Canadian Association of Palynologists
Association Canadienne des Palynologues

NEWSLETTER

Volume 21 Number 2 December 1998

Season's Greetings!

This issue marks the end of my tenure as Newsletter Editor. Looking back, it is hard to believe that ten years have gone by, although the stack of paper made by the last 20 back issues is a stark reminder of the passage of time! Although it has been a lot of work, it has also been great fun. I have learned a lot about desktop publishing and design that has stood me in good stead for other projects. I have much enjoyed my contact with colleagues from Canada and throughout the world and I wish to take this opportunity to thank you for your support and contributions over the last decade. I hope that you will continue to support the new Editor, who ever that may be.

I am concerned for the future of the Newsletter. CAP suffers from the same troubles as other volunteer organizations, notably a diminishing pool of ever-more-harried volunteers. As time and cutbacks have gone on, it has become ever more difficult compile the Newsletter. I have relied on several stalwart contributors for much of the content. With the number of voluntary contributions decreasing, I have had to become more wily and creative at getting material. So I ask you all to think about the value of CAP in your professional life and, if you think it is worthwhile, provide your support in the form of news, announcements, and articles for future CAP Newsletters.

I am pleased that this has turned out to be such an interesting issue. There are a number of articles on palynological topics, including a fascinating account by Dallas Mildenhall of the application of palynology in criminal investigation. Meeting reports, comments on processing and data analysis, book reviews, and the AGM minutes round out the issue. On a more sombre note, we are saddened to report the death of L. R. Wilson. However, the obituary by Aureal Cross describes a long and productive professional life filled with achievements and contributions to science. This should be an inspiration to us.

I thank Ian Campbell and the Canadian Forest Service for help in mailing this Newsletter. Thanks also to the contributors to this issue: Vaughn Bryant, Gail Chmura, Isabelle Chouine, Aureal Cross, Rob Fensome, Roland Hall, Martin Head, Jock McAndrews, Francine McCarthy, Lou Maher, Dallas Mildenhall, Tim Patterson, Niels Poulsen, John Smol, Rebecca Teed, and Zicheng Yu. As ever, thanks to Yves Beaudoin for assistance with this issue.

CAP EXECUTIVE 1998

Rob Fensome	President
Martin Head	President-Elect
Francine McCarthy	Secretary/Treasurer
Alwynne Beaudoin	Newsletter Editor
Gail Chmura	CAP Councillor to IFPS

CAP EXECUTIVE 1999

Rob Fensome	President
Martin Head	President-Elect
Francine McCarthy	Secretary/Treasurer
TBA	Newsletter Editor
Gail Chmura	CAP Councillor to IFPS

ISSN 1188-3596

President's message

Crossroads can be dangerous - more so in some parts of the world than in others. For example, in recent travels in Argentina it became evident, confirmed by local opinion, that road signs are there taken to be "suggestions", not imperatives as we in Canada tend to view them. Crossroads in Argentina are definitely more dangerous than crossroads in Canada.

These are literal crossroads of course. But it seems to me that CAP may be at another kind of crossroads - the figurative kind. CAP was established as a focus for Canadian palynologists and palynology. The Newsletter keeps us abreast of affairs palynological in Canada and projects Canadian palynology to the world. The existence of CAP means that Canada is officially represented within the International Federation of Palynological Societies, and it was under the auspices of CAP that Canada was able to invite the palynologists of the world to the International Palynological Congress at Calgary in 1984. I think that most, if not all, Canadian palynologists would agree with me that these are still items of utmost importance.

However, with the (slight) decline in the number of members, and an (apparent?) reciprocal increase in the demands on everyone's time, it is more difficult to find people willing to take on tasks such as Newsletter editorship. CAP is by no means unique in this problem. When we do have the position of Website Director formally established, we will perhaps need to start thinking about the respective roles of printed and electronic media. I know that this comment will elicit strong reaction from those members who dislike electronic media, so I should calm the waters by saying that I don't see CAP dropping the Newsletter in favour of only a website in the near future - in any case by-law changes would have to be enacted. But Newsletters tend to be more work and more costly to both the members and the organization than are websites. Can a website serve as the glue that keeps us together? Would people consider CAP a worthwhile organization to belong to if there were no mail-distributed, printed Newsletter?

Although, as mentioned, the total membership has declined slightly from last year to this, some aspects of the membership statistics are interesting. The number of full (Canadian) individual members has declined from 77 percent last year to 71 percent this year, in contrast to the increase from 23 percent to 29 percent in the number of associate (non-Canadian) members. (More statistics - but not lies and damn lies - can be found in Francine McCarthy's article, from which I gleaned these tidbits of information.) This parallels the trends seen in organizations such as AASP, in which I believe the increasingly greater majority of members are now non-American. Thus, while the raison d'être for CAP will always remain Canadian palynology, it may be Canadian palynology with an increasingly international flavour. For this reason I personally feel that it is important to open full CAP membership to everyone, Canadian or not.

Whatever the future of CAP and Canadian palynology, the past success of CAP - or at least the last decade of success - is largely the result of Alwynne Beaudoin's work on the Newsletter. We owe a huge vote of thanks to Alwynne for making the Newsletter the best in the business. We've appreciated your hard work Alwynne. (However, we may not lose Alwynne's industriousness entirely, since she has agreed to be nominated as Website Director, if we can ever get enough darn ballots to make the position official.)

Last but not least, a happy festive season to everyone and may 1999 be your best year yet!

Rob Fensome
CAP President

TABLE OF CONTENTS

From the bureaucrat's desk

On behalf of CAP, it is a pleasure to welcome Linda Shane (University of Minnesota), Mary Vetter (University of Regina), and Sheila Vardy (University of Waterloo) as new members.

Dues Due

If your name appears below, here is a gentle reminder that your membership subscription becomes due at the start of 1999:

A. Ahmed, T. Anderson, E. Asselin, D. Batten, M. Boyd, D. Braman, I. Campbell, G. Chmura, T. Demchuk, S. Douglas, R. Fensome, J. Ford, K. Gostlin, J.-N. Haas, R. Hall, D. Hallett, C. Hartkopf, M. Head, J. Jansonius, R. Kalgutkar, P. Kuhry, T. Lacourse, J. Lentin, R. Mathewes, K. Matsuoka, J. McAndrews, C. McGregor, R. Mott, S. Porter, J. Ross, W. Sarjeant, A. Sarvis, R. Stancliffe, L. Suneby, S. Sutherland, A. Traverse, B. Van Helden, R. Vance, J. White , V. Wiggins, S. Yazvenko, and Z. Yu.

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. 36. Funds should be sent to:

Francine M. G. McCarthy, CAP Secretary/Treasurer
Department of Earth Sciences, Brock University
St. Catharines, 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

Wednesday, October 26 1998, 6:00 pm
Huron Room, Sheraton Centre, Toronto, Ontario

Present: Martin Head (President-Elect, Chair), Francine McCarthy (Secretary/Treasurer), Alwynne Beaudoin (Newsletter Editor, Recording Secretary), J. H. McAndrews, Linda Shane, Rebecca Teed

Note: Although this meeting was held following standard parliamentary procedure, it was actually inquorate (six CAP members are need for a quorum). Hence it is recognized that these minutes do not have the force of authority. Therefore these minutes are presented here primarily as a record of the discussions that took place. Although the members of the CAP Executive that were present at the meeting took some decisions in order to maintain the running and good order of the society, some of these decisions are subject to ratification at the next AGM, assuming that it is quorate.

1. Opening

The President-Elect, Martin Head, called the meeting to order at 6:15 p.m. Those present introduced themselves. The meeting agenda and ancillary documents were distributed.

2. Opening Remarks

Martin Head welcomed CAP members and visitors to the meeting. He acknowledged the generosity of Jeff Fawcett (University of Toronto and GSA Meeting Organizing Committee) for making the meeting room available to CAP at no charge.

3. Minutes of the 1997 Annual General Meeting

In 1997, the AGM was held at the Swope Centre, Woods Hole, Massachusetts, USA, in conjunction with AASP's 30th Annual Meeting. The minutes of this AGM were tabled, briefly reviewed, and accepted (moved Francine McCarthy, seconded Alwynne Beaudoin).

4. President's Report

The President, Rob Fensome, was not present at the meeting. His report was tabled and read by Martin Head. This report is reproduced below:

The last year has been more eventful than usual for the Canadian Association of Palynologists - although not all in a positive vein. The tragic and untimely loss of our IFPS Councillor, Julian Szeicz, will cast a shadow over the annual meeting this year, and he will be sadly missed. However, I would like to welcome Gail Chmura to the CAP executive and thank her for agreeing to take over Julian's job. I also welcome Martin Head back onto the executive as the new President-Elect: Martin agreed to volunteer in the absence last year of any other nominations for the post.

The second and last *CAP Newsletter* of 1998 will also be the last to be edited by Alwynne Beaudoin, who is retiring as CAP Editor. In many societies, of course, the newsletter is an important instrument of communication: in CAP's case it is almost true to say that the newsletter has been the society. I would like to take this opportunity to issue a HUGE vote of thanks to Alwynne for not only carrying out the editor's job, but for doing it so superbly. Alwynne has made the *CAP Newsletter* one of the best - perhaps the best - in the business, and she will be a hard act to follow.

Because of the need to report minutes of meetings and to announce upcoming events, a newsletter editor also needs to keep her finger on the pulse of the society and the community that it represents. In this sense, Alwynne, more than anyone, has maintained CAP as a viable organization over the last decade. Thus, I'm more than happy to announce that, while relinquishing her role as Newsletter Editor, she has agreed to continue for now as Website Director (a new formal position on the executive if the proposed by-law changes are passed). While the Newsletter will remain the basic tool of communication of CAP for the foreseeable future, the website will have an increasingly important role to play. (For those who are unaware of the fact, Alwynne is also the founder of the CAP website and has been looking after that alongside her Newsletter duties.)

As I write, we have yet to find a new Newsletter Editor to replace Alwynne. I would like to encourage members to seriously consider this very rewarding and influential role.

On another matter, the CAP By-laws were formulated over a decade ago and have never been modified. While change for the sake of change is pointless (in my experience a fact that seems generally lost on bureaucrats who create forms), a number of issues have come to the fore in recent years that have led to the desirability in the opinion of the current executive to change several By-laws. Most of these proposals are, I think, noncontroversial, such as the need for a Website Director and the desirability of clarifying the actions that need to take place if a member of the executive resigns during his or her tenure.

More controversial perhaps is the proposal to merge the categories of members and correspondents of the society, so that every individual paying dues becomes a full and equal member. Up to now, only citizens or residents of Canada could be members of CAP. This condition has elicited comments: for example, in his 1998 textbook (p. 26), Al Traverse implied that non-Canadians were not welcome in CAP. Actually, as I understand the history, far from being a non-welcoming gesture, the segregation was actually intended as a sign that CAP did not wish to be seen as a threat to the territory of other well-established palynological organizations. Whatever original motive the by-laws surrounding individual membership represented, the current executive believes that they are indeed somewhat parochial and inappropriate for the threshold of a new millennium.

I regret not being able to attend the 1998 AGM of CAP, but send my best wishes for its success.

Rob Fensome
1998-1999 President of the
Canadian Association of Palynologists

Martin Head moved a vote of thanks (seconded by Francine McCarthy) to Alwynne Beaudoin for service to CAP in the capacity of Newsletter Editor over the past ten years.

5. Secretary-Treasurer's Report

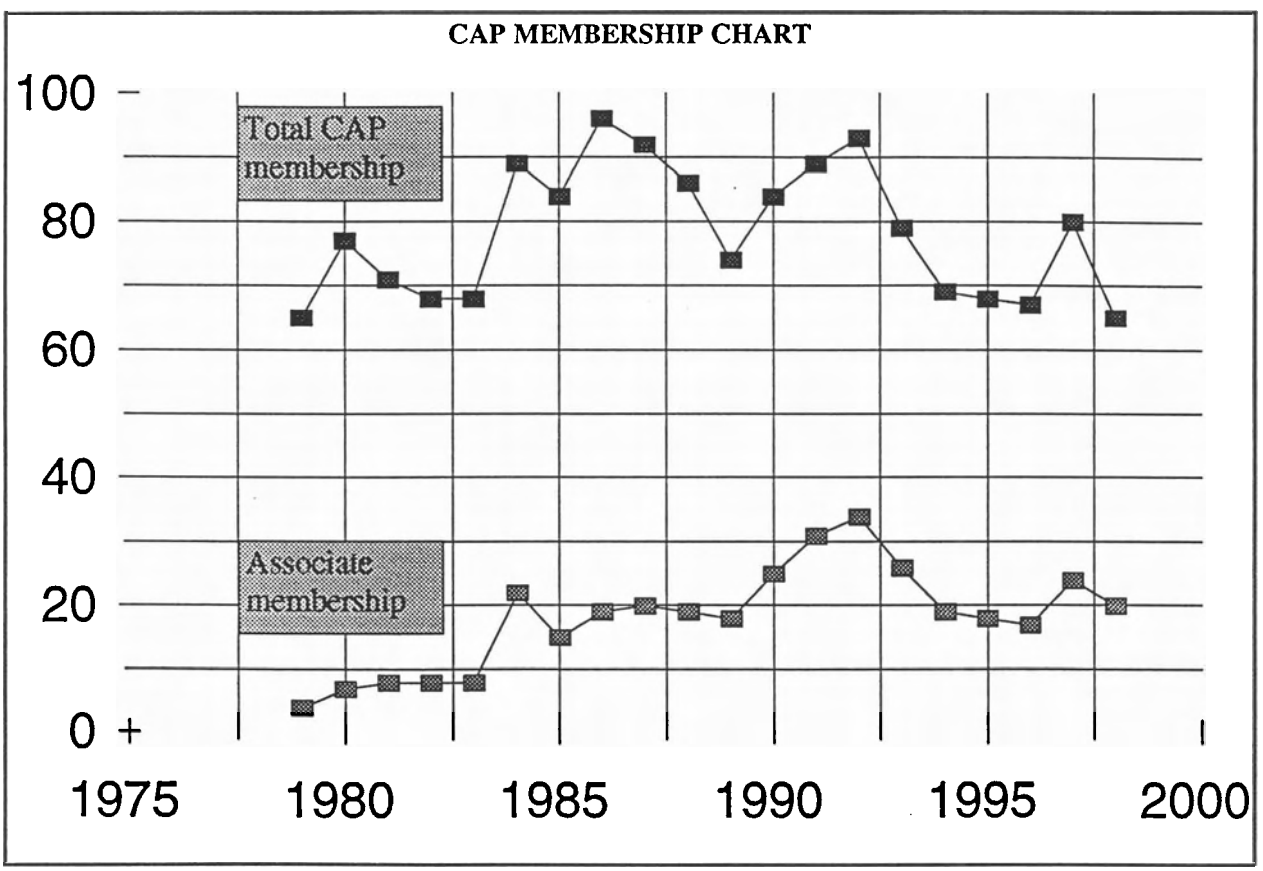
Francine McCarthy reported on the membership and financial situation as follows (report presented at the meeting and amended December 12 1998):

i) Membership Report

As of October 27 1998, CAP had a total of 66 members in good standing, of which 46 were full members, 19 associate members, and 1 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, as has occurred in the past. CAP's membership has hovered around 70 since declining from *ca.* 90 during the late 1980s and early 1990s. Associate members have made up over 35% of the CAP membership since 1990 (see Membership Chart below). The increase in the relative number of associate members over the 15 out of 69 reported at the last AGM may be due to increased exposure via the Web. The decline in the number of Canadian members of CAP is troubling.

ii) Financial Report

The balance in the CAP account was $1674.35, 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 $214.69. Our healthy overall balance is due to prepaid memberships (see Financial Statement). As can be seen in the accompanying financial statement, our major expenditures are production costs for the two issues of the Newsletter. It might be wise (financially-speaking) to consider moving toward the production and mailing of a single issue. Another substantial expenditure is the annual fee which we pay the IFPS, at $1.50 US/ full member, a fee not helped by our weak dollar. The only other routine fee is to the Registry of Joint Stock Companies, which more than doubled in 1997 to $25.00



iii) Appointment of Auditor

Jan Jansonius agreed to act as auditor for this fiscal year. Many thanks for his able assistance in this matter. The audited statement is included with this report (p. 7).

