conferences and meetings, research notes, abstracts from recently-completed theses,

news of publications, summaries of on-going work at university departments, and photographs of palynologists or palynomorphs! I wish to thank Ian Campbell and the Canadian Forest Service for continuing assistance with mailing the Newsletter.

CAP's WWW presentation also continues in a healthy state, registering around 200 - 250 hits per month. The site is giving CAP more international exposure and we have gained some overseas members as a result. The presentation is always a "work in progress" and continues to evolve. A considerable amount of material has been added over the last year, including some photos to illustrate articles already in the presentation. I have also added a Guestbook and a search utility to the presentation. I welcome suggestions for additional material that may be useful to palynologists. If there are no objections, I am happy to continue as *CAP Newsletter* Editor and Web Site Manager for another year.

However, this letter brings to the CAP Executive and AGM my decision to resign as *CAP Newsletter* Editor, effective at the end of 1998. It has been a fun and rewarding experience but I feel that it is time for me to move on to other challenges and allow someone else the opportunity to bring their own fresh perspective to the Newsletter. To allow a smooth transition and time for another Editor to step forward, I am willing to edit the next three issues of the Newsletter (i.e., until the end of 1998), so that the new Editor can be confirmed at the next AGM. I am asking, therefore, that the Nominating Committee be charged with the responsibility of finding a new Newsletter Editor, to take over for the first issue of 1999 (Vol. 22, Issue 1).

It seems that this may be an opportune time to consider the status of Newsletter Editor and Web Site Manager. I took over as Newsletter Editor before the WWW existed. The development of a web site for CAP grew naturally out of the editorship. However, web site maintenance requires increasing amounts of time. Given the work that is involved in both editing the Newsletter and maintaining the web site, I suggest to the AGM that the positions of Newsletter Editor and Web Site Manager be split up at the end of 1998. I think it is unrealistic to expect one person to do both. Although the technology associated with the WWW is rapidly evolving, I expect this communication method to continue for some time. Therefore, if maintaining a web site is seen as a priority for CAP, I propose establishing a new position, Web Site Manager. I further propose that this officer be added to the CAP Executive. I think that it is important to maintain stability in the address (URL) of CAP's web site, partly because it is widely linked to from many other presentations. At present, CAP's website resides on my personal account at the University of Alberta. For this reason, I am willing to continue as CAP's Web Site Manager beyond 1998 unless an alternative long-term location for the site can be found or another member wishes to take this on.

I regret that I will not be able to be present at the AGM to discuss these issues. I look forward to working with the membership and the Executive to ensure continuity in the operation of the Newsletter and Web Site over the next year.

Respectfully submitted,
Alwynne B. Beaudoin

7. IFPS Councillor's Report

The IFPS Councillor, Julian Szeicz, was not present at the meeting, but his report was tabled and duly accepted. His report is reproduced below:

Matters with the IFPS have been quiet since last summer's Houston meeting, but here are a few items which can be reported:

- Mailings of the 1996 Directory of Palynologists was completed in late 1996. These were sent to all full CAP members.
- Two issues of *Palynos* have been/are being sent out. These usually get to me quite late - the June, 1997 issue was received in the last week of August this year.
- the financial statement for the IFPS was sent to me in April 1997, and I attach a copy below [Editor's note: This is not included here]. The numbers come out at about $2,900 on the plus side. With the help of Francine McCarthy, our CAP dues were paid to the IFPS well before the deadline.

SECRETARY/TREASURER'S REPORT
FINANCIAL STATEMENT
(for the period June 21, 1996-September 11, 1997)

Credits:	
Balance forward (June 21, 1996)	$1180.04
Other credits:	
Dues and subscriptions	$971.20
Interest	$2.24
Total credits:	$2153.48
Debits:	
Production costs for May 1996 Newsletter	-$235.81
Production costs for December 1996 Newsletter	-$236.68
IFPS dues	-$106.95
Registry of Joint Stock Companies	-$25.00
Prepaid subscriptions (1998-2000)(44@$10.00)	-$440.00
Total debits:	-$1044.44

BALANCE:

On September 11, 1997 funds in the CAP account stood at $1549.04.

Respectfully submitted by

Francine M.G. McCarthy
CAP Secretary/Treasurer (September 11, 1997)

Statement by appointed auditor

It is my opinion that the above financial statement represents a full and fair account of the financial affairs of the Canadian Association of Palynologists for the above period.

J. Jansonius
Auditor for CAP (September 18, 1997)

• Voting among IFPS Councillors took place for a third Vice President of the IFPS for 1996-2000, to complement Stefan Piasecki and Ana Teresa Romero Garcia. Of the four councillors who were willing to stand for the position, Madeline Harley of the Linnean Society Palynology Group was elected.
• the list of CAP members that I have been using for mailings is a little old now - if it is possible, it would appreciate getting an updated list from whomever is responsible. I will then check the numbers on the list against the numbers of *Palynos* I am being sent, to make sure there are enough copies for all of our members.

Respectfully submitted,
Julian Szeicz

8. Appointment of Auditor

Jan Jansonius has agreed to act as auditor for the next fiscal year.

9. Appointment of Nominating Committee

A nominating committee will have to be struck within the next month. A new position will be created on the CAP Exective if the decision is made to split the Newletter Editor and Website Manager positions as suggested by Alwynne Beaudoin, who will be stepping down as Newsletter Editor at the end of 1998. In addition, we will have to elect a new President Elect, as Ian Campbell will be stepping down as President, and will be succeeded by our current President-Elect, Rob Fensome.

10. Location for the 1998 AGM

No decision was made regarding the venue for next year's AGM. Two possible venues were discussed, the AASP meeting in Mexico and the GSA meeting in Toronto, however it was agreed to put off making a decision. The venue will be announced in the May 1998 *CAP Newsletter.*

11. Other business

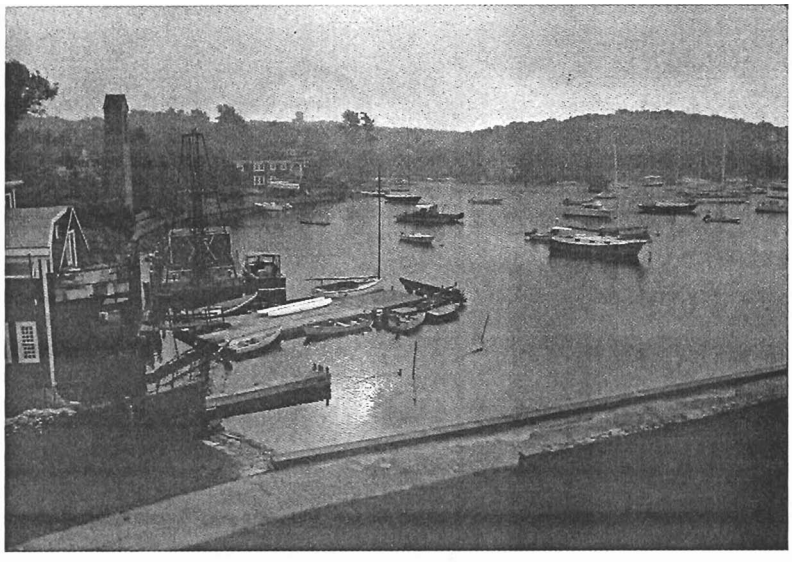
Rob Fensome and Ian Campbell will review the CAP bylaws and suggest changes before next year. There being no additional business, the meeting was adjourned at 4:05 p.m.

Far and wide....

PALYNOLOGY AT THE HOLE

The 30th Annual Meeting of the American Association of Stratigraphic Palynolygists (AASP) took place this year in the idyllic setting of Wood's Hole, Massachusetts. Wood's Hole is the home of the Marine Biological Laboratory (MBL), Wood's Hole Oceanographic Institution (WHOI or "Hoo-ee" as it seems to be called by locals), Alvin the submersible, and the ferry services to the evocative Martha's Vineyard and Nantucket islands. The venue was indeed different from a hotel-orientated setting, more familiar for AASP meetings. Most attendees stayed at the Swope Center of the MBL, which not only provided beds, but meals, "free" booze during the 5 o'clock to 6 o'clock happy hour (hic), and a sumptuous lobster supper (yes, which even we lobster connoisseurs from Nova Scotia enjoyed, though perhaps we may have been mellowed in our lobster assessment capability by the foregoing happy hour).

Not only the accommodation differed from the usual format. The organizers, Sarah Damassa, Ken Piel and Paul Strother, decided to focus the meeting around a particular theme and invite several "keynote" talks relating to that theme. The theme chosen was "Evolution of the Marine Phytoplankton" and the invited talks were on diatoms, dinoflagellates, invertebrates, nannoplankton and Precambrian life. We'll discuss these talks in more detail below. We feel that this experimental format was a resounding success from the scientific point of view: the general quality of the talks was excellent and the interest level was indicated by the



A general view from Rob Fensome's room at the Swope Center. (Photo: Rob Fensome).

high level of animated discussion that arose in the ample scheduled question periods. What may have been a problem was the marketing of the idea: the fact that only 59 people registered, although possibly a sign of the times, may also reflect the feeling of non-phytoplankton oriented palynologists that the meeting would hold no interest for them. If this is the case, it's a shame because it was not the intention of the organizers to exclude other aspects of palynology, and other aspects were certainly well represented among the presentations.

So, more about the juicy invited talks. Andrew Knoll was the first invitee off the mark on Monday morning. He discussed "Life in the Precambrian Oceans". Andy noted that leiospheres, which are presumably the earliest remains of eukaryotes, first appeared about 2400 Ma and that acritarchs showed substantial morphological differentiation by 1300 Ma. This diversity was abruptly curtailed at the onset of the Varinger glacial event, but increased again at the same time as the Ediacaran fauna, only to decline again just before the end of the Precambrian. It is sobering to think that all these events happened before the Cambrian "explosion", which only 50 years ago was heralded as the onset of significant life on Earth. Andy also showed that examination of Precambrian fossils can stimulate the discovery of new living organisms - a new living genus and species was discovered in intertidal encrustations after fossils from analogous Precambrian paleoenvironments had pointed the way.

The Monday afternoon invited paper was on dinoflagellates, co-authored by the two of us and three other Canadians, neontologists Max Taylor and Gary Saunders and paleontologist Graham Williams. We're not sure if there is some significance to the fact that it took only one author each to discuss the other keynote topics, but five of us to discuss dinos! (Shades of "How many Lower Slobovians does it take to screw in a light bulb?") Anyway, we attempted to review the evidence for the course and pattern of dinoflagellate evolution, bringing in considerations from the fossil record, biogeochemical evidence (more below), and the ultrastructure of modern dinos and their molecular phylogenetics (i.e., "RNA studies"). The way all these sources of evidence are coming together is an exciting current development that will be a major theme at next year's DINO6 meeting in Trondheim, Norway.

On Tuesday afternoon Sherwood ("Woody") Wise led off with a relaxed and stimulating discussion of calcareous nannofossils, which of course mainly consist of coccoliths. Woody told us that the group first appeared in the Late Triassic and diversified to such an extent through the Jurassic that the expansion is reflected in the change from "black" to "brown" to "white" Jura in Europe. Through to the Early Cretaceous, the greatest diversity and abundance was in open ocean environments. In the Late Cretaceous, this focus shifted to the continental shelves and interior seaways, the result being the great chalk belts of North America and Europe that gave the Cretaceous its name.

Woody noted that, unlike dinoflagellates, nannoplankton underwent a sudden and drastic extinction at the K/T boundary, rebounded to some extent in the Paleogene, but then generally declined in the Neogene. Many aspects of this pattern - appearance in Late Triassic, diversification in the Jurassic, peaks in mid to late Cretaceous and decline in the Neogene - are intriguingly familiar to dinoflagellate workers.

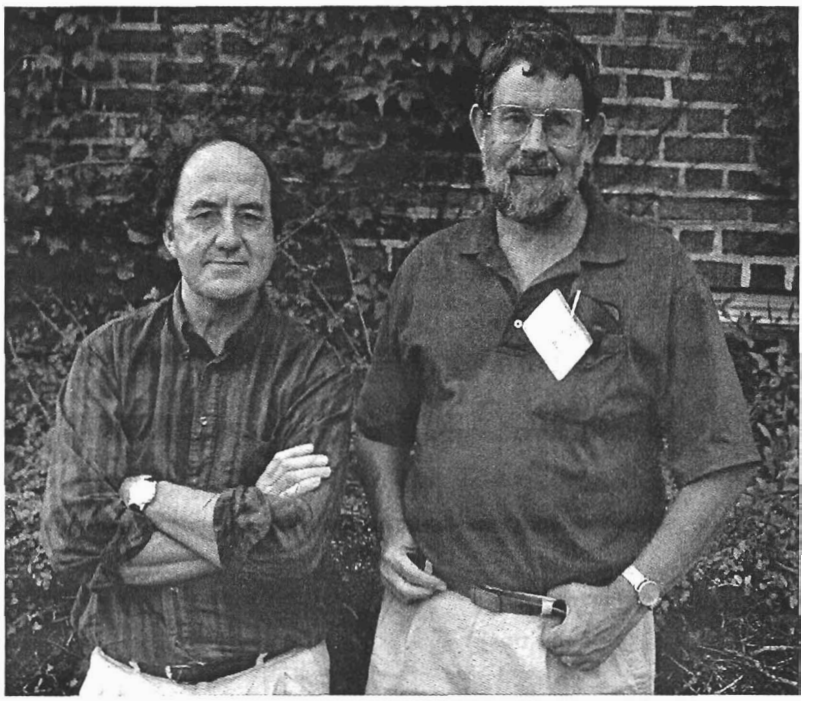
John Barron is perhaps best known to a general audience for his papers on paleoclimatology, but his roots are in the diatom business, and it was as a specialist in that siliceous group of microfossils that John addressed us on Wednesday morning. He told us that the earliest definitive diatoms are from the Early Jurassic, but the earliest forms are from the Early Cretaceous. Diatoms may have evolved earlier than these records suggest, but the vulnerability of the opaline silica diatom frustules to alkaline pore waters and temperatures in excess of 50°C makes their preservation in older rocks a risky business. John suggested that continued study of diatoms in protective concretions should in the future contribute significantly to our understanding of early diatoms. There was an "explosive" (John's word) radiation of diatoms in the Late Cretaceous, but no major extinction event at the K/T boundary. He suggested that the presence of resting spores (or "cysts") in the life cycle allowed diatoms to survive that environmental crisis - a possibility that we might also invoke for dinoflagellates. In the Cenozoic, diatoms had their ups and downs that John related to climate, but, unlike dinos and nannos, no general decline in the Neogene.

