Canadian Association of Palynologists
Association Canadienne des Palynologues

NEWSLETTER

Volume 19 Number 2 December 1996

Season's Greetings!

This Newsletter reports several milestones in the life of CAP. There are two highly significant changes in the Executive. After almost a decade as Secretary/Treasurer, Martin Head is stepping down and, after eight years as CAP's representative to IFPS, David Jarzen has handed on the baton to Julian Szeicz. Both Martin and David deserve a huge vote of thanks from CAP for their contributions to the smooth running of the organization, and not least for their many contributions to the *CAP Newsletter*! David and Susan Jarzen are also moving to Florida to take up new jobs and I take this opportunity to wish them well. I am sure CAP members will join with me in welcoming two new members to the CAP Executive: Julian Szeicz, CAP's representative to IFPS, and Francine McCarthy, who takes over as CAP Secretary/ Treasurer.

At page 24 in this issue another important (at least, in my mind) milestone will be passed: 500 pages of the *CAP Newsletter* since I took over as editor at the beginning of 1989. Looking back over the last eight years and seventeen issues it is difficult to assimilate the impact that technological changes, especially e-mail and the explosive development of the WWW and CD-ROM technology, have had on the broadcasting and transmission of information and production of the Newsletter. These changes have, of course, affected all branches of scholarly endeavour, not just palynology. But we can clearly see both ends of this spectrum illustrated in articles in this issue, by Linda Shane and John Matthews. Linda Shane's essay on Paul Sears and his influence on North American palynology, notably through his editorship of the *Pollen and Spore Circular*, highlights the important role that informal communication through Newsletters has had on the trajectory of science. The *CAP Newsletter* is, therefore, the heir to a long and honourable tradition and is, I trust, continuing it. John Matthews' article on the cutting-edge CD-ROM technology for information presentation vividly demonstrates the power and potential of this new method. With its ability to combine verbal

OUTGOING CAP EXECUTIVE 1995-1996

Ian Campbell	President
Rob Fensome	President-Elect
Martin Head	Secretary/Treasurer
Alwynne Beaudoin	Newsletter Editor
David Jarzen/ Julian Szeicz	CAP Councillor to IFPS

INCOMING CAP EXECUTIVE 1997-1998

Ian Campbell	President
Rob Fensome	President-Elect
Francine McCarthy	Secretary/Treasurer
Alwynne Beaudoin	Newsletter Editor
Julian Szeicz	CAP Councillor to IFPS

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descriptions with different types of imagery in a flexible format, this approach is likely to be extremely useful in palynology, which is a discipline that relies heavily on visual discrimination and pattern recognition.

Besides these two fascinating articles and much other interesting material, this issue also contains news of kudos gained by CAP members John Smol, Graham Williams, and Pierre Richard. For a comparatively small organization, CAP certainly has a great number of distinguished scientists! On behalf of CAP, I congratulate these scholars on their achievements.

I extend thanks to Ian Campbell and the Canadian Forest Service for assistance with mailing this *CAP Newsletter*. Many thanks to the following contributors to this issue: Wes Blake, Ian Campbell, David Cobb, Sue Dunlop, Rob Fensome, Helen Gillespie, Douglas Hallett, Martin Head, Jan Jansonius, David Jarzen, Susan Jarzen, Rolf Mathewes, John Matthews, Stephen Porter, Linda Shane, Paul Strother, and Catherine Yansa. Thanks also to Yves Beaudoin for technical assistance.

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President's message

ELECTRONIC JOURNAL

CAP has received a proposal for a new electronic journal titled *Paleontologica Electronica*. This is to be a web-based peer-reviewed journal, with all the possibilities that implies - color images, animation, rapid publication, etc. The group organizing this journal is seeking our support.

They require two things: money (of course) and server space. While CAP is not wealthy enough to be able to contribute a significant amount of money, server space would seem to be an option. Being at a federal institution where I am the only paleontologist, I doubt I could get space on my server; perhaps another CAP member would like to consider obtaining server space for this.

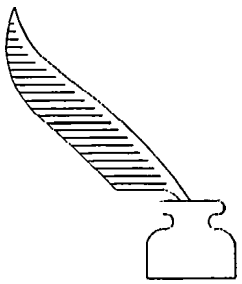
In exchange for providing server space, CAP would receive unlimited space for CAP-related announcements and advertising, and links in the journal to the CAP web page

The complete text of the proposal is on the web: http://www-odp.tamu.edu/publications/PALEO/PROPOSAL.HTM

There is also a link at the table of contents of a sample issue: http://www-odp.tamu.edu/publications/PALEO/TOC.HTM

Please take the time to check this out, think about it, and decide whether or not you feel positively enough about this to seek server space for it at your institution. I feel it is a worthwhile project for CAP to be involved in; please let me know how the rest of you feel.

Ian D. Campbell
CAP President



From the bureaucrat's desk

It was a pleasure to meet so many CAP members at the excellent Ninth International Palynological Congress in Houston last June. At the CAP AGM (held at the 9IPC) I announced that I would not be "running" for another term in office, reckoning that 10 years as Secretary/ Treasurer was plenty enough time for both CAP and me.

So with this final column I want to say how much I've enjoyed working with you, the CAP membership. I particularly want to thank the following CAP executive members with whom I've had the great pleasure to serve over the past decade: Alwynne B. Beaudoin, Jon Bujak, Elliott Burden, Wayne Brideau, Ian Campbell, Rob Fensome, Bert Van Helden, Dave Jarzen, Sue Jarzen, Jocelyn Legault, Judith K. Lentin, Glen MacDonald, Rolf W. Mathewes, Graham Williams, and many others. Geoff Norris of the University of Toronto deserves special thanks not just for his auditing of the CAP accounts over many years, but also for his long-term support of my CAP activities here at Toronto. Francine McCarthy will be taking over as my replacement and I wish her every success in this very rewarding job.

On behalf of CAP, it is a pleasure to welcome Eva Koppelhus (Royal Tyrrell Museum of Palaeontology, and Geological Survey of Denmark and Greenland), Catherine Yansa (University of Wisconsin-Madison), John Matthews (Nepean, Ontario), and Esther Asselin (Geological Survey of Canada-Quebec) as new members.

Dues Due

If your name appears below, a gentle reminder that your membership subscription becomes due at the start of 1997 (or at the start of 1996 as indicated in parentheses):

D. Braman, I. Campbell, G. Chmura (1996), B. Cumming (1996), L. de Verteuil (1996), H. Eland, J. Ford, L. Fortner, M. Garneau, P. Gunther, D. Hallett, T. Irwin (1996), D. Jarzen, P. Kuhry (1996), A. Kumar, A. Larouche, K. Lease (1996), H. Leereveld (1996), J. Legault, G. Mangerud (1996), H. Nohr-Hansen, S. Porter, C. Rogers, J. Smol, I. Spooner, R. Stancliffe, L. Suneby, A. Sweet (1996), A. Traverse (1996), B. Van Helden, R. Vance, S. Vardy (1996), G. Williams, and Zicheng Yu.

Martin J. Head
Department of Geology
Earth Sciences Centre
University of Toronto
Toronto, Ontario, M5S 3B1

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. 44. After January 1 1997, funds should be sent to the new Secretary/ Treasurer:

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

MINUTES OF THE CANADIAN ASSOCIATION OF PALYNOLOGISTS ANNUAL GENERAL MEETING

Tuesday, 25th June 1996, 7:00 p.m.
Galveston Room, Marriott Hotel,
Houston, Texas

Those Present: Ian Campbell (President), Rob Fensome (President Elect; Recording Secretary), Martin Head (Secretary-Treasurer), Jan Jansonius, David Jarzen (outgoing IFPS Councillor), Susan Jarzen, Arun Kumar, Jocelyne Legault, Fabienne Marret, Rolf Mathewes, Colin McGregor, Geoff Norris, Christine Rogers and Julian Szeicz (incoming IFPS Councillor)

1. Opening

The president, Ian Campbell, called the meeting to order and, since not everyone was mutually acquainted, invited all present to introduce themselves. Martin Head distributed the meeting agenda and ancillary documents.

2. Minutes of 1995 Annual General Meeting

The 1995 AGM was at the Chateau Laurier in Ottawa in conjunction with the AASP Meeting. The minutes were tabled and accepted.

3. President's Report

Ian Campbell noted that at this point, since he had been in office for only a short period (taking the helm after previous President Glen MacDonald's move to the United States and consequent resignation), there was nothing substantive for him to report. He noted, however, that he was pleased to see that the society was further in the black. Also that Julian Szeicz's department has agreed to mail *Palynos* and that his own office will mail the *CAP Newsletter*.

[There was some discussion regarding the current status of the Presidency and confusion as to whether: 1) Ian's term should end in 1996, since he was made interim president upon the resignation of Glen MacDonald, this appointment cancelling his President-Elect status; or 2) he should continue now with his statutory term of two years, having completed the last few months as "emergency" interim president. The by-laws are not explicit on this point. The consensus was that a fair compromise would be for Ian to continue in office for one more year and then for current President-Elect, Rob Fensome, to take over.]

4. Secretary/Treasurer's Report

i) Membership Report.

Martin Head reported that, as of 27th April 1996, CAP had a total of 52 members in good standing, comprising 41 full members, 10 correspondents and 1 institutional member. This compares with a total membership of 46 for the same time last year. It is too early to say how many members in good standing we will have for 1996, but it would appear that the several-year decline in membership has begun to level out.

ii) Financial Report.

Martin concluded that the Association's finances are in good shape and likely to remain so given the mailing arrangements mentioned above. With regard to the cost of mailing *Palynos*, the question was raised of duplication of effort of other societies mailings. Several members present confirmed that they receive more than one copy of *Palynos*. However, it was generally viewed that it was not worthwhile trying to rationalize the situation for the benefit of minimal savings. A motion was passed unanimously recommending that CAP members receiving extra copies of *Palynos* should pass the duplicates on to students if possible.

iii) Auditor's Report.