Francine McCarthy
CAP Secretary/Treasurer

This report generated some discussion. Francine pointed out that CAP's outgoing expenses exceeding incoming revenue by about $200. The decline in Canadian members is quite noticeable. How can CAP attract and keep new members? Martin commented that the funds in hand give CAP a buffer to consider changes. Alwynne pointed out that postal charges for mailing the Newsletter are not included in the expenses, because Ian Campbell has very kindly been taking care of sending out the last few issues through his office. With the change in editor, this will probably change. Mailing charges are likely to be substantial. The exact cost will depend on the mix of Canadian to overseas members, but mailing charges are substantially higher for Newsletters mailed to the US and overseas. Martin noted that Institutional Members need reminder notices and invoices for dues payment and Francine undertook to send these out. It was also noted that overseas correspondents do not receive *Palynos* through CAP neither do we pay IFPS dues for them. Martin asked if Francine could undertake to compile a membership chart for the Newsletter, since this gave a good visual impression of the membership trends.

4. Newsletter Editor/Website Manager's Report

Alwynne Beaudoin presented a verbal report in which she noted that the Newsletter continues in a generally healthy state, although it is becoming more difficult to get contributions. She encouraged those present at the meeting to consider submitting material for future issues. She thanked CAP members for their support over the years. She reported that a new Newsletter editor has not yet been appointed.

The Website also continues to be a popular resource, registering around 200-300 hits/ month. Material is added as it becomes available. Items such as the Directory listing and Conference listing are updated on a regular basis. The site is linked from many sites worldwide. For this reason, it is important to maintain it in a stable location. Hence, Alwynne indicated willingness to continue maintaining the Website. She requested suggestions for additional material that could be included.

Jock McAndrews commented that he found the Book Reviews valuable. He offered to contribute a report on a fieldtrip to Canada by European scientists this summer. Rebecca Teed indicated that she might have reports on AMQUA and the GSA available. It was generally agreed that the website was a useful resource.

5. IFPS Councillor's Report

Gail Chmura, CAP Councillor to IFPS was not present. Gail took over this position following the death of Julian Szeicz earlier this year. Martin Head distributed and read her report which is reproduced below.

Upon becoming IFPS Councilor my first task was to distribute (by post) the most recent issue of *Palynos*, volume 21, No. 1 (June 1998). This was done in early September, at no cost to CAP.

On September 1, the president of IFPS, Owen Davis, notified me that changes to the IFPS Constitution would soon be proposed, to be voted upon at the next IPC Convention. My intention is to notify CAP members of the proposed changes. I hope to use the *CAP Newsletter* if distribution schedules are appropriate, or an alternative mechanism would be to publish these on the CAP website.

Gail Chmura
CAP Councillor to IFPS

6. Changes to CAP By-laws

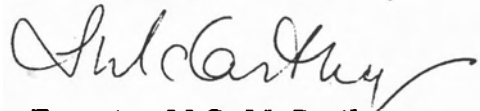
Martin explained the background to this issue to those at the meeting. The last issue of the *CAP Newsletter* (Vol. 21, No. 1, May 1998) contained a "Notice of Special Resolution to Modify the By-laws of the Canadian Association of Palynologists" and a ballot form that members were asked to return to Francine McCarthy in time for the AGM. He called on Francine to open and count the votes.

FINANCIAL STATEMENT
(for the period of 97 08 11 -- 98 10 27)

Credits:		
Balance forward (97 08 11)		$1549.04
New credits:		
Membership dues and subscriptions	$684.17	
Bank interest	$3.58	
Total new credits		$687.75
Debits:		
Production costs Newsletter Spring 1997	-$118.13	
Production costs Newsletter Fall 1997	-$216.57	
Production costs Newsletter Spring 1998	-$89.27	
IFPS dues	-$100.22	
Money order re IFPS dues	-$3.25	
Registry of Joint Stock Companies	-$25.00	
Total new debits:		-$562.44
BALANCE:		
Funds in the CAP account on 97 10 27 stood at		$1674.35

This amount includes $350.00 in prepaid membership dues and subscriptions (for the years 1999-2001); this will affect the income from this source for the years indicated.

Respectfully submitted by

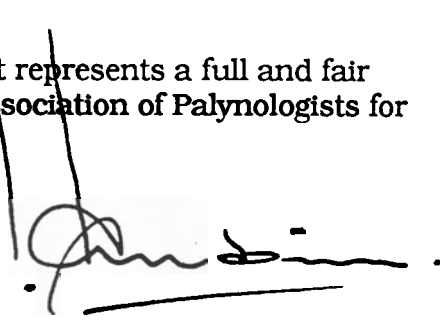


Francine M.G. McCarthy
CAP Secretary/Treasurer,
dated October 27, 1998.

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 period indicated above.

Jan Jansonius
Auditor for APC.



Francine had received eleven mail-in ballots, which she opened in the presence of the meeting. Three mail-in ballots were not eligible (from CAP corresponding members). This left eight eligible votes. Even with the votes of the membership present at the meeting (three more), this did not provide enough votes to make a decision. The By-laws require that 25% of the membership must vote. After considerable discussion, it was decided to place the Resolution and the Ballot on CAP's website, and send out a general announcement to the membership (by e-mail) asking them to vote. It was decided to hold the voting open until January 31 1999. The votes registered at this AGM are to be carried over until the next AGM. Additional votes generated from the webpage announcement will also be presented at the next AGM. It is hoped by this means to gain enough votes to render the decision valid.

7. Newsletter Editor

Martin reported that the Executive has not so far been successful in finding someone to take over as Editor. He cast this open to the meeting but no volunteers came forward from the floor. Francine suggested reducing the number of issues to one per year, to reduce the amount of work for the Editor. Martin pointed out that this would require an amendment to the By-laws which might be difficult to secure. He suggested scaling back on the size of each issue. He thought it remained a timely and useful means of distributing information and felt that maintaining two issues a year was important. Alwynne felt that it would be difficult to keep paying members with only one issue per year (would people think the dues were worth it?). If it went to totally electronic distribution, as has been suggested, this would cut out members, especially from overseas, who do not have internet access. Moreover, she felt that people would be unlikely to pay dues for an electronic version, since there is a perception that such material is free.

Several people commented on the duplication in material between the CAP and AASP Newsletters. Alwynne noted that this is unavoidable since she does not always know that material has been submitted to both. She agreed that keeping a distinct identity for the *CAP Newsletter* was important.

It was agreed that the CAP Executive would search for a new Editor, given that there is some slack time after the production of the December issue. It is hoped to have a new editor in place to take over production of the May issue.

8. Any Other Business

a. Appointment of Auditor

Francine undertook to contact Jan Jansonius to ask if he would be prepared to continue as Auditor for another year. (She had to leave the meeting at this point).

b. Location of 1999 AGM

After some discussion, it was decided to try and hold the next CAP Annual General Meeting during the AASP meeting in the fall. The Executive will contact the AASP meeting organizers to ask permission to do this. The place, date and time of the meeting will be announced in the May 1999 issue of the *CAP Newsletter* (Vol. 22, No. 1).

9. Closing

As there was no other business to discuss, President-Elect Martin Head declared the meeting adjourned at 7:13 pm.

Have YOU paid your dues?

See page 3 for dues notice and page 38 for membership form

Far and wide....

AMQUA DIARY

AMQUA, the American Quaternary Association, holds a big meeting every two years. These meetings consist of a series of talks and poster sessions about ongoing research, so it's an opportunity both to present one's own research and to hear about the cutting edge of the field. The research being presented at the meeting comes from the fields of geology, palaeoclimatology, palaeoecology, and archaeology. This year, the meeting was held in Puerto Vallerta, Jalisco, Mexico. The meeting lasts two-and-a-half days, but I ended up going one day early and leaving a day late because of flight availability.

Thursday, September 3rd:

Linda Shane gave me a ride to the airport at a hideously early hour of the morning. Arriving in Puerto Vallerta, I took a taxi to the Hotel Krystal Vallerta where the conference was being held and where I would be staying. It is a huge, walled, motel-style village, part of a long strip of such hotels along the beach between the town and the airport.

After checking in, I hopped on a bus full of alarmed Mexicans and headed into town. The Mexicans local to Puerto Vallerta seem to be mostly of Mayan descent, so American and Spanish-descended Mexican tourists really stood out, and the locals did not expect to see any on the bus! I wandered around the town for a while. It's a pretty, colourful place. Near the beach, it's all geared to tourists: restaurants and gift shops. Inland, going uphill, are the Mexican neighbourhoods. I don't speak any Spanish and few of the shopkeepers spoke English, but it wasn't a problem to pick up soda and snacks. I decided to find Scotch tape for the poster I'd brought to the conference. This turned into an absurdly complex enterprise. Finally, I went into a scuba-tour agency to ask the receptionists if they knew where to find Scotch tape. It turned out that they didn't speak much English, but one had a handheld-computer dictionary and was able to tell me that the Spanish word for "tape" was "cinta". I asked someone else for directions and found a stationary store hidden behind an unmarked door between two gift stores.

I ate dinner at a restaurant called *Spaghetteria Cianti*. It was early enough that I was the only customer. I ate on a patio with a beautiful view of the Pacific. Then I headed back to the hotel, just as the daily rainstorm hit. The other Quaternarists were just setting off to get dinner. There was a gorgeous rainbow over the mountains, but it was one of those things that just never comes out in a photograph (though no one had a camera to test this). George Jacobson recommended the pool by the ocean, so I put my swimsuit on and headed out there. It was actually several connected pools with bridges over them and various platforms under the water. I stayed to watch the sunset over the Pacific.

Friday, September 4th:

I woke up late. I wandered into the lobby and registered for AMQUA. AMQUA gave every attendee a handy small backpack so I could bring my umbrella into town, which is what I did. I talked to a group of Quaternarists I met on the beach, including Walt Dean, a carbonate guy from the USGS, and Cathy Whitlock, a palynologist from the University of Oregon. That evening was the opening mixer for the AMQUA meeting. I found out that Barbara Hansen and Vic Barnett, who are also from the University of Minnesota, had come. I talked a group of students and techs from the University of Oregon.

Saturday, September 5th:

The morning started with a wake-up call at 7 am. The sessions started that day, so no more being a tourist! The talks start at 8 in the morning and run until 5 pm, with a one-hour lunch break and two 15-minute coffee breaks, and then everyone looks at posters or, if they are presenting posters, talk to the people looking at posters until 7 pm.

I arrived at the conference hall early to put up my poster, but there were only enough boards to put up half of the posters at a time, and mine was scheduled for Sunday. But some folks were putting their posters on the walls, including Lisa Doner, a grad student I knew from Colorado, so she let me use her poster board for Saturday. I lent my pen-knife to Kate Laird and my "cinta" to Platt Bradbury, then left the hapless diatomists to their posters while I tried to help Barb Hansen put up hers. The sessions started with oceanography and ice-core stuff, including some major new records. I got no breakfast until the coffee break, when we were supplied with tasty little breads. I finished putting up my poster over lunch, so there was no time to eat then, either. The afternoon talks focussed on climatology, glaciers, and diatoms and went by quickly. That evening, I was able to go look at the other posters and talk to the other Quaternarists. Rhawn Denniston had his poster on the wall behind mine, dealing with carbon- and oxygen-isotope ratios in stalagmites. I also got a look at Dick Baker's poster on early Holocene plant macrofossils from Iowa, and promised him a copy of my thesis. Eric Grimm chastised me about the low percentages of spruce pollen in the late Wisconsin part of my Pittsburg Basin record. Bill Watts, from Trinity in Ireland, also visited my poster.

My poster was entitled "A 130,000-Year-Long Pollen Record from Pittsburg Basin and Catfish Pond, Illinois". It's a summary of the results of my dissertation work, pollen analyses of two lakes in central Illinois and modern analogue analyses. The Pittsburg Basin project is a re-analysis of a record studied over 25 years ago by Dr Eberhard Gruger. Pittsburg Basin has been collecting sediment since the penultimate ice age. The basal assemblage indicates spruce woodland, typical of a midwestern glacial sediments. Above it is an assemblage of deciduous forest types: oak, hickory, elm, ash, and others, including beech and sweetgum, that are rare in the area today, and of prairie types. This is assigned to the last interglacial. This assemblage is succeeded by a mixture of wetland and prairie pollen, and that in turn is succeeded by a prairie assemblage with some spruce and pine pollen. Both of these are assigned to the latest glacial. The current interglacial is represented by an assemblage of oak, hickory, and prairie pollen types. Adjacent Catfish Pond (only 2.5 km away), may have been more sheltered from fire, because its pollen record (covering the current interglacial and the end of the last glacial) contains lower percentages of prairie pollen and higher percentages of tree pollen.

Sunday, September 6th:

Yet again, I got an early wake-up call and headed for the poster room in the conference centre. I moved my poster to the approved spot, then went to the talks. Our hosts, the Quaternarists from the National University in Mexico City, presented the morning sessions. They had obviously been preparing for these talks for a while with well-organized talks and excellent graphics. Deciding we needed a break from our posters, Val Barber (University of Alaska - Fairbanks), Marilyn (Val's mother who was in Mexico on vacation), and I ate lunch in the pool. It was only 60 pesos for chicken tacos and mixed drinks as big as our heads! The afternoon featured a number of neat archaeology talks dealing with recent discoveries like the Sundadont people who first colonized the Americas 13,000 years ago and the trade between the Mesoamericans and the rest of North America, particularly the Anasazi people. During the evening, I stood by my poster to talk to people who wandered by, like Greg Willes, Tom Minckley, Val, and Victor. Finally I took down my poster and headed to another building for the AMQUA '98 banquet.

Monday, September 7th:

I packed quickly and carried my gear down to the conference centre. The last talks were that morning, dealing with tropical ecology and resulting in interesting debate between Paul Colinvaux, a palynologist, who sees no evidence of prolonged drought in the Amazon Basin during the last ice age and David Webb, a mammal palaeontologist, who does.

Cary Mock (University of Oregon), Vic, Val, Marilyn, Ray Spear (SUNY-Geneseo), and I assembled an expedition to Yelapa, a nearby fishing town with no roads leading to it and therefore no cars. We headed for the ferry docks, but were stopped by taxi drivers who pointed out that it was siesta hour and recommended that we charter a boat

at the city docks. So we grabbed sodas from a nearby convenience store and tacos from a street vendor and rented a boat (it cost $20 an hour). We had a long, beautiful trip across Flag Bay. The hills around Puerto Vallerta are covered by lush secondary rainforest. We could see the resort where "Night of the Iguana" was filmed. The boat handler took us through caves in Los Arcos, a group of tiny islands, where we saw huge tropical fish and dolphins busily hunting. We landed at the beach in Yelapa and a couple of small boys appointed themselves our guides to a really spectacular waterfall that none of us had known to expect. Our young guides led us to a small shop where one of the locals sold tiny animal sculptures and tee shirts. We headed back to the boat, and the boat guy simply took us to the other side of town, where there were a row of bars along the beach and lots of lounge furniture, where we sat for the rest of the afternoon and drank beer. Lots of friendly village dogs came by to socialize. We ended up at a restaurant where I had the only spicy meal I ate in Puerto Vallerta: chicken molé, in a chocolate sauce that is rich but not sweet. It was very good.