With no disrespect intended to Andy, Woody and John, the star of the invited speakers was Richard Bambach, who delivered an exceptional presentation on the "Evolution of the Marine Ecosystem" after dinner on Tuesday. Richard reviewed the changes in ecosystem structure through time, emphasizing the metazoan invertebrates. The first 2.5 billion years of the history of life was a story involving only producers and decomposers - no consumers. Consumers first appeared in the Vendian, but their limited presence even then allowed the sessile Ediacaran fauna to survive. With the Cambrian radiation and consequent increase in consumers, Ediacaran type faunas could no longer survive. Richard pointed out that, although there is perhaps not a significant difference between Paleozoic and later diversities of marine animals, Paleozoic forms were mosty gristle and skin - if you look inside a brachiopod, "there's no one home". However, organisms that dominated the Mesozoic and Cenozoic seas were fleshy, more massive, and included more carnivores, signifying a change in energy transfer and other ecological factors. Why a talk on such macrofossils at a meeting focusing on phytoplankton? Well, phytoplankton are "fish food" of course, and a full understanding of the ecological and evolutionary patterns among consumers can only be gained by a consideration of patterns at the lower end of the food chain. Richard posed the critical questions: 1) what changes in the primary ecosystem influence the consumer system; and 2) what are the feedbacks from consumers that influence primary producers?

Of the other talks, space limits the number that we can mention specifically, and we have to be honest and say that, even between the two of us, we didn't attend every talk - collaborative discussions (perhaps the most valuable aspect of meetings) distracting our attention for some of the time. Apart from the invited presentations, the highlight for both of us was Nina Talyzina's talk (co-authored by Michael Moldowan and the late Gonzalo Vidal) on the distribution of dinosterane geochemical biomarkers in Early Cambrian acritarchs. Using a novel application of a technique from cell biology, Nina was able to extract and concentrate fractions from standard palynological preparations based on their different fluorescence characteristics. The resulting fractions consisted of leiospheres and tasmanitids, neither of which yielded dinosteranes, and acanthomorph acritarchs, which did. These results have obvious implications for the affinities of some acanthomorph acritarchs, and are consistent with molecular phylogenetic evidence, which suggests that the dinoflagellate lineage evolved in the Late Precambrian. Nina's work is intriguing, innovative, thoughtful and

clearly carefully carried out. Questions remain however: where does the dinosterane come from - one wouldn't expect it to be associated within the "sporopollenin" walls in the living organisms; are we sure that the closest living relatives of dinoflagellates (apicomplexans and ciliates) lack dinosteranes; and are the results repeatable using confirmed dinos and prasinophytes of the later fossil record?

Paul Strother reminded us that that bane of a group, the "boring" leiospheres, are polyphyletic and can be marine, and, perhaps surprisingly, non-marine as far back as the Cambrian. Thomas Servais, in a paper co-authored with Stuart Molyneux, expressed scepticism about whether "lineages" of (especially Ordovician) acritarchs can be considered truly evolutionary in nature.



Barry Dale and David Wall at the conference.
(Photo: Rob Fensome)

John Beck provided a summary of his work on the Silurian Arisaig Group of Nova Scotia, a spectacular succession that has received surprisingly limited palynological attention in the past. In addition to a diverse acritarch flora (130 species), an impressive non-marine spore and cryptospore flora occurs starting in the Llandovery, and transgressive-regressive trends are evident in the distribution of major palynomorph groups and palynofacies.

Moving up section into the Mesozoic and Cenozoic, Raffaella Bucephalo Palliani and Jim Riding presented a very interesting story of Early Jurassic dinoflagellate migrations and paleoecology. Tipped off by the fact that certain taxa have different ranges in the Boreal and Tethyan Realms, Raffaella and Jim revealed evidence for two migrational events, one at the early/late Pliensbachian boundary, the other in the mid Toarcian.

Calcareous dinoflagellates are a group that have had a blossoming of attention lately, with several recent major monographs (most written, oddly, by authors with surnames starting with a "K"). Calcareous dinos with visible tabulation all show a stable peridiniacean pattern, and have a range of characteristic "apical" archeopyles, the likes of which have only very exceptionally been found among organic-walled forms. However, Sarah Damassa presented the final talk of the meeting on a group of organic-walled cysts that clearly show the archeopyle styles so characteristic of calcareous cysts. Sarah's interpretation was that these new forms do not appear to represent linings of calcareous cysts from which the inorganic component has been dissolved, but separate, albeit related, forms. Sarah's material is from the Eocene to Miocene of several localities in the North Atlantic and its borderlands.

The history of dinoflagellate studies has had its share of enduring "dynamic duos" - its own versions of Batman and Robin. There was Cookson and Eisenack in the 1950's and 1960's and Lentin

and Williams in the 1970's through 1990's. The "Batman and Robin duo" (though we're not revealing who we think of as Batman and who as Robin) forever associated with Wood's Hole is that of Wall and Dale. David Wall and Barrie Dale carried out seminal work on dinoflagellate cyst-theca relationships at the Marine Biological Laboratory primarily in the mid to late 1960's. The dynamic duo was reunited at this meeting, and both were active participants. Barrie, indeed, treated us to a talk, co-authored with his wife, Amy Dale, on environmental controls on the evolution of cyst-forming dinoflagellates. Barrie and Amy took the 20 most common modern cyst types and assigned tham to four environmental categories: warmer coastal, colder coastal, cosmopolitan and oceanic. Barrie pointed out that the geological record of these categories shows some notable trends. The warmer water and oceanic types, as well as most of the cosmopolitan types have longer histories (back to the Eocene in many cases) than the colder water types (only back to the late Miocene at most). Thus the warmer water and oceanic forms have been able to "track" their environments during times of climate change and the cosmopolitan forms have been able to tolerate those same changes. In contrast, the colder water species have more recently evolved in response to the onset of new cold water environments.

Gordon Wood and co-authors presented an integrated palynological and organic geochemical study of an Eocene source rock in Pakistan. Through an interval of less than 2 m, there were large vertical variations in organic facies and the proportions of reworked Jurassic palynomorphs and in situ palynoflora. Particularly unusual was the occurrence of organic remnants of possible diatoms (whose presence is consistent with the geochemical biomarkers) and a nearly monospecific assemblage of an undescribed dinoflagellate. The latter assemblage also yielded an unusual, unidentified dinosterane-like molecule that can perhaps serve as an indicator of similar environments.

There were several papers dealing with purely Quaternary topics. CAP Secretary/Treasurer, Francine McCarthy, in a paper co-authored with Steve Blasco, David Dubas and Kevin Gostlin, asked "Where have all the sediments gone?" We found out that the title didn't refer to some Great Rock Robbery perpetrated at geological departments throughout the world, but an apparent gap in the sedimentary record of Georgian Bay since the mid Holocene, its temporal extent confirmed by palynology. The authors attributed the gap - actually a condensed succession - to a dramatic decrease in sediment influx due to cessation of transgression. Francine alluded to the important environmental inplications of this interpretation.

The only paper of the technical session (in contrast to the invited papers) that was not based on palynomorphs was presented by Melissa McQuoid, from Victoria, B.C. Her paper, co-authored with Louis Hobson, involved a study of diatoms and silicoflagellates as Holocene climatic indicators in Saanich Inlet, B.C. The inlet has laminated sediments that can be sampled at annual and subannual resolution. Short cores have revealed a record over the last 100 years, and longer timescales can be examined from cores taken on the *JOIDES Resolution*'s visit to Saanich Inlet as ODP Leg 169S (see *CAP Newsletter* 19(2):16-18, 1996, and *CAP Newsletter* 20(1):8-10, 1997).

John Wrenn presented a paper with several coauthors on the application of palynology and other microfossil methods (phytoliths and diatoms) to high-resolution dating in Holocene sediments in the Mississippi Delta area. By a combination of plant introduction records and other historical events a very precise chronology was established for the period AD 1750 to 1900, an interval otherwise undatable using radiometric techniques. Particularly interesting was the use of characteristic carbon spherules in palynological preparations to recognize the onset of the use of different types of fuel, and the use of *Vigna luteola* (cow pea) pollen as a proxy for sugarcane production.

A common topic of discussion during this meeting was the application of computers to palynology. This subject received specific attention in a

Tuesday morning session entitled "Palynology and the Internet". Owen Davis discussed in general terms about the protocols in use on the Internet and their utility for palynology. Clearly there is great potential for the easy storage and distribution of large amounts of palynologically related text and image data on the World Wide Web. Subsequent speakers discussed several implementations of palynological data distribution and analytical tools. For example, there was free software from the International Quaternary Association (Louis Maher), paleobotanical information (Mike Boulter), and the Global Pollen Database (Eric Grimm and John Keltner). In two later talks during the last day of the conference, Robert Williams and Eric Monteil introduced the audience to Dinium-Alpha, program for storing dinoflagellate images and morphologic and stratigraphic data. Robert also gave an impromptu demonstration of digital image processing as it applies to palynomorphs. With image capture hardware becoming relatively inexpensive and yielding much better results than a few years ago, a suprising amount of work can now be done "filmless", offering advantages in cost and versatility.

Outside of the formal talks, there was a demonstration by Ken Piel of a new graphical interface to the PALYNODATA database of pre-Quaternary palynological information. This vast dataset is now much more accessible than in earlier implementations. Another commercial demonstration was for equipment for microwave-enhanced digestion of palynological samples (as described in *Palynology*, Vol. 18, p. 23).

Awards were given out at the AASP Business Luncheon at – where else – the Swope Center on Thursday. Robert Booth, a student of Fred Rich at Georgia Southern University, won the best student paper award for his presentation "Palynology and Depositional History of Late Pleistocene and Holocene Coastal Sediments from St. Catherines Island, Georgia, U.S.A." (He also won the award for the longest title – just kidding.) Merrell Miller of AMOCO, Houston won the best poster award for his poster "Palynological Characterization of a Silurian Transgressive Event". And last but not least, our own former CAP President from Simon Fraser University, Rolf Mathewes, was inducted as the new President of the American Association of Stratigraphic Palynologists. Congratulations Rolf - doubly so if you're still with us at the end of this wordy review!

As far as meetings go, this was one of the best organized and most stimulating that we have attended, and Ken, Paul and Sarah are to be commended for arranging and staging such a successful meeting.

Rob Fensome and Andrew MacRae
Geological Survey of Canada (Atlantic)
Dartmouth, Nova Scotia

9TH IPC *NEW FRONTIERS AND APPLICATIONS IN PALYNOLOGY SYMPOSIUM*: SOME COMMENTS FROM THE SYMPOSIUM ORGANIZER

The *New Frontiers and Applications in Palynology Symposium* was one of 30 Symposia held during last year's 9th International Palynological Congress in Houston. In introducing the Symposium, I attempted to chart some of the significant landmarks on the frontiers of palynology. From the earliest identification of pollen grains in 1682, to the current and expanding use of the Internet and the World Wide Web, palynologists have been exploring and expanding the frontiers of their discipline. I did this to set the most contemporary of frontiers – the papers to be given at the Symposium – into the broader context of the path of that expansion: seminal and emerging landmarks included the coining of the term "palynology", the application of sophisticated and powerful computer-based statistical and numerical analysis, and the expansion of palynology both in terms of the types of palynomorphs used and the applications to which palynology is being put. To illustrate this theme, I unashamedly adopted imagery from the early western

films depicting the "wild west", an appropriate frontier, I thought, for the Houston setting and Symposium theme; the images and ideas we establish now contribute to our successors' ideas.

The Symposium had a distinct theme – New Frontiers and Applications in Palynology. While, as Symposium convenor, I was aware both that all the presenters and members of the audience have their own specific research and scholarly interests, ideas and contexts, I encouraged all participants in this Symposium to consider the theme of the Symposium carefully. An ideal outcome of the Symposium was that we would all able to place our own individual study or ideas into as broad a context as possible. If we are able to ask questions such as the following, we should be able to truly push forward the frontiers of palynology.

• What are the key palynological developments in our research fields?
• How appropriate are existing palynological methods to addressing research questions in our individual fields of interest?
• How may existing methods be developed to enhance the relevance of palynology to our research fields?
• What, if any, are the limitations of palynological analysis in our field of interest, and how may we overcome these?

I leave the individual participants – both on the stage and in the audience – to judge whether we were successful. Perhaps we made a few small steps forward ... any steps are important steps.

There are several ways in which we may address such questions. We may be able to put our own individual research interests into the broader contexts of palynology as a discipline in its own right, or the disciplines such as geology and biology within which palynology plays a contributing role. We may, alternatively, become somewhat reflective in our practice of palynology, and broaden our view to consider the palynological landmarks of the last century and the significant recent developments in palynology. We may even become adventurous, and consider the future direction or directions of palynology. The paper presenters adopted all of these approaches to varying degrees, many doing as any frontier settler does: exploring promising paths and charting our progress for those who follow. A list of the presenters and their papers will give some idea of the diverse paths of exploration.

To introduce the Symposium, I presented my overview, entitled "Landmarks on the frontiers of palynology: An introduction to the New Frontiers and Applications in Palynology Symposium". This introduction gave the late comers some time to settle before the serious business began with Miklas Kedves' overview on trends and new aspects of experimental palynology. This was something of a departure for most of the palynologists present at the Symposium who tended to take a hstorical and morphological view pollen, spores and the rest.

The first topic session focused on methods. This opened with Jean-Luc Lenoir's description of the exciting new preparation technology, focused microwaves. Rae Jones later followed this up with his discussion of its applications, presenting some truly impressive examples of the speed and clarity of preparation using this technology. I think no-one could but be impressed at the potential of this new approach to sample preparation, and the Pro-Lab staff at the demonstration table were kept busy with enquiries. However, not to be out-done, Lynne Milne presented a double session, first talking about her methods of "temperature surface-embedding for time-saving ultramicrotomy, and a simple method for multiple microscopy (LM, SEM, TEM) of single grains", and following it up with a workshop demonstration of methods. Lynne's entertaining talk and workshop distinguished itself as probably being the only profit-making talk at the Congress, with the crowds flocking round to buy her

sample preparation kits. After coffee, I continued the topic session with a double act, presenting a preliminary look at radiocarbon dating of palynomorphs with one of my co-authors, Dan Penny. Unfortunately, I did not, as I had hoped, have my results to present at the time! Consequently, we hurriedly moved on to more advanced results. Keith Bennett opened a group of papers discussing the application of computers to palynology with his discussion of the use of World Wide Web resources for displaying pollen catalogues. Robert Williams and Douglas Somoza then described, with impressive laptop presentations, their respective dinoflagellate cyst identification expert systems. Finally, after lunch, we concluded this methods session with Bob Ravn's rather neat description of correlation coefficient analysis, which he described as an objective means for the comparison and graphical display of whole-population palynological data. We rounded up the session, by coming full circle with Rae Jones' focused microwaves. I closed by drawing the audience's attention to a poster of an absent-to-be participant, Johannes van de Laar, who fortunately turned up and was able to discuss his poster illustration of the determination of spore color alteration by means of color image analysis.