Geoff Norris again acted as auditor and has officially signed his name to a statement to the effect that the Association's books are in good order. This audited statement is included as part of these minutes on p. 8.

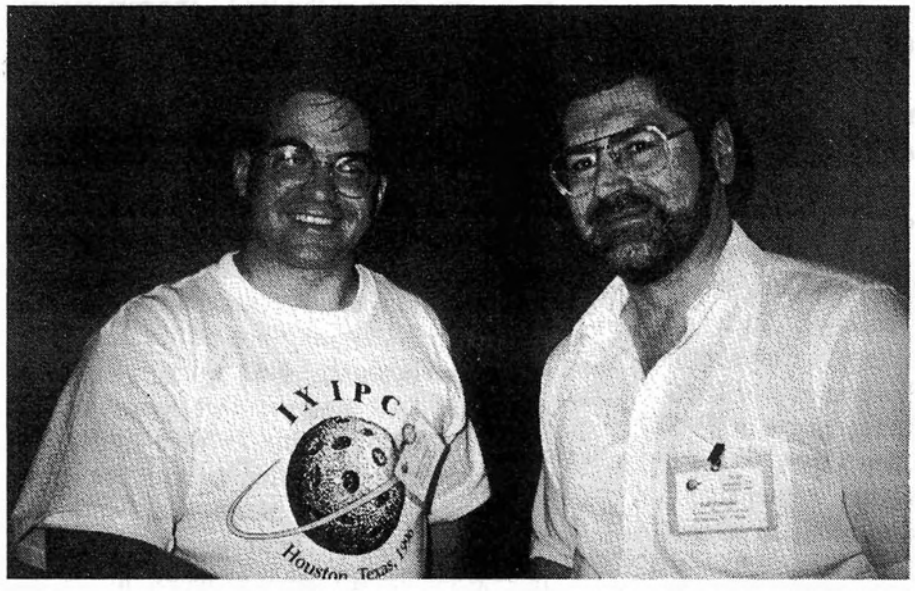
5. Review of dues structure

No review was considered necessary at this time.

6. Newsletter and Web Site report

Since Alwynne Beaudoin was not able to be present, her report was tabled and duly accepted. It was moved that Alwynne should be encouraged to carry on her good work as Newsletter Editor and Web Site manager, and a vote of appreciation of her efforts was proposed, seconded and carried unanimously. Her report is as follows:

> The *CAP Newsletter* continues in a healthy state with two substantial issues since the last AGM. I thank all the contributors to these issues. I would like to encourage all CAP members to consider submitting articles and material to future Newsletters, including research notes, essays, announcements, thesis abstracts, [news of] publications, reports from departments, and other news of palynologists and palynology.
>
> A number of suggestions from the last AGM, mainly dealing with production cost reductions, have been pursued in the last year. Members whose dues were significantly in arrears received a reminder letter instead of the December 1995 issue. This was quite successful and resulted in several renewals. I am continuing to explore other methods of mailing and producing the Newsletter although I have not yet come up with anything that I consider to be satisfactory or an improvement on the present system. However, judicious editing and layout controls have ensured that the Newsletter stays within the weight limit of the 100 g postal rate without, I hope, sacrificing content. I propose therefore, finances permitting, to continue with the current Newsletter style and production system.
>
> The CAP World Wide Web page also continues in a healthy state, registering around 200 "hits" each month. One suggestion from the last AGM, the compilation of a list of Canadian palynology theses, has been pursued. This thesis listing is now a component of the CAP Library. I would be grateful for any further citations to add to this list. I have also included a section of book reviews, the Internet Discussion List listing has expanded considerably, and I have added another article to the "Recent Articles" segment. I have several other items I am intending to add to the page as time permits. Suggestions from the membership for additional material would be welcome.



Ian Campbell (CAP President) and Rob Fensome (CAP President-Elect) at the AGM in Houston, Texas. (Photo: S. A. Jarzen).

If there are no objections, I would be happy to continue as *CAP Newsletter* and Web Page Editor for another year.

7. IFPS Councillor's report

In tabling his report, Dave Jarzen especially noted his thanks to Susan Jarzen and the Canadian Museum of Nature. His report reads as follows:

As I write this, my final IFPS Report, the IX IPC at Houston is only weeks away. I am looking forward to these meetings on several accounts, one of which is that after eight years as CAP Councillor, I can now see that CAP is indeed an active organization, not only within the boundaries of Canada, but also in the international aspects of its activities. We can be proud of our history in the IFPS, including our active membership in the IFPS Executive, hosting the 6th IPC in Calgary, and always, yes always, supporting the IFPS in its role as the umbrella organization for the world palynological community.

As most of you will already know by the time you read this message, Dr Owen Kent Davis (University of Arizona, Tucson, Arizona) has been elected as the sixth and next President of the IFPS for the term 1996-2000. He has appointed Dr Scott Anderson (Northern Arizona University, Flagstaff, Arizona) as Secretary-Treasurer for the same term. The position of Newsletter Editor remains to be announced. [After Dave had submitted this report, it was announced that Dr Frederick Rich of Georgia Southern College, Statesboro, Georgia, has accepted the position of IFPS Newsletter Editor.] With this change in IFPS Executive, I will also step down as IFPS Vice-President representing Actuopalynology. After the Houston meeting, President Davis will appoint three new Vice-Presidents (two representing paleopalynology and one to represent actuopalynology).

The Houston meeting promises to be one of the best in many years. The organizing team has worked long and hard to insure a diverse and challenging program. The Second Edition of the World Directory of Palynologists will be distributed free to registered participants at the IX IPC. The task of assembling and editing this valuable reference source was that of Owen Davis, the current IFPS Secretary-Treasurer. Owen is to be congratulated for this onerous undertaking.

Martin Head (University of Toronto, Toronto, Ontario), CAP Secretary-Treasurer, has maintained up to date and clean records of our dues and membership to the IFPS. Our most current dues payment was made on 27 April 1996 in the amount of $126.48 Cdn which at the then exchange rate of 1.36 is equivalent to $93 US. This covers CAP dues at $1.50/member/year and includes current paid members and a few late paying members for 1995. It is the opinion of this retiring Councillor that the $1.50 dues per member is excellent value for membership in the IFPS. The two annual issues of *Palynos* alone make the dues amount a real bargain.

Julian Szeicz (Queens University, Kingston, Ontario), is the newly elected Councillor to the IFPS for the term 1996-2000. Julian, like all past CAP Councillors, will need your help to keep CAP an active participant in the international scene. We must keep Julian informed of our activities, major publications, field work, visitations and other CAP events so that he may report this information to the *Palynos* Editor for dissemination. It is often difficult for us as Canadians to brag about our work or accomplishments; however, today with increasing layoffs and changes in career paths, it has become necessary to place our

positive offerings in the 'store window'. By providing Julian with news items of our many accomplishments (e.g., "NEWS FLASH: CAP Members Are Editors of AASP Mammoth Tome in Three Volumes") we will remain an active society and will better inform the world palynological community of our needs and accomplishments.

Thank you for the support all of you have shown me over the past eight years. It has been enjoyable and never a bore being your CAP Councillor. I have tried to attend all CAP AGM's, only missing a few now and again. Susan Jarzen (Unofficial Assistant CAP Councillor, and Official CAP Photographer) has been, of course, my greatest source of support and help. Thanks are also due to Martin Head for "keepin' the books" and to Alwynne Beaudoin for providing me with many news items which I supplied to the IFPS and *Palynos* as an information source and for publication.

Thanks to all of CAP .... As Davey Crocket once said to Sam Houston, "hope to see you in Texas ...."

Thanks to Dave for his good work as CAP IFPS Councillor were proposed, seconded and carried unanimously.

The meeting then discussed publication of the World Directory, the second edition of which was published at the Houston IPC. The IFPS President has already made it known that the World Directory was able to be published (at least to acceptable quality) only because of a private donation from Dr Lucy Cranwell. The implication was that future Directory's would need a similar influx of additional funds. Geoff Norris pointed out that publishing the Directory on the World Wide Web would cut costs considerably: palynologists from less developed countries might still need paper copies, but printing and mailing costs could be substantially reduced. The meeting authorized incoming Councillor Julian Szeicz to investigate the possibilities and ramifications of producing an electronic version of the World Directory.

8. Appointment of Auditor and Nominating Committee

Since Martin Head has stated his intention to step down as CAP Secretary-Treasurer, it was decided that appointment of CAP Auditor should wait until a new Secretary-Treasurer has been elected - until the start of 1997.

The task of seeking out a nomination for a new Secretary-Treasurer goes to the Nominating Committee - Gail Chmura and Jocelyne Legault - who were duly appointed.

9. Location for the 1997 AGM

It was decided that the next CAP AGM would be held in conjunction with the 1997 AASP Meeting, which will take place at Woods Hole, Massachusetts between the 14th and 18th September, 1997.

10. Other business

There was a discussion about the use of profits from IPC Meetings. These have, apparently, been variously used in the past as, for example, seed money for the next IPC and funding for student travel to conferences. The meeting authorized Julian Szeicz to encourage the IFPS Council to persuade future IPC organizers to maintain an adequate and appropriate bookkeeping and show accountability.

11. Closing

As there was no other business the meeting was closed with unanimous assent.