Tuesday, September 8th:

I slept in, then had another lunch with Val and Marilyn in the pool. This time, we got our mixed drinks in coconuts. Finally I took a cab with Cary and Vic to the airport. I read articles on the plane back, discussed them with Vic.

All-in-all it was a good conference. The work-hard-and-play-hard ethic of geology definitely dominated our activities. The locals organizing committee from the National University of Mexico did a great job not only presenting their own work, but in getting everything set up. Although the food and drinks were reasonable prices, without some supporting grants I'd never have been able to afford to attend the conference and I understand that many other graduate students and unemployed academics weren't as fortunate. As a result, a lot of Quaternarists could not attend and the scholarly part of the conference was very likely poorer for it.

Rebecca Teed
University of Minnesota
E-mail: teed0003@tc.umn.edu

1998 MOOREXKURSION TO SOUTHERN ONTARIO

For a week in August, 20 Europeans (France, Germany, Netherlands, Switzerland) and Herb Wright visited Quaternary palaeoecology sites. This was the first time in its 25 year history that this annual event was made to North America. They were interested because here in North America the evidence for human impact on vegetation and environment is relatively late, within the past millennium. Among sites visited were Crawford Lake where fossil maize pollen predicted a 14th century Iroquoian village which was then found, excavated and reconstructed. We also went to Rice Lake where fossil wild rice pollen is linked to prehistoric occupation beginning 3,700 years ago.

In the Luther Marsh Conservation area, fossil pollen showed that bog succeeded fen when *Tsuga* crashed 4,500 years BP; the succession and crash parallels a drop in annual precipitation of 30 cm according to the pollen-climate transfer function. We lifted a core from the peat mat surrounding a bog lake, found mud underlay the surficial peat and concluded that bog was invading the lake.

At Shepherd Lake on the Bruce Peninsula co-leader Jean Nicolas Haas showed with his close-interval pollen and macrofossil analysis that the widespread *Tsuga* crash was accompanied by intervals of low lake level.

In the Toronto's Don Brickyard a new interglacial pollen diagram was presented. It was similar to the work of the late Jaan Terasmae including the pollen of the now southern *Liquidambar*. Pollen-climate transfer functions indicated not only warmer summers but colder winters. *Sphagnum* spores and spruce pollen rose with the onset cooling leading to glaciation.

On our visit to Niagara Falls, Francine McCarthy described the geological history of the falls. Next year's exkursion to the Netherlands will be hosted by Bas van Geel and Roel Janssen.

John H. McAndrews
Curator emeritus, Royal Ontario Museum

NEWS FROM SASKATOON

In response to your circular invitation for information, I should note that work here continues on the Jurassic to Palaeocene dinoflagellate and acritarch assemblages of Argentina and Chile, in association with Dr Mirta Quattrocchio and Dr Wolfgang Volkheimer, and has begun on assemblages from the subsurface Jurassic of Lithuania, in association with Dr Petras Musteikis. I am also undertaking some SEM and taxonomic studies of Late Precambrian to Cambrian acritarchs from Lithuania and Finland, in co-operation respectively with Dr Tadas Jankauskas and Dr Anneli Uutela.

These latter collaborations began during a lecture and research tour of the Baltic countries, prior to my participation in the Dino 6 meeting in Trondheim, Norway. This tour took me also to Latvia and Estonia. At Trondheim, I gave an evening presentation on the history of dinoflagellate study and presented a paper, written jointly with Dr F. J. R. Taylor, on possible lines of future research on fossil or living dinoflagellates. My historical paper, "From Excystment to Bloom? Personal recollections of thirty-five years of dinoflagellate and acritarch meetings" was published during the meeting (Norges teknisk-naturvitenskapelige Universitet Vitenskapsmuseet, Rapport Botanisk, serie 1998-2, pp. 1-23, 14 pls.).

Work on the "Dinoflagellates" volume for the Treatise on Invertebrate Paleontology is proceeding steadily in association with Dr. Robert A. Fensome and Dr. F.J.R. Taylor. The introductory chapters have already gone to press. A new version of the dinoflagellate-acritarch Glossary, of which Dr. Graham Williams is prime author and to which I have contributed, is on its way to press.

I was recently in Edmonton, along with my wife Peggy and my research assistant Mrs Linda Dietz, as guests of the University of Alberta to participate in the official opening ceremonies of the Special Collection on the History of Science and Technology at the University Library. This collection is based upon my donations (past and continuing); it is now available for use to any visitors to the library.

More recently, I participated in the 31st Annual Meeting of the American Association of Stratigraphic Palynologists, held in Encenada, Baja California, Mexico. My enjoyment of a very interesting meeting was somewhat reduced by a mild visitation of "Montezuma's Revenge," which persisted until after return to Saskatoon. It was perhaps fortunate that I was not speaking at the meeting!

Dr William A.S. Sarjeant, F.R.S.C.
Department of Geological Sciences
University of Saskatchewan
114 University Place, Saskatoon
Saskatchewan S7N 5E2 Canada
Tel: (306) 966-5722, Fax: (306) 966-8593

NEW FACULTY APPOINTMENT AT THE UNIVERSITY OF WATERLOO

Dr Roland Hall was recently appointed as an Assistant Professor at the Department of Biology, University of Waterloo. Roland will take up the position in September 1999 and return to Canada from Northern Sweden where he is currently a Senior Scientist at the Climate Impacts Research Centre (CIRC, www.kiruna.se/~circ) located at the Abisko Scientific Research Station (www.ans.kiruna.se) in Swedish Lappland (68°21'N, 18°49'E). He is also an Assistant Research Professor at the Department of Environmental Health, Umeå University, Sweden. Roland heads the Palaeoecology Lab at CIRC, which aims to provide new information about how past climatic conditions have changed in northern Sweden during the Holocene, and to determine how climatic

factors regulate the structure, function and productivity of lake communities.

Roland's research combines fields of aquatic ecology, paleolimnology, palaeoecology and multivariate statistics to study impacts of climatic change and other stressors (nutrients, acidification) on lakes and reservoirs. He has developed quantitative methods to measure and predict ecosystem responses to human disturbances and climatic changes (Hall *et al.*, in press; Hall and Smol, 1992, 1996; Reavie *et al.*, 1995). A major theme of Roland's research is to determine how changes in the landscape surrounding lakes affect aquatic communities. Ongoing research is developing transfer functions for quantifying climatic variability during the past 9,000 years from diatom algae, fossil algal pigments and chironomids preserved in sediment cores from subarctic lakes in northern Sweden (68°N latitude). Additionally, collaborative research with Peter Leavitt (University of Regina, Canada) and John Smol (Queen's University, Canada) quantifies the impacts of multiple stressors (urban pollution, agriculture, climate) on a chain of naturally-eutrophic lakes in the Qu'Appelle Valley, Saskatchewan. Studies of lakes in the Muskoka-Haliburton region of Ontario, in collaboration with scientists at the Dorset Research Centre (Ministry of Environment and Energy), quantify changes in concentrations of phosphorus, dissolved organic carbon, lakewater pH and deepwater anoxia due to cottage development, past logging and acidification.

Prospective graduate students can contact Roland Hall at CIRC, Box 62, S-981 07 Abisko, Sweden (E-mail: Roland.Hall@ans.kiruna.se).

Recent Publications (since 1996):

HALL, R. I., P. R. Leavitt, A. S. Dixit, R. Quinlan and J. P. Smol. In press. Effects of agriculture, urbanization and climate on water quality in the northern Great Plains. *Limnology & Oceanography* Special Issue on Effects of Multiple Stressors on Freshwater and Marine Ecosystems.

Leavitt, P. R., D. L. Findlay, R. I. HALL, D. W. Schindler and J. P. Smol. In press. Algal response to dissolved organic carbon loss and pH decline during whole-lake acidification: Evidence from paleolimnology. *Limnology & Oceanography* Special Issue on Effects of Multiple Stressors on Freshwater and Marine Ecosystems.

Leavitt, P. R., R. I. HALL, R. D. Vinebrooke, S. E. Wilson, J. P. Smol, R. E. Vance and W. M. Last. In press. Multiproxy record of prairie lake response to climatic change and human activity: Clearwater Lake, Saskatchewan. *Geological Survey of Canada Bulletins*.

Wilkinson, A. N, R. I. HALL and J. P. Smol. In press. Chrysophyte cysts as paleolimnological indicators of environmental change due to cottage development and acidic deposition in the Muskoka-Haliburton region, Ontario, Canada. *Journal of Paleolimnology*.

HALL, R. I., and J. P. Smol. In press. Diatoms as Indicators of Lake Eutrophication. Book Chapter in Smol, J. P., and E. F. Stoermer (Eds.) *The Diatoms: Applications for the Environmental and Earth Sciences*. Cambridge University Press.

Larsen, C. P. S., R. Pienitz, J. P. Smol, K. A. Moser, B. F. Cumming, J. M. Blais, R. I. HALL and G. M. MacDonald, 1998. Relations between lake morphometry and the presence of laminated lake sediments: a re-examination of Larsen and MacDonald (1993). *Quaternary Science Reviews* 17(8):711-717.

Quinlan, R., J. P. Smol and R. I. HALL, 1998. Quantitative inferences of past hypolimnetic anoxia in south-central Ontario lakes using fossil chironomids (Diptera: Chironomidae). *Canadian Journal of Fisheries and Aquatic Sciences* 54: 587-596.

Vinebrooke, R. D., R. I. HALL, P. R. Leavitt and B. F. Cumming, 1998. Fossil pigments as indicators of phototrophic response to salinity and climatic change in lakes of western Canada. *Canadian Journal of Fisheries and Aquatic Sciences* 54:668-681.

HALL, R. I., P. R. Leavitt, J. P. Smol and N. Zirnhelt, 1997. Comparison of diatoms, fossil pigments and historical records as measures of lake eutrophication. *Freshwater Biology* 38: 401-417

HALL, R. I., and N. D. Yan, 1997. Comparing annual population growth estimates of the exotic invader *Bythotrephes* by using sediment and plankton records. *Limnology & Oceanography* 42:112-120.

Magnuson, J. J., K. E. Webster, R. A. Assel, C. J. Bowser, P. J. Dillon, J. G. Eaton, J. G. Evans, E. J. Fee, R. I. HALL, L. R. Mortsch, D. W. Schindler and F. H. Quinn, 1997. Potential effects of climate change on aquatic systems: Laurentian Great Lakes and Precambrian Shield Region. *Hydrological Processes* 11: 825-871.

HALL, R. I., and J. P. Smol, 1996. Paleolimnological assessment of long-term water-quality changes in south-central Ontario lakes affected by cottage development and acidification. *Canadian Journal of Fisheries and Aquatic Sciences* 53: 1-17.

NEWS FROM THE JURASSIC MICROFOSSIL GROUP

In August (this year) at the 5th International Symposium on Jurassic Stratigraphy in Vancouver in Canada, Susanne Feist-Burkhardt (Geol.-Pal. Institut, Schnittspahnstrasse 9, D-64287 Darmstadt, Germany, E-mail: feist@bio.tu-darmstadt.de) volunteered to serve as secretary, convenor and newsletter editor for JMG. The computer database of the Research Directory of the Members of JMG is still being managed by Patricia Whalen (521 St. Albans Lane, Eureka Springs, Arkansas, 72632, USA, E-mail: micropaw@ipa.net), and the publications index by David C. Cole (Department of Geology, University of Southampton, Highfield, Southampton SO9 5NH, UK, E-mail: d.c.cole@soton.ac.uk).

The JMG members present at the JMG group meeting in Vancouver (August, 18, 1998) agreed on continuing paying a subscription for the *JMG Newsletter*, however, Susanne will explore the possibility of publicizing the *JMG Newsletter* as a newsletter on the web. If the newsletter will appear on the web, the subscription for the newsletter will only be for a those who want the newsletter in printed version, distributed by post. Susanne will bring further information on this and on payment a fee for printed version of the newsletter soon. The *JMG Newsletter* will in the future be published in the summer each year.

Niels E. Poulsen
E-mail: nep@geus.dk

LEONARD RICHARD WILSON 1906 - 1998

Leonard Richard Wilson was born in Superior, Wisconsin July 23, 1906. He died at his home in Norman, Oklahoma, July 15, 1998 at the age of 92. He was the elder of two sons of Ernest and Sara Jane Cooke Wilson. He is survived by his wife Marian De Wilde whom he married September 1, 1930. Their son, Richard Graham Wilson, of West Fork, Arkansas, and daughter Marcia Graham Wilson Roe of Norman, Oklahoma, 11 grandchildren and 7 great-grandchildren also survive.

Richard (Dick) Wilson was proud of his roots as a Viking. He traced his forebears back through three centuries to Viking communities in the Orkney Islands and Thurso, Scotland, which borders the strait that separates the Orkneys from the mainland of Scotland, and into northern England.

Richard grew up in Superior, Wisconsin. There, a physician neighbour, Dr George Conklin, first introduced Dick to the great world of the natural sciences. Conklin was an expert on bryophytes and was curator of the Sullivant Moss Society's world-wide collections of mosses and liverworts. Dr Conklin also conducted research on freshwater sponges. Wilson later utilized these invertebrates in his studies of Wisconsin's freshwater lakes. Conklin also led Wilson through scouting to become the first Eagle Scout in Superior.

Dick had a paper route that included several of the faculty members of Superior State Teachers College (now University of Wisconsin - Superior). Prof. J. A. Merrill, who taught geology and geography at the college, was one of his customers. Merrill had studied at Harvard and his doctoral thesis was on a Cretaceous problem in Texas. Merrill, who had also published the first paper on hystrichosphaerids in the United States, taught Dick to recognize those microorganisms. Wilson's fascination with these grew through his years as he worked with freshwater lakes and later whenever he examined marine rock samples.

L. R. Wilson (third from left) in 1931 at the Two Creeks Conference of the International Geological Congress. He was a first year graduate student at the time. Professor F. T. Thwaites is fifth from left.

Richard enjoyed outdoor activities as a boy, including skiing cross-country. He later became a down-hill skier and broke his back preparing for the 1928 Olympic tryouts in ski-jumping. He liked biking and he once took a one-thousand-mile tour in England. Also in college, he joined the fencing team and later he coached fencing at Coe College.

This broad background in botany and geology impressed the various professors with whom he studied at the University of Wisconsin, Madison. He became field assistant to Norman C. Fassett (systematic botany). He also caught the attention of William H. Twenhofel (geology and sedimentology), F. T. Thwaites (glacial geology) and E. A. Birge (zoology and limnology). Professor Birge, who was director of the Wisconsin Geological and Natural History Survey, engaged Wilson to assist in some of his own research on biology of freshwater lakes. Later, as president of the University of Wisconsin, Birge, who was then studying the physics of light as it affects plant growth in lakes, became a lifelong friend and continued some research with Wilson for several years.

Wilson's family desired that he should have some education in England, so he went to Leeds University in Yorkshire for his junior year. Leeds is only about 100 km south of his grandparents' home at Stockton-on-Tees, England, near Newcastle. There he studied with W. H. Burrell, director of the University Herbarium. Burrell has been credited with publishing the first paper on pre-Pleistocene palynology in England, 1924. During Wilson's year at Leeds, Gunnar Erdtman, Swedish pioneer in pollen analysis, presented several lectures there which initiated Burrell's and Wilson's interest in the palynology of peat and coal. This interest grew rapidly in Wilson's mind and was applied first in his masters' and doctoral research on Wisconsin's peat deposits. Fred Thwaites and Norman Fassett directed Wilson's study of the vegetation and geology of the Two Creeks Forest bed, which became an internationally recognized focal point for Late Wisconsinan glacial deposits.