The second topic session turned out to be rather shorter than expected, but nevertheles, we were treated to some fascinating discussions of frontier applications. Willy Groenman-Van Waateringe brought a range of issues together with her discussion of the pollen found in animal coats, describing her work on some of the furs found on the famous Ice Man recently uncovered on the Austrian-Italian border. Here Willy discussed, amongst other things, her work on the effects of hide processing on pollen grains. The session was closed with Christian Mulder's detailed discussion of the use of radionuclides for actuopalynological research, using modern pollen data from central Europe and radioactive fallout from the Chernobyl accident as a rather interesting and extremely exact time marker.

My general impression of all this – and as Convener, I of course have a slight bias – is that it all went very well. Remarkably for a Symposium on the last day and on the morning after the Congress Banquet, this Symposium drew a standing-room-only crowd. My task now is to get some of the papers to publication. I am currently co-editing, with Valerie Hall at Queens University Belfast, a special issue of *Review of Palaeobotnay and Palynology* on New Frontiers and Applications of Palynology. This volume will contain a selection of the papers presented at the Symposium, plus some from the sessions on tephra-linked pollen analytical studies, forensic palynology and phytoliths and pollen.

William E. Boyd
School of Resource Science & Management
Southern Cross University
P.O. Box 157, Lismore, N.S.W. 2480
Australia
Tel: (066) 203 007
FAX: (066) 212 669
E-mail: bboyd@scu.edu.au

7th INTERNATIONAL SYMPOSIUM ON PALEOLIMNOLOGY

Aug 28 - Sept 2 1997, Heiligkreuztal, Germany

Over 200 participants recently congregated near the small town of Riedlingen, in Southern Germany, to participate in the **7th International Symposium on Paleolimnology**. The symposium took place at Monastery Heiligkreuztal, which was founded in 1227, but has now been converted into a conference center.

The conference was primarily organized by German and Swiss paleolimnologists, with the Organizing Committee composed of J. Merkt, A. Kleinmann, A. Lotter, B. Scharf, E. Schulz, and M. Sturm. A central theme of the meeting was the use of high-resolution laminated lake sediment to reconstruct environmental change. In contrast to previous symposia, posters were the main form of

communication (accompanied by 3 minute oral presentations for some of the posters), with only a few introductory, keynote talks. In addition to the formal presentations and posters, a pre-congress excursion to the crater lake of the Laacher See Volcano and the maar lakes of the West Eifel volcanic field, and a post-congress excursion to lakes in central Switzerland, were also offered for interested participants.

Following the opening session on August 29, the first set of presentations focused on human impacts and natural variability, which was opened by a lead talk by N. J. Anderson. This was followed by a shorter section on the microstructure of varves and laminae, introduced by A. Kemp's lecture. That evening, a workshop was convened on the paleolimnology of Lake Baikal.

The morning of the second day was devoted to the paleolimnology of saline lakes, which was introduced by E. Schulz. This was followed by presentations from studies conducted on most of the saline lake regions on the world. A mid-conference excursion to Lake Constance followed that afternoon. In the evening, Bill Last and John Smol (co-editors of *Journal of Paleolimnology*), accompanied by Dr Rene Mijs (the journal's publishing editor at Kluwer Academic Publishers), convened a meeting and "question and answer period" on the Journal (http://www.umanitoba.ca/geoscience/paleolim/jopl.html). One aspect of this workshop was to summarize the continuing rapid expansion and new features of the journal. The *Journal of Paleolimnology* will be publishing the proceedings of the symposium.

The morning of the third day began with a presentation by H.J.B. Birks on numerical tools and their applications to high-resolution studies. This was followed by a series of presentations on methods as well as other paleolimnological applications. A second mid-congress excursion to Lake Federsee, and the archeological finds from this region, occupied the afternoon.

The final day opened with a lecture by B. Ammann on laminated archives of environmental change, followed by a series of diverse posters on primarily laminated sediments.

The final session focused on thanking the various organizers, and voting on the location of the next Symposium. It was decided that the **8th International Symposium on Paleolimnology** would be held at Queen's University, Kingston, Ontario, Canada, most likely in late summer, in the year 2000.

John P. Smol
Editor, *Journal of Paleolimnology*
Paleoecological Environmental Assessment and Research Lab (PEARL)
Department of Biology, Queen's University
Kingston, Ontario, K7L 3N6, Canada
Tel: (613) 545-6147
FAX: (613) 545-6617
E-mail: smolj@biology.queensu.ca

PALYNOLOGY ONBOARD THE *JOIDES RESOLUTION* – LEG 174A TO THE NEW JERSEY SHELF

I sailed as shipboard paleontologist (dinoflagellate) on ODP Leg 174A (June-July, 1997). The principal aim of our leg was to investigate the link between glacioeustatic sea level fluctuations and the architecture of continental margins, i.e., to test the concepts of sequence stratigraphy on the New Jersey margin.[1,2] Two sites on the mid shelf (88-100 m water depth) and one site on the upper slope (639.4 m water depth) were cored and logged as part of a long-term project to core a transect across the New Jersey margin, including onshore drilling (ODP Legs 174X and 150X) as well as previous legs on the lower New Jersey margin (e.g., ODP Leg 150, DSDP Legs 93 and 95).

I worked the infamous midnight to noon shift in the Paleo Lab, where the biostratigraphers looking for nannofossils and planktonic forams were generally frustrated by the (not unexpected!) scarcity of calcareous plankton in shelf sediments,

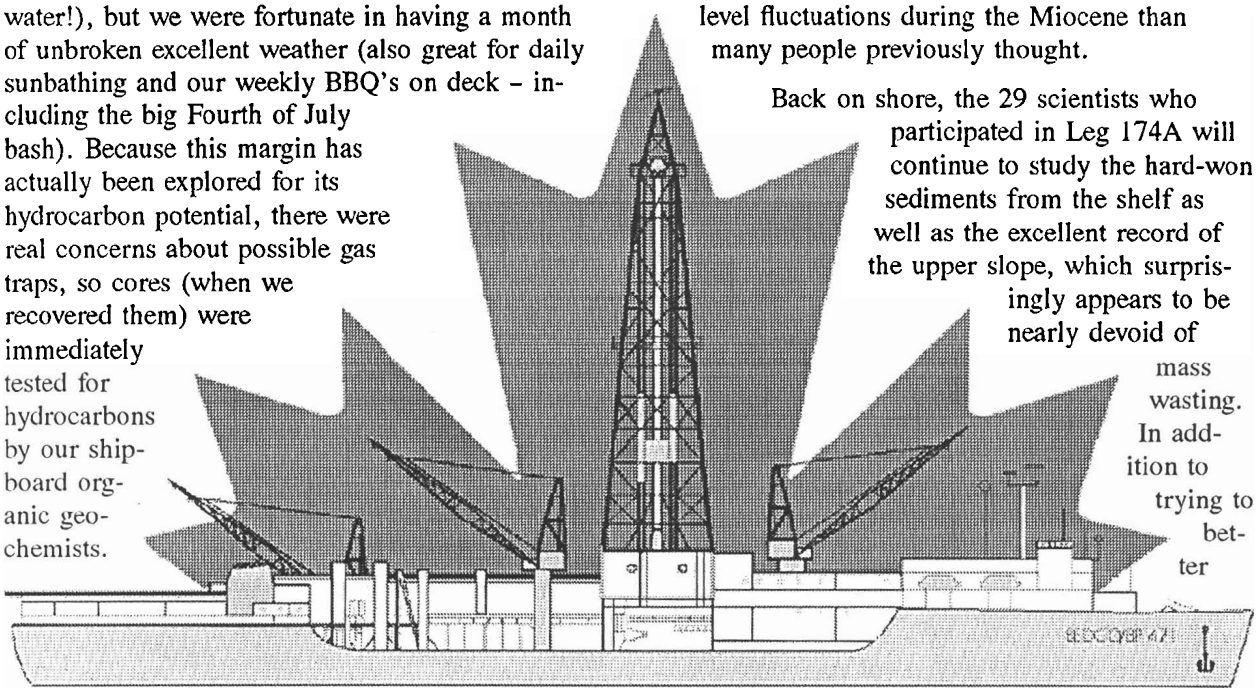
though they were abundant just beyond the shelf-break at the last site we cored (Site 1073) on the upper slope. Fortunately, palynomorphs were almost always abundant in shelf sediments, and I was usually able to assign an age to my samples. Laurent de Verteuil's dinocyst zones, which he erected for the U.S. Atlantic Coastal Plain[1] and also identified on the New Jersey slope and rise during ODP Leg 150,[2] were a tremendous help to me in assigning ages to the thick Miocene sequences on the New Jersey margin, and my PhD work[3] on the New Jersey slope and rise helped me assign ages to the younger units. The downside, which only palynologists can really appreciate, was the long (hazardous and tedious!) processing required, which is particularly frustrating in a setting where quick age picks are essential.

In a sense, I was lucky that we encountered so many drilling problems on the shelf, which let me catch up on my processing and analysis! Our leg really tested the limits of the *JOIDES Resolution* for several reasons. Shallow water conditions made it more difficult to keep the ship dynamically positioned on the shelf (where the maximum allowable 4% excursion from vertical was only 4 m in 100 m water!), but we were fortunate in having a month of unbroken excellent weather (also great for daily sunbathing and our weekly BBQ's on deck - including the big Fourth of July bash). Because this margin has actually been explored for its hydrocarbon potential, there were real concerns about possible gas traps, so cores (when we recovered them) were immediately tested for hydrocarbons by our shipboard organic geochemists.

The thick sequences of relatively clean unconsolidated quartz sand were our biggest problem however, both in maintaining hole stability and in recovering core samples. Core recovery was only 32.2% for the two shelf sites (1071 and 1072), but was (predictably) excellent on the upper slope site (1073), ~99.9%.

We were nevertheless able to identify a number of unconformities which were prominent surfaces on seismic reflection profiles. The best estimates of ages for these surfaces from our shipboard work were 80-250 ka, ~400 ka, 1.7-4.5 Ma, 7.4-11.3 Ma, and >11.3 Ma. Paleoenvironmental interpretations based primarily on benthic foraminifera as well as pollen, dinocyst, and sedimentological data also allowed us to estimate amplitudes of sea level fluctuations. One of the most exciting shipboard discoveries was the recovery of sediments interpreted as estuarine just above the oldest unconformity (m1, >11.3 Ma - late middle Miocene) at Site 1071. These sediments contained very few dinocysts, but abundant pollen and plant detritus as well as some fungal spores and hyphae. The implication is that the top of the sequence developed very close to sea level, suggesting more large-scale sea level fluctuations during the Miocene than many people previously thought.

Back on shore, the 29 scientists who participated in Leg 174A will continue to study the hard-won sediments from the shelf as well as the excellent record of the upper slope, which surprisingly appears to be nearly devoid of mass wasting. In addition to trying to better



constrain the age of the sediments (and therefore the span of time represented by the unconformities), I look forward to examining fluctuations in the transfer of sediments and nutrients from the continent to the deep sea in response to sea level change, using terrestrial palynomorphs as a proxy of terrigenous flux. We'll be discussing the results of this work at our planned post-cruise meeting in Utah next summer, and it will give us a chance to get together once more with a great bunch of people that we got to know really, really well (warts and all!) during a month of constant, relentless interaction under stressful conditions.

Francine M. G. McCarthy
Department of Earth Sciences, Brock University
St. Catherines, Ontario, L2S 3A1, Canada
E-mail: francine@craton.geol.brocku.ca

References

1. Christie-Blick, N., J. A. Austin Jr, *et al.*, in press. *Proc. ODP Init. Reps.* 174A.

2. Miller, K. G., G. S. Mountain, and the Leg 150 Shipboard Party and members of the New Jersey Coastal Plain Project, 1996. Drilling and Dating New Jersey Oligocene-Miocene Sequences: Ice Volume, Global Sea Level and Exxon Records. *Science* 272: 1097-1098.

3. de Verteuil, L., and G. Norris, 1996. *Micropaleontology* Vol. 42 (supplement), 172 pp.

4. de Verteuil, L., 1996. Data Report: Upper Cenozoic Dinoflagellate Cysts from the Continental Slope and Rise Off New Jersey. *Proceedings of the Ocean Drilling Program, Scientific Results* 150, 439-454.

5. McCarthy, F. M. G., 1992. *Quaternary Climate Change and the Evolution of the Mid-Latitude Western North Atlantic Ocean: Palynological, Foraminiferal, Sedimentological and Stable Isotope Evidence from DSDP Sites 604, 607, and 612.* Unpublished PhD Thesis, Dalhousie University, Halifax, Nova Scotia, 269 pp.

[Editor's note: Logo used with permission of Helen Lasthiotakis, Associate Director, Canada ODP.]

TERRESTRIAL PALEOECOLOGY AT THE GEOLOGICAL SURVEY OF CANADA COMES TO AN UNTIMELY END

Palynology in Canada suffered an unexpected setback this summer. In spite of the current widespread interest in climate change and the unique perspective the paleoclimatic record contributes to this issue, Geological Survey of Canada (GSC) management has chosen to shift emphasis in their climate program from understanding climatic history to societal adaptation to future change. As a result, a forty five year history of research contributions documenting Quaternary paleoenvironments in Canada will come to an end on March 30, 1998. In addition to terminating this research effort in the country's only national paleoecological laboratory, the decision negatively impacts the Canadian government's ability to prepare for climate change, since all aspects of climate change research should be drawn on if sound strategies to cope with future contingencies are to be formulated. The fact that this round of cuts was not a government-wide reduction in funding, but instead a shift from supporting scientific research to implementation of a Common Office Environment (standardized computer hardware and software throughout the department) and other bureaucratic initiatives within Natural Resources Canada, makes the decision even more difficult for us to comprehend. Whether comprehensible or not however, the decision has been made. Before the doors close here, we thought it would be appropriate to briefly recount some of the history of the GSC Paleoecology Lab and acknowledge those who contributed to its success.

Quaternary paleoecology at the Geological Survey of Canada began some forty five years ago with the hiring of Jaan Terasmae to study the palynology of buried organic deposits in the St. Lawrence lowlands, Toronto area and northern Ontario, as well as the numerous other peat deposits throughout Canada. His two volumes "Contributions to Canadian Palynology" became classics and were followed by numerous publications of studies in many regions of Canada. Terasmae left the GSC in 1968 to take up a teaching position at Brock University. Although retired, he still retains a keen interest in palynology.

Bob Mott commenced his career at the Survey in 1958 as Terasmae's summer field assistant mapping the surficial geology of the Cornwall and St. Lawrence Seaway area, and as Terasmae's assistant in the Palynology Lab. When Terasmae left the GSC in 1968, Mott undertook the supervision of the laboratory. Mott's early work on Saskatchewan lake deposits was followed over the years by studies throughout Canada, often in collaboration with GSC mapping projects. Identification of sub-fossil wood specimens was developed by Mott as an additional service provided by the Lab. Most recently Mott's research focused on the Maritimes where he studied postglacial lake and buried organic deposits which led to the recognition of the late-glacial Younger Dryas climatic oscillation. Studies of numerous buried organic deposits of interstadial and interglacial affinity increased our knowledge of the vegetation and climate of these intervals. Mott retired in 1992 but has since received emeritus status and continues his research.