Rob Fensome
CAP President-Elect
Geological Survey of Canada - Atlantic
P.O. Box 1006
Dartmouth, Nova Scotia, B2Y 4A2

FINANCIAL STATEMENT

(for the period October 2, 1995 – June 21, 1996)

Credits:	
Balance forward (October 2, 1995)	$1156.80
Other credits:	
Dues and subscriptions	473.21
Interest	2.67
Total credits:	$1632.68
Debits:	
Production charges for winter 1995 and special newsletters	–$315.56
I.F.P.S. dues	–126.48
Service charge	–0.60
Registry of Joint Stock Companies	–10.00
Prepaid membership subscriptions (1997–99) (34@10.00)	–340.00
Total debits:	–$792.64
BALANCE:	$840.04

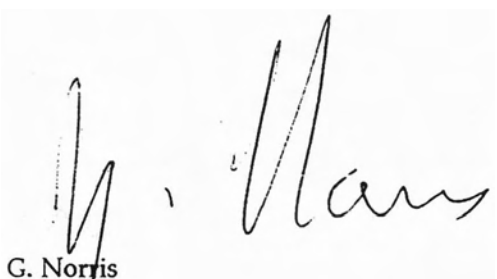
On June 21, 1996 funds in the CAP account stood at $1180.04.

Respectfully submitted by

Martin J. Head
CAP Secretary/Treasurer (June 22, 1996)

Statement by appointed auditor

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



G. Norris
Auditor for CAP (June 24, 1996)

Far and wide....

IXth INTERNATIONAL PALYNOLOGICAL CONGRESS

The Ninth International Palynological Congress (IPC) took place at the J.W. Marriott Hotel in Houston, Texas, 23-28 June 1996. About 450 delegates convened from all over the world and, for the first time officially, these included members of the International Association of Aerobiologists - this group having joined the International Federation of Palynological Societies (IFPS), the IPC's sponsoring body, only last year. Also, for the first time in my experience of attending palynological meetings, there was a significant Russian contingent. CAP was well represented, with most of the executive attending (the report of the AGM, which took place at the IPC, is included elsewhere in this Newsletter), as well as a number of other prominent Canadian palynologists.

The scientific sessions offered a rich menu, with topics ranging from the geologically recent (e.g., "Forensic Palynology" and "Aerobiology") to the old (e.g., "Cryptospores and the Origins of Terrestrial Floras"); and from the straightforward ("Cretaceous Palynology") to the more esoteric ("Palynomorph Distribution Patterns and their Interpretation"). A full slate of posters as well as intensive sessions, led to a very busy schedule. Oral papers of Canadian interest, in program order, were those by Grace Parsons and Geoff Norris on Paleogene dinoflagellates from the Beaufort-Mackenzie region; Esther Asselin *et al.* on Late Ordovician chitinozoa from the Lac-Saint-Jean Outlier, Quebec; Patrick Cashman on Devonian spores of Prairie evaporites; Koldo Nuñez-Betelu and Len Hills on a new Late Coniacian dinoflagellate, *Odontochitina octopusa*, from the Arctic; Eva Koppelhus on the palynology of the *Centrosaurus* bone beds from Dinosaur Provincial Park, Alberta; Rolf Mathewes on Late Wisconsin paleoecology in coastal British Columbia; John Beck and Paul Strother on Silurian spores and cryptospores from Arisaig, Nova Scotia; Nuñez-Betelu and Hills again on the sequence stratigraphy of a Late Cretaceous coastal to offshore transition in the Arctic; Ian Campbell and others on fire, climate and vegetation in the Canadian Late Holocene; and M.G. Pellatt and others on pollen analysis and ordination of lake surface sediments from coastal British Columbia (with apologies for any that I may have missed).

No individual could do justice to the vast range of talks and posters, displays of the latter changing daily. As I look through the program again, I find myself regretting "the ones that got away" — for example, I had to miss K. Oeggi's talk on "Pollen analysis of the Iceman's colon content" — an intriguing title on a gruesomely fascinating topic. (This reminds be of an Arts and Entertainment TV network documentary on Egyptian mummies in which one of our colleagues was identified on screen as a "pollenologist".) However, such regrets notwithstanding, for me and I'm sure many others, meetings like the IPC are important opportunities to "network" — to sit down and discuss ongoing projects with far-flung colleagues, to generate new collaborative, and perhaps business, opportunities and to generally talk science, preferably over dinner or a beer, with like-minded people.

In this respect, the social events of a meeting are of great importance. The 9th IPC was no exception and some excellent events were organized. After the Plenary Session welcoming delegates on the Sunday evening, the huge Exhibition Center of the Marriott Hotel (which only a short while previously had housed a political

rally for President Clinton) was the venue of the opening Reception. On Wednesday lunchtime, the host society, AASP, held its annual luncheon, at which German dinoflagellate worker Hans Gocht and our own Graham Williams, were both deservedly awarded with the AASP Medal for Scientific Excellence. Graham was so taken aback that his acceptance speech was uncharacteristically restrained and polite. (However, he has now recovered.) The IFPS banquet on Thursday evening was buffet style and "Tex-Mex" in content — the buffet style again allowing for fluid social discourse, to me preferable to more formal arrangements where one can sometimes feel a bit trapped. Breakfast each day also became a social event, since the hotel supplied a generous spread of bagels, muffins, fruit and beverages outside the conference rooms each morning. Tuesday through Thursday, there were trips to NASA's Houston Space Center for those whose schedules allowed.

The trilogy *Palynology: Principles and Applications* had its launch at the Congress. For those of you who don't know by now, the book, published by AASP, is a multi-authored, three volume set on all aspects of palynology. Its editors are CAP members Jan Jansonius and Colin McGregor.

In all, the organizing committee of Vaughn Bryant, John Wrenn, Bob Clarke, David Pocknall, Dave Goodman, Sarah Damassa and Doug Nichols should be congratulated for a job excellently done. It should be mentioned that, in the weeks leading up to the meeting, illness in the family and a personal accident to Vaughn Bryant threw a monkey-wrench into the organization. It is to all the credit of the whole committee that the meeting went without a visible hitch. Both AASP and Elsevier are planning to publish segments of proceedings from the 9th IPC. The 10th IPC will be held in Nanjing, China in the year 2000. See you there (if not at the next CAP AGM)!

Rob Fensome
Dartmouth, Nova Scotia

SIXTH CANADIAN PALEONTOLOGY CONFERENCE

The Sixth Canadian Paleontology Conference convened at the Sir Wilfred Grenfell College, Corner Brook, Newfoundland from September 28-30 1996. Its theme — Economic and Applied Paleontology — and the location — western Newfoundland — were chosen in part to expose conference participants to the setting for the recent hydrocarbon exploration activity in western Newfoundland. Over thirty participants from universities, government and industry in Canada, the United States, and from as far away as St. Petersburg (Russia, not Florida) attended. Conference organizers were Drs Henry Williams and Elliott Burden of Memorial University of Newfoundland.

The three day conference included one day of oral presentations and two field excursions to the Port au Port Peninsula, one on the first day of the conference and another on the third day. The first day of outcrop hopping was an excellent ice breaker, a way for participants to get to know the crowd and get a feel for their audience before the more formal technical session which followed on the second day. The Port au Port Peninsula of Newfoundland is a beehive of activity right now with as many as ten companies drilling and bidding on exploration rights — what better way than this to see the geology and find out what all the fuss is about. On the first day in the Port au Port region the sun (along with some of the paleontologists) was splitting the rocks. The second day in the field the drizzle dampened the rocks but not the spirits of the participants. Henry, although failing miserably to push back the tide on the first day's excursion, did come through for the graptolite workers of the world and stopped the rain just in time to view the rather excellent Ordovician graptolites in Piccadilly Quarry. Mini buses and deli style lunches provided by the organizers made the field trips quite comfortable and enjoyable.

There was something in the field excursions for even the most esoteric tastes — the invisible for sampling — acritarchs, conodonts and chitinozoa, and the visible — corals, bivalves, worm tubes, brachiopods, fossilized tree trunks, graptolites and more. Participants saw potential source rocks (black and dark brown shales of the Humber Arm Supergroup) and reservoir rocks (karst features within the St. George and Table Point groups). If these rocks weren't enough to convince those sceptics present of possible oil in the Port au Port region then attitudes changed when they saw the oil well site at Port au Port #1 where the Christmas tree or capped well head still remains as oil exploration continues.

The one day of talks covered everything from corals to coccoliths. Paleontology and hydrocarbon exploration was a common theme. Lower Paleozoic exploration activity in western Newfoundland was highlighted by Louise Quinn, who stressed the role of paleontology in unravelling the timing of tectonic events. Henry Williams and Elliott Burden used conodonts, chitinozoans, acritarchs and graptolites to map thermal maturation, and Helen Gillespie established acritarch zones for correlation with the subsurface. Further afield, Godfrey Nowlan brought us up to date on the new frontiers for Lower Paleozoic oil activity in the Western Canada Sedimentary Basin. Mike Melchin (Gentzis *et al.*) demonstrated the use of graptolite reflectance in assessing thermal maturation in Arctic Canada. Talks by Sandy McCracken (McCracken *et al.*) and Chris Barnes on conodonts of Baffin Island and western Newfoundland and the Anticosti Basin, and Terry Poulton (Craig *et al.*) on Lower Jurassic coccoliths of Alberta, stressed the importance of sound paleontology in exploration activity. Jisuo Jin presented his work on the recovery of brachiopod communities during the Early Silurian on Anticosti Island, and Graham Young integrated data from across Canada to determine controls on Silurian tabulate corals. Peter von Bitter and Paul Schenk presented talks on tube worms and other fossils associated with mineralized deposits and we had a chance to see this odd biota on the field trip the following day. Jean Dougherty (co-author Janet Waddington) warned us of the danger to paleontological collections across the country due to reduced funding. Alex Smirnov (Smirnov *et al.*) gave the award winning student presentation, not on oil, but on the Holocene palynological history of northeastern Newfoundland and demonstrated that environmental cyclicity correlates with changes in regional cod stocks. Helen Gillespie's talk on Late Ordovician Acritarchs of the Winterhouse Formation (Long Point Group) was the runner up.