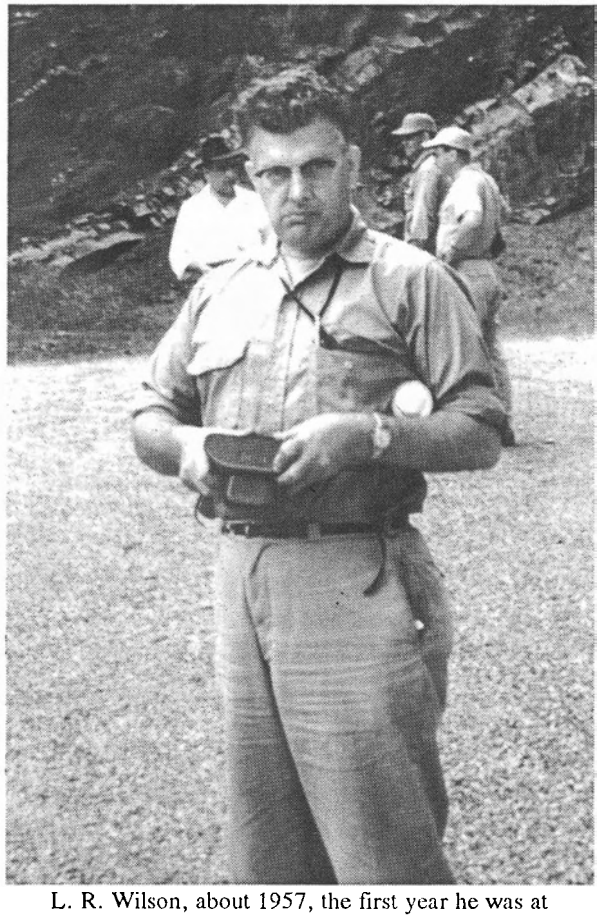
Wilson's doctoral dissertation, an analysis of plant microfossils in 10 bogs, Douglas County, Wisconsin was used to determine the history of the several stages in the shorelines of the Nipissing Great Lakes and Lakes Algonquin and Duluth. This information enabled Wilson to demonstrate several stages of plant succession over the glacial terrain and the vegetation's control of soil type, certain other edaphic factors, and effects of fire. He also prepared another extensive report, equivalent to another Ph.D. dissertation, on lake development and plant succession in the Highland District, Muskellunge Moraine, and the outwash area of Vilas County, Wisconsin.

Wilson was instructor to professor of geology at Coe College, Cedar Rapids, Iowa, 1934-1947; professor and head of the Geology and Mineralogy

Department, University of Massachusetts, 1947-1956; professor of geology, Graduate School of Arts and Science at New York University; geologist, Oklahoma Geological Survey 1957-1977; professor of geology, University of Oklahoma 1957-1962; Curator of Micropaleontology and Paleobotany, Sam Noble Museum of Science and History (now Oklahoma Museum of Natural History); and the George Lynn Cross Research Professor of Geology and Geophysics, University of Oklahoma, 1969 - 1977, when he became professor emeritus of geology and curator emeritus of micropaleontology and paleobotany. Dick was Melhaupt Scholar, Ohio State University 1939-1940 working on pollen-analysis of Ohio prairies and woodlands of the Postglacial Xerothermic Interval with the eminent ecologist, Prof. E. N. Transeau of Ohio State University. He was director of the Greenland Ice Cap project, "Mint Julep", 1952-1953. He worked with Robert Shrock at the Massachusetts Institute of Technology field camp in Nova Scotia during the summers of 1950-1955. Wilson also applied his knowledge of biostratigraphy and palynology to professional contract work for several oil companies in United States and South America, 1945 to 1972.

Wilson was a serious, dedicated teacher. He demanded much from his students in reports and notebooks. He gave very tough examinations over reading material and identification of the age, source, and history of various rocks and samples of rocks. He also included a great deal of botanical information in his geology lectures and field trips. Dr Rudolph Edmund, at the fiftieth anniversary of the National Association of Geology Teachers (NAGT) in a presentation to Wilson in 1988 wrote, "L. R. Wilson championed the field as the best way to teach earth processes .... students followed him into the field, into the lab, and into research." Wilson had been one of five founders of the Association of College Geology Teachers in 1938, the forerunner of the National Association of Geology Teachers.

Wilson worked diligently with James M. Schopf in the preparation of the landmark paper "An annotated synopsis of Paleozoic fossil spores and the definition of generic groups", published by the Illinois State Geological Survey in 1944. In that paper, which was



L. R. Wilson, about 1957, the first year he was at Oklahoma University. Photograph taken at a Field Seminar in the Ouachita Mountains.

a major factor in bringing order to the presentation of palynological information of pre-Pleistocene palynological studies in North America, they elucidated seven guiding principles for classifying and defining the then-existing genera of fossil pollen and spores.

Wilson, together with one of his former part-time students, Ruth Webster, as an assistant, completed an exhaustive study of the palynology of the strata in two wells in Texas for Carter Oil Company (early subsidiary of Exxon Production and Research Company). These analyses, with over 9500 photomicrographs, were published in five volumes. Distribution of these tomes was limited to a few specialists and museums. However, this extended study contributed importantly to the application of palynological techniques to the exploration for oil by several

companies immediately following World War II.

Professor Wilson directed about 50 masters and doctoral theses. Many of those students constituted the nuclei of the staffs of several oil company palynological laboratories. Several became teachers, some worked for various geological surveys, and a few entered other areas of geological research, exploration or administration. Wilson published about 200 research reports, notes and abstracts.

L-R: Aureal Cross with L. R. Wilson and Marion Wilson, photographed on June 15 1992 at their home in Norman, Oklahoma, with their dog, Gretchen.
(Photo: Huang Wei)

Wilson received numerous honours and awards. He was a Fellow in the Geological Society of America (GSA) and a member of the Botanical Society of America (BSA) and the American Association for the Advancement of Science (AAAS) for over 50 years. He was elected as an Honorary Member of the American Association of Stratigraphic Palynologists (AASP), founding member of the National Association of Geology Teachers (NAGT), and Erdtman International Medalist for Palynology from the Paleontological Society of India. He was a longtime member of various other societies and several state academies of science. Wilson served on the Commission Internationale de Microflora du Paleozoic, and the editorial board of *Micropaleontology*. He was elected to the Order of Mark Twain on the basis of research in Greenland and Pleistocene to Recent deposits in North America.

He was a member and sometime president of the Oklahoma Chapter of the Society of Sigma Xi and the Oklahoma Chapter of Phi Beta Kappa honorary scholastic fraternity. He was adviser to the University of Massachusetts chapter of the honorary geologic fraternity, Sigma Gamma Epsilon.

Wilson's role as an educator was outstanding. His contributions to application of palynology to exploration for oil, and interpretation of environments of deposition of ancient sedimentary rocks have been preeminent. He was a gentleman of high character and scholarly pursuits. He was an indefatigable teacher and firm disciplinarian in classroom, laboratory, and field studies, and a pioneer in several areas of his research. He continued to publish short papers almost to the time of his death. He was a true "Viking" through 65 years of the highest order of professional contribution to teaching and research in biological and geological sciences.

He was the major player in the rise of palynological science in the middle of the 20th Century.

Aureal T. Cross
Department of Geological Sciences
Michigan State University
East Lansing, Michigan, MI 48824, USA

ESSAYS

IT JUST TAKES A FEW SPECKS OF DUST AND YOU ARE CAUGHT

It was late and dark and she was sure she was being followed but as she rounded the corner and went down the side street the footsteps did not appear to follow. What she did not know was that there was a short cut from the main road to a spot further down the side street and that was where he was waiting. As she passed the alleyway he pounced, grabbed her and dragged her into the dark alleyway. She screamed. He threatened to kill her if she screamed again. They struggled. She was raped and violated several times and left injured, dazed and scared to move, her clothes ripped off and scattered around her. By the time she composed herself and sought assistance the assailant was well gone.

She was able to give the police a good description of the assailant and an arrest was soon made. The suspect admitted that he had been in the area and that he had seen the girl. She had appeared a little distressed and he had asked her if there was anything wrong and could he assist. She told him that she had just had a fright and was okay now. He must have been the first person she saw and she must have put my face onto the face of the assailant, he said to the Police.

This incident is based on an event that happened in one of New Zealand's largest cities. It is typical of such attacks that happen, unfortunately, more often than we would like in all countries. In more cases than we would like to admit it is difficult to prove that the suspect was ever at the scene of the crime, particularly when no bodily fluids are left at the scene. Invariably in such cases the suspect's clothing can pick up microscopic remains from the scene. These remains can occasionally be either unique or highly unusual and "fingerprint" the suspect to the scene.

In this case the Police had little to go on. The suspect denied having entered the alleyway - there was no reason why he should be there, he was just a passer-by in the wrong place at the wrong time. There was no DNA evidence and since he had admitted to seeing and helping her any hairs from body or clothing that may have been exchanged was of little use. There was the evidence of one pubic hair on the victim matching the prime suspect. What else could the Police use?

The area where the rape took place was an asphalted alleyway, leading to several properties, lined on one side by a garden of exotic horticultural shrubs. Parts of the plants had broken and were spread over the asphalt. During the struggle the pair had rolled into the garden. Some of the plants were in flower.

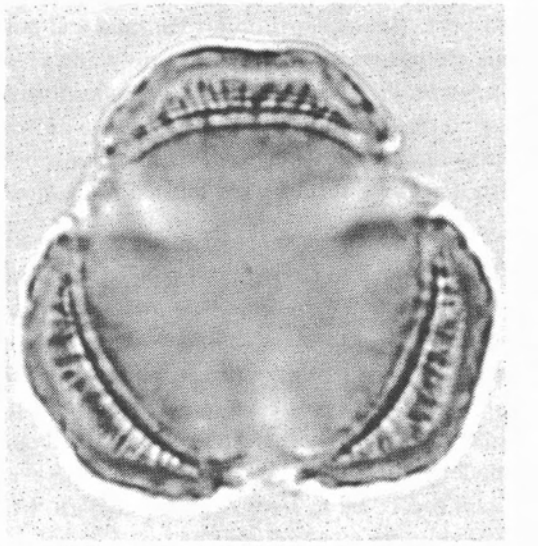
The Police had as a matter of course taken all the suspect's clothing. His jeans and T-shirt had dirt stains and the Police thought that these may have come from the scene. They cut out the dirty patches and sent them to forensic scientists, along with a control sample of dirt from the crime scene, to see if any match could be obtained, but mineral and clay analyses of the soil could not pinpoint an area as specific as the Police needed.

Next, the samples were sent to the forensic palynologist, a scientist who studies the legal aspects of spores and pollen, to see if the scene had a signature or fingerprint that could be picked up on the suspect's clothing. The control sample and pieces of cloth cut from the jeans and T-shirt were subjected to chemical treatment and centrifuging, concentrating the spores, pollen and other organic material. This material was mounted in a preserving medium under cover slips on glass slides and examined under a high powered light microscope. The different spores and

pollen were identified and their percentages calculated. The control sample from the scene indeed proved to have a signature that if found on the clothing of the assailant would be difficult to explain unless he had been there.

The control sample contained a large number of fungal hyphae, fruiting bodies and spores, including a large, three-pored, thick-walled spore. The pollen was dominated by the Northern Hemisphere species *Artemisia arborescens* (77%), a plant that was subsequently identified by the palynologist from police photographs taken of the scene and from pollen samples taken from the vegetation growing there. *A. arborescens* in New Zealand can grow to almost 2 m in height and has distinctive deeply incised, narrow, whitish leaves and stems covered in dense hairs. The natural distribution of *Artemisia* is in arid areas of the United States and South America and on the steppes of Europe. A lot of the *Artemisia* pollen was still in clumps indicting that the source of the pollen was at that scene. No other individual fern spore or pollen type formed more that a few percent. The identified spores and pollen were light-coloured and contained cell contents. Mixed with these were very poorly preserved darker etched grains that were a year or more old and lacked cell contents.

Then the jeans were sampled and compared with the control sample. Material from both samples had the same range of preservational characteristics. The spores, pollen and other organic material were a mixture of dark, poorly preserved and light coloured, well preserved spores and pollen dominated by pollen of *Artemisia arborescens* (53%), many with cell contents still intact. Again the *Artemisia* pollen grains were in clumps. It is unusual to get 50% *Artemisia* pollen on the ground, unless samples are taken from directly under a flowering plant, let alone on clothing. The same three-pored, thick-walled fungal spore was also abundant. There were other pollen grains found on the jeans, primarily pollen from various daisies and the myrtle family, that were not found at the scene. Other grains were expected as the small 35 x 40 mm piece of jeans material was processed intact to obtain the pollen, and the cloth would hold pollen collected since its last wash and possibly before.



Pollen grain of *Artemisia arborescens*, approx. 28 μm diameter. (Photo: D. Mildenhall)

Because the jeans contained such a large amount of *Artemisia* pollen, it was decided to process the piece of cloth cut from the T-shirt. This measured 200 x 110 mm. Preservation of the organic material was the same as the organic material from the jeans with many of the pollen grains retaining their cell contents. Thirty-one percent of the pollen sample consisted of *Artemisia* pollen and there were a few grains of the three-pored, thick-walled fungal spore. Again, so much *Artemisia* pollen was present that the clothing had to have been in contact with the parent plant. A lot of different pollen types, including daisies, grasses and myrtles, were also located. Since this piece of cloth was so much larger than the jeans material many more pollen and spores grains were collected, diluting the percentage of *Artemisia* pollen from the crime scene. What were the chances of the suspect having such a large percentage of *Artemisia* pollen on his clothes without ever having visited the scene? We can approach this question in several ways.

First, *Artemisia arborescens* is not a common plant. It is grown in New Zealand as a decorative shrub so it can be found occasionally in private and public gardens. Investigations showed that this plant did not occur anywhere near the usual haunts of the

suspect. His explanation for the mud and pollen on his clothes was that he wore them while servicing his car in the backyard of his flat. This backyard consisted of a lawn surrounded by a fence on which ivy grew and along which a few native plants occurred. No *Artemisia* shrubs were located in the area.

Second, the chances of someone picked off the street at random having such a large percentage of *Artemisia* pollen on them was considered. In our laboratory we have processed over 1000 recent samples from many sources around New Zealand and *Artemisia* has never been found in more than trace amounts, and only then in less than 10 samples. No modern samples from the northern hemisphere, examined by us in New Zealand, contain *Artemisia* pollen in the numbers obtained in this case. So we can say that at the least it would be one chance in a thousand and certainly the chances would be immensely higher than this.

Third, what are the chances of pollen randomly attaching themselves to the clothes? *Artemisia* pollen is wind-dispersed but most of the pollen falls within a few hundred metres of the parent plant and gets diluted very quickly by all the other air-borne pollen types in the area. Not all pollen from an individual plant is dispersed at the same time so vast quantities are never carried in the air at any one time, unless a large percentage of the area is cover by many *Artemisia* plants. In New Zealand this is never the case. Also, since the clothing of the suspect had clumps of *Artemisia* pollen this indicated direct contact with the plant as the pollen would only be blown around as individual grains. Given the percentages on the clothing, it would be extremely unlikely that any clothes would have such a huge percentage from random gathering of pollen. The fact that many of the pollen grains still had intact cell contents indicated that the grains had arrived on the clothing within the last few months at the most.

Fourth, would it be possible for the suspect to have obtained this large percentage of *Artemisia* pollen on his clothing through random contact with a plant that we knew nothing about? It is highly likely that a chance brushing against an *Artemisia* shrub would result in the pollen attaching itself to the clothing. The suspect would have to be wearing the same jeans and T-shirt and the pollen would have to attach themselves to the same spot of dirt on both items of clothing. No *Artemisia* pollen was found on a control sample of cloth from another position on the jeans. For the pollen to still be in clumps, not subsequently brushed off, associated with spots of dirt, and in such high percentages the contact would have had to be prolonged and with a degree of force to ingrain the dirt plus pollen into the clothing.