Dendrochronology received some attention by the GSC for a few years in the latter 1960's. Marion Parker was employed to determine the feasibility of conducting dendrochronological studies in Canada. He worked in various areas of the country and developed methods for utilizing wood density as a tool for determining past climate changes affecting trees. Unfortunately, this line of research was not supported, and Parker left for a position in Vancouver.

Leanne Wilson-Gill joined the Paleoecology Laboratory as a technician in 1968. She fulfilled this vital function as well as publishing reports on her own until 1981 when she changed venue and accepted other duties within the Department.

In 1970 Sigrid Lichti-Federovich joined the unit as a palynologist. Her research interests were centered on postglacial sites in Alberta and older sites in the Yukon. Sigrid's focus later changed and she began the study of diatoms which she pursued until her retirement in 1992.

Palynological expertise in the unit increased in 1971 with the arrival of Thane Anderson. Initially, Thane worked for the GSC at the Canada Centre for Inland Waters in Burlington, Ontario, where his research focused on Great Lakes deposits. He continued these studies after moving to Ottawa in 1976, and broadened his interests to include many areas of Canada from Prince Edward Island, to southern Ontario, western Canada, the Arctic, and Newfoundland. Anderson has been involved in a wide range of projects with workers within the Terrain Sciences Division, other Government agencies and universities, and has compiled syntheses for various regions. More recently he has been using palynology to document climate induced water level changes in lakes on the Oak Ridges Moraine, southern Ontario, as well as examining tsunami-laid deposits in coastal areas of Newfoundland, and tying landslide events in the Ottawa area to past climate change.

Expertise in the unit broadened further in 1973 with the arrival of John Matthews to conduct studies in paleoentomology. John's efforts were focused on sites throughout the Arctic, in particular Yukon. Paleoclimate interpretations based on insect remains became a service that complemented many projects, both within and outside government. John's involvement in compilations and syntheses broadened knowledge of Arctic paleoclimatology, a basic requirement to the understanding of future climate change and its impact on northern regions. John retired from the GSC in 1997, but remains keenly involved in science through his interest in the production of CD-ROMs that are aimed at

disseminating topical scientific issues to a wide audience.

Lynn Ovenden, a bryologist, worked in the Paleoentomology Lab in the early 1980's, focusing on organic deposits. Mosses provided a further insight into paleoclimate, particularly in Arctic environments. Lynn left the GSC when no continuing positions became available. Able assistance in the Paleoentomology Lab was also provided by Linda Barton from 1980 until 1986, when she left the GSC to pursue other interests.

Alice Telka moved from the Radiocarbon Lab to the field of insects in 1986 when she took over Linda's position. Alice also provided expertise in plant macrofossil identification, a great asset to paleovegetation reconstruction and to the understanding of paleoclimatic conditions. Alice broadened her interests by gaining expertise in the identification of chironomids. Alice was not only involved with the laboratory but was an integral part of Matthews' field studies.

In 1984, Hélène Jetté was hired to work in the Lab. Hélène had been a palynologist in the Laboratoire de Palæophytogéographie et de Palynologie with Pierre Richard and came to the GSC highly recommended. Hélène was initially an assistant in the Lab but eventually assumed supervisory duties from Mott. Besides providing valuable paleoecological contributions to many GSC colleagues, she conducted her own field studies in the Yukon. Development of databases and the production of transfer functions, vital requirements in the study of paleoclimates, followed as she became adept with computers. Hélène contributed to and edited the 6K BP volume of *Géographie physique et Quaternaire* and was preparing paleovegetation maps of other Late Quaternary time slices when her position was abruptly terminated in 1995 in a previous cost-cutting exercise. Hélène took another position within Natural Resources Canada where her abilities are greatly appreciated.

Sylvia Edlund had been a part of the Terrain Sciences Division for a number of years before joining the Paleoecology Section. Sylvia's research involved the botany of the Arctic and its relationship to climate, topography and geology. Her knowledge of modern vegetation and climate of the Arctic provided a valuable insights into past climate and vegetation. Sylvia took medical retirement in 1994.

Sheridan Hipwell joined the Paleoecology Lab in 1992 as a technician for Hélène Jetté. Sheri remained in the Lab as the contact person to conduct lab preparations and to help arrange new systems for the Lab work, until her departure from the GSC in early 1997.

Diatom analysis in the unit was revived in 1993 with the addition of Clément Prévost. Clément worked with Anderson on the Oak Ridges Moraine project and continues to provide paleolimnological expertise in the ongoing GSC "Metals in the Environment" program.

Expertise in plant macrofossils, particularly in the Arctic, was enhanced with the addition of Michelle Garneau in 1990. Although part of the Paleoecology Lab in an organizational sense, Michelle was stationed in the Quebec GSC office. Michelle's efforts were mainly focused on peat deposits in the Arctic, although she has also worked on projects in subarctic and temperate regions during her tenure with the GSC. She has recently compiled a synthesis of Arctic global change studies, which will appear in the near future as a GSC Bulletin.

Bob Vance was moved in August of 1996 from the Calgary office of the GSC, where he had been conducting plant macrofossil studies of lake level changes in the southern prairies, as part of the Palliser Triangle Global Change Project. Once in Ottawa, he continued his Palliser studies and coordinated development of a Canadian paleoecological database. This database was to be used to generate maps of past vegetation and lake level dynamics, which could then be used to infer past climatic conditions. This work was a component of the ongoing Climate System History and Dynamics Project, where geological datasets were being used to test the ability of Canada's General Circulation Model to "hindcasting" past climatic conditions.

Over its 45 year existence, the Paleoecology Lab has had a close affiliation with the Radiocarbon Laboratory. In fact, from the late 1960s until the mid-1980s, the Radiocarbon Lab was a part of the Paleoecology Section. J. A. (Sandy) Lowdon provided valuable advice to the paleoecologists up to 1981 and Roger McNeely has continued to provide advice and expertise to the group. As a result of this close association, the Paleoecology group has substantially enhanced the information provided by the Lab through sample identifications, as well as macrofossil and microfossil determinations of associated deposits. This collaboration with the Radiocarbon Lab resulted in significant contributions to scientific projects and syntheses, such as; Jetté's identifications of Arctic driftwood to strengthen documentation of Holocene Arctic ocean current dynamics, Lichti-Federovich's analyses of diatom profiles in the Fraser Delta to enhance regional paleoenvironmental interpretations, and Matthew's collaboration on the Pasley River site to provide detailed interpretations of early Holocene environmental dynamics, and Mott's collaboration on an arctic interglacial site.

Student assistants (too numerous to name individually here), both in the field and labs, have been invaluable over the years. The often mundane tasks of obtaining sediment cores and processing samples were willingly conducted by a number of enthusiastic students. The Paleoecology Group hope that these persons obtained at least some degree of knowledge and satisfaction from their association with us.

As the end of Quaternary paleoecological studies at the GSC rapidly approaches, those of us still involved in the final few weeks have some concerns over the fate of the accumulated reference materials, databases and samples. Efforts are being made to have space and equipment available for the reference collections so that researchers throughout the country can make use of these assets. In addition, we are now in the process of forwarding data to the North American Pollen and Plant Macrofossil Databases where it will, of course, be available to all interested parties.

The fate of samples stored in cold rooms and other areas is less certain. Space is in demand, so efforts are being made to have researchers arrange long term loans of samples and cores that they are interested in. Several decades of field work has produced a large number of samples and cores from widespread areas of Canada. Numerous lake sediment cores, many of which have been radiocarbon-dated but not yet analyzed, have still not found a secure resting place. Anyone interested in these samples and cores should contact us soon.

All of us in the soon to be disbanded paleoecology research group, and we are sure others mentioned above, look back with gratitude and appreciation for the many years of collaboration with colleagues here at the GSC and at other agencies and universities in Canada and throughout the world. Our hope is that once the impacts of Global Climate Change become even more apparent to the Federal government and its managers, the role of paleoecology in understanding and anticipating these impacts will become apparent and the science may once receive the support it deserves.

Bob Mott, Bob Vance, Thane Anderson,
Michelle Garneau and Alice Telka
Ottawa, Ontario

HEADING SOUTH

As most CAP readers are now aware, Susan and I have left the Canadian Museum of Nature and have accepted a position at the Florida Museum of Natural History (http://www.flmnh.ufl.edu), University of Florida, Gainesville, Florida. After 23 years of service to Her Majesty Queen Elizabeth II, and the people of Canada, we felt, for a number of reasons, that it was time to move on.

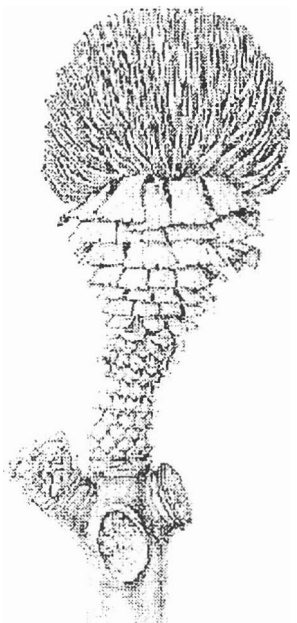
The Canadian Museum of Nature (CMN) has over the past few years experienced major changes in direction, leadership, and lack of co-operation between management and staff. For these and some lesser reasons, the research function at the CMN had not been of the caliber and nature that I felt I

could continue to support. This attitude coupled with a desire to try "something new" led Susan and I to begin looking southward for employment. The current, newly appointed, management team at the Canadian Museum of Nature seems to me to be headed now in the proper direction. Perhaps in a few years the CMN can regain its former place as a leader in Canadian natural history research and collections.

Although we are both US citizens, the move back to the States was in many ways like a move to a "foreign" country. The pace of life in the southern parts of the US is somewhat "slower" and perhaps more carefree than that which we were accustomed to in Ontario. The Florida weather is, of course, drastically different than that of Ottawa, as are the hospital and dental programs available to Florida residents. Each of these topics, the weather, the pace of life and health plans, could in themselves make an interesting item for the *CAP Newsletter*. I will not, however, dwell on these issues, save for the note that at least as far as I am aware, Ontario has in many ways taken care of its residents in a far superior fashion than have its neighbors to the south.

Officially, I was hired as a Senior Biologist and Collections Manager for the Paleobotanical Collections at the FLMNH, the State Museum, on the Campus, and affiliated with the University of Florida. My task for the first couple of years will be to organize and catalogue the large collection of plant macrofossils and microfossils housed at the FLMNH. The vast majority of the collections were transferred to the FLMNH along with Professor David Dilcher, when he accepted a post at the FLMNH. With Dilcher and the Indiana Collections, the FLMNH also hired Dr Steven Manchester as Associate Curator.

Since 1990, the collections have received only the basics of care and curation, as time, money and space were at a premium. Together however, Drs Dilcher and Manchester were successful in securing an NSF Grant which covers, for the next three years, the total curation needs for the collection. With the grant in hand, I was hired to carry out the



Reconstruction of the fruiting axis of *Lesqueria elocata* (Lesq.) Crane & Dilcher 1984. An early angiosperm from the Upper Albian-Middle Cenomanian Dakota Formation of central Kansas and the Woodbine Formation of Texas.
Illustration © D. L. Dilcher.

important task of bringing this valuable collection to the condition it deserves. At the end of the NSF contract, the University of Florida has agreed to pick up the position as a State line staff appointment.

The FLMNH Paleobotanical Collection (http://www.flmnh.ufl.edu/natsci/paleobotany/paleobotany.htm) includes approximately 130,000 specimens. This is a conservative estimate that does not take into account the fact that an individual hand sample may contain more than one fossil of interest. In addition, the facility houses the John W. Hall paleobotanical collection (approximately 20,000 specimens) currently on a long-term loan from the University of Minnesota.

The collection is international in scope, ranging from the Proterozoic to the Pleistocene, including

collections from 35 countries. Particular strengths of the collection are: Cretaceous of the United States western interior (~17,000 specimens), Cretaceous and Eocene of southeastern North America (~31,000 specimens), Eocene and Oligocene of the Pacific northwest (~20,000 specimens), and Pennsylvanian of Indiana and Illinois (~7,000 specimens).

Systematically the greatest strength of the collection is in Cretaceous-Tertiary angiosperms, which are represented by large numbers of well-preserved fruits and flowers as well as leaves and wood. A majority of publications generated by the collection have dealt with angiosperm systematics, but publications also have been generated on algae, fungi, lycopods, ferns, seed ferns, conifers, and insect mines and have been used to address questions of phylogeny, paleogeography, and paleoclimate.

The type specimen collection includes all FLMNH paleobotanical specimens that have been cited in published literature, extending from the 1920's to the present. Approximately 130 publications are known to have cited specimens that now reside in the FLMNH paleobotanical collection. There are currently more than 3,000 type, figured and cited specimens housed at the FLMNH. For a complete listing of these publications and theses, see: http://www.flmnh.ufl.edu/natsci/paleobotany/publications.htm

The Paleobotany collections also house the David Dilcher and Herman Becker Library of over 30,000 entries including books, monographs, journal runs and reprints. To support the fossil collections and as a source of comparative material the Paleobotany collections also maintain a Modern Leaf Collection (a major collection of 6,000 specimens) and a Modern Fruit and Seed Collection (in the development stages with about 500 specimens). All the individual collections including the macrofossils, microfossils, leaf, fruit and seed collections are entered into the Microsoft Access™ relational data base system and are searchable within a myriad of selected fields. The computer-accessible database of the FLMNH Paleo-botanical Collection will be useful to investigators nationally and internationally as well as within the University of Florida because it will allow us to provide detailed information on our holdings as a basis for researchers to plan study visits and/or request loans of specimens or information on specific locality data.