Guest speaker Dr Rex Gibbons, the Minister of Mines and Energy for the Province of Newfoundland and Labrador, addressed the public on "Oil exploration in western Newfoundland — past, present, and future" and much mingling followed at the reception in the Fine Arts Gallery at Sir Wilfred Grenfell College.

Although there were a small number of participants, the conference members left Newfoundland with a strong sense of fellowship and belonging to the paleontological community. The pristine condition of the environment, spectacular landscape, and the warm Newfoundland hospitality made this one field trip to remember.

Our compliments to Henry, Elliott and those students who helped to make this conference a success.

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and
Marion G. Parsons
Current address: Department of Earth Sciences
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DR PIERRE J. H. RICHARD PRESENTED WITH THE CAG AWARD FOR SCHOLARLY DISTINCTION IN GEOGRAPHY

At the Canadian Association of Geographers Annual Meeting, held in Saskatoon in May 1996, CAP member Pierre Richard was presented with the CAG Award for Scholarly Distinction in Geography. The citation, read at the presentation, is as follows:

In a professional career that spans more than twenty-five years, Dr Pierre Richard has made an outstanding contribution to our knowledge of the postglacial vegetation history of Quebec through the investigation of palaeophytogeography—the study of past plant distributions, primarily by pollen and plant macrofossil analysis.

Born in Montreal, Pierre Richard was educated at Laval University, the University of Paris-Orsay, and the University of Montpellier, where he studied with the distinguished palynologist Dr M. Van Campo. Following five years as Visiting Professor at the University of Quebec at Chicoutimi, in 1976 Pierre Richard joined the faculty of the Department of Geography at the University of Montreal, a department he still calls home and which he chaired from 1986 to 1990. Here, he is also director of the Laboratoire Jacques-Rousseau which focusses on research into palaeophytogeography and palynology and which, with its extensive reference collection of several thousand pollen samples and macrofossils specimens, is a magnet for students and researchers.

Dr Richard's main research interests have always been in the vegetation history of Quebec. His studies have encompassed all parts of this vast and diverse region, from the Ungava Peninsula and James Bay, to the St. Lawrence Valley and Gaspé. The Laboratoire Jacques-Rousseau archives pollen and plant macrofossil records from over two hundred sites in Quebec. Many of these records have been produced by Pierre Richard or his students and colleagues. These vast amounts of data comprise the BDPMQ (Base de données polliniques et macrofossiles du Québec). Much of this information is shared with other researchers through co-operation with other databases, for example the Canadian Palaeoecological Database (at the Geological Survey of Canada, Ottawa, Ontario) and the North American Pollen Database (NAPD at the National Geophysical Data Centre, Boulder, Colorado). Pierre Richard also has a keen interest in pollen taxonomy and identification and has published extensively on these topics, including a series of papers comprising the "Atlas pollinique des arbres et de quelques arbuste indigènes du Québec" in *Le Naturaliste Canadien* (1970), greatly aiding the work of other researchers in eastern Canada.

His contribution, however, has been considerably more than simple data generation and description. His first pollen paper was published 1967 and subsequently he has published almost seventy papers and given numerous conference presentations. His writing shows a truly geographic perspective, demonstrated by his concern with the analysis and interpretation of the spatial patterns shown in these pollen records, rather than the more traditional, purely site-specific, reconstructions. The availability of many records from throughout Quebec now permits the development of regional syntheses. Much of Pierre Richard's recent writing concentrates on the integration of information from these records, documenting broad-scale changes that outline the development of the present vegetation distribution within this huge area. A recent notable example is his examination of "Postglacial

palaeophytogeography of the eastern St. Lawrence River Watershed and the climatic signal of the pollen record" (*Palaeogeography, Palaeoclimatology, Palaeoecology*, 1994) which synthesizes pollen work from over 150 sites. His work has also led to significant advances in our understanding of the glacial history of Quebec, especially the chronology and character of deglaciation. In recent years, his research has concentrated on the Gaspé region where he has been concerned with late-glacial and early postglacial environmental change. Lately, he has been examining the role of fire in the eastern boreal forest.

Dr Richard's influence spreads far beyond his personal endeavours as he has been involved in the supervision of more than 35 graduate students and researchers, resulting in the production of eighteen Master's theses and one Doctoral dissertation to date. Several of these former students and associates have gone on to develop their own high-profile academic careers.

Since 1977, Pierre Richard has been involved in the production of the scholarly journal *Géographie physique et Quaternaire*, as editor and director. Under his guidance, GpQ has become the flagship publication for Quaternary work in Canada, and the designated publication outlet for the Canadian Quaternary Association (CANQUA).

Pierre Richard is a member of several national and international professional societies, including AQQUA (Association québécoise pour l'étude du Quaternaire), of which he was a founding member in 1973, and CAP (Canadian Association of Palynologists), to name just two. He takes his duties to these societies seriously, and is a regular and valued contributor to their newsletters. In 1993, his scholarly achievements were given national recognition by his election as a Fellow of the Royal Society of Canada.

No appreciation of Pierre Richard's professional career would be complete without mention of his infectious enthusiasm and generous personality. By conferring this Award for Scholarly Distinction on Dr Richard, the Canadian Association of Geographers acknowledges the outstanding contributions and intellectual achievements of an inspiring and influential scholar.

Alwynne B. Beaudoin
Edmonton, Alberta

DR JOHN P. SMOL NAMED A FELLOW OF THE ROYAL SOCIETY OF CANADA

John Smol's early schooling was in Montreal and his B.Sc. was obtained from McGill University in 1977. He obtained his M.Sc. from Brock University in 1979 and his Ph.D. from Queen's University in 1982. John's doctoral studies were supported by NSERC post-graduate scholarships and this was followed by an NSERC Post-doctoral Fellowship at Queen's University and an NSERC Visiting Research Fellowship with the Geological Survey of Canada. Dr Smol was first appointed in the Department of Biology at Queen's University, Kingston, Ontario, in September 1984, and by 1991 he was Full Professor. At Queen's he presently supervises the Paleoecological Environmental Assessment and Research Lab (PEARL), whose 20+ members constitute the largest paleolimnological laboratory in the world. John was elected a Fellow of the Geological Association of Canada in 1989 and a Fellow of the Arctic Institute of North America in 1993.

John was awarded an NSERC E. W. Steacie Memoral Fellowship in 1990. In 1992, he was awarded the Botanical Society of America Darbaker Prize, and in 1993, along with his lab., he was presented with the North Americal Lake Management Society (NALMS) research award. In 1993, he was also awarded the National Research Council's Steacie Prize, as Canada's most outstanding scientist or engineer. In 1994, he received an award from Atomic Energy of Canada Ltd., and was presented with the Queen's University Prize for Excellence in Research. He

was chosen by the Canadian Society of Limnologists as the 1995 Rigler Prize winner, and the Canada Council has awarded him a Killam Fellowship for 1995-1997. Having just turned 40, he has recently been elected a Fellow of the Royal Society of Canada, Academy of Science.

With well over 150 publications to his credit, as well as book chapters and technical reports, John has also authored over 300 conference presentations. Many of these were invited and several were opening keynote addresses. He was editor-in-chief of a major book on diatom paleolimnology and acid precipitation, and he co-edited a book on chrysophytes. In addition, he wrote the *Atlas of Chrysophytean Cysts* (together with colleagues in his lab. at Queen's), which describes the taxonomy and ecology of this new group of paleoindicators. He is currently working on two more books, including a textbook on paleoenvironmental perspectives to lake and river pollution. As well as producing all these publications, he has carried out field-work in the Arctic nearly every year since 1983!

John's research was instrumental in the acid rain debates (he received a citation from the US government for his "outstanding contributions" to the NAPAP program, and he was an author of the state-of-science report to Congress). His paleoenvironmental approaches are now rapidly being incorporated into other studies of environmental change, such as climatic change, biodiversity, and lake management issues.

John has served or serves on a large number of panels and review committees, such as NSERC's strategic grant selection panel for Environmental Quality, the Scientific Advisory Committee for the NSERC Joint Global Ocean Flux Study (JGOFS), the steering committtee for the NSF Paleoclimate of Arctic Lakes and Estuaries (PALE) panel, the Research Advisory Committee for the Canadian Museum of Nature, the advisory board of the US NOAA Diatom Paleolimnology Data Cooperative, and the Geological Survey of Canada's Palliser Triangle Global Change Advisory Board. John is the founding editor of the *Journal of Paleolimnology* and continues on as co-editor-in-chief. In addition, he serves on the editorial board of three other journals. Dr Smol also serves as CANQUA's representative on the Partnership Group for Science and Engineering (PAGSE), organized under the auspices of the Royal Society of Canada with the aim of making the public more aware of Canadian science.

We congratulate him on his remarkable career, his valuable contributions to numerous facets of science, and his outstanding ability and enthusiasm as a teacher.

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601 Booth Street
Ottawa, Ontario, K1A 0E8

DR GRAHAM L. WILLIAMS PRESENTED WITH THE AASP MEDAL OF SCIENTIFIC EXCELLENCE

Graham Williams was awarded the AASP Medal of Scientific Excellence at the recent IPC meeting in Houston, Texas. The medal was presented by Jan Jansonius at the AASP Annual Luncheon on June 26. The citation, which was read by Jan Jansonius, is as follows:

Graham Williams began his study of fossil dinoflagellates a postgraduate student with Charles Downie in 1959. His 1963 doctoral thesis dealt with Paleogene dinoflagellates of the London Clay. This was one of the first detailed studies of Paleogene fossil dinoflagellates and in its published form, as part of the now famous "DDSW" (Davey, Downie, Sarjeant and Williams 1966) monograph, had great influence — both for the descriptions and indicated ranges of many important new species, but also for the exemplary style and format of the descriptions.