Finally, there were all the large, three-pored, thick-walled fungal spores. These too were on both the jeans and T-shirt. These types of spore are not commonly found on clothing, and never in the percentages seen here.

Taking the physical evidence of a broken bush of *Artemisia aborescens* at the crime scene, the chances are astronomically small of picking a person at random with: a. 31%-53% *Artemisia* pollen occurring on their clothing; b. that pollen being in clumps indicating intimate contact with the source plant; c. that pollen containing a large percentage of specimens with intact cell contents indicating recent contact with the parent plant, and; d. the pollen being associated with an unusually large percentage of one type of fungal spore.

Therefore the evidence strongly supported the idea that the soil on the jeans and T-shirt came from the crime scene represented by the control sample.

Also at the scene were flowering pelagoniums. Pelagonium pollen were found on the jeans and T-shirt but oddly enough did not occur in the control sample. The pelagoniums were growing immediately underneath the *Artemisia*. The flowers had not released their pollen but were crushed during the struggle and pollen released onto the clothing of the suspect.

These conclusions were presented in court and were accepted as being undisputable evidence indicating that the suspect had to have been at the scene, and was therefore the assailant. He was to be sentenced to eight years' imprisonment.

Palynological evidence may not be able to prove that a crime has been committed but it can provide

valuable evidence that can help the Police come to an understanding of what has happened at a criminal scene. Not all palynological evidence will be useful in a court of law, but it can still provide or change the directions Police enquiries may be running. There are only a small number of experts in the field of forensic palynology but they could be used more frequently. Scene-of-crime police and forensic scientists could be more aware of the potential for forensic palynology and routinely consider its use. The more quickly control and evidential samples can be collected the better, and there is a strong case for the automatic collection of control samples at crime scenes in case forensic palynology is subsequently needed to help identify, link, and place suspects at a crime location.

There are many ways in which palynological evidence can be acquired and the events described above are but one possible scenario. A portfolio of cases has now been documented and these are available on request. For another application of forensic palynology, take a look at http://www.gns.cri.nz/news/release/forensic.html. For further information contact:

Dr Dallas Mildenhall
Institute of Geological and Nuclear Sciences
P O Box 30 368, Lower Hutt, New Zealand
Email: mildenhalld@wpo.gns.cri.nz

PHENOLOGY AND PALYNOLOGY

I am a PhD student at the Palynology Laboratory of Montpellier University, France, and I thought perhaps *CAP Newsletter* readers might be interested to hear about my research. I will defend my PhD thesis on December 11 1998. My thesis deals with phenology modelling ("Temperate-zone tree phenology modelling and its application in evolutionary biology"). You may wonder what this has to do with palynology? It is very simple: I have developed phenological models using aeropalynological data (principally European data but also Canadian data). I have already published two papers on this topic:

Chuine, I., P. Cour, and D. D. Rousseau, 1998. Fitting models predicting dates of flowering of temperate-zone trees using simulated annealing. *Plant, Cell, Environment*, 21, 455-466.

Chuine, I., P. Cour, and D. D. Rousseau, 1998. Selecting models hypotheses using long term airborne pollen time series: implications for tree phenology modelling studies. *Plant, Cell & Environment*, In press.

Among other papers, I am preparing another paper with the Canadian airborne pollen data. At the 6th International Congress on Aerobiology, held in Perugia, Italy, 31 August - 5 September 1998, I gave a lecture which seemed to have interested palynologists working on phenology. My thesis does not focus on palynology directly but the abstract of my lecture in Perugia may be of interest to palynologists:

Advantages of Aerobiological Data for Phenology Modelling and Studies. C. I. Chuine and C. P. Cour, Laboratory of Palynology, ISEM Montpellier, France

During the last twenty years, the causes and consequences of variation of phenology has received much interest from ecologists concerned in problems related to global warming. The interest in phenology was principally induced by biosphere modelling since phenology is one of the factors controlling net ecosystem productivity, a component of the global carbon cycle. A study of the reproductive phenology of temperate-zone trees is held using aeropalynological data from Europe and Canada over 20 years and more than 30 localities. Peaks of pollen concentration of arboreal taxa, mono or bi-specific measure the dates of flowering of different tree species. European data have been used to test classical budburst models and also new models. The advantage of the aeropalynological data for phenology modelling are of three orders. First, dates of flowering measured by the pollen peaks represent the mean date of flowering of the population living around the sampling station. This is an important advantage compared to traditional phenological observations of tree individuals, since the variance of phenological events in a local population is of 2 to 4 weeks. The reasons of such variance are the result of a polymorphism of the

genes implicated and "white noise" due to micro-climatic conditions or local perturbations. Thus, data of individual trees may not lead to the characteristics of the population or the species concerned. Second, budburst model parameters have been shown to be particularly sensitive to the meteorological and phenological data used to adjust them. Meteorology is rarely recorded with phenological observations on tree individuals and the nearest meteorological station may not record the microenvironmental conditions experienced by those individuals. The use of a global response of trees to climate, as permitted by pollen data, allows the use of regional meteorological data without loss of information. Third, since populational data of many localities are available through Europe from Abisko to Oran, population biology studies on phenology can be held. In particular, the study of local adaptation of phenology to climate, an important topic for a wide use of phenology models.

Aeropalynological data have been successfully used to select the best predictor models of the dates of flowering of a dozen tree species. Models selected are particularly accurate to predict data external to the data set used to adjust them. Conditions for robust studies are discussed. Results concerning local adaptation of phenology to climate show that its intensity depends on the species concerned and should be taken into account for widespread predictions for certain species.

For more information or to discuss my work, please contact me at:

Isabelle Chuine
Laboratoire de Paleoenvironnements & Palynologie
Institut des Sciences de l'Evolution de Montpellier
Case 061, Université Montpellier II
Place Eugène Bataillon
34095 Montpellier cedex 05, France
E-mail: chuine@isem.isem.univ-montp2.fr

AND NOW FOR SOMETHING COMPLETELY DIFFERENT....

As a Quaternary palynologist, I spend much of my time scrambling around bogs and peatlands, often surrounded by a cloud of whining mosquitoes. These sites are a primary archive of material for palaeo-ecology. So I was particularly interested in a Press Release posted to the BRITARCH discussion list by Dr Michael Heyworth of the Council for British Archaeology last summer. The salient points from this article are summarized below. Clearly, Quaternary palynologists have a vested interest in preserving peatlands. The situation in Canada may not be quite so critical as in the UK, but those of us who are both palynologists and gardeners should take note!

KICK PEAT OUT OF YOUR BED AND BACK ONTO THE BOG

International Bog Day VII (July 26) is the ideal day to give peat the elbow, make your garden a peat-free zone - and help Britain's bogs survive. On International Bog Day VII, the Peatlands Campaign Consortium is appealing to gardeners to help keep peat where it belongs.

Use of peat in the UK has risen since 1993 from 2.7 million cubic metres per year and all but six per cent of the peatlands have already been destroyed or damaged through draining, afforestation and peat extraction - most of the peat mining in Britain is of nationally important bogs. Throughout the world bogs are under threat - even in Ireland which in popular imagination has lots of peatland. In the UK, more than 94 per cent of lowland bogs have been destroyed or damaged. Each year 2.7 million cubic metres of peat is used - the equivalent of a 40-litre bag of peat for every man, woman and child in the UK.

Conservation groups in the UK have organized bog walks and visits, so everyone can see the wealth of life that flourishes on our peatlands. Bog wildlife highlights include the giant bog raft spider, carnivorous sundew plants and jewel-coloured damsel and dragonflies. Thorne and Hatfield Moors near Doncaster are home to some 3000 plants and animals. And peatlands are not just about wildlife - formed after the last ice age, peat bogs hold hidden archaeological treasures too. And they act as carbon sinks, like natural sponges soaking up carbon dioxide in the atmosphere.

Kicking peat out of your flowerbeds and pots is easy, because there are many widely available alternatives, such as composted bark and 'zoo poo' which can make an elephantine contribution to the health of your dahlias. Garden plants don't need peat - wild ones such as sundew, butterwort and bog rosemary do. Heathers and azaleas can be fed sequestered iron to keep soil to their liking - the addition of peat is really not necessary. Professional and amateur gardeners, including those at the Royal Botanic Gardens of Kew, have ceased to use peat.

PALYNOLOGICAL MYTHS: MONITORING CONTAMINATION OF FOSSIL POLLEN PREPARATIONS

Modern pollen occasionally appears in fossil preparations and can be detected by the contained cytoplasm and/or pristine condition and often bright stain. The sources include pollen carried by air currents through open windows, and contaminated reagents including water and dirty glassware. The usual response to these potential sources of contamination is, besides closing the window, to filter the air entering the preparation lab and use chemically pure reagents including distilled water. This may be an expensive solution to a non-problem. In my windowfull lab, contamination is rare and I prove it by running a control.

The control is done by simply preparing a sample containing only the *Lycopodium* spike tablet as a member of a sample batch of fossil sediment, i.e., running a "blank" sample. My preparation uses technical grade reagents and tap water. After mounting the concentrates, in the control slide I count 1,000 *Lycopodium* spores and other pollen and spores; usually there in no pollen. From this I conclude that the rate of laboratory contamination of fossil slide preparations is way below 1 per thousand fossil pollen. It's not what comes in the window but what gets under the coverslip that counts!

John H. McAndrews
Curator emeritus, Royal Ontario Museum
E-mail: jock.mcandrews@utoronto.ca

On the shelf

RECENT PUBLICATIONS BY CANADIAN AND OTHER PALYNOLOGISTS - 10

*Campbell, I. D., C. Campbell, M. J. Apps, N. W. Rutter, and A. B. G. Bush, 1998. Late Holocene ~1500 yr Climatic Periodicities and their Implications. *Geology* 26(5):471-480

*Chmura, G. L., P. Chase, and J. Bercovitch, 1997. Climatic Controls on the Middle Marsh Zone in Fundy Saltmarshes. *Estuaries* 20(4):689-699.

Clague, J. J., R. W. *Mathewes, J. P. Guilbault, I. Hutchinson, and B. D. Ricketts, 1998. Pre-Younger Dryas Resurgence of the Southwestern Margin of the Cordilleran Ice Sheet, British Columbia, Canada: Reply to comments. *Boreas* 27(3):229-230.

Doubleday, N. C. (Weeks), J. P. *Smol, R. J. *Mott, and R. N. McNeely, with contributions from colleagues of Dr. Terasmae at the Geological Survey of Canada and Brock University 1998. Dr. Jaan Terasmae (1926-1998), Professor Emeritus, Brock University: Remembered. *Journal of Paleolimnology* 20:203-204.

*Fensome, R. A., J. Bujak, B. Dale, E. H. Davies, J. D. Dodge,L. E. Edwards, R. Harland, M. J. *Head, and 7 others, 1998. Proposal to Conserve the Name Protoperidiniaceae against Congruentidiaceae, Diplopsalaceae and Kolkwitziellaceae (Dinophyceae). *Taxon* 47: 727-730.

*Haas, J. N., S. Karg, and P. Rasmussen, 1998. Beech Leaves and Twigs Used as Winter Fodder: Examples from Historic and Prehistoric Times. *Environmental Archaeology* 1:81-86.

*Haas, J-N., I. Richoz, W. Tinner, and L. Wick, 1998. Synchronous Holocene Climatic Oscillations Recorded on the Swiss Plateau and at Timberline in the Alps. *The Holocene* 8(3):301-309.

Head*, M. J. 1998. Marine Environmental Change in the Pliocene and Early Pleistocene of Eastern England: the Dinoflagellate Evidence Reviewed. In T. Van Kolfschoten and P. Gibbard (eds.), *The Dawn of the Quaternary*. Mededelingen Nederlands Instituut voor Toegepaste Geowetenschappen TNO, 60:199-225.

*Head, M. J., 1998. Pollen and Dinoflagellates from the Red Crag at Walton-on-the-Naze, Essex: Evidence for a Mild Climatic Phase During the Early Late Pliocene of Eastern England. *Geological Magazine* 133(7).

*Head, M. J., 1998. New Goniodomacean Dinoflagellates with a Compound Hypotractal Archeopyle From the Late Cenozoic: *Capisocysta* Warny and Wrenn, emend. *Journal of Paleontology*, 72(5): 795-807, 5 pls.

*Heinrichs, M. L., S. E. Wilson, I. R. Walker, J. P. *Smol, R. W. *Mathewes, and K. J. Hall, 1997. Midge- and Diatom-based Palaeosalinity Reconstructions for Mahoney Lake, Okanagan Valley, British Columbia, Canada. *International Journal of Salt Lake Research* 6(3):249-267.

Holme, P. J., S. R. *Hicock, and L. E. Jackson Jr., 1998. Quaternary Geology and Terrain Inventory, Eastern Cordillera NATMAP Project. Report 5: Stratigraphic Correlations of Glacial Deposits in the Beaver Mines Map Area, Southwestern Alberta. *Current Research 1998-E, Geological Survey of Canada*, 11-17.

*Kuhry, P. 1998. Late Holocene Permafrost Dynamics in Two Subarctic Peatlands of the Hudson Bay Lowlands (Manitoba, Canada). *Eurasian Soil Science* 31(5):529-534.

Laird, K. R., S. C. Fritz, B. F. *Cumming, E. C. Grimm, 1998. Early-Holocene Limnological and Climatic Variability in the Northern Great Plains. *The Holocene* 8(3):275-285.

Larsen, C. P. S., R. Pienitz, J. P *Smol, K. A. Moser, B. F. *Cumming, J. M. Blais, G. M. Macdonald, and R. I. *Hall, 1998. Relations Between Lake Morphometry and the Presence of Laminated Lake Sediments: A Re-examination of Larsen and MacDonald (1993). *Quaternary Science Reviews* 17(8):711-717.

Last, W. M., R. E. *Vance, S. Wilson, and J. P. *Smol, 1998. A Multi-proxy Limnologic Record of Rapid Early-Holocene Hydrologic Change on the Northern Great Plains, Southwestern Saskatchewan, Canada. *The Holocene* 8(5):503-520.

Lemmen, D. S., R. E. *Vance, I. A. Campbell, P. P. David, D. J. Pennock, D. J. Sauchyn, and S. A. Wolfe, 1998. Geomorphic Systems of the Palliser Triangle, Southern Canadian Prairies: Description and Response to Changing Climate. *Geological Survey of Canada, Bulletin* 521. 72 pp.

*McCarthy, F. M. G., and P. J. Mudie, 1998. Oceanic Pollen Transport and Pollen:Dinocyst Ratios as Markers of Late Cenozoic Sea Level Change and Sediment Transport. *Palaeogeography, Palaeoclimatology, Palaeoecology* 138(104):187-206.

Moser, K. A., J. P. *Smol, D. R. S. Lean, and G. M. MacDonald, 1998. Physical and Chemical Limnology of Northern Boreal Lakes, Wood Buffalo National Park, Northern Alberta and the Northwest Territories, Canada. *Hydrobiologia* 377:25-43.

Smith, M. J., M. G. Pellatt, I. R. Walker, and R. W. *Mathewes, 1998. Postglacial Changes in Chironomid Communities and Inferred Climate Near Treeline at Mount Stoyoma, Cascade Mountains, Southwestern British Columbia, Canada. *Journal of Paleolimnology* 20:277-293.

Stea, R. R., and R. J. *Mott, 1998. Deglaciation of Nova Scotia: Stratigraphy and Chronology of Lake Sediment Cores and Buried Organic Sections. *Géographie physique et Quaternaire* 52(1):3-21.

*Szeicz, J. M., B. A. Zeeb, K. B. Bennett, and J. P. *Smol, 1998. High-resolution Paleoecological Analysis of Recent Disturbance In a Southern Chilean *Nothofagus* forest. *Journal of Paleolimnology* 20:215-252.