The work here at the FLMNH is a new challenge for Susan and me. Susan has been hired on a part-time basis to assist Dr Dilcher with specific library and general office work, and Dr Manchester has hired her to assist me in the Paleobotany collections to carry out the much needed sorting, labeling and data entry of the thousands of, as yet, uncataloged material. My research interests remain eclectic, and I expect to publish a few papers on a variety of topics over the next few years. Papers currently in press include my work on the Ethiopian Gondar Hanging (Jarzen 1997) and a final volume on the early history of the Proteaceae in Australia (Dettmann and Jarzen 1998). Once the bulk of the collections here at the FLMNH are properly curated and managed, I may turn my palynological interests towards the Tertiary of the neotropics, an area where I began my professional career many years ago (Graham and Jarzen 1969). Details of my career, travels and published papers are available at: http://www.flmnh.ufl.edu/staff/dmjcva.htm

If you are interested in learning more of the specifics involving the collection, please contact me at the following address:

Dr David M. Jarzen, Collection Manager
Division of Paleobotany
Florida Museum of Natural History
University of Florida
Gainesville, Florida, FL 32611-7800, U.S.A.
Tel: (352) 392-3947
FAX: (352) 846-0287
E-mail: dmj@flmnh.ufl.edu

All in all, the decision to move back to the US was a difficult one to make. Susan and I spent many an evening discussing the probable ramifications of such a move at this time in our professional careers. I would not, nor probably could not, have made the move and change without the total

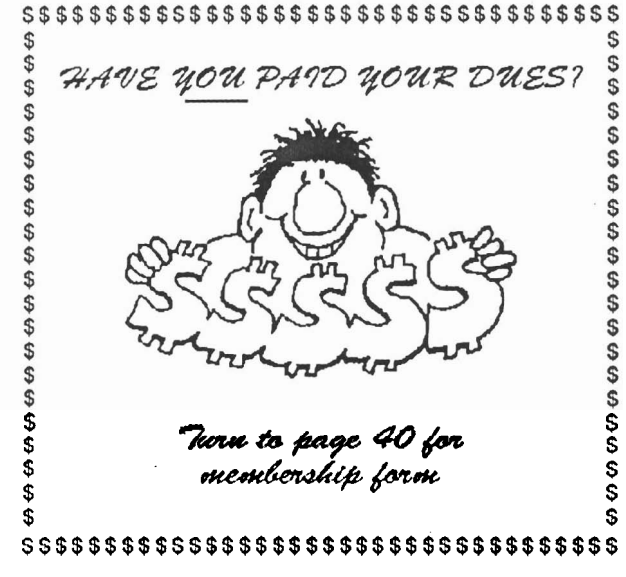
support of Susan. We now and again think back to the Canadian days and the life we had in the "north". Canada was good to us, as were the friends and colleagues at the Canadian Museum of Nature. But in a very strange way I feel like Don Quixote, when, after years of travel about the plains of LaMancha and after "fighting windmills" once too often, he turned to his friend and companion and noted calmly and perhaps with a sigh of relief...."It's time to go home, Sancho".

References

Dettmann, M. E., and D. M. Jarzen (in press). The early history of the Proteaceae in Australia: the pollen record. *Australian Systematic Botany*.

Graham, A., and D. M. Jarzen, 1969. Studies in neotropical paleobotany. I. The Oligocene communities of Puerto Rico. *Annals of the Missouri Botanical Garden* 56:308-357.

Jarzen, D. M. (in press). Palynological analysis of the Gondar (Ethiopia) hanging. *In* J. H. Wrenn and V. M. Bryant Jr (editors), *New Developments in Palynomorph Sampling, Extraction, and Analysis*. AASP Contribution Series.



ESSAYS

MYRIOPHYLLUM IN BRITISH COLUMBIA

In British Columbia (the westernmost Canadian province) we have a group of aquatic vascular plants that occur in eastern North America and reappear here on the west coast. It would be extremely interesting to learn the history of their distribution. I would be glad to suggest suitable study sites, however, I cannot provide any funding.

Below is an article I posted in BEN (Botanical Electronic News) # 171 that deals with a new water-milfoil species found in British Columbia.

Adolf Ceska
P.O. Box 8546
Victoria, British Columbia, V8V 3S2, Canada
E-mail: aceska@freenet.victoria.bc.ca

Myriophyllum pinnatum: A New Species for British Columbia

In the fall 1996, Frank Lomer found a large population of flowering water-milfoil that we identified as *Myriophyllum pinnatum* (Walt.) B.S.P. (syn.: *M. scabratum* Michx., family Haloragaceae). The locality was a shallow artificial lake in Minnekhada Park in Coquitlam, east of Vancouver, British Columbia.

Myriophyllum pinnatum belongs to the section Tessaronia. This section is characterized by having male flowers with four anthers (instead of eight in the other species) and having leaves arranged in the "pseudowhorls" (= you can find single scattered

leaves besides those that are in whorls). *M. pinnatum* differs from all other species of Tessaronia by having ridges of the fruit covered with sessile glands.

Sterile specimens are difficult to identify since they can be confused with *M. hippuroides* which is quite frequent in the lower Fraser River Valley. Chromatographic analysis of flavonoids that proved to be a reliable identification tool in sterile specimens of some *Myriophyllum* species, however, does not work in the subgenus Tessaronia, since all British Columbia members of this group have an identical flavonoid pattern (Ceska 1977; Ceska and Ceska 1986). Herbarium specimens of *M. pinnatum* have "wiry" stems that turn darker after drying compared with thick-stemmed deep green specimens of *M. hippuroides*, but for reliable identification, fertile specimens are needed. In nearby Pitt Lake, we collected strange specimens with wiry stems in 1979, but we were unable to identify them since we could not find fertile specimens. In a 1996 trip we stopped at Pitt Lake and got fruiting material that we identified as *M. pinnatum*. Later we found several fertile collections from Pitt Lake made by T. C. Brayshaw that we also identified as *M. pinnatum*.

Myriophyllum pinnatum is a species of eastern North America. It is difficult to conjecture whether it was introduced to British Columbia. It may well belong to the interesting group of aquatic vascular plants indigenous to the Pacific Northwest that occur both in eastern and western North America with a gap in the prairie provinces. Les (1986) gave a list of species with similar distribution and discussed the phytogeography of these species. In the Herbarium of the Royal British Columbia Museum (V) there is a fragment of a sterile plant collected in Pitt Lake by J. K. Henry in October 1916 (V 41,820b) that is most probably *M. pinnatum*. This may indicate that *M. pinnatum* has been well established in the Pitt Lake area for a long time.

Attention palynologists and palaeobotanists! There are interesting projects related to the genus *Myriophyllum* or to the aquatic plants in British Columbia that should be investigated:

1. The palynological study of *Myriophyllum* in British Columbia by Mathews (1978) should be extended by those species of milfoil that have been added to the flora of British Columbia since the 1970's (Ceska and Warrington 1976; Ceska *et al.*, 1986): *Myriophyllum farwellii*, *M. quitense*, *M. pinnatum* and *M. ussuriense*.

2. An attempt should be made to trace the history of distribution of the group of aquatic plants native to eastern North America and occurring in British Columbia and the Pacific Northwest.

Adolf and Oluna Ceska
aceska@freenet.victoria.bc.ca
and Frank Lomer (ubc@unixg.ubc.ca)

References

Ceska, A., and P. D. Warrington, 1976. *Myriophyllum farwellii* (Haloragaceae) in British Columbia. *Rhodora* 78:75-77.

Ceska, O., 1977. Studies on aquatic macrophytes, part XVII: Phytochemical differentiation of *Myriophyllum* taxa collected in British Columbia. Water Investigation Branch, Victoria. 33 pp.

Ceska, O., and A. Ceska, 1986. *Myriophyllum* (Haloragaceae) in British Columbia: problems with identification. In: Lars W. Anderson, editor. Proceedings of the First Symposium on watermilfoil (*Myriophyllum spicatum*) and related Haloragaceae species, pp. 39-50. Aquatic Plant Management Society Vicksburgh, Mississippi.

Ceska, O., A. Ceska and P. D. Warrington, 1986. *Myriophyllum quitense* and *Myriophyllum ussuriense* (Haloragaceae) in British Columbia, Canada. *Brittonia* 38: 73-81.

Les, D. H., 1986. The phytogeography of *Ceratophyllum demersum* and *C. echinatum* (Ceratophyllaceae) in glaciated North America. *Canadian Journal of Botany* 64:498-509.

Mathews, R. W., 1978. Pollen morphology of some western Canadian *Myriophyllum* species in relation to taxonomy. *Canadian Journal of Botany* 56:1372-1380.

THE OLDEST LIVING PLANT INDIVIDUAL

A team of scientist working at the Plant Science Department, University of Tasmania and Parks and Wildlife Service, Department of Environment and Land Management, Tasmania (Jasmyn Lynch, Jayne Balmer, Dr Greg Jordan, Dr Jocelyne Cambecedes, Richard Barnes, and Dr Rene Vaillancourt) have discovered the oldest living plant individual known to date.

Lomatia tasmanica (common name King's Holly), which is a member of the Proteaceae family, is known by only one population which is located in the World Heritage area of South west Tasmania, Australia. It grows along creek gullies in remnant rain-forest.

An isozyme analysis found that it possessed zero genetic diversity (all living plants of the species are exactly the same). On the other hand, a closely related species (*Lomatia tinctoria*) which also propagates vegetatively had a normal level of genetic diversity. Chromosome counts revealed that *Lomatia tasmanica* had a triploid chromosome number and this genetic information explains the observations that *L. tasmanica* appears to be sterile (it flowers but never forms mature fruits), and shows little morphological variability. This evidence strongly suggests that the entire species is a single clone that propagates vegetatively.

The *L. tasmanica* clone (spanning 1.2 km) is the second longest in the world after the box-huckleberry clone (*Gaylussacia brachycera*) in North America (Pennsylvania) which is reported to be 2 km in length. A clone of this size must be very old. Indeed, under the cold climate of South-west Tasmania and because of the poor soil (quartz based), vegetative propagation is likely to be very slow.

Fortunately, fossil leaf fragments, identical to living *L. tasmanica* were found in a fossil deposit 8.5 km of the extant population. These permit a more precise age estimate. These fossils have a ^{14}C age of 43,600 years. The oldest reported plant

King's Holly (*Lomatia tasmanica*)
Photo: Parks and Wildlife Tasmania

clone is the box-huckleberry which was aged at 13,000 years (Wherry 1972). The oldest living tree is believed to be a bristlecone pine (*Pinus aristata*) in Arizona which has been dated using dendrochronology at 4,700 years. *Lomatia tasmanica* appears to be the oldest living plant individual known to date. A manuscript that provides more details is due to appear in 1998 in the *Australian Journal of Botany*.

Rene Vaillancourt
CRC for Sustainable Production Forestry
Plant Science Department, University of Tasmania
GPO Box 252-55
Hobart, Tasmania 7001, Australia
E-mail: R.Vaillancourt@plant.utas.edu.au

Literature cited and further reading:

Cook, R. E., 1983. Clonal plant populations. *American Scientist* 71:244-253.

Lynch, A. J. J., R. W. Barnes, J. Cambacedes and R. E. Vaillancourt, in press. Genetic evidence that *Lomatia tasmanica* (Proteaceae) is an ancient clone. *Australian Journal of Botany* 46.

Vaillancourt, R. E., G. Jordan, J. Cambacedes and A. J. J. Lynch, 1996. Is *Lomatia tasmanica* a 43,000 year old clone? Presented at the Royal Botanical Gardens Commemorative Conference, Proteaceae Symposium, September 29-October 5. Melbourne, Victoria, Australia.

Wherry, E. T., 1972. Box-huckleberry as the oldest living protoplasm. *Castanea* 37:94-95.

[Editor's note: This item was originally published in BEN (Botanical Electronic News) # 149. It is reproduced here with permission.]

STATISTICS FOR *LYCOPODIUM* TABLETS

Pollen analysts often add *Lycopodium* tablets (obtained from Lund University, Sweden) to pollen preparations during processing, in order to calculate microfossil concentrations (see Stockmarr 1971). Each batch of tablets comes with an estimate of the spore content, given usually as the mean and standard deviation of five tablets. Depending on the characteristics of the sample, it is not always necessary to use five *Lycopodium* tablets. So palynologists may need to calculate statistics for other numbers of tablets. Taking Batch 710961 as an example and assuming that Lund is correct in their statistics that five of their *Lycopodium* tables in this batch contain (mean ± standard deviation) 69,556 ± 1541 spores, then what are the statistics for one, two, or three tablets?

The mean number of grains in a group of N tablets = N times the mean number of grains per tablet (Y). Lund determined that their five-tablet mean was 69,556, so a single tablet's mean is 13,911, as they indicate.

The standard deviation of a group of N tablets = square root of N times the standard deviation of the individual tablet; that is SQR(N) x s. (See Maher 1981, pp. 158-159). So the standard deviation for a single tablet is 689. Similar computations can be done for other numbers of tablets, as shown in the table below.

Number of Tablets	Group Mean	Group S.D.	Coefficient of Variation
1	13,911	689	4.95%
2	27,822	975	3.5%
3	41,733	1193	2.9%
4	55,644	1378	2.5%
5	69,556	1541	2.2%
10	139,110	2179	1.6%

Louis J. Maher
Department of Geology & Geophysics
University of Wisconsin - Madison
Madison, Wisconsin, WI 53706, U.S.A
E-mail:maher@geology.wisc.edu

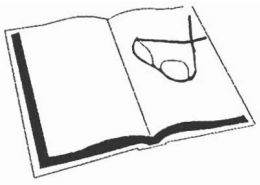
References

Maher, L. J., 1981. Statistics for Microfossil Concentration Measurements Employing Samples Spiked with Marker Grains. *Review of Palaeobotany and Palynology* 32:153-191.

Stockmarr, J., 1971. Tablets with Spores used in Absolute Pollen Analysis. *Pollen et Spores* 13:615-621.

[Editor's note: This item was elicited in response to a recent question by Martin Head posted on the POLPAL discussion list. It is reproduced here, in slightly modified form, with permission.

For more information on *Lycopodium* spore tablets, including details about where to order them from, please take a look at the CAP www presentation, at http://www.ualberta.ca/~abeaudoi/cap/cap.htm, and follow the link under "Equipment and Supplies".]



On the shelf

RECENT PUBLICATIONS BY CANADIAN AND OTHER PALYNOLOGISTS - 8

Abell, D. C., H. Friebe, C. *Schweger, A. S. K. Kwok, and P. Sporns, 1996. Comparison of Processed Unifloral Clover and Canola Honey. *Apidologie* 27:451-460.

Achab, A., E. *Asselin, D. Lavoie, and J. M. Mussard, 1997. Chitinozoan Assemblages from the Third-Order Transgressive-Regressive Cycles of the Upper Gaspé Limestones (Lower Devonian) of Eastern Canada. *Review of Palaeobotany and Palynology* 97:155-175.

Bastien, D.-F., and M. *Garneau, 1997. *Macroscopic Identification of 36* Sphagnum *Species in Eastern Canada*. Geological Survey of Canada Miscellaneous Report 61, 41 pp.

*Beaudoin, A. B., D. S. Lemmen and R. E. *Vance, 1997. Paleoenvironmental Records of Postglacial Climate Change in the Prairie Ecozone. Online paper and sites database for EMAN (Ecological Monitoring and Assessment Network), at http://www.cciw.ca/eman-temp/reports/publications/nm97_paleo/intro.html

Dallimore, S. R., S. A. Wolfe, J. V. *Matthews Jr, and J.-S. Vincent, 1997. Mid-Wisconsinan Eolian Deposits of the Kittigazuit Formation, Tuktoyaktuk Coastlands, Northwest Territories, Canada *Canadian Journal of Earth Sciences* 34:1421-1441

*Garneau, M., 1997. Paleoécologie d'un secteur riverain de la Rivière Saint-Charles: analyse macrofossile du site archéologique de la Grande Place, à Québec. *Géographie physique et Quaternaire* 51(2):211-230.