After his graduation, Graham found a job as palynologist with Pan American Petroleum (now Amoco Petroleum Company). His first project was to set up a biostratigraphic framework for nonmarine Tertiary sediments of Washington and Oregon, obviously based on pollen and spores. Next, he was assigned to study the biostratigraphy of the East Coast offshore of Canada where Amoco was drilling. When, in 1971, the Geological Survey of Canada opened an eastern office, the Atlantic Geoscience Centre (now Geological Survey of Canada, Atlantic) in Dartmouth, Nova Scotia, it was natural that Graham would become its resident Mesozoic-Tertiary palynostratigrapher.

During the early years at AGC, Graham examined a large number of wells and gained an increasing knowledge of dinoflagellate biostratigraphy. This phase of his career culminated in a GSC Paper entitled "Palynological zonation and correlation of 67 wells, eastern Canada" (Barss *et al.* 1979), of which Graham was the most significant contributor, having run 44 of the 67 wells in about eight years. Graham was also the moving force behind several papers outlining the dinoflagellate zonation of offshore eastern Canada (Williams 1975; Williams and Bujak 1977; Bujak and Williams 1977, 1978).

During that same decade, in spite of this exhausting pace, Graham started his collaboration with Judi Lentin in producing the "Lentin and Williams" indexes of fossil dinoflagellates (Lentin and Williams 1973, 1977, 1981, 1985, 1989, 1993). This index is a primary reason why fossil dinoflagellate taxonomy is in an organized state, unlike the taxonomy of most other microfossil groups; it has set the standard for other indexes. Graham is now involved in a seventh edition of this classic. Still during this period, Graham used his expertise to contribute chapters on dinoflagellates and related microfossils to two multi-authored textbooks (Williams 1977, 1978) and as well was the driving force behind two editions of a glossary on dinoflagellate and acritarch terminology (Williams *et al.* 1972, 1978), of which a third edition is almost ready for publication. And, finally, he co-authored a major monograph on fossil peridinioid dinoflagellates (Lentin and Williams 1980).

In 1978, Graham became Head of the Eastern Petroleum Geology Subdivision at the AGC, but he continued to publish. Apart from two editions of the Lentin and Williams Index, he completed another contribution on the Paleogene of southern England (Bujak *et al.* 1980), and three important conceptual papers, respectively on dinoflagellate evolution (Bujak and Williams 1981), dinoflagellate diversity through time (Bujak and Williams 1979), and paleoprovincialism (Lentin and Williams 1980).

In 1985, Graham realized that management was not his true vocation, and he stepped back into the trenches as a research scientist. His first task was as co-editor of a major volume on the continental margin of eastern Canada in the Decade of North American Geology (DNAG) series (Keen and Williams 1990), which included a definitive overview of the biostratigraphy (Williams *et al.* 1990).

Indeed, Graham's contributions to areas other than palynology have become increasingly noticeable. He was a leading founder of the Atlantic Geoscience Society, to which he made a number of significant contributions, such as assisting in the planning and production of a series of videos on geology for use in schools. He further is involved in the EdGeo instructional workshops for teachers in Nova Scotia, as well as SITS (Scientists in the Schools) program, and regularly gives presentations on geology to school children. Graham was senior editor of the "Lexicon of Canadian Stratigraphy. Volume VI. Atlantic Region" (Williams *et al.* 1985), and currently is deputy-editor of Canada's most prestigious geoscience journal, the *Canadian Journal of Earth Sciences*.

However, Graham's most important expertise is in dinoflagellate research, where his vast energy and acute perceptiveness have caused him to acquire an encyclopedic knowledge of fossil dinoflagellates which he is willing to share with-

out reserve. His reviews of manuscripts are invariably helpful and instructive, because he is a great teacher. For two recent courses (given in 1994, mainly with Henk Brinkhuis and Sarah Damassa, at Utrecht and Houston), Graham developed a system of sheets detailing published justification for ranges—a further innovative tool demonstrating his great respect for, and attention to, detail.

Since stepping down from management, Graham has continued his research on dinoflagellates. This resulted in a benchmark publication on dinoflagellate biostratigraphy (Williams and Bujak 1985); a catalogue of fossil dinoflagellate genera with his great friend Lew Stover (Stover and Williams 1987); contributions to the New Series of the prestigious "Eisenack Catalog" (Fensome *et al.* 1991, 1993, 1995, in press), not to mention smaller but still important papers. He further played a vital role in formulating the first detailed comprehensive phylogenetic classification of dinoflagellates (Fensome *et al.* 1993a), and has been integrally involved in contributing ideas to a series of papers on dinoflagellate evolutionary patterns (Fensome *et al.*, in press; MacRae *et al.*, in press; Damassa and Williams, in press). Perhaps most significant for AASP was Graham's idea to produce a multi-authored textbook on palynology, that evolved into *Palynology: Principles and Applications* (Jansonius and McGregor 1996). Graham, Rob Fensome, and Bruce Tocher together set out the first scheme for this work while driving home from Dino IV, but it was Graham's initial concept that took off under the impetus of his drive and energy. Typically, in the chapter for which he was responsible (Stover *et al.* 1996), Graham made himself the last author, although he contributed by far the greater share of the work.

Graham has always considered himself to be a member of the larger paleontological and geological community, but in co-operative projects is modest and self-effacing—even when he provides the main stimulus towards progress. Throughout his career he has shown integrity and excellent judgement, and has contributed enormously in nurturing what was an emerging discipline, helping to shepherd it to a maturity where it has become an essential component of frontier exploration worldwide. Characteristically, the larger part of Graham's monumental output is in joint authorship. This account gives only the highlights of his career; the details would fill many more pages. With prodigious energy and phenomenal power of concentration, he will work long days to finish his commitments, while always keeping a positive attitude and cheerful disposition. He cares deeply not only about science as a field of endeavour, but about his colleagues as scientists and people. He has achieved excellence in every sense of the word, and his nomination for the AASP Medal of Scientific Excellence is surprising only in that it has been so long in coming.

[Editor's note: This citation was originally published in *AASP Newsletter* 29(3):6-7. It will appear, together with literature citations and responses, in *Palynology* Volume 21]

ODP COMES TO BRITISH COLUMBIA

A new interdisciplinary research project was recently launched, involving several subprojects that may be of interest to CAP members. Multiple sediment cores spanning the last 12,000 years were recovered from Saanich Inlet near the city of Victoria on Vancouver Island, Canada (Figure 1), as part of the Ocean Drilling Project (ODP Leg 169s). The ODP flagship *JOIDES Resolution* with its 200 foot high drill-tower provided a spectacular sight while coring for two days in mid August (Figure 2). The converted oil exploration vessel was operating in an unusual near-shore environment, coring in about 200 m of water instead of the thousands of meters in its typical ocean theatre of operations.

Supported mainly by a Collaborative Special Project grant from the Natural Sciences and Engineering Research Council of Canada, scientific

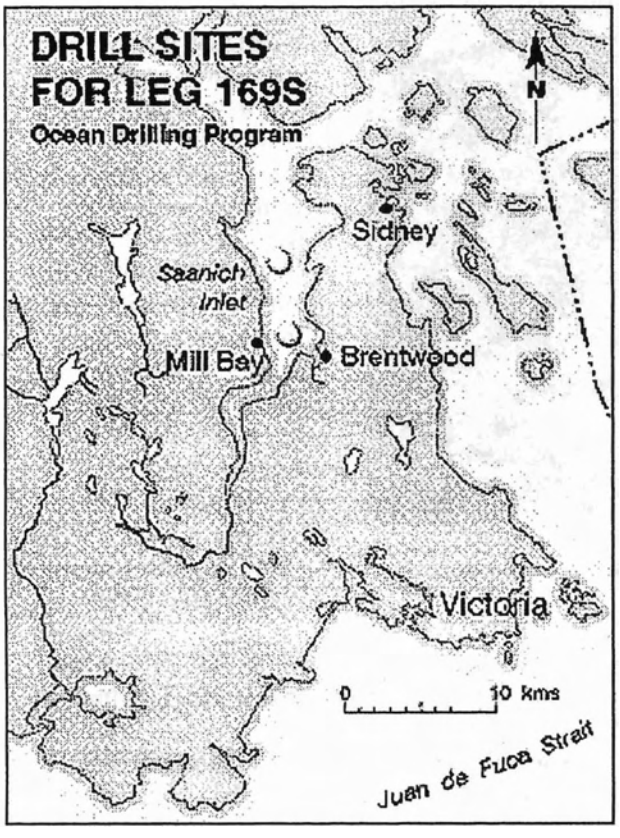

Figure 1: Location of ODP coring sites in Saanich Inlet. Map courtesy Sue Dunlop, University of Victoria, B.C.

analyses will be performed in the areas of geochemistry, sedimentology, paleoseismicity, microbiology and palaeoecology. The palaeoecology component will focus on questions of rates of change in marine productivity, using fish remains, foraminifera, diatoms, and dinoflagellates. For terrestrial environments along the Saanich Inlet, the focus will be on vegetation dynamics (including fire history) and climatic changes, based largely on pollen and charcoal analyses. Pollen analyses will be conducted by Richard Hebda (Royal British Columbia Museum) and Rolf Mathewes (Simon Fraser University), along with a graduate student and postdoctoral fellow.