Wilkinson, A. N., and J. P. *Smol, 1998. Chrysophycean Stomatocyst Flora from Southcentral Ontario Lakes. *Canadian Journal of Botany* 76:836-862.

*Yansa, Catherine H., 1998. Holocene Paleovegetation and Paleohydrology of a Prairie Pothole in Southern Saskatchewan, Canada. *Journal of Paleolimnology* 19(4):429-441.

* denotes a CAP member

NEW BOOKS

The Dawn of the Quaternary: Proceedings of the SEQS-Euromam symposium, 1996. Edited by T. Van Kolfschoten and P. Gibbard (1998), *Mededelingen Nederlands Instituut voor Toegepaste Geowetenschappen TNO*, 60, 602 p. (ISBN 90-72869-61-3). Soft cover.

The Bisschoppelijk Centrum at Rolduc, near Kerkrade, Netherlands is a modern conference centre tastefully converted from the buildings of an early 10th century former Abbey of Regular Canons of St. Augustine. This historic and picturesque setting was the venue, in 1996, of an international conference on late Pliocene and early Pleistocene environments. The conference drew nearly 100 participants, including many from Russia. "The Dawn of the Quaternary" is the symposium volume for that conference. At 602 pages in length, comprising 36 contributions from 76 authors, it is much longer than originally envisioned. It is to the great credit of its editors that this volume was published at all, let alone just more than two years after the conference, given the recent re-organizations endured by its publisher, the Dutch Geological Survey.

The volume relates to a contentious issue in Plio-Pleistocene geology: where to place the boundary! Although set by international agreement near the top of the Olduvai subchron at about 1.8 Ma (the Vrica section, Italy), there are strong and persistent arguments for returning this boundary to its former placement at 2.55 Ma. This older boundary marks a major global climatic shift from a pre-glacial to glacial world, characterized by higher-amplitude climatic cycles and beginning with an exceptionally cold event recognized globally in the oxygen isotope record. It coincides with a historically important floral break in The Netherlands, a country with a particularly complete sequence of continental and marginal marine deposits bridging this time interval. This floral break is at the base of the Praetiglian pollen stage, where boreal forest passes into tundra-like vegetation at the same time as major glaciation took grip in the North Atlantic. Zagwijn, in the opening paper, discusses the history of research into the famous Dutch clay pits of Tegelen, Belfeld and Reuver, a history which itself is interwoven with that of the Plio-Pleistocene boundary. Zagwijn is clear about his own opinions on the boundary: "if one regards the Pleistocene as the Glacial Epoch ... the base of the Praetiglian is indeed the most natural position for the Plio-Pleistocene boundary. Therefore let us start this discussion all over again!". This is a fitting enough prelude, but the volume is by no means restricted to discussions of boundaries; the climatic and paleo-environmental issues are what really pervade.

Mammal evolution (especially voles, which are very good for age dating over this interval) and palynology are major themes in the volume, along with sedimentology and useful regional overviews. The paucity of dinoflagellate studies (those of eastern England are reviewed and reassessed in the chapter by me) serves only to expose a wide-open research area. This volume will be indispensable to any Quaternary specialist working in Europe, and will be of interest to Quaternary and Pliocene palynologists much further afield. Papers dealing specifically with palynology are listed below.

Zagwijn, W. H. Borders and boundaries: a century of stratigraphical research in the Tegelen - Reuver area of Limburg (The Netherlands), pp. 19-34.

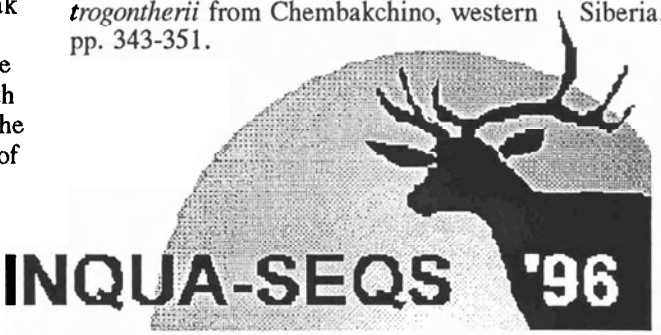
Westerhoff, W. E., P. Cleveringa, T. Meijer, Th. van Kolfschoten, and W. H. Zagwijn. The Lower Pleistocene fluvial (clay) deposits in the Maalbeek pit near Tegelen, The Netherlands, pp. 35-70.

Head, M. J. Marine environmental change in the Pliocene and early Pleistocene of eastern England: the dinoflagellate evidence reviewed, pp. 199-225.

Mayhew, D. F., and P. L. Gibbard. Early Pleistocene small mammal remains and pollen flora from the Crag at Weybourne, Norfolk, England, pp. 263-269.

Iossifova, Yu. I., and V. V. Semenov. Climate-stratigraphy of the Pre-Tiglian–Bavelian analogues in Central Russia (the Don Drainage Basin), pp. 327-338.

Borodin, A., P. Kosintsev, E. Zinoviev, S. Trofimova, and A. Nekrasov. Palaeoecological investigations of the landscape inhabited by the early Middle Pleistocene mammoth *Archidiskodon trogontherii* from Chembakchino, western Siberia, pp. 343-351.



Ravazzi, C., and A. Moscariello. Sedimentation, palaeoenvironmental evolution and time duration of earliest Pleistocene climatic cycles in the 24 - 56 m FM core interval (Leffe Basin, Northern Italy), pp. 467-489.

Meijer, T. References of relevant publications about Pliocene and Early Pleistocene deposits in the Netherlands, pp. 579-601.

Martin J. Head
Department of Geology, University of Toronto
E-mail: head@quartz.geology.utoronto.ca

Seventy million years of vegetation history

I recently received a notice to say that Dr. Alan Graham, a palynologist specializing in the Tertiary (and also my advisor), has just published a book called *Late Cretaceous and Cenozoic History of North American Vegetation (North of Mexico)*.

From the Oxford University Press flyer: "This book is a unique and integrated account of the history of North American vegetation and paleoenvironments over the past 70 million years. It includes discussions of the modern plant communities, causal factors for environmental change, biotic response, and methodologies. The history reveals a North American vegetation that is vast, immensely complex, and dynamic."

Contents: 1) Setting the goal–the modern vegetation of North America; 2) Cause and effect–factors influencing the composition and distribution of North American plant formations through the late Cretaceous and Cenozoic time; 3) Context; 4) Methods, principles, strengths, and limitations; 5) Late Cretaceous through Early Eocene North American vegetational history; 6) Middle Eocene through Early Miocene North American vegetational history; 7) Middle Eocene through Pliocene North American vegetational history; 8) Quaternary North American vegetational history; 9) The origins of North American biogeographic affinities

Publication date: November 1998; 384 pp; 171 illus.; ISBN: 511342-X. Prepublication price is US$68 (reg. US$85) with US$3.50 shipping on the first copy and US$1.50 for each additional. Send orders to: Oxford University Press, Attn: Order Entry Dept, 2001 Evans Road, Cary, North Carolina, NC 27513 USA

Linda C. K. Shane
University of Minnesota
shane002@maroon.tc.umn.edu

palyno bytes

DIGITAL *ATLAS OF COAL GEOLOGY* NOW AVAILABLE

The *Atlas of Coal Geology* (American Association of Petroleum Geologists Studies in Geology #45), a 4-yr publication project of the Energy Minerals Division-AAPG and The Society for Organic Petrology, is available as of the end of November from AAPG. The atlas was compiled by Alex Papp, Jim Hower, and Doug Peters; with Papp and Hower responsible for volumes I and II of the atlas, respectively. This is the first publication by AAPG that is entirely digital, with no associated printed material, and is being produced in CD-ROM format.

The *Atlas of Coal Geology* CD-ROM is designed as a combination reference and learning resource for novice- through expert-level geoscientists in the energy industry and academia. This publication is the first in over 30 years to fully and pictorially cover the topic of coal geology in all its aspects: coal deposition and sedimentary environments, structural geology, coal components, coal petrology, environmental aspects, coal utilization (coal mining and coalbed methane) and more. The Atlas contains over 660 colour (primarily) and black-and-white digital pictures, from various coal basins around the world, pertaining to these many aspects of coal geology. It is a first-rate research and teaching tool!

All text and picture captions on the CD-ROM can be searched by key words or through the Table of Contents. All pictures and text (both background text and captions) are downloadable for reproduction for reference, presentation, and teaching purposes.

Volumes 1 and 2 of the *Atlas of Coal Geology* CD-ROM emphasize coal geology and coal petrology, respectively. The coal geology volume includes 393 images relating to megascopic coal geology,

exploration, mining, and coalbed methane (CBM). The coal petrology volume includes 275 sets of images pertaining to microscopic examination of coals, including macerals and minerals in coals. All pictures are fully captioned. Supporting and background text exceeds the equivalent of 250 printed pages!! Reference lists are included and linked to the Atlas text to allow you to find additional information.

The Atlas contains the following sections:

Volume 1 - Coal Geology: Overview of Coal Exploration; Introduction to Coal Mining; Overview of Coalbed Methane; Coal Depositional Systems; Paleochannel Facies Details; Splits, Partings, Rider Coals, and Subseams; Sedimentary Intrusions; Controls on Mining and CBM Development; Stress Environment; Folds and Inclined Beds; Joints; Cleats; Slickensides in Coal-Bearing Strata; Faults; Igneous Intrusions and Extrusions; Coal Seam Burns; Weathering; Environment and Coal Resource Utilization

Volume 2 - Coal Petrology: An Introduction: Origin of Coal; Macerals; Maceral Analysis; Microlithotypes; Lithotypes; Minerals and Mineral Matter; Coalification; Vitrinite Reflectance; Coal Utilization; Combustion; Metallurgical Coals; International Classification

The Atlas is best used on a Pentium or MMX (IBM-compatible) computer, Windows 95 or newer operating system, with 16 MByte RAM or higher, 4X CD reader, 2 MByte video display card set to 16-bit color ("High Color") or better, and screen resolution (desktop area) of 800 x 600 pixels or better. The Atlas also is compatible with Mac systems.

A sample of the Atlas and order forms soon will be available on the EMD and TSOP web sites (http://www.emdaapg.org or http://www.tsop.org, respectively). Cost: US$39 for AAPG and TSOP members; US$52 for non-members. To request further information on the Atlas or to order it by phone, contact:

Ron Hart, Datapages, Inc.
1743 East 71st Street, Tulsa
Oklahoma, OK 74136, USA
Tel: 918-496-7777, Fax: 918-496-3756
E-mail: rhart@datapages.com

HOW TO COMPUTE AGE-DEPTH RELATIONSHIPS FOR A CORE

In Quaternary pollen analysis, it is common practice to estimate age-depth relationships for a core, based on radiocarbon dates, and use these data in the computation of, for example, pollen accumulation rates (PAR). Recently, there has been considerable discussion on the TILIA-L discussion list about the best method for fitting radiocarbon dates to depths in a core. I tend to agree with the comments made by other researchers that there is no *a priori* 'BEST' method for this. Nonetheless, cores are routinely 'dated.' Some procedures work well with one core and provide unsatisfactory results with another. I have always felt it was a pity to choose a particular fitting method without ever examining other possibilities. That is why I produced a simple computer program that lets one read an ASCII file of the core's dates, plot the points on the screen, and then fit the data with a variety of different assumptions. DEP-AGE.EXE is a DOS program, but it runs well in a DOS window of WINDOWS. It can be picked up from Keith Bennett's INQUA File Boutique (http://www.kv.geo.uu.se/inqua) or from my mirror site at the University of Wisconsin (http://www.geology.wisc.edu/~maher/inqua.html).

Download a copy of DEP-AGEZ.EXE, a self-extracting zipped version of the program DEP-AGE.EXE. It is designed to facilitate the conversion of core depths (cm) into estimates of their equivalent age in C-14 years. (It fits by linear segments, cubic splines, exponential functions, power functions, and by best-fit polynomials of orders 1, 2, 3, ...) You can save the resulting data and formulae so that they can be used elsewhere.

Many people routinely use TILIA and TILIA.GRAPH for computations on their raw pollen data and to display the results as a pollen diagram. There was some interest in whether the results obtained with DEP-AGE could be imported into TILIA's spreadsheet and used in the construction of the final diagram. I have now modified DEP-AGE (Version 3.9) to allow that transfer.

TILIA allows you to export your data as a WISCONSIN format data file (TILIA menu item D, F). The WISCONSIN format uses the name extension '.RAW' (e.g, BLUELAKE.RAW). Put that file in the directory with DEP-AGE before running DEP-AGE. Then run DEP-AGE with the BLUELAKE.C14 file for your site, select your favoured rate model, and save it as BLUELAKE.RAT. Return to DEP-AGE's main menu, and choose item 3. Item 3 allows you to try a few values to test the general results of the function. Pressing "enter" or "carriage return" without specifying a depth, gets you back to the initial menu, but you are first given the opportunity of exporting the results to TILIA.

DEP-AGE will load the BLUELAKE.RAW file and change it by appending each level's age (yr) and its apparent sedimentation rate (cm/yr). For purposes of documentation, the RATe file (BLUELAKE.RAT) on which those dates were based is appended to the end of the *.RAW file. The file is then saved with either the same or a new name. The revised *.RAW file can then be imported back into TILIA (menu item C, F) and used in that program.

DEP-AGEZ.EXE includes sample files, and a short article expressing my philosophy on the subject... free! The revised DEP-AGE.EXE (version 3.9) is now available on Keith Bennett's INQUA File Boutique (http:// www.kv.geo.uu.se/inqua) and my mirror site at: http://www.geology.wisc.edu/ ~maher/inqua

Louis J. Maher
Geology & Geophysics
University of Wisconsin - Madison
Madison, Wisconsin, WI 53706, USA
Tel: (608) 262-9595, Fax: (608) 262-0693
E-mail: maher@geology.wisc.edu

Lacourse, Terri, 1998. *Late Quaternary Vegetation History of Sulphur Lake, Southwest Yukon Territory, Canada*. M.A. Thesis, University of Ottawa, Ontario, Canada. 59 pages. Supervisors: Konrad Gajewski, P. G. Johnson, and Robert J. Mott.

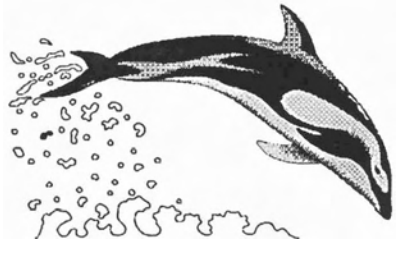
Paleoecological studies based on the analysis of pollen in lake sediments offer the potential for high resolution and well-dated independent records of past vegetation and climate. Sulphur Lake, located in the southwest Yukon (60°95N, 137°95W; 847 m), was chosen for a paleoecological study to explore post-glacial vegetation dynamics in this region of the boreal forest. A 5 m sediment core was raised from the deepest section of Sulphur Lake using a modified Livingstone piston corer. The sequence spans the full postglacial and reveals significant late glacial and Holocene vegetation changes that provide new information on the regional paleoecological history of the southwest Yukon. The pollen spectra indicate that between approximately 12,000 and 11,250 yr BP, the vegetation was an open alpine tundra marked by the presence of *Artemisia*. The vegetation then progressed from an open birch shrub tundra to a poplar woodland at 10,250 yr BP. *Juniperus* populations expanded at 9500 yr BP and by 8400 yr BP, spruce invaded the region. The relatively closed white spruce forest that occupies the region today was established by approximately 8000 yr BP. *Alnus crispa* increased at 6000 yr BP, however the increase in *Picea mariana* found at this time at most sites in the Yukon was not present at Sulphur Lake. Black spruce was not a dominant component of the vegetation in the Shakwak Trench as it was to the immediate southeast. The basal radiocarbon date demonstrates that the chronology of regional deglaciation needs to be more firmly established.