*Hallett, D. J., L. V. Hills, and J.J. Clague, 1997. New Accelerator Mass Spectrometry Radiocarbon Ages for the Mazama Tephra Layer from Kootenay National Park, British Columbia, Canada. *Canadian Journal of Earth Sciences* 34:1202-1209

Head, M. J., 1997. Thermophilic Dinoflagellates from the Mid Pliocene of Suffolk, Eastern England. *Journal of Paleontology* 71(2):165-193.

Holman, J. A., C. R. Harington, and R. J. *Mott, 1997. Skeleton of a Leopard Frog (*Rana pipiens*) from Champlain Sea Deposits (ca. 10 000 BP) Near Eardley, Quebec. *Canadian Journal of Earth Sciences* 34(8):1150-1155.

*Kalgutkar, R. M., 1997. Fossil Fungi from the Lower Tertiary Iceberg Bay Formation, Eureka Sound Group, Axel Heiberg Island, Northwest Territories, Canada. *Review of Palaeobotany and Palynology* 97:197-226.

*Kuhry, P., 1997. The Paleoecology of a Treed Bog in Western Boreal Canada: A Study Based on Microfossils, Macrofossils and Physico-Chemical Properties. *Review of Palaeobotany and Palynology* 96:183-224.

Lemmen, D. S., R. E. *Vance, S. A. Wolfe, and W. M. Last, 1997. Impacts of Future Climate Change on the Southern Canadian Prairies: A Paleoenvironmental Perspective. *Geoscience Canada* 24(3):121-133.

Leroy, S. A. G., 1997. Climatic and Non-climatic Lake-level Changes Inferred from a Plio-Pleistocene Lacustrine Complex of Catalonia (Spain): Palynology of the Tres Pins Sequences. *Journal of Paleolimnology* 17:347-367.

Levac, E., and A. de Vernal, 1997. Postglacial Changes of Terrestrial and Marine Environments Along the Labrador Coast: Palynological Evidence from Cores 91-045-005 and 91-045-006, Cartwright Saddle. *Canadian Journal of Earth Sciences* 34(10):1358-1365.

McAndrews, J. H., 1997. Pollen Analysis of a Sediment Core from a Bog Adjacent to the Fisher Site. *In* P. L. Storck, *The Fisher Site: Archaeolog-*

ical, Geological and Paleobotanical Studies at an Early Paleo-Indian Site in Southern Ontario, Canada, pp. 295-297. Memoirs of the Museum of Anthropology, University of Michigan, Number 30.

McAndrews, J. H., 1996. Habitat History at Levera National Park, Grenada. *Rotunda*, Spring 1996, pp. 41-42.

*McCarthy, F. M. G., E. S. Collins, J. H. McAndrews, H. A. Kerr, D. B. Scott and F. S. Medioli, 1995. A Comparison of Postglacial Arcellacean ("Thecamoebian") and Pollen Succession in Atlantic Canada, Illustrating the Potential of Arcellaceans for Paleoclimatic Reconstruction. *Journal of Paleontology* 69:980-993.

Pellatt, M. G., and R. W. *Mathewes, 1997. Holocene Treeline and Climate Change on the Queen Charlotte Islands, Canada. *Quaternary Research* 48:88-99.

Pellatt, M. G., R. W. *Mathewes, and I. R. Walker, 1997. Pollen Analysis and Ordination of Lake Sediment-Surface Samples from Coastal British Columbia, Canada. *Canadian Journal of Botany* 75:799-814.

Pengelly, J. W., K. J. Tinkler, W. G. Parkins, and F. M. G. *McCarthy, 1997. 12 600 Years of Lake Level Changes, Changing Sills, Ephemeral Lakes and Niagara Gorge Erosion in the Niagara Peninsula and Eastern Lake Erie Basin. *Journal of Paleolimnology* 17(4):377-402.

Quattrocchio, M. E., and W. A. S. Sarjeant, 1996. Early Palaeocene (Danian) Dinoflagellates from the Colorado Basin, Argentina. *Revista Española de Micropaleontologia* 28(3):111-138.

Quattrocchio, M. E., W. A. S. Sarjeant and W. Volkheimer, 1996. Marine and Terrestrial Jurassic Microfloras of the Neuquén Basin (Argentina). Palynological Zonation. *GeoResearch Forum*, Vols. 1-2, pp. 167-178, figs. 1-4.

*Richard, P. J. H., J. J. Veillette, A. C. Larouche, B. Hetu, J. T. Gray, and P. Gangloff, 1997. Chronologie de la Déglaciation en Gaspésie: Nouvelles Données et Implications. *Géographie physique et Quaternaire* 51(2):163-184.

Ritchie, J. C., 1997. Book Review: Palaeoecological Events During the Last 15 000 Years - Regional Syntheses of Palaeoecological Studies of Lakes and Mires in Europe, 1996 (Birks, Ralska-Jasiewiczowa, Wright). *Journal of Paleolimnology* 18(2):205-207.

Sarjeant, W. A. S., 1997. Review of R. Goldring, *Fossils in the Field. Information Potential and Analysis. Earth Science Reviews* 42(3):187-188.

Sarjeant, W. A. S., 1997. Review of J. Jansonius and D. C. McGregor, *Palynology: Principles and Applications. AASP Newsletter* 30(2):5-8. [Also published April-May 1997 on the AASP website at http://opal.geology.utoronto.ca:80/AASP/PPPreview.html]

Sarjeant, W. A. S., 1996. Review of S. K. Donovan, *The Palaeobiology of Trace Fossils. Geoscience Canada* 23(1):55.

Sarjeant, W. A. S., 1996. Dinosaur Extinction: Sudden or Slow, Cataclysmic or Climatic? [Essay review of D. Archibald, *Dinosaur Extinction and the End of an Era*]. *Geoscience Canada* 23(3):161-164.

Sarjeant, W. A. S., and R. P. W. Stancliffe, 1996. The Acritarch Genus *Polygonium* Vavrdová emend. Sarjeant and Stancliffe 1994; A Reassessment of its Constituent Species. *Annales de la Société Géologique de Belgique, Maurice Streel Volume* Vol. 117, pt. 2, pp. 355-369, tabs, 1-2.

Sarjeant, W. A. S., and M. Vavrdová, 1997. Taxonomic Reconsideration of *Multiplicisphaeridium* Staplin, 1961 and Other Acritarch Genera with Branching Processes. *Geolines* (Praha), Vol. 5, pp. 1-52, pls. 1-4, text-figs. 1-4, tables I-III.

Stimec, J., C. D. Scott-Dupree, and J. H. McAndrews, 1997. Honey Bee, *Apis mellifera*, Pollen Foraging in Southern Ontario. *Canadian Field-Naturalist* 111(3):454-456.

*Szeicz, J. M., 1996. White Spruce Light Rings in Northwestern Canada. *Arctic and Alpine Research* 28:184-189.

*Szeicz, J. M., and G. M. MacDonald, 1996. A 930-year Ring-width Chronology from Moisture Sensitive White Spruce (*Picea glauca* Moench) in northwestern Canada. *The Holocene* 6:345-351.

*Vance, R. E., W. M. Last, and A. J. Smith, 1997. Hydrologic and Climatic Implications of a Multidisciplinary Study of Late Holocene Sediment from Kenosee Lake, Southeastern Saskatchewan, Canada. *Journal of Paleolimnology* 18:1-29.

von Bitter, P. H., and B. E. Eley, 1997. Fossil Hill Formation Chert at the Fisher Site: Geological Source and Significance. *In* P. L. Storck, *The Fisher Site: Archaeological, Geological and Paleobotanical Studies at an Early Paleo-Indian Site in Southern Ontario, Canada*, pp. 223-235. Memoirs of the Museum of Anthropology, University of Michigan, Number 30.

Warny, S. A., and J. H. *Wrenn, 1997. New Species of Dinoflagellate Cysts from the Bou Regreg Core: A Miocene-Pliocene Boundary Section on the Atlantic Coast of Morocco. *Review of Palaeobotany and Palynology* 96:281-304.

*White, J. M., T. A. Ager, D. P. Adam, E. B. Leopold, G. Liu, H. Jetté, and C. E. *Schweger, 1997. An 18 Million Year Record of Vegetation and Climate Change in Northwestern Canada and Alaska: Tectonic and Global Climatic Correlates. *Palaeogeography, Palaeoclimatology, Palaeoecology* 130:293-306.

Williams, C. A., L. V. Hills, and F. F. Krause, 1996. Preserved Organic Matter and Miospores in Buried Middle Devonian (Giventian) Paleosols: Indicators of Weathering, Oxidation and Maturity. *Catena* 21(1-2):1-19.

*Yu, Zicheng, 1997. Late Quaternary Paleoecology of *Thuja* and *Juniperus* (Cupressaceae) at Crawford Lake, Ontario, Canada: Pollen, Stomata and Macrofossils. *Review of Palaeobotany and Palynology* 96:241-254.

[Note: * Denotes a CAP member]

CONTINENTAL DRILLING FOR PALAEOCLIMATE RECORDS: A REFERENCE BOOKLET FOR YOUR SHELVES IF YOU WORK ON LACUSTRINE SEDIMENTS

The PAGES report: **Colman, S. M., 1996. *Continental Drilling for Palaeoclimate Records.* PAGES workshop report, series 96-4, 104 pages, ISBN 3-9521078-3-2.** Released in 1996, it is now also available from http://www.pages.unibe.ch/pages.html/

This document is extremely rich in information as well as tips for those collecting and studying lacustrine sediment. It has been put together by S. Colman (USGS) with the contribution of participants to a PAGES workshop, entitled "Continental drilling for palaeoclimate records", sponsored by the Past Global Change (PAGES) project, a core project of the International Geosphere-Biosphere Programme (IGBP) and by the GeoForschungsZentrum, Potsdam, Germany, in conjunction with the International Continental Drilling Programme (ICDP).

The long and detailed chapter entitled "Recommendations" is the most important one as it describes step by step what to do before, during and after a drilling campaign. There are sections on planning and advance work (seismic, location of holes, planning of sample share), drilling technologies and operation (type of drilling systems, rafts), post-drilling operations (transport, storage), drilling technologies for remote areas, sampling and analytical methods (with emphasis on the sequence of analyses: non-destructive and destructive methods, pre-core opening, and pre-core sampling analyses), data management and dissemination both within and outside the group, and finally the publication protocols. The document also contains a rich chapter with up-to-date bibliographical references, as well as an appendix with addresses of drilling companies and the technical description of the systems.

Until now it seems that the continental community has not felt the need to team up around large projects as the ice and marine communities did. There are, however, some large palaeoclimatic projects that may be launched on lakes and require a sharing of facilities and a desire to work together. Large lakes on all continents may contain lacustrine archives extending to several 10s of meters, maybe even >100 m. High resolution analyses would provide, therefore, several life-times of work for palynologists.

The paper version of PAGES reports are usually free of charge. If you are not on the mailing list of the PAGES office, you may receive a copy by contacting them at: Pages Office, Baerenplatz 2, CH 3011 Bern, Switzerland, tel.: +41-31-312 3133, fax.: +41-31-312 3168, e-mail: pages@ubeclu.unibe.ch. All copies of this report have, however, been distributed. It is possible to down load the volume from the PAGES web site at http://www.pages.unibe.ch/pages.html/

Suzanne A. G. Leroy
Centre for Palaeoecology, School of Geosciences
Queen's University, Belfast, Northern Ireland
Tel: +44-1232-273 978, FAX: +44-1232-321 280
E-mail: s.leroy@qub.ac.uk

JOURNAL OF PALEOLIMNOLOGY: CELEBRATING TEN YEARS OF PUBLICATION

With the release of the last issue of volume 18, the *Journal of Paleolimnology* reached another significant milestone of ten years of publication. Looking back at the last ten years, we are proud of the efforts that have been made by our authors, referees, and publishers to make this journal such a success. It has been an exciting and productive decade. The steady expansion and diversification of paleolimnology behooves us to continue to evolve and expand aspects of the journal to meet the challenges of the next millennium. Many of these changes are detailed in the lead editorial in the first issue of 1998 (*J. Paleolimnology* 19,1). In summary, these new changes include:

i) Rapid Communications – a new "fast-track" section of the journal for select contributions.

ii) A New Series of Invited Review Articles: The D. G. Frey and E. S. Deevey Reviews

iii) Expansion of World Wide Web (WWW) Facilities. As most of you know, the *Journal of Paleolimnology* WWW page address changed last year, in part to keep up with the expansion of users and the journal itself. The new url is: http://www.umanitoba.ca/geoscience/paleolim/jopl.html In addition to our own journal WWW page, Kluwer Academic Publishers also offers a useful web site (http://www.wkap.nl), which includes additional information on this journal (as well as other journals and books). The Kluwer WWW site also supports a search engine, where one can search past issues of the journal by submitting a key word or author. All these services are free of charge.

The special, much-reduced personal subscription rate is also available again for 1998 (contact John Smol at smolj@biology.queensu.ca). We also plan to collate a subject and author index in 1998 (covering the first 20 volumes of the journal), and considerable expansion in the area of electronic publishing is also coming.

If you have any questions or comments regarding the journal, please contact one of the co-editors:

John P. Smol
Paleoecological Environmental Assessment and Research Lab (PEARL)
Department of Biology, Queen's University
Kingston, Ontario, K7L 3N6, Canada
Tel: (613) 545-6147, FAX: (613) 545-6617
E-mail: smolj@biology.queensu.ca
or
William M. Last
Department of Geological Sciences
University of Manitoba
Winnipeg, Manitoba, R3T 2N2, Canada
Tel: (204) 474-8361, FAX: (204) 474-7623
E-mail: mlast@ms.umanitoba.ca

FOSSIL FLOWERING PLANTS OF THE USSR

Takhtajan, A., (editor) 1982. ***Fossil Flowering Plants of USSR, Volume 2 Ulmaceae, Moraceae, Cannabaceae, Urticaceae, Fagaceae and Betulaceae.*** **Ivan Fedorov Printing House (*In Russian*).**

215 pages covering 40 genera; 172 plates; 132 text figures of leaves, fruits, seeds and flowers; 700 photographs of specimens; geographic and stratigraphic distribution given for each species and synonomies and important features; type material illustrated for each species; contains comprehensive list of known fossil records of extant/extinct genera of the six families, locality maps, stratigraphic tables, and pertinent literature on each species.

Budantsev, Lev, (editor) 1994. ***Fossil Flowering Plants of Russia And Adjacent States, Volume 3 Leitneriaceae, Myricaceae and Juglandaceae.*** **Ivan Fedorov Printing House (*In Russian*).**

133 species of Leitneriaceae, Myricaceae (fruit remains only) and Juglandaceae described and illustrated; 84 tables; 700 photographs of specimens; geographic and stratigraphic distribution given for each species; synonomies and important features listed; type material illustrated for each species; comprehensive list of known fossil records of these three families, with locality maps, and pertinent literature given for each species.