The excitement generated by this project is a consequence of the special sedimentary conditions found at Saanich Inlet, which will allow for "ultra-high resolution" of critical intervals of rapid environmental change. Sedimentation rates are rapid, accumulating up to 118 m of deposits during postglacial time, and about 80 m of the core is characterized by superbly preserved laminations, almost certainly annual varves. Much of the basin fill must have formed under anoxic conditions, preserving the laminae and a wealth of organic materials. Stage 1 of the pollen analysis will involve taking approximately 550 samples, one at about every 25 years, to produce a high-resolution pollen diagram for the reconstruction of vegetation history. Stage 2 will focus on the analysis of critical and controversial periods of environmental change, such as the Younger Dryas chronozone, the Pleistocene-Holocene boundary, the very warm period centered around 9000 radiocarbon years BP, and others. Since the laminations are relatively thick (8-15 mm), it will be possible to sample annually and even subannually to provide an unmatched level of palynological detail for past periods of rapid environmental change.

When the results are all in, Saanich Inlet will join a select list of other near-shore anoxic basins such as the Santa Barbara Channel off California and Venezuela's Cariaco Basin. The data from these sites will be critical in understanding the dynamics of global climatic and oceanographic changes in the past, and will help us in preparing for the future.

News Update:
Victoria drilling expedition initial results

The specialized scientific ship, *JOIDES Resolution*, spent August 19 to August 21 1996 obtaining a continuous series of core samples up to 120 m long at each of two sites in Saanich Inlet. The sampling took place in the centre of the inlet, in water depths of 200 to 230 metres, near Brentwood Bay and immediately south of Patricia Bay (Figure 1). The highlights of the drilling program to date, based on visual examinations of the cores, include:

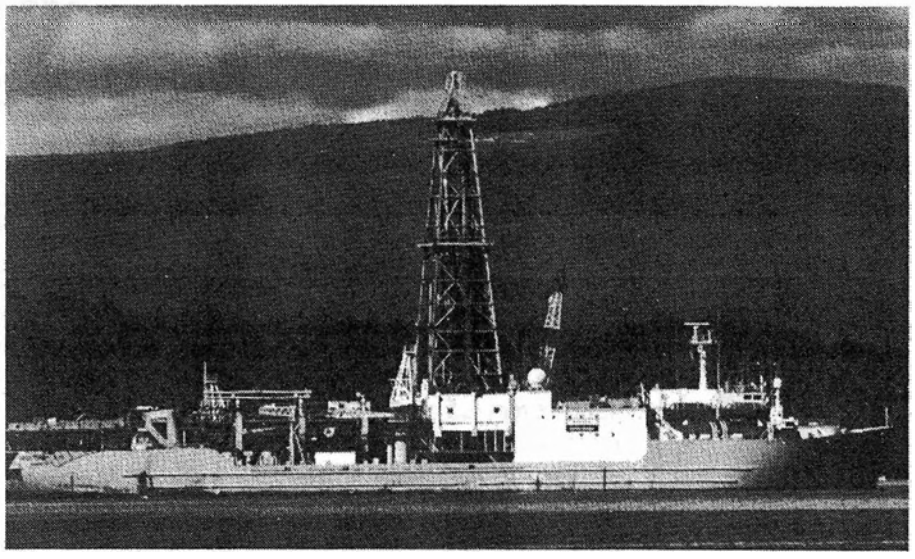

Figure 2: *JOIDES Resolution* in Saanich Inlet. Photo: R. W. Mathewes

- a complete record of annual, seasonal and even higher resolution environmental conditions, both terrestrial and oceanic, though the Holocene (last 12,000 years) and latest Pleistocene was obtained;
- lamina pair thickness (i.e., annual accumulation) varies from an average of about 6 mm to more than 1.5 cm;
- fish remains (mainly vertebrae) were found at several depths in cores from the two sites; wood debris and charcoal fragments were also recovered;
- there appears to be a cyclicity in lamina thickness and composition on a decadal to century time scale; the causes of these changes are not known at present;
- the Mazama Ash was found in cores from both drill sites; it appears as a white layer about 1 cm thick and was deposited 6,800 years ago from the eruption of Mount Mazama (Crater Lake, Oregon);
- massive intervals several tens of centimetres thick are evident throughout the cores, interspersed with finely laminated muds, and probably related to both earthquake-triggered underwater landslides and to periods of re-oxygenation of bottom waters;
- bottom waters immediately following deglaciation were apparently well oxygenated, as shown by the homogeneous character of the sediments and a well-developed bivalve fauna;
- after an initial transition from clearly cold climatic conditions (glacial) to warmer (as seen in a change from gray, stiff muds to olive coloured, progressively more laminated muds), there was a brief return to cold conditions before the final establishment of conditions similar to today; this brief return of colder conditions may correlate with similar episodes seen elsewhere in North America and Europe;
- glaciomarine sediments (deposited in the ocean under the influence of nearby glaciers) consist of stiff gray muds with some sand layers, chaotically bedded silts and sands and scattered very small pebbles reflecting the presence of tidewater glaciers in the vicinity of Saanich Inlet; these sediments are older than about 12,000 years.

For further information, including more pictures, consult the ScienceWeb at http://scienceweb.dao.nrc.ca/can/field/ocean/jrodp/jrvisit.html

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plus additional material (News Update) from ScienceWeb included with the permission of the WebMaster, Don Moffatt

Essays

OPPORTUNITY TO OBTAIN COPIES OF SOME SPECIAL HISTORICAL DOCUMENTS: PAUL SEARS AND THE *POLLEN & SPORE CIRCULAR*

History of science is always fascinating and teaches us much about ourselves. Paul Bigelow Sears was one of the premiere North American ecologists of the 1930s, '40s, and 50s. His book *Deserts on the March* is as fully current today as it was at its writing in 1935. He was not the very first person to apply palynological methods to Quaternary sites in North America, but he was an early and successful champion of such research.

During World War II and somewhat afterward, Sears initiated and sponsored a newsletter originally called *Pollen Analysis Circular*, later changed to *Pollen and Spore Circular*. The LRC (Limnologial Research Center) at the University of Minnesota has a full set of these mimeographed circulars. They are fascinating reading (see below). On the basis of an earlier request for interest, we have decided to have sets made on acid-free archival paper and bound with a continuous coil binding. There are 180 pages (single side). The cost per book will be $20.00 USD plus $6.50 postage and handling within the USA (total $26.50). Shipping out of the country will cost more: air packet $21.00 (7-14 days) or surface printed matter $6.50 (6 to 8 weeks) (totals $41.00 USD or $26.50 USD). This is a volunteer-based project. Please make cheques payable in US$. We cannot accept credit cards, and we have not allowed for any extra costs incurred for handling POs or international funds.

If you find yourself interested in a copy of the *Pollen and Spore Circular*, please send an e-mail specifically to shane002@maroon.tc.umn.edu. Enough interest has already been expressed to justify a run of 25 copies. This project is self-funded, so please do not offer to get a copy unless you really plan to do it.

In 1991 in Columbus, Ohio, the Ohio Academy of Sciences meetings held a symposium honoring the many roles of Paul Sears as ecologist, paleoecologist, educator, and a highly active member of the Ecological Society of America. Below is an extract from the near-final draft of my chapter (in press) on the role of Paul Sears in the history of North American paleoecology. The entire book with chapters by several people will be available from the Ohio Academy of Science in 1997.

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PAUL BIGELOW SEARS: CONTRIBUTIONS TO PALEOECOLOGY

ABSTRACT: Although not the very first person in North America to study fossil pollen, Paul Bigelow Sears was the primary pioneer this field now known as a component of paleoecology. He established the primary tools and techniques to accomplish such research, and he asked and set the foundation for many of the critical research questions that concern this field today. The tools he helped create were (1) the methodology and

taxonomy of pollen analysis; (2) the use of early land-survey data to represent the vegetation record prior to European agricultural development, a critical strategy in identifying modern climate analogs for fossil pollen assemblages; and (3) the fostering of mechanisms for international and interdisciplinary communication necessary to approach the global nature of the questions being asked. Sears used these tools to address a series of fundamental research problems: the relative ages of glacial geomorphic features, rates of basin sedimentation, regional sequences of revegetation after final deglaciation, climatic interpretation of vegetation change, rates of vegetation change, and the synchroneity of the North American and European climatic history. The field of paleoecology, frequently considered to be esoteric, has become one of primary research concerns today. The record of past changes are essentially our only source of possible models for the ecological significance of the changes predicted from global models of predicted future vegetation and climate change.

. . . . .

International and interdisciplinary communication:

The final tool I mention is that of interdisciplinary communication. In May, 1943 Sears mailed out from Oberlin College 49 copies of *Pollen Analysis Circular* Number 1. This 4-page document starts with the following statement:

> Because of the suspension of many scientific meetings and increasing handicaps to travel, the undersigned feels greatly the need of a freer interchange of information among those who are interested in pollen analysis in this country. He is therefore ready to underwrite the preparation and mailing of two issues to those who may be interested, after which, if the response seems to justify it, Professor L. R. Wilson of Coe College, Cedar Rapids, Iowa has indicated that he will be willing to underwrite two additional circulars, and Professor J. E. Potzger of Butler University, Indianapolis, Indiana, two more. (p. 1)

The group receiving the first circular were from England, Scotland, Finland, Canada, and all over the United States with addresses in geology and botany departments, museums, high schools, private homes, state and federal organizations, and even an Air Force base. A bibliographic project was started, with almost all the entries concerning vegetation history after the retreat of the last glacial ice. There were 4 issues in 1943, 4 in 1944, 3 in 1945, and 6 between 1946 and 1949. The last issue, No. 18, came out in 1954, was 36 pages long, and went to a mailing list of at least 200 scientists. It had become unmanageable for a few persons and was incorporated with a similar project run by the journal, *The Micropaleontologist*, out of the Department of Micropaleontology, Museum of Natural History, New York. A small glimpse into Sears' sense of humor is seen on the front cover of the last issue [a sketch], where the 5-year hiatus in publication is indicated by the term "grenzhorizont". In northwestern European bogs this was believed to be a synchronous period of drying when peat accumulation stopped (Birks and Birks 1980).