PALYNO-LIT

In the sea there are mysterious comings and goings, both in space and time: the movements of migratory species, the strange phenomenon of succession by which, in one and the same area, one species appears in profusion, flourishes for a time, and then dies out, only to have its place taken by another and then another, like actors in a pageant passing before our eyes. And there are other mysteries. The phenomenon of "red tides" has been known from early days, recurring again and again down to the present time - a phenomenon in which the sea becomes discoloured because of the extra-ordinary multiplication of some minute form, often a dinoflagellate, and in which there are disastrous side effects in the shape of mass mortalities among fish and some of the invertebrates. Then there is the problem of curious and seemingly erratic movements of fish, into or away from certain areas, often with sharp economic consequences. ...

In the discovery of the biological role played by the sea water and all it contains, we may be about to reach an understanding of these old mysteries. For now it is clear that in the sea nothing lives to itself. The very water is altered, in its chemical nature and in its capacity for influencing life processes, by the fact that certain forms have lived within it and have passed on to it new substances capable of inducing far-reaching effects. So the present is linked with the past and future, and each living thing with all that surrounds it.

From *The Edge of the Sea* by Rachel Carson (1952). A suitable quotation perhaps in view of the following announcement!



Announcements

RESEARCH OPPORTUNITY FOR M.SC. AND/OR PH.D. STUDENTS

I have received major funding for a NSERC strategic grant research project entitled "Long-term variability in pelagic fish abundance and oceanographic conditions on the British Columbia shelf: implications for strategic fisheries planning". This multidisciplinary project will involve researchers from 9 institutions in the US and Canada and will be carried out over the next three years. The inter-disciplinary nature of the project will also provide an excellent opportunity for students to study aspects of this important problem from a number of perspectives. I am specifically seeking students interested in utilizing foraminifera, or similar micropaleontological proxies, as their primary research focus. These positions will be fully funded.

Project Summary:

Information on the natural variability of marine fish abundance and its relationship to fish production and oceanographic and climatic conditions is urgently needed. The highly publicized recent Pacific salmon crisis off British Columbia and Washington State, and particularly the economically disastrous collapse of the Atlantic cod fishery were at least partially the result of ocean/atmospheric impacts, and clearly illustrate why an understanding of these processes is strategically important. Effingham Inlet on the west coast of Vancouver Island has a well-preserved sedimentary record of fish scale deposition that will help us to develop a long-term history of economically important pelagic fish populations (Pacific anchovy, Pacific herring, Pacific hake, Pacific sardine, and Pacific mackerel). To distinguish local and regional paleoceanographic phenomena results from Muchalat Inlet, on the central west coast of Vancouver Island,

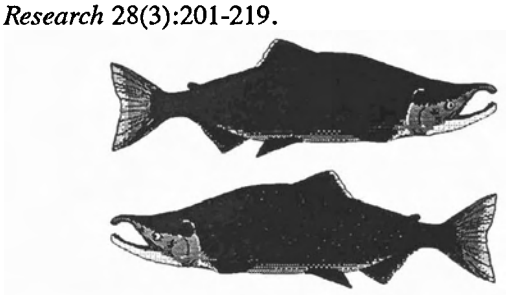
and Smith Inlet, opening into Queen Charlotte Sound, as well as other sites, will also be analyzed.

This record is critical to understanding and quantifying the large-scale fluctuations of fish populations inferred from the recent history of these fisheries along the west coast of North America. In conjunction with our international collaborators, we will develop an integrated history of the space-time variability of these fish populations in the North American Upwelling Zone over the past 5000 years. We will document large-scale climate and oceanographic changes based on sediment geochemical analysis and fossil materials (e.g., dinoflagellates, foraminifera, diatoms) embedded in the same sedimentary matrix as the fish scales. This will enable us to relate the fish population histories to climate-scale oceanographic changes. The results of our research will thus define the dominant forcing functions and scales of temporal variability in the coastal ocean and help the fishing industry to best utilize their resources to respond to natural variations in fish stocks that are not solely the result of fishing pressures.

Dr R. Timothy Patterson
Ottawa-Carleton Geoscience Center
and Department of Earth Sciences
College of Natural Sciences, Carleton University
1125 Colonel By Drive
Ottawa, Ontario, K1S 5B6, Canada
Tel: (613) 520-2600 X 4425, Fax: 613-520-4490
E-mail: tpatters@ccs.carleton.ca
WWW: http://www/carleton.ca/~tpatters

Recent reference

Blais-Stevens, A., and R. T. Patterson, 1998. Environmental indicator potential of Foraminifera from Saanich Inlet, Vancouver Island, British Columbia, Canada. *Journal of Foraminiferal Research* 28(3):201-219.



RESEARCH GRANTS

I am pleased to announce that The Paleobiological Fund's Student Research Grant Program has begun its 1999 grant cycle and is currently accepting student research grant proposals. Please visit the Fund's web page for more information or feel free to contact me directly. The Fund's address is 6809 Crossman Street, Annandale, Virginia 22003, USA. The Paleobiological Fund's web page address is: http://members.aol.com/cpaleo

Curtis Bentley
Cpaleo@aol.com

MESOZOIC-CENOZOIC DINOFLAGELLATE CYST COURSE, URBINO, ITALY

May 17-22, 1999

Conducted by Graham L. Williams (AGC), Jonathan P. Bujak (LEXIS) and Henk Brinkhuis (LPP, Utrecht University). Local coordinator: Prof Dr Rodolfo Coccioni, University of Urbino

A general course on aspects of Mesozoic-Cenozoic dinoflagellate cyst bio- and ecostratigraphy will be held at the premises of the University of Urbino, Italy, between May 17 through 22, 1999. Information on morphology, taxonomy and stratigraphic ranges of ca. 600 selected species will be provided, besides presentations on applications of quantitative dinocyst analysis in terms of reconstructions of paleoenvironment and paleoclimate. Case histories of reconstructions of e.g. third order sea level cycles and orbital forcing will be presented. Participants will be provided with a detailed manual, besides a CD-ROM with illustrations of key-taxa. A mid-week excursion is planned, with visits to Jurassic, Cretaceous and Tertiary outcrops, including for example, the Cenomanian/Turonian, Cretaceous/Tertiary, Eocene/Oligocene and Oligocene/Miocene boundaries. Fees include the manual, CD-ROM and excursion, and are set at: industrial staff US$ 550, academic staff US$ 350, and PhD/MSc students US$ 200.

Lodging can be arranged in a variety of hotels in the famous medieval city of Urbino, and if budget requires, on the nearby Urbino Campsite for students. Associated lodging and travel costs are at participant's expense.

The minimum number of participants is set at 15, the maximum at 40. Registration and money-transfer deadline is set at April 1, 1999. Money should be transferred to the account of the LPP Foundation: ABN/AMRO bank 46.50.04.512, indicating Urbino Dinocourse 1999. LPP's VAT/BTW no. is NL 89.58.427.B.01

Don't hesitate.... Reserve your seat now! If interested, please send queries, and/or your personal information, including your affiliation (company or academic institution) to:

Henk Brinkhuis
Laboratory of Palaeobotany and Palynology
Utrecht University
Budapestlaan 4, 3584 CD Utrecht, The Netherlands
Tel +31.30.2537691, Fax +31.30.2535096
E-mail: H.Brinkhuis@bio.uu.nl

SPECIAL PERSONAL SUBSCRIPTION OFFER FOR THE *JOURNAL OF PALEOLIMNOLOGY* (JOPL)

The *Journal of Paleolimnology* (JOPL) is an international journal, covering all aspects of paleo-environmental work dealing with lake and river sediments. Wetland, peatland, and estuary systems are also eligible for publication. Currently, JOPL publishes two volumes a year, of four issues each. There are no page charges, and lead authors receive 50 reprints free of charge.

Once again this year, Kluwer Academic Publishers is letting the editors of JOPL to offer a much reduced personal subscription rate. In 1999, JOPL will publish volumes 21 and 22, each containing 4 issues. The special rate to obtain both volumes next year is $120.00 US (postage and handling included, VAT extra if applicable). If you are interested in this offer, please contact John Smol (smolj@biology.queensu.ca) for details, or check the JOPL WWW site at: http://www.umanitoba.ca/geoscience/paleolim/jopl.html

COURSES AVAILABLE IN UK

(I) **Introduction to Ostracod Analysis** (Dr J. Holmes, Kingston University) Course dates: 22nd - 24th February 1999, Course Fees: £180

Ostracods are small aquatic bivalved crustaceans with calcite shells that are often preserved well in Quaternary sediments. The aim of this 3 day course is to provide participants with a theoretical and practical understanding of the role of ostracods in Quaternary palaeoenvironmental reconstruction. Particular emphasis is placed on non-marine ostracods and their application to Quaternary palaeolimnology.

(ii) **Introduction to Benthic Foraminifera Analysis** (Dr M. Kaminski) Course dates: 25th - 26th February 1999, Course Fees: £120

Foraminifera are among the most abundant and widely distributed microfossils in Cenozoic marine sediments, and are found in environments ranging from the high marshes to the deep ocean. Quantitative analysis of planktonic and benthic foraminifera is a useful tool in many branches of marine science, particularly important for biostratigraphy and interpreting past environments. The aim of the course is to provide a primer on the study of planktonic and benthic foraminifera, and to give examples of how foraminifera can be used as palaeoceanographic/palaeoenvironmetal tools.

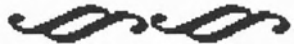
(iii) **Introduction to Dendrochronology and Dendroclimatology** February 18th - 19th 1999
Dr M. C. Bridge (Institute of Archaeology)

Tree-ring dating of standing buildings, archaeological timbers, and landscape events (floods, fires, earthquakes, volcanic eruptions etc.) has become a widely used technique, giving far greater dating resolution

than just about any other. It is important however that those who wish to use this methodology understand both its strengths and limitations. Similarly, tree-ring characteristics (width, density, chemical composition) are extensively used as proxy data sets for reconstructing past environmental conditions at a range of temporal and spatial scales. The aim of this course will be explain the basic techniques commonly used, discuss their limitations, and explore the wealth of information which has been, and may be, derived from tree-rings.

For more details or to register for these courses, please contact:

Catherine Dalton
Environmental Change Research Centre
University College London
26 Bedford Way, London WC1H OAP UK
Tel: 44 (0)171 380 7575, Fax: 44 (0)171 380 7565
E-mail: cdalton@geog.ucl.ac.uk
http://www.geog.ucl.ac.uk/ecrc/ teaching.htm



THE SOCIETY FOR ORGANIC PETROLOGY STARTS STUDENT GRANTS PROGRAM

The Society for Organic Petrology (TSOP) is pleased to announce the inauguration of its Student Grants program. Monetary awards up to a maximum of US$1,000 will be granted to qualified masters or doctoral candidates who demonstrate the application of organic petrological concepts to research problems.

The purpose of the Student Grants program is to foster research in organic petrology, which includes coal petrology, kerogen petrology, organic geochemistry and related discipline, by providing support to graduate students from around the world. Factors to be weighed in the selection of successful applicants include: qualifications of the applicant as indicated by past performance, originality and research potential of the proposed project, support of the department in which the work is being done, and perceived significance of the project to organic petrology.

The grant program will be initiated with a maximum of two grants each year of up to US$1,000 each. Grants are to be applied to expenses directly related to the student's thesis work, such as summer fieldwork, laboratory analyses, etc. A portion (not to exceed 25%) of the funds may be used to attend TSOP Annual Meetings. Funds should not be used to purchase capital equipment, to pay salaries, tuition, room, or board during the school year. At the conclusion of the research project, the awardees are required to publish an extended abstract in the *TSOP Newsletter* and will be encouraged to present their results at the TSOP Annual Meeting. The TSOP Grant Program focuses on support of qualified candidates for masters or equivalent degrees. Qualified doctoral candidates with expenses beyond the usual scope of funding by other agencies are also encouraged to apply.

The Society for Organic Petrology was founded in 1984. TSOP is an Associated Society of the American Association of Petroleum Geologists (AAPG) and a member society of the American Geological Institute (AGI).

Applications are due by March 31, 1999. Applications and information are available at the TSOP webpage (www.tsop.org) or by contacting:

TSOP Research Committee Student Grants Program
c/o C. L. Thompson-Rizer, Chairperson
Conoco Inc. PR 3072, P. O. Box 2197
Houston, Texas, TX 77252-2197, USA
Tel: 281-293-3160, Fax: 281-293-3833
E-mail: carolyn.thompson-rizer@usa.conoco.com

IMMINENT AREA CODE CHANGES

If you have correspondents or colleagues in northern Alberta, especially the Edmonton area, please be aware that the area code for telephone and fax numbers will be changing at the end of January 1999 from 403 to **780**. Please update your address books accordingly. Calgary numbers will be unaffected; their area code will remain 403.

Postdoctoral Fellowship in PALEOECOLOGY/PALEOLIMNOLOGY: IMPACTS OF CLIMATE CHANGE ON LAKE-LAND INTERACTIONS IN NORTHERN SWEDEN

We are recruiting a **Postdoctoral Researcher** to join our multidisciplinary paleoecology program based at the Climate Impacts Research Centre (CIRC) in Abisko, Sweden, and administered by the Dept. of Environmental Health, Umeå University. The successful candidate will undertake research to assess how past changes in climate and terrestrial vegetation during the Holocene regulate lake ecosystems in the subarctic region of northern Sweden. Ideally, the person should be interested to undertake analyses of chironomids (to infer past summer air temperatures, benthic conditions) and plant macrofossils (to reconstruct past catchment vegetation) in sediment cores from selected lakes along steep eco-climatic gradients. These analyses will complement ongoing studies that examine diatoms (to quantify DOC, pH and summer air temp.) and fossil pigments (to estimate algal production and UV radiation flux - collaboration with Dr Leavitt, University of Regina, Canada) from the same sediment cores, as well as chironomids in other cores. Quantitative reconstructions will be based on transfer functions that we are currently developing from a 100-lake training set.

The north of Sweden contains extensive wilderness areas with varied landscapes ranging from lowland conifer forests to glaciated mountains, and an abundance of rivers and lakes. Steep climatic and ecotonal boundaries exist in close proximity, and human impacts on the area are less than in many places elsewhere. As a consequence, it is possible to observe basic relationships between climatic and ecological processes.

The position is financed by a Postdoctoral Exchange Fellowship from the Swedish Natural Science Research Council (NFR; www.nfr.se). Funding is available for one year, with opportunities for continuation. Candidates must have completed a PhD degree within the past 3 years at an institution other than Umeå University. The stipend is tax-free and depends on your age and family situation. For example, someone from Europe who is < 30 yr old receives 212,000 SEK (US$ ~27,200), whereas a person >30 yr receives 250,000 SEK (US$ ~32,000) per year. Those from outside Europe (i.e., N. America, etc.) would receive extra funds to help defray travel costs. An additional 34,700 SEK (US$ ~4,400) is provided for each family member.

The successful candidate will work with the Paleoecology Lab at CIRC (www.ans.kiruna.se/~circ), located at the Abisko Scientific Research Centre (www.ans.kiruna.se) in the town of Abisko. The position is administered by Umeå University, and you will also interact with members of Professor Ingemar Renberg's lab at the Dept. of Environmental Health (www.mhs.umu.se/forskning/ECAG.htm). The town of Abisko is situated 200 km north of the Arctic Circle in a beautiful setting in northern Sweden. Abisko is 100 km from the main centre of Kiruna (to the east in Sweden) and 90 km from the town of Narvik and beautiful fjords of northern Norway. There is a 100-yr tradition of scientific activity in the region. CIRC is currently financed with a 5-year grant from European Union structural funds and Swedish regional funds (aimed to improve regional development through research and education). The research is linked to the multidisciplinary activity of the Environment and Space Research Institute (MRI). A stimulating, cross-disciplinary environment exists with other research teams in Aquatic Ecology, Terrestrial Ecology, Dendrochronology, Remote Sensing, Glaciology, Meteorology, and GIS.