The price per volume is $49.00 (USD) plus shipping $7.00 (USD) in North America; or plus shipping $10.00 (USD) overseas. Please make cheques payable to "David Dilcher". For more information or to purchase these volumes, please contact:

Dr David L. Dilcher
Florida Museum of Natural History
University of Florida
P.O. Box 117800
Gainesville, Florida, FL 32611-7800, U.S.A.

NEW BOOK ON PHYTOLITHS

Pinilla, A., J. Juan-Tresserras and M. J. Machado (Editors), 1997. ***The State-of-the-art of Phytoliths in Soils and Plants.*** **Monografia 4 del Centro de Ciencias Medioambientales, CISC. Madrid, Spain. 292 pp. ISBN 84-00-07674-5. Price: 6.000 pts.**

This publication contains twenty-eight papers out of the fifty-four presented in the 1st European Meeting on Phytolith Research (Madrid, Spain, September 1996). Twenty-five are in English, three are in Spanish. Papers of this book offer very important and diverse information since their authors are rearchers from Europe, America, China, India and Australia.

Phytoliths are microscopic bodies formed in the tissues of the plants. There are phytoliths formed from silica that occur in ground water as monosilicic acid, and other phytoliths are calcium oxalate crystals, formed from calcium and oxalic acid.

This book makes evident the importance of phytoliths in soils and sediments. There is also help in clarifying archaeobotanical problems in relation with the use of plants by humans in an evolutionary and cultural change context. They allow the reconstruction of the plant history of certain areas, and the taxonomic value of silica and calcium oxalate phytoliths have been proven. Regarding the latter, their relevance in the calcium cycle in soil has been also considered. Please send orders to:

A. Pinilla
Centro de Ciencias Medioambientales, CSIC
Serrano, 115 dpdo.
E-28006-Madrid, Spain
FAX: +34-1-5640800
E-mail: ebvpn90@fresno.csic.es

palyno bytes

NORTH AMERICAN POLLEN DATABASE

This is a general call for data to all potential contributors to the North American Pollen Database (NAPD). The North American Pollen Database (NAPD) is a repository for Quaternary pollen data and related metadata. Entry of a large backlog of data is approaching completion and in anticipation of that time we are sending out a request for new data.

NAPD is a public database available from the World Data Center-A for Paleoclimatology sponsored by the NOAA Paleoclimatology Program and housed at the National Geophysical Data Center (NGDC) in Boulder, Colorado. NAPD is, in fact, a subset of the Global Pollen Database, housed at NGDC. The complete relational database as well as various ASCII and spreadsheet files for individual sites are available from the the NGDC Web site. The relevant URL's are:

http://www.ngdc.noaa.gov/paleo/paleo.html
[NOAA Paleoclimatology Program]
http://www.ngdc.noaa.gov/paleo/pollen.html
[Pollen Database Page]
http://www.ngdc.noaa.gov/paleo/napd.html
[NAPD Page]

As an incentive to contributors, we have conducted an inventory that identifies over 2000 potential sites for inclusion in NAPD. At present, over 600 of these sites are already archived. The "Unacquired Sites Inventory" is a listing of sites that NAPD would like to acquire. This inventory is available in a MapPad file. MapPad displays site locations and associated publications. You can obtain the MapPad file and program from our Web site: http://www.museum.state.il.us/research/napd/mainmenu.html.

NAPD includes a list of workers who have contributed data or are referenced bibliographically. In order to maintain a current list of e-mail addresses, postal addresses, and position titles, we additionally request that you return a short note to us containing your name, address, position, and e-mail address.

We strongly encourage you to inform us of corrections or omissions to the site inventory, and, please, contribute your valuable data. For corrections, contributions, or just for fun, contact Stephen Porter (napd@museum.state.il.us) or Eric Grimm (grimm@museum.state.il.us).

Stephen C. Porter
Illinois State Museum
Research and Collections Center
1011 East Ash Street
Springfield, Illinois, IL 62703, U.S.A.

THECAMOEBIAN BIBLIOGRAPHY

I would like to announce that The Dalhousie Thecamoebian Bibliography is now available on the World Wide Web. It contains over 3000 entries and can be browsed by author. We would appreciate any comments, corrections and additions to the bibliography which will be continually updated. As I am sure most will agree, the World Wide Web provides a perfect venue for the publication of a bibliography. It is inexpensive and allows constant updates.

URL: http://meguma.earthsciences.dal.ca/~fmedioli/Intro.html

Eduard G. Reinhardt
Department of Earth Sciences
Dalhousie University
Halifax, Nova Scotia, B3H 3J5, Canada
E-mail: ereinhar@is.dal.ca

INQUA DATA-HANDLING METHODS NEWSLETTER

INQUA - Commission for the Study of the Holocene: Sub-Commission on Data-Handling Methods, Newsletter 16 is now available on the World Wide Web at http://www-palecol.plantsci.cam.ac.uk/inqua/

I will be generating a text-only version that can be sent by e-mail to those that do not have full internet access. Please let me know if you would like to receive this. I will also be producing a paper copy for those with no internet access. Please let me know if you know of anyone who might like this. I am afraid that funds no longer permit circulation of paper copies to everyone.

As you will see, the Web site contains all the past newsletters, and the entire site is fully searchable. I hope that you find this useful.

As ever, I would be extremely grateful for any contributions to the newsletter, or any suggestions for contributions.

Keith Bennett
Department of Plant Sciences
University of Cambridge
Downing Street, Cambridge CB2 3EA
England, U.K.
E-mail: kdb2@cam.ac.uk

CANADIAN PALAEONTOLOGY ON THE WEB

The Geological Survey of Canada, Council of Chairs of Canadian Earth Science Departments, and the Paleontology Division of the Geological Association of Canada have produced or recently updated the following web pages that you may wish to check for access to Canadian paleontology:

http://www.nrcan.gc.ca/~rose/paleo/directry.htm
http://www.nrcan.gc.ca/~rose/paleo/links-cd.htm
http://iago.stfx.ca/people/paleodiv/pd.html

Regarding the first web page, a searchable Directory of Canadian Paleontologists, the obvious initial technical defects have been resolved, but a big deficiency is in the missing or out-of-date information on many individuals, especially quaternary and vertebrate workers outside of geology departments. Please help us complete the database by submitting your data and encouraging your colleagues to do so, perhaps by forwarding this message on.

Perhaps electronic tools of this sort will allow us to deal more easily with reductions in professional paleontology resources and provide us with mechanisms for strategic analysis of our situation. The primary purpose of the directory is to put Canada-based workers in contact with each other and to make them accessible to potential clients in Canada or beyond. For this reason, paleontologists based outside of Canada are not included, except for members of the Paleontology Division of GAC.

Note also that the Links to Canadian Paleontology page gives instructions regarding a new electronic Discussion Group that may serve as a communications vehicle amongst Canadian paleontologists.

Terry Poulton
Chief Paleontologist, Geological Survey of Canada
Tel: (403) 292-7096, FAX: (403) 292-6014
E-mail: poulton@gsc.nrcan.gc.ca

CAUGHT IN THE WEB - 2

Seeds are as fascinating as pollen. They are small, superby engineered entities that few people ever look at closely. The "Seeds of Life" web site (http://versicolores/seedsoflife/ehome.html) offers a glimpse at these intriguing structures. Compiled by Françoise Brenckmann, who has been photographing seeds since 1976, the site includes background information on seeds and their role in plant reproduction. The heart of the site is the many good photographs showing the diversity of form, colour and structure in seeds.

Anyone involved in web-page design or maintenance soon develops their own distinctive style and strongly-held opinions on good and bad design. But even experienced web page designers will find much of value in The Yale C/AIM Style Manual (http://info.med.yale.edu/caim/manual/index.html). This is one of the most useful on-line resources available. With its own restrained design and clear layout, the site is its own best advertisement. It also comes in a .pdf version, so you can make a print-out for permanent reference.

Jonathan Adams has compiled a thought-provoking site at http://www.esd.ornl.gov/ern/qen This *Review and Atlas of Palaeovegetation* consists of "preliminary land ecosystem maps of the world since the last glacial maximum". Take a look at the reconstructions for North America, for instance.

Finally, keep an eye on CAP's own website, at http://www.ualberta.ca/~abeaudoi/cap/cap.htm, for new material, including a detailed listing of upcoming conferences to help you plan your summer travel!

ICBN ON WWW

The International Association for Plant Taxonomy announces the availability of the English text of the International Code of Botanical Nomenclature (Tokyo Code) on the WWW:

http://www.bgbm.fu-berlin.de/iapt/nomenclature/code/tokyo-e/

The appendices are currently being converted and will be published as they become available. We would appreciate any information on errors which may have been introduced in the conversion process.

Walter G. Berendsohn
Freie Universitaet Berlin
Botanic Garden and Botanical Museum
Berlin-Dahlem
Koenigin-Luise-Str. 6-8, 14191 Berlin, Germany
E-mail: wgb@zedat.fu-berlin.de

Hay, Murray B., 1996. *Diatom-based Model for Reconstruction of Paleohydrology in the Mackenzie Delta, Northwest Territories, Canada.* Unpublished M.Sc. dissertation. Biology Department, Queen's University, Kingston, Ontario, Canada. 155 pp. Supervisor: Dr John P. Smol

Estimation of past discharge from major arctic watersheds is critical for understanding long-term natural variability and response of large watersheds to climatic change. Coastal delta floodplain lakes are tightly coupled to the discharge variation of their associated river systems. Fossil diatom assemblages within the lake sediments should provide integrative records of these interactions. Surface sediments and environmental variables were collected from 77 lakes in the Mackenzie Delta, N.W.T. (Canada), representing lakes having continuous connection with the Mackenzie River (no-closure), lakes that flood each spring (low-closure), and lakes that flood only every few years (high-closure).

High-closure lakes differed significantly ($P < 0.05$) from the no-closure and low-closure lakes in surface area, as well as winter methane and sulfate concentrations. Elevated winter methane concentrations represent high summer lake production, whereas elevated winter sulfate concentrations reflect stronger river influence and reduced anaerobic decomposition. Canonical variate analysis (CVA) significantly separated lake categories along a 'strong river influence/low summer lake production' to 'weak river influence/high summer lake production' gradient.

Canonical correspondence analysis (CCA) of the surface diatom assemblages showed the river

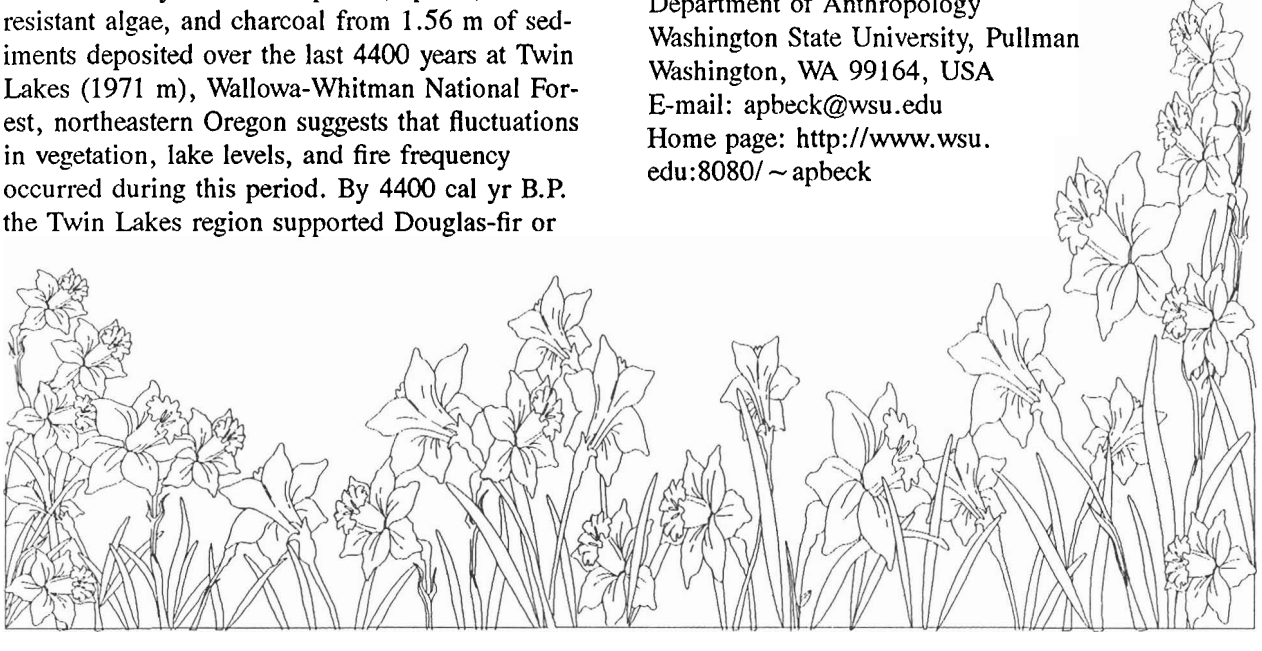
influence/production gradient to account for a significant amount of variation within the diatom assemblages. Epiphytic diatom taxa were associated with the macrophyte-rich high-closure lakes, whereas the turbid, river-dominated lakes were characterized by diverse benthic *Nitzschia* and *Navicula* assemblages.

Predictive models using partial least squares (PLS) regression and calibration were developed for winter methane concentrations to estimate delta lake production. The development of a robust ($r^2_{(jack)}$ = 0.61, $RMSE_{(jack)}$ = 0.798) model provides a tool for high-resolution, quantitative estimates of river-influence within Mackenzie Delta lakes, thereby permitting inference of past Mackenzie River discharge using fossil diatom assemblages found within Mackenzie Delta sediment records.

Pierce-Beck, Abigail, 1996. 4400 Years of Vegetation Change At Twin Lakes, Wallowa Mountains, Northeastern Oregon. Department of Anthropology, Washington State Unversity, Pullman, U.S.A. 51 pages. Supervisor: Dr Peter J. Mehringer Jr

This analysis of fossil pollen, spores, acid resistant algae, and charcoal from 1.56 m of sediments deposited over the last 4400 years at Twin Lakes (1971 m), Wallowa-Whitman National Forest, northeastern Oregon suggests that fluctuations in vegetation, lake levels, and fire frequency occurred during this period. By 4400 cal yr B.P. the Twin Lakes region supported Douglas-fir or larch. Abundant microscopic charcoal deposited at this time suggests frequent wildfires. The climate may have been warmer and possibly more moist than thereafter. A peak in charcoal and in pollen and spores of littoral species implies a short dry interval at about 3900 cal yr B.P. Less charcoal and increasing pine, spruce, and fir pollen indicate that a cooling trend followed. This may have resulted in a decreased wildfire frequency and the development of a closed canopy forest. By 2000 cal yr B.P. rising amounts of microscopic charcoal and declining occurrences of pine and spruce microfossils suggest an increasing fire frequency. Ample Douglas-fir or larch pollen around 1250 cal yr B.P. implies a brief warm episode. Afterwards, spruce and fir pollen increased though microscopic charcoal remained plentiful and lake levels appear unchanged. Declining frequencies of charcoal and increasing amounts of spruce, fir, and pine pollen indicate cooling temperatures by 325 cal yr B.P. After a brief abundance of spruce pollen at 150 cal yr B.P. modern fire suppression and disturbance becomes evident with a reduction in charcoal, an increase in diploxylon (lodgepole) pine and fir pollen, and the presence of microfossils from weedy or exotic species.