These Circulars are wonderful reading, full of interesting insights into scientific issues, happenings, and politics. (They were all mimeographed onto inexpensive paper and hence are somewhat fragile. A full set is available at the Limnological Research Center, University of Minnesota.) One question that was hotly debated was the name of the circular, finally settling on *Pollen and Spore Circular* to indicate that people interested in taxonomy and in pre-Quaternary and pre-angiosperm problems were truly part of the group. Another was the degree of organization needed — to stay informal or to have a more

complex structure. An amusing example comes with the issue of reprints. One suggestion was that the group members all send multiple copies of reprints to the editor, who would then distribute sorted bundles to the members. Clearly this could become a terrible task given the constantly changing membership size and the cost of postage. In *Pollen and Spore Circular* no. 9 Stanley Cain points this out and then states, "If you think a plea for voluntary exchange of reprints is appropriate, why not formulate a statement to that effect for P.A.C." (p.1). Sears' short reply was as follows:

> BY ALL MEANS EXCHANGE REPRINTS! The editor recalls many years ago the advice of an elder worker to a young scientist anxious to build up his own reprint collection. It was: "First distribute your own." Professor Cain's suggestion in the preceding paragraph certainly ought to be taken seriously by every one of us. (p. 1)

The Circulars are full of personal touches from many of the leading scientists of the day. I think the letter dated January 15, 1945 by the renowned British scientist Harry Godwin (later Sir Henry) in *Pollen and Spore Circular* no. 10 said it best and most poignantly:

> I have been getting the pollen analysis circulars quite regularly and they give me a lot of pleasure, and are useful in indicating what is going on, and in giving candid and informal opinions SUCH AS FOLKS WOULD NEVER PUBLISH [emphasis added]. That is why on the whole I like the show as it now is, and am rather against a formal organization. (p. 3)
>
> When our pollen analysis community has got integrated and the world will let us do it I should dearly like to raise the wind enough to come over to the States to take part in a meeting about all the matters we have in common. (p. 3)

Thus with this project Sears helped to hold communication together among an international and interdisciplinary group of scientists during World War II, an extremely difficult time for such interactions.

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POLLEN IS GETTING A BAD RAP

Pity the poor pollen. An elemental life force of nature, it gets scant respect at the top of the food chain. We fight it with whatever means at our disposal — antihistamines, injections, air filters, a sudden urge to see Sudbury, and TV weather stations that report daily pollen counts with the solemnity of a Canadian constitutional crisis.

Small wonder, since our own bodies are the culprits; they've misunderstood pollen from the start, and evolution is taking its own sweet time to get it right.

What is pollen that we should get it so wrong? Our bodies tell us it makes us sneeze, wheeze, leak at eyes and nose, and we should have invested in Kleenex when the earth was young. What they don't tell us is that pollen carries the male sex cells of flowering plants and certain trees — notably conifers and birches — and that these microscopic organisms, carried hither and yon on the wayward wind, sometimes alone, sometimes piggybacking on bees, bats and

birds, start the birth of a seed when they come to land.

If they land up human nostrils, our bodies, leaping to the wrong conclusion as if it were an Olympic discipline, react with a sneezing tornado. Outside our noses, those tiny organisms are the breath of life.

The Roman naturalist Pliny knew this. He called pollen the dust of fertilization. This was acute observation, since the microscope was about 1,600 years in the future: the dust of pollen grains range in size from large (such as corn pollen, which you can *just* see if you know where to look) to very small indeed (such as forget-me-not pollen, 10,000 of whose grains could fit on a pinhead).

These grains, often travelling thousands of miles from their source, enable more than a quarter million plants to reproduce. Without them foodies and gardeners would have to make do with basics such as potatoes, onions, bananas, parsnips, ferns, seaweed and moss. Without them we would also have no bread or bagels, no jeans or cotton shirts, no wine of beer, no cigars or grass, and you would not be reading about it on this page.

This is simple pollen arithmetic. For pollen calculus we go to palynologists, the only people to fully realize what pollen is and give it its due. These are the serious pollen experts whose discipline has thrilling overtones, to the uninitiated, of water divining's darker mysteries.

Palynologists help solve crime, sometimes murder — one in Denmark, by deciphering the pollen code written in a speck of dirt on a shoe-sole. The pollen showed the suspect had been in an area that he denied being in, thus torpedoing his alibi.

And through the '60s and into the '80s, palynologists were enthusiastically employed in North American oil exploration. By studying pollen trapped in rock strata, they could show the oil men where and how deep to drill. And where not to, which can be just as important with drilling costs up to and beyond $5,000 a foot, sometimes to depths beyond 10,000 feet.

"The palynologist will decipher the pollen grains, like marker symbols," said Dr Vaughn Bryant, Head of the Palynology Laboratory at Texas A&M University, "And then tell the company either, You've got to go another 6,000 feet — or, Cut bait, time to go home." No small responsibility with a potential $30 million of experiment riding on his word.

Palynologists used to do this more than they do today.

"They're coming back," says Dr Jan Jansonius of Calgary, gamely. He is visiting scientist for the Geological Survey of Canada and co-editor of *Palynology: Principles and Applications*. "But not to the same extent as in the Golden Age."

Twenty years' ago, up to 200 palynologists worked full time for oil companies, some 50 of them in Canada. Today, most have been forced into early retirement or academia.

"The trouble was, we did it so well we worked ourselves out of a job," says Dr David Jarzen, a palynologist who worked for Pan-American in the '60s. "We produced so much solid data from pollen research, all of it now filed in computer data-bases, that companies feel they have all the information they need, and if they need more they hire a palynologist as a freelancer, maybe six months at a time."

Some idea of palynologists' standing in the oil community today can be judged by the reaction of Exxon, of Irving, Texas, and its Canadian arm, Imperial Oil, of Toronto.

"Palynologists? How do you spell it? ... We have no record of any," said an Exxon public affairs executive. Ten minutes and one 'phone call later, I ran three of them to earth, hiding their lights under a pollen-riddled bushel, at

Exxon's offices in Houston. Twelve years' ago, the company employed 25.

Imperial oil was similarly stumped, coming up with no current or past palynologists on their books, despite the fact that Calgary's Dr Jansonius, palynologist extraordinaire, worked for the company from 1958 - 1988.

Still, for the ardent pollen buff there is life after all. Buffs don't come much more ardent than Dr Jarzen, until recently palynologist with the Canadian Museum of Nature in Ottawa. He is a man of wide-ranging enthusiasms: study of pollen tells us, he explains, that for most of known history the North Pole was as green as the Carolinas, that right now we're at the end of a cold snap, and if we could only live for another 21 million years we'd see the North Pole green again.

What excites Dr Jarzen most these days is the study of the pollen content in bowels. He does not shy from a suggestion that he might be the No. 1 fecal expert in Canada.

"Well, oh, yeah, I guess so," he says. "I love studying feces, you can tell so much from them."

On Dr Jarzen's plate, so to speak, have been pollen grains from the feces of marsupials from Australia, of hippopotamuses from Zambia — "hippos are great to study, they do it in water, then thrash it around with their tails so that it drops in small bits to the bottom, and we now believe that dinosaurs did it like that, too" — and currently and most notably, of 7,000-year-old pre-pharaonic mummies of the Chinchorro tribe from Chile, an assignment he received from York Central Hospital in Richmond Hill, Ontario.

"From this, well, human crap, we're trying to track down, through the pollen traces, the origins of certain parasitic diseases like roundworm and ringworm," says Jarzen. "The pollen will also tell us what they ate, and from that how they lived, and maybe what led to their downfall."

It's invigorating to listen to palynologists with their blood up and the wind behind — the one percent defenders of the pollen faith against the ninety-nine percent rest of us. It would be good to report that Dr Jarzen's body, out of respect for his pollen work, had worked out a truce during hay fever season.

"No, I'm just getting over my allergies now," he said. "I do see the irony of it."

With all pollen's pluses — as life source and nature's unerasable fingerprint — we might ask where our bodies, or our noses, have gone wrong. And go on asking, as there is no clear-cut answer.

Allergists know what happens long before the pollen reaches the bowel. Antibodies of immunoglobulin (IGE) line the nasal passages and are fired off like heat-seeking missiles (histamines) at the first hint of a perilous pollen invasion. The result is what we know as hay fever — a misnomer, since it has nothing to do with hay and it is not a fever — which allergists fight with antihistamines, inhalants and, less often, injections.

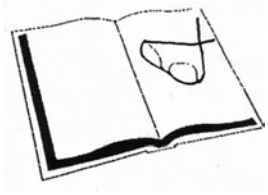
But why does the body react this way, since pollen is essentially benign?

"In a sense it's a false alarm," says Dr Stuart Berger, senior research scientist in immunology at Wellesley Hospital, Toronto. "It's the body's response to something in the environment, to protect us from parasites." And it's "inappropriate", since the body is not in danger.

So the mystery, on a personal level, remains. Allergists have tenure for the foreseeable future, while the rest of us wait an evolutionary eon or two for the body to wise up and learn some manners.

David Cobb
Toronto, Ontario

[Editor's note: A version of this article originally appeared in the *Toronto Star*, June 2 1996.]



On the shelf

RECENT PUBLICATIONS BY CANADIAN PALYNOLOGISTS - 6

Allen, G. A., J. A. Antos, A. C. Worley, T. A. Suttill, and R. J. *Hebda, 1996. Morphological and Genetic Variation in Disjunct Populations of the Avalanche Lily *Erythronium montanum*. *Canadian Journal of Botany* 74:403-412

*Beaudoin, A. B., 1996. Padding Around the Prairies. *INQUA - Commission for the Study of the Holocene: Sub-Commission on Data-Handling Methods, Newsletter* 14:12-14.

*Beaudoin, A. B., and M. J. *Head, 1996. CAP and AASP Launch Two New WWW Sites for Palynologists. *Journal of Paleolimnology* 15(3):279-280.

*Beaudoin, A. B., M. Wright, and B. Ronaghan, 1996. Late Quaternary Landscape History and Archaeology in the "Ice-Free Corridor": Some Recent Results from Alberta. *Quaternary International* 32:113-126.

*Chmura, G. L., 1994. Palynomorph Distribution in Marsh Environments in the Modern Mississippi Delta Plain. *Geological Society of America Bulletin* 106(5):705-714.

*Chmura, G. L., and P. Aharon, 1995. Stable Carbon Isotope Signatures of Sedimentary Carbon in Coastal Wetlands as Indicators of Salinity Regime. *Journal of Coastal Research* 11(1):124-135.

*Chmura, G. L., and E. C. Kosters, 1994. Storm Deposition and Patterns of ^{137}Cs Accumulation in Marsh Sediments of the Mississippi Delta Plain. *Estuarine Coastal and Shelf Science* 39:33-44.

Clague, J. J., and R. W. *Mathewes, 1996. Neoglaciation, Glacier-dammed Lakes, and Vegetation Change in Northwestern British Columbia. *Arctic and Alpine Research* 28:10-24.

Clayden, S. L., L. C. Cwynar , and G. M. *MacDonald, 1996. Stomate and Pollen Content of Lake Surface Sediments From Across Tree Line on the Taimyr Peninsula, Siberia. *Canadian Journal of Botany* 74:1009-1015.

Embry, A. F., and L. B. *Suneby, 1995. The Triassic-Jurassic Boundary in the Sverdrup Basin, Arctic Canada. *Canadian Society of Petroleum Geologists Memoir* No. 17: 857-868.

*Fensome, R. A., R. A. MacRae, J. M. Moldowan, F.J.R. Taylor and G. L. *Williams, 1996. The Early Mesozoic Radiation of Dinoflagellates. *Paleobiology* 22:329-338.

Hansen, B.C.S., G. M. *MacDonald, and K. A. Moser, 1996. Identifying the Tundra-Forest Border in the Stomate Record: An Analysis of Lake Surface Samples from the Yellowknife Area, Northwest Territories, Canada. *Canadian Journal of Botany* 74:796-800.

Helmens, K. F., P. *Kuhry, N. W. Rutter, K. Van Der Berg, and A.F.M. De Jong, 1996. Warming at 18,000 yr B.P. in the Tropical Andes. *Quaternary Research* 45:289-299.

Kalkreuth, W. D., C. L. Riediger, D. J. *McIntyre, R.J.H. Richardson, M. G. Fowler, and D. Marchioni, 1996. Petrological and Geochemical Characteristics of Eureka Sound Group Coals (Stenkul Fiord, Southern Ellesmere Island, Arctic Canada). *International Journal of Coal Geology* 30:151-182.

Kurita, H., and D. J. *McIntyre, 1995. Paleocene Dinoflagellates from the Turtle Mountain Formation, Southwestern Manitoba, Canada. *Palynology* 19:119-136.

Lerbekmo, J. F., A. R. *Sweet, and D. R. *Braman, 1995. Magnetostratigraphy of Late Maastrichtian to Early Paleocene Strata of the Hand Hills, South Central Alberta, Canada. *Bulletin of Canadian Petroleum Geology* 43:35-43.

*MacDonald, G. M., and McLeod, 1996. The Holocene Closing of the "Ice-Free" Corridor: A Biogeographical Perspective. *Quaternary International* 32:87-95.

MacRae, R. A., R. A. *Fensome, and G. L. *Williams, 1996. Fossil Dinoflagellate Diversity, Originations, and Extinctions and their Significance. *Canadian Journal of Botany* 74:1687-1694.

MacRae, R. A., L. V. *Hills, and D. J. *McIntyre, 1996. The Paleoecological Significance of New Species of *Limbicysta* (Acritarcha) From the Upper Albian of the Canadian Arctic Islands. *Canadian Journal of Earth Sciences* 33:1475-1486

Manum, S., and G. L. *Williams, 1995. Hypocystal archeopyles in the dinoflagellate cyst genus *Caligodinium* Drugg. *Palynology* 19:183-190.

Mathison, S. W., and G. L. *Chmura, 1995. Utility of Microforaminifera Test Linings in Palynological Preparations. *Palynology* 19:79-86.

*McGregor, D. C., 1996. Spores of the Escuminac Formation. In *Devonian Fishes and Plants of Miguasha, Quebec, Canada*, edited by H. P. Schultze and R. Cloutier, pp. 91-102.

Osborn, G., C. Clapperton, T. Davis, M. *Reasoner, D. T. Rodbell, G. O. Seltzer, and G. Zielinski, 1995. Potential Glacial Evidence for the Younger Dryas Event in the Cordillera of North and South America. *Quaternary Science Reviews* 14:823-832.

Smirnov, A., G. L. *Chmura and M. F. Lapointe, 1996. Spatial Distribution of Suspended Pollen in the Mississippi River as an Example of Pollen Transport in Alluvial Channels. *Review of Palaeobotany and Palynology* 92:69-81.

*Spooner, I. S., G. D. Osborn, R. Barendregt, and E. Irving, 1996. A Middle Pleistocene (Isotope Stage 10) Glacial Sequence in the Stikine River Valley, British Columbia. *Canadian Journal of Earth Sciences* 33:1428-1438.

Williams, S. H., E. T. *Burden, L. Quinn, P. H. von Bitter and A. R. Bashforth, 1996. *Geology and Paleontology of the Port au Port Peninsula, Western Newfoundland - A Field Guide*. Canadian Paleontology Conference Field Trip Guidebook No. 5, 74 pp. (Price $10. This volume can be obtained from: Geological Association of Canada, Publications Department (NEGSA 96), c/o Department of Earth Sciences, Memorial University of Newfoundland, St. John's, Newfoundland A1B 3X5)

*Yu, Zicheng, J. H. *McAndrews, and D. Siddiqi, 1996. Influences of Holocene Climate and Water Levels on Vegetation Dynamics of a Lakeside Wetland. *Canadian Journal of Botany* 74:1602-1615.

Zelenitsky, D. K., and L. V. *Hills, 1996. An Egg Clutch of *Prismatoolithus levis* oosp. nov. From the Oldman Formation (Upper Cretaceous), Devil's Coulee, Southern Alberta. *Canadian Journal of Earth Sciences* 33:1127-1131.

Zelenitsky, D. K., L. V. *Hills, and P.J. Currie, 1996. Parataxonomic Classification of Ornithoid Eggshell Fragments from the Oldman Formation (Judith River Group; Upper Cretaceous), Southern Alberta. *Canadian Journal of Earth Sciences* 33:1655-1667

[Note: A * denotes a CAP member]

FORENSICS

In perusing a recent issue of *Geotimes* (February 1996, p. 7), Jan Jansonius came across this item. Given the recent discussions of palynologists becoming involved in forensics, this may be of interest to some readers:

ASFE: Professional firms practicing in geosciences, has published: ***Expert: a guide to service as a forensic professional and expert witness***. The 56 page guide gives detailed instructions for engineers, environmental consultants and other design professionals who lack forensic experience and are asked to support litigation or arbitration. US $65; available from ASFE, 8811 Colesville Road, Suite G106, Silver Spring, Maryland 20910, U.S.A.,Tel: (301) 565-2733, FAX: (301) 589-2017.

PALYNOLOGY: PRINCIPLES AND APPLICATIONS

The milestone publication *Palynology: Principles and Applications* is edited by CAP members Jan Jansonius and Colin McGregor. The publication is in three volumes, totalling 1330 pages, with 125 photographic plates, 14 in colour. It consists of 32 chapters which cover most aspects of palynology and most geologic intervals. CAP is very well-represented in this project. Besides the editorship, CAP members have made significant contributions to the volumes, writing many of the chapters.

The set costs $100 USD plus $15 USD to cover postage and packing for each set ordered. Cheques in US funds should be made payable to AASP Foundation. Please send orders to:

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palyno bytes

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CAP WWW PAGE UPDATE

The CAP WWW presentation continues to grow. The Library section has been expanded, with more references, book reviews, and a list of palynological theses. I have added in a "Guest-book" feature so that visitors can comment directly on their likes and dislikes in the presentation. The list of links continues to expand, as does the "Dictionary of Quaternary Acronyms and Abbreviations", which now contains over 720 entries.

If you haven't visited the page recently, drop by and take a look at:

http://www.ualberta.ca/~abeaudoi/cap/cap.html

MAILING LISTS FOR GEOSCIENCE JOURNALS AND GEOSCIENCE MEETINGS

Dr Wuchang Wei of the Scripps Institution of Oceanography, California, has established a series of mailing lists that provide geoscientists with monthly information about geoscience meetings, new geoscience books, and tables of contents for geoscience journals. The service is free. The list of journals included in this service is very extensive, well over 250, and contains many journals that palynologists might find useful, such as *Canadian Journal of Earth Sciences*, *Quaternary Research*, *Holocene*, *Journal of Micropalaeontology*, and *Review of Palaeobotany and Palynology*. Among many other items, it also includes Preliminary Reports and Technical Notes produced by the Ocean Drilling Program (ODP). The list is far too long to be included in full here but it will be added soon, together with the subscription instructions, to the CAP WWW presentation. In the meantime, more information on this service can be found at the following web site:

http://wwei.ucsd.edu