We seek a self-motivated person who is willing to join a team of researchers to assess the impacts of past climatic and vegetational changes on lake ecosystems. Preference will be given to those with good knowledge of quantitative methods in paleoecology (e.g., multivariate statistics and transfer functions), expertise in analysis of plant macrofossils and/or chironomids, and a proven ability to publish in peer-reviewed journals. Those with expertise in other paleoecological methods (e.g., diatoms, geochemical methods, etc.) are also encouraged to apply. A demonstrated ability to successfully compete for research funds is an advantage. Ideally, candidates should be available by March 1999, or sooner if possible.

To apply, please send your application not later than 25 January 1999, with a Curriculum Vitae, list of publications, description of relevant experience, and names and addresses (including fax and email) of at least 2 references to: Dr Roland Hall, CIRC, Abisko Scientific Research Centre, Box 62, S-981 07 Abisko, Sweden. Tel. +46 980-40009; Fax +46

980-40171; E-mail: Roland.Hall@ans.kiruna.se. For more information, please contact Dr Hall or Prof. Ingemar Renberg, Dept. of Environmental Health, Umea University, S-901 87 Umea, Sweden. Tel. +46 90-786-6029; Fax +46 90-786-6705; E-mail: Ingemar.Renberg@mhs.umu.se

CHANGE OF ADDRESS

I have recently moved to Edmonton to work with Ian Campbell (Canadian Forest Service) and Dale Vitt (University of Alberta). Currently, I am working on a peatland modelling project. Colleagues, please update your address books as shown below:

Zicheng Yu
Canadian Forest Service - NRCan, 5320 - 122 Street
Edmonton, Alberta T6H 3S5, Canada
Tel: (403) 435-7304, Fax: (403) 435-7359
E-mail: zyu@nrcan.gc.ca

REQUEST FOR POLLEN SLIDES

I am putting together a paleoecology lab for a General Ecology course at UNC-Wilmington for spring 1999. For this lab, I would like the students to examine a variety of well-preserved pollen grains under the microscope. Not being a palynologist, I'd appreciate receiving used slides that otherwise would be discarded that I could use in this lab. Although slides with pollen grains of species found in the eastern U.S. are preferred, I will take slides with pollen from anywhere in the world. In addition, samples of all ages are welcome. If you have slides that you would like to donate for this course, please send them to the address below. Thank you for your help.

Steve Emslie
Department of Biological Sciences
University of North Carolina
Wilmington, North Carolina, NC 28403, USA
E-mail: emslies@uncwil.edu

POLLEN AND CHARCOAL ANALYSIS SERVICE

I offer my services in counting pollen and spores (500 pollen grains/sample) to any palynologist, geologist or ecologist who has samples to be counted but does not have the time or personnel to effectively count their samples. Services offered include sample processing (if necessary), sample counting, and the preparation of a pollen diagram and report.

I specialize in North American pollen, with a specialization in pine pollen (*Pinus banksiana*, *Pinus resinosa*, *Pinus strobus*). I can also identify pollen from any part of North America and Europe.

I learned the technique of pollen analysis under the supervision of Dr Pierre Richard at the University of Montreal. I spent a few months (9) in Sweden learning the technique with Dr Marie-Josée Gaillard, under the supervision of Dr Bjorn Berglund. I have also worked in Sweden with Dr Richard Bradshaw at the Southern Swedish Forest Centre in Alnarp. A year ago, I moved to Edmonton to finish my PhD under the supervision of Dr Ian Campbell at the Canadian Forest Service. My PhD subject is looking at the effect of disturbance (mainly fire) on the distribution of boreal species. My supervisor is Dr Yves Bergeron at the Université du Québec à Montréal.

For further information or to arrange a contract for such work, please contact:

Isabelle Larocque
10359-93rd Street
Edmonton, Alberta, T5H 1X2, Canada
Tel: (403) 423-0548, E-mail: d301534@er.uqam.ca

BACK ISSUES OF *CAP NEWSLETTER* AVAILABLE

Are you missing a few recent issues of the *CAP Newsletter*? I know you'd all like to have a complete set of the newsletters adorning your bookshelves! To help fill in those gaps, I have copies of back issues of the *CAP Newsletter* available as follows:

Vol 20 No 2 (Dec 97), Vol 20 No 1 (May 97), Vol 19 No 2 (Dec 96), Vol 18 No 3 (Dec 95), Vol 18 No 2 (Oct 95 - AASP 95 Special Issue), Vol 18 No 1 (May 95), Vol 17 No 1 (May 94), Vol 16 No 2 (Dec 93), Vol 16 No 1 (May 93), Vol 15 No 2 (Dec 92), Vol 13 No 2 (Dec 90), Vol 11 No 2 (Dec 88), Vol 11 No 1 (May 88), Vol 10 No 2 (Dec 87), Vol 10 No 1 (May 87), Vol 9 No 2 (Dec 86), Vol 9 No 1 (May 86)

Anyone wanting copies of any of these back issues, please contact me, specifying issues required, and I will send them along to you.

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

DEADLINES

Please submit items for the next issue of the *CAP Newsletter* (Volume 22, Number 1, May 1999) by **April 15 1999**. Conference reports, announcements, field trip reports, notices of new books, book reviews, news, and essays on topics relevant to Canadian palynology are all welcome. Submissions by disk or e-mail are preferred. 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. Pending the appointment of a new editor for the *CAP Newsletter*, please send material for the next issue to:

Dr Rob Fensome, CAP President
Geological Survey of Canada - Atlantic
P.O. Box 1006, Dartmouth
Nova Scotia, B2Y 4A2, Canada
Tel: (902) 426-8513, Fax: (902) 426-7827
E-mail: fensome@agc.bio.ns.ca

Meeting calendar

1999

January 18 1999. **Workshop on Decoding Canada's Environmental Past: Adaptation Lessons Based on Changing Trends and Extremes in Climate and Biodiversity**. Victoria, British Columbia, Canada. Details: Don C. MacIver, Atmospheric Environment Service, Environment Canada, 4905 Dufferin Street, Downsview, Ontario, M3H 5T4, Canada, Tel: (416) 739-4391, Fax: (416) 739-4882, E-mail: don.maciver@ec.gc.ca

March 1-3 1999. **Thirteenth Annual Conference and Workshops on Applied Geologic Remote Sensing**. Vancouver, British Columbia, Canada. Details: EI/Geologic Conference, P.O. Box 134008, Ann Arbor, Michigan, MI 48113-4008, USA, Tel: (734) 994-1200 X3234, Fax: (734) 994-5123, E-mail: wallman@erim-int.com Website: http://www.erim-int.com/CONF/GRS.html

March 11-13 1999. **The Western Division, Canadian Association of Geographers Annual Meeting**. Kelowna, British Columbia, Canada. Details at conference website: http://www.geog.ouc.bc.ca/wcag/info.html. Ian Walker will be organising a special symposium on Late-Quaternary Palaeoecology and Palaeoclimatology. The symposium will focus principally on palaeoecological evidence of climatic changes in two broad areas: 1) western Canada and the northwestern U.S., and/or 2) arctic and alpine treelines. If you are interested in participating, please send Ian a note together with a tentative title, at your earliest convenience. Details: Ian R. Walker, Department of Biology, North Kelowna Campus, Okanagan University College, 3333 College Way, Kelowna, British Columbia, V1V 1V7, Canada, E-mail: iwalker@okanagan.bc.ca

March 28 - April 1 1999. **European Union of Geosciences Meeting (EUG 10)**. Details from conference website: http://eost.u-strasbg.fr/EUG/symposia.html

May 10-14 1999. **AQQUA Annual Meeting** University of Ottawa, during the 67e Congrès de l'ACFAS. Details: http://office.geog.uvic.ca/dept/cgrg/bulletin.htm

May 17-22 1999. **Mesozoic-Cenozoic Dinoflagellate Cyst Course.** Urbino, Italy. Details: Henk Brinkhuis, Laboratory of Palaeobotany and Palynology, Utrecht University, Budapestlaan 4, 3584 CD Utrecht, The Netherlands, Tel +31.30.2537691, Fax +31.30.2535096, E-mail: H.Brinkhuis@bio.uu.nl. See p. 30

May 26-28 1999. **GAC/MAC Joint Annual Meeting.** Laurentian University, Sudbury, Ontario.

Details: P. Copper, Department of Earth Sciences, Laurentian University, Sudbury, Ontario, P3E 2C6, Canada. Tel: (705) 6675-1151, X2267, Fax: (705) 675-4898, E-mail: gacmac99@ nickel.laurentian.ca Website: http://www.laurentian.ca/www/geology/gacmac99.htm

June 1-5 1999. **Canadian Association of Geographers (CAG) Annual General Meeting.** Lethbridge, Alberta, Canada. Details: Dr. Robert Rogerson, Local Arrangements Committee Chair, E-mail: rogerson@hg.uleth.ca

June 14-18 1999. **Canadian Society of Petroleum Geologists (CSPG) and Petroleum Society Joint Convention.** Theme: "Digging Deeper: Finding a Better Bottom Line". Calgary, Alberta. Details: John L. Chipperfield, Tel: (403) 294-5540, Fax: (403) 294-5580, E-mail: john.chipperfield@sproule.com Website: http://www.cspg.org/index.html

August 3-11 1999. **XV INQUA Congress.** Durban, South Africa. Theme: "The Environmental Background to Hominid Evolution in Africa". XV INQUA Congress details: Dr. D. M. Avery, Secretary-General, South African Museum, P.O. Box 61, Cape Town 8000, South Africa. Tel: +27-21-243330, Fax: +27-21-246716, E-mail: mavery@samuseum.ca.za See also http://inqua.nlh.no/congress/congress.html

The Congress may include the following proposed sessions which may be of interest to palynologists:

Commission on Palaeoclimate: Working group on Milankovitch and Plio-Pleistocene vegetation succession from 2.6 to 0.9 Ma. Details: Dr Suzanne A. G. Leroy, Centre for Palaeoecology, School of Geosciences, Queen's University Belfast, Belfast BT7 1NN, N. Ireland. Tel: +44-1232-335 143 and 273 978, Fax: +44-1232-321 280, E-mail: s.leroy@qub.ac.uk Websites: http://www.qub.ac.uk/geosci/admin/staff/leroy.html and commission of palaeoclimate website: http://inqua.nlh.no/comm/palclim.html

Quaternary and Holocene sedimentary records in Central Africa and their palaeoenvironmental interpretation. Details: Dr Juergen Runge, Physical Geography, University of Paderborn, Germany, E-mail: arung1@hrz.uni-paderborn.de, and Dr Daniel Olago, IGBP-START Office, Nairobi, Kenya, E-mail: pagesnbo@form-net.com

Carbon Cycle Changes: Peak Glacial Versus Interglacial Conditions - INQUA Commission On Carbon/IGCP-404 Details: Jonathan Adams (jonathan@elvis.esd.ornl.gov) or Hugues Faure (faure@luminy.univ-mrs.fr).

Modern Pollen Records And Their Use In Interpreting Past Tree-Lines And Past Climate. Details: Sheila Hicks (Oulu, Finland, sheila.hicks@oulu.fi) and Heather Tinsley (Bristol, UK, R.C.Tinsley@Bristol.ac.uk)

August 17-21 1999: **9th Canadian Paleontology Conference.** Calgary, Alberta. In association with the International Conference on the Carboniferous and Permian systems and the Pander Society. Details:

Charles Henderson, Department of Geology and Geophysics, University of Calgary, Calgary, Alberta, T2N 1N4, Canada. Tel: (403) 220-6170, E-mail: henderson@geo.ucalgary.ca

August 20-29 1999. **CANQUA Meeting**. Calgary, Alberta, Canada. Technical and poster sessions August 23-26, Field trips August 20-22, and August 27-29. Details: Dr Derald G. Smith, CANQUA Conference Chair, Department of Geography, University of Calgary, Calgary, Alberta, T2N 1N4, Canada, Tel: (403) 220-6191, Fax: (403) 282-6561, E-mail: dgsmith@acs.ucalgary.ca Conference website: http://pc56.ss.ucalgary.ca/

September 26-30 1999. **The Society for Organic Petrology (TSOP), 16th Annual Meeting**. Salt Lake City (Snowbird Resort), Utah, USA. Details: Jeff Quick, Utah Geological Survey, 1594 West North Temple, Suite 3110, Salt Lake City, Utah 84114-6100 USA, Tel: (801) 537-3372, Fax: (801) 537-3400, E-mail: nrugs.jquick@state.ut.us Website: http://www.tsop.org

October 25-28. **Geological Society of America, Annual Meeting**. Denver, Colorado, U.S.A. Details: GSA HQ, Box 9140, 3300 Penrose Place, Boulder, Colorado 80301, U.S.A. Tel: (303) 447-2020, X133, E-mail: meetings@geosociety.org

2000

May 29-June 2 2000: **GEOCANADA 2000**. Joint meeting of Canada's major geoscience societies, including the Geological Association of Canada (GAC), the Mineralogical Association of Canada (MAC), the Canadian Society of Petroleum Geologists (CSPG), the Canadian Society of Exploration Geophysicists (CSEG), the Canadian Well Logging Society (COOLS) and others. University of Calgary, Alberta. Details: Dr Grant Mossop, Geological Survey of Canada, 3303-33rd Street N.W., Calgary, Alberta, T2L 2A7, Canada. Tel: (403) 292-7049, Fax: (403) 292-5377, E-mail: mossop@gsc.nrcan.gc.ca

June 24-30 2000. **10th International Palynological Congress (IPC)**. Nanjing, China. Details: Secretary of the Organizing Committee for 10th International Palynological Conference, Nanjing Institute of Geology and Palaeontology, Academia Sinica, 39 East Beijing Road, Nanjing, 210008, People's Republic of China. Electronic version of first circular, with registration form, available at: http://members.spree.com/sip/spore/index.htm Information on International Palynological Congresses is available at http://geo.arizona.edu/palynology/ifps.html

July 30 - August 3 2000. **Sixth Quadrennial Conference of the International Organization of Paleobotany (IOPC IV - 2000)**. Qinhuangdao, Hebei, China. Details: Prof. Lujun Liu, Secretary-General of IOPC-VI Organizing Committee, Nanjing Institute of Geology and Palaeontology, Academia Sinica, 39 East Beijing Road, Nanjing 210008, PR China, Tel.: +86-25-6637 208, Fax: +86-25-3357 026, E-mail: paleobot@public1.ptt.js.cn

August 6-17 2000: **31st International Geological Congress**. Rio de Janeiro, Brazil. Theme: "Geology and Sustainable Development: Challenges for the Third Millennium".

Details: Secretariat Bureau, Av. Pasteur, 404 - Casa Brazil 2000 - Urca, Rio de Janeiro - RJ - Brazil, CEP 22.290-240. Tel: 55 21 295 5847, Fax: 55 21 295 8094, E-mail: 31igc@31igc.org, Website: http://www.31igc.org

November 13-16 2000. **Geological Society of America, Annual Meeting**. Reno, Nevada, U.S.A. Details: GSA HQ, Box 9140, 3300 Penrose Place, Boulder, Colorado 80301, U.S.A. Tel: (303) 447-2020, X133, E-mail: meetings@geosociety.org

More conference information, together with other material relevant to Canadian palynology, can be found on CAP's website at http://www.ualberta.ca/~abeaudoi/ cap/cap.htm

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. Catharines, 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:_____