Present address: Abigail P. Beck
Department of Anthropology
Washington State University, Pullman
Washington, WA 99164, USA
E-mail: apbeck@wsu.edu
Home page: http://www.wsu.edu:8080/~apbeck



Announcements

JURASSIC NEWS

New Chairman and Secretary of the International Subcommission on Jurassic Stratigraphy (ISJS)

Last autumn Prof. Dr Raymond Enay retired as chairman for ISJS. Dr Giulio Pavia (Dipt. Scienze della Terra, Torino Italy) has become the new chairman for ISJS. Guilio Pavia is assisted by the new secretary for ISJS, Dr. Fabrizio Cecca (Universita degli Studi di Urbino, Italy).

Jurassic Microfossil Group (JMG)

At the International Symposium on Jurassic Stratigraphy in Poitiers, France, September 1991, the structure and activities of JMG were changed. The biostratigraphic tasks were transferred to the relevant stage working group. The purpose of JMG has since been to bring information to this large group of micropalaeontologists, who otherwise will be completely outside any information on the activities within ISJS.

The role of JMG is to broadcast information on activities of the International Subcommission on Jurassic Stratigraphy. The information may lead micropalaeontologists to discover relevant tasks to be carried out for the stage working groups. Other activities within JMG are the JMG Members Research Directory Database, now managed by Patricia Whalen (Arkansas, U.S.A.), and the JMG publication index database, now operated by David Cole (University of Southampton, U.K.).

JMG Newsletter

The *JMG Newsletter* is published annually and sent to subscribers, the chairman and secretary of the International Subcommission on Jurassic Stratigraphy (ISJS), and convenors of working groups of ISJS. The *JMG Newsletter* is now distributed for approximately $5 (USD) per volume, which covers printing and mailing costs. The next volume of *JMG Newsletter* is due for autumn 1998. For more details, please contact Niels Poulsen (address below).

New Convenor for JMG

I will be resigning as convenor for the JMG after 3 years in this position. My future research activities will mainly be Late Neogene-Quaternary dinoflagellate cyst studies with special reference to palaeoclimate and environment. Without an active research within the Jurassic, I feel that the responsibility for JMG should be given to an active member of JMG. I am planning to leave the post as secretary and *JMG Newsletter* editor at the 5th International Congress on Jurassic Stratigraphy, Vancouver, Canada, 12-25 August 1998 (see page ??). Anyone, who would like to take over as convenor for JMG, please contact me for questions. Also I would like to inform the upcoming JMG meeting at the 5th ISJS about any candidacy for the post as JMG convenor (secretary and newsletter editor).

Niels E. Poulsen
G E U S
Geological Survey of Denmark and Greenland
Department of Environment History and Climate
Thoravej 8, Dk-2400 Copenhagen NV, Denmark
E-mail: nep@geus.dk

TSOP MEETING

The Society for Organic Petrology (TSOP), 15th Annual Meeting in conjunction with the Canadian Society for Coal Science and Organic Petrology (CSCOP), July 26-30, 1998, Halifax, Nova Scotia, Canada. Information: P. K. Mukhopadhyay, Global Geoenergy Res., Ltd., Box 9469, Station A, Halifax, Nova Scotia B3K 5S3 Canada, Tel./FAX: (902) 453-0061, E-mail: avery@agc.bio.ns.ca. Details and virtual abstract: http://agc.bio.ns.ca/tsophalifax98.

POLLEN SLIDE EXCHANGE

I have around 450 reference pollen slides from temperate and desertic belts of Eurasia and North Africa for exchange against more species from the same area.

As I have at the moment a special project on *Ulmus* and *Zelkova*, I am ready to give two slides for one of these two genera.

To get the full list, please contact me directly at my e-mail address.

Suzanne A. G. Leroy
Centre for Palaeoecology, School of Geosciences
Queen's University, Belfast
Belfast, Northern Ireland
e-mail: s.leroy@qub.ac.uk.

POST DOCTORAL RESEARCH POSITIONS

The Centre for Climate and Global Change Research (C2GCR), McGill University, Montreal, Quebec will be looking to fill up to five post doctoral (PD) research positions over the next few months. The Centre has 15 Faculty members and over 50 graduate students from the Departments of Atmospheric and Oceanic Sciences, Biology, Economics, Geography, and Natural Resource Sciences at McGill University, and Sciences de la terre and Géographie of the Université du Québec à Montréal and Université de Montréal respectively. The Centre has a wide range of research interests in the interaction among the physical, chemical, biological and socio-economic elements of climate and global change.

The C2GCR post doctoral research positions are usually for two years (one year plus a renewal of one year). Salary ranges based on experience, but is normally between $30,000 and $35,000 (CDN) per year. Appointments are normally made for January 1, June 1, or September 1.

Areas of research focus for Centre members are: modelling the response of ecosystems to climatic and environmental change; biospheric feedback to change in climate and CO_2 concentrations; palynological and paleoclimatic studies; modelling atmosphere-ocean-sea ice interactions; surface and airborne measurements of the exchanges of energy and trace gases; analysis and modelling of climate variability; ecosystem carbon balance and trace gas exchange; global, regional and local climate modelling; radiation transfer in GCMs.

Send application including a letter of intent, a resume, and examples of recent research publications to:

Nigel T. Roulet, Director
Centre for Climate and Global Change Research
McGill University
805 Sherbrooke St. West
Montreal, Quebec, H3A 2K6, Canada

Also arrange to have sent three letters of reference to the Director of C2GCR. For more information about the C2GCR post doctoral research positions contact the Director by Facsimile (1-514-398-1381) or by e-mail at ccgcrdir@felix.geog.mcgill.ca. More information regarding the Centre can be found at our home page: http://www.meteo.mcgill.ca.

The University is committed to equity in employment.

SOURCE FOR SILICONE OIL

It has come to my attention that there are a number of people interested in procuring smaller (less than 55 gallon!) quantities of silicone oil for mounting pollen. I have recently been in contact with a company that supplies pint quantities of silicone oil of different viscosities for a reasonable price. Although they do not stock 2000 cs silicone oil, they are willing to make up "special blends" from the stocks that they have in order to accomodate their customer's wishes. The price of a pint

of "in-stock" silicone oil is normally $46.00 (USD). A "special blend" of 2000 cs can be made up for $92.00 (USD)/pint for the first pint (the "blending" cost). Thereafter, each pint that is ordered at the requested viscosity is $46.00 (USD). I am assuming that one would have to place a single order for multiple pints of a special viscosity in order to pay the blending fee only once. The company is:

Johnson Instrument Sales, Inc., 880 North Addison Avenue, Elmhurst, Illinois, IL 60126, U.S.A.
Tel: (630) 832-2700, FAX: (630) 832-2752

The leaflet sent to me by the company listed the oil under their "Viscosity Standards" section with a note to refer to page 34 of their catalog for details - information that might be useful when placing an order.

Pietra Gardetto Mueller
Illinois State Museum
Research and Collections Center
1011 East Ash Street
Springfield, Illinois, IL 62703, U.S.A.
Tel: (217) 524-2926
E-mail: mueller@museum.state.il.us

CHANGES OF ADDRESS

Please note the following changes of address:

Dr Zicheng Yu
Limnological Research Center
University of Minnesota
310 Pillsbury Drive S.E.
Minneapolis, Minnesota, MN 55455, U.S.A.
Tel: (612) 624-7005, FAX: (612) 625-3819
E-mail: yuzi@lrc.umn.edu

Dr Katrina Moser
Department of Geography, University of Utah
260 S. Central Campus Dr. Rm. 270
Salt Lake City, Utah, UT 84112-9155, U.S.A.
Tel: (801) 585-5800
E-mail: katrina.moser@geog.utah.edu

Dr Roland Hall
CIRC, Abisko Scientific Research Centre
Box 62
S-981 07 Abisko, Sweden
Tel: +46 980-40162 (general office)
FAX: +46 980-40171
E-mail: Roland.Hall@ans.kiruna.se

Remember, if you move, please let us know where you are! Maintaining an up-to-date mailing list is a real challenge. It is difficult to keep track of CAP members on the move, especially graduate students who may complete their program of study and travel on to another location. A returned Newsletter (marked "Not known at this address") is sometimes the only indication that another CAP member has "got lost"!

DEADLINES

Please submit items for the next *CAP Newsletter* (Volume 21, Number 1, May 1998) by April 15 1998. I prefer to receive material in MS-DOS WordPerfect 5.1 or 6.0 format; text files are also fine. I encourage submission of material by disk or, preferably, e-mail. Each item should also be sent as hardcopy. Articles may include diagrams and photos; for photographs, please provide a glossy black-and-white or colour print (3" x 5") from a picture with good contrast. Colour slides may also be submitted. Illustrations may be submitted in digital format, CorelDraw 4.0 format or as bitmap files (.tif or .pcx). Please send material to:

Alwynne B. Beaudoin
CAP Newsletter Editor
Archaeological Survey
Provincial Museum of Alberta
12845-102nd Avenue
Edmonton, Alberta, T5N 0M6, Canada
Tel: (403) 453-9192
FAX: (403) 454-6629
E-mail: abeaudoi@gpu.srv.ualberta.ca

Meeting calendar

1998

February 9-12 1998: Second Workshop on Global Paleoenvironmental Data. Boulder, Colorado, U.S.A. Details: Robin Webb or Dave Anderson: Tel: (303) 497-6160; FAX (303) 497-6513, E-mail: danderson@ngdc.noaa.gov, rwebb@ngdc.noaa.gov

February 10-13: 7th International Nannoplankton Association (INA) Conference. La Parguera, Puerto Rico. Will include results from all fields of nannoplankton research, including both palaeontological and biological aspects, with a special session on the role of coccolithophores in global change. Details from website: http://wwei. ucsd.edu/INA7.htm

April 6-10: 3rd International Symposium: C14 and Archaeology. Lyons, France. Details: Secretariat of the C14 and Archaeology Symposium, Centre de Datation par le Radiocarbone - Batiment 217, 43, Bld du 11 Novembre 1918, 69622 Villeurbanne Cedex, France. FAX: (33) 72 43 13 17.

May 18-20: GAC/MAC Meeting. Québec City, Québec. Will include a Special Session on "Distribution Patterns of Fossils in Paleozoic Sequences of Northeastern North America". Field trip on "Paleontology, Stratigraphy and Sedimentology of Lower to Middle Paleozoic Rocks of the Anticosti Basin, National Park of Mingan Islands and Anticosti Island". L'Association québecoise pour l'étude du Quaternaire (AQQUA) will hold its annual meeting during the conference, and will co-sponsor, with the Canadian Geomorphology Research Group (CGRG), a symposium on "Quaternary sea levels in Canada, particularly during the Holocene". Details: Mme Agathe Morin, Département de géologie et de génie géologique, Université Laval, Pavillon Adrien-Pouliot, Sainte-Foy, Québec, G1K 7P4, Canada. Tel: (418) 656-2193, FAX: (418) 656-7339, E-mail: quebec98@ggl.ulaval.ca Website: http://www.ggl.ulaval.ca/quebec98.html

June 7-12: Dino 6. Trondheim, Norway. Details: Dino 6 Secretariat, NTNU Museum of Natural History and Archaeology, Attn: Morten Smelror, N-7004 Trondheim, Norway. Tel: +47-73-592147, FAX: +47-73-592223, E-mail: morten.smelror@vm.ntnu.no. Website: http://www.ntnu.no/vmuseet/dino6

June 24-26: 7th International Conodont Symposium (ECOS VII). Bologna and Modena, Italy. Details: M. C. Perri, Dipartimento di Scienze della Terra e Geologico Ambientali, via Zamboni 67, 40126 Bologna, Italy, Tel: 39-51-354560, FAX: 39-51-354522, E-mail: perri@ geomin.unibo.it

June 28-July 5: Gondwana 10: Event Stratigraphy of Gondwana. University of Cape Town, South Africa. Details: Deborah McTeer, Gondwana 10 Congress Co-ordinator, Postgraduate Conference Division, UCT Medical School, Anzio Road Observatory, 7925, Cape Town, South Africa. Tel: +27-21-406-6348, FAX: +27-21-406-6263, E-mail: deborah@medicine.uct.ac.za Website: http://www.uct.ac.za/depts/cigc

July 6-9: Pollen and Spores: Morphology and Biology. Conference organized by the Linnean Society Palynology Specialist Group (LSPSG) in collaboration with the Royal Botanic Gardens, Kew and the Natural History Museum, London. Details: Lisa von Schlippe, Conference Administrator, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB, England, U.K., FAX + 44 (0)181 332 5176/5278, E-mail: l.von.schlippe@rbgkew.org.uk

July 7-11: FORAMS '98. Monterrey, Mexico. Details: Martha A. Gamper, E-mail: gamper@servms.fiu.edu. Website: http://www.fiu.edu/~longoria/forams98.htm

July 26-30 1998: The Society for Organic Petrology (TSOP) 15th Annual Meeting. With the Canadian Society for Coal Science and Organic Petrology (CSCOP). Halifax, Nova Scotia, Canada. Details: P.K. Mukhopadhyay, Global Geoenergy Res., Ltd., Box 9469, Station A, Halifax, Nova Scotia B3K 5S3, Canada, Tel:/FAX: (902) 453-0061, E-mail: avery@agc.bio.ns.ca. Web site: http://agc.bio.ns.ca/tsophalifax98

CAP MEMBERSHIP FORM

Canadian Association of Palynologists (CAP) membership is open to all members of the palynological community in Canada. The Association is devoted to promoting the exchange of information among palynologists in Canada. Palynologists from outside Canada may become corresponding members for the same dues, with no voting rights. Membership dues include two issues a year of the *CAP Newsletter*, to which all members are invited to contribute. CAP is also affiliated with the International Federation of Palynological Societies (IFPS) and CAP members receive two issues of the IFPS newsletter (*PALYNOS*) each year.

----------cut-----here----------

CAP membership dues are $10 per year in Canadian funds payable at the beginning of the year. Lapsed members are removed from the mailing list after one year, following a reminder notice. Members may, if they wish, pay for up to three years in advance. Please send a cheque or money order payable to CAP to:

Francine M.G. McCarthy, Department of Earth Sciences, Brock University, St. Catherines, Ontario, L2S 3A1, Canada

Name and title:_____

Affiliation:_____

Address:_____

_____

_____

Tel:_____FAX:_____E-mail:_____

Research interests:_____

_____

_____

Indicate: Renewal:_____New membership:_____Amount enclosed:_____

May we include your name/address/research interests in the on-line "Directory of Palynologists" in the CAP World Wide Web page? Yes:_____ No:_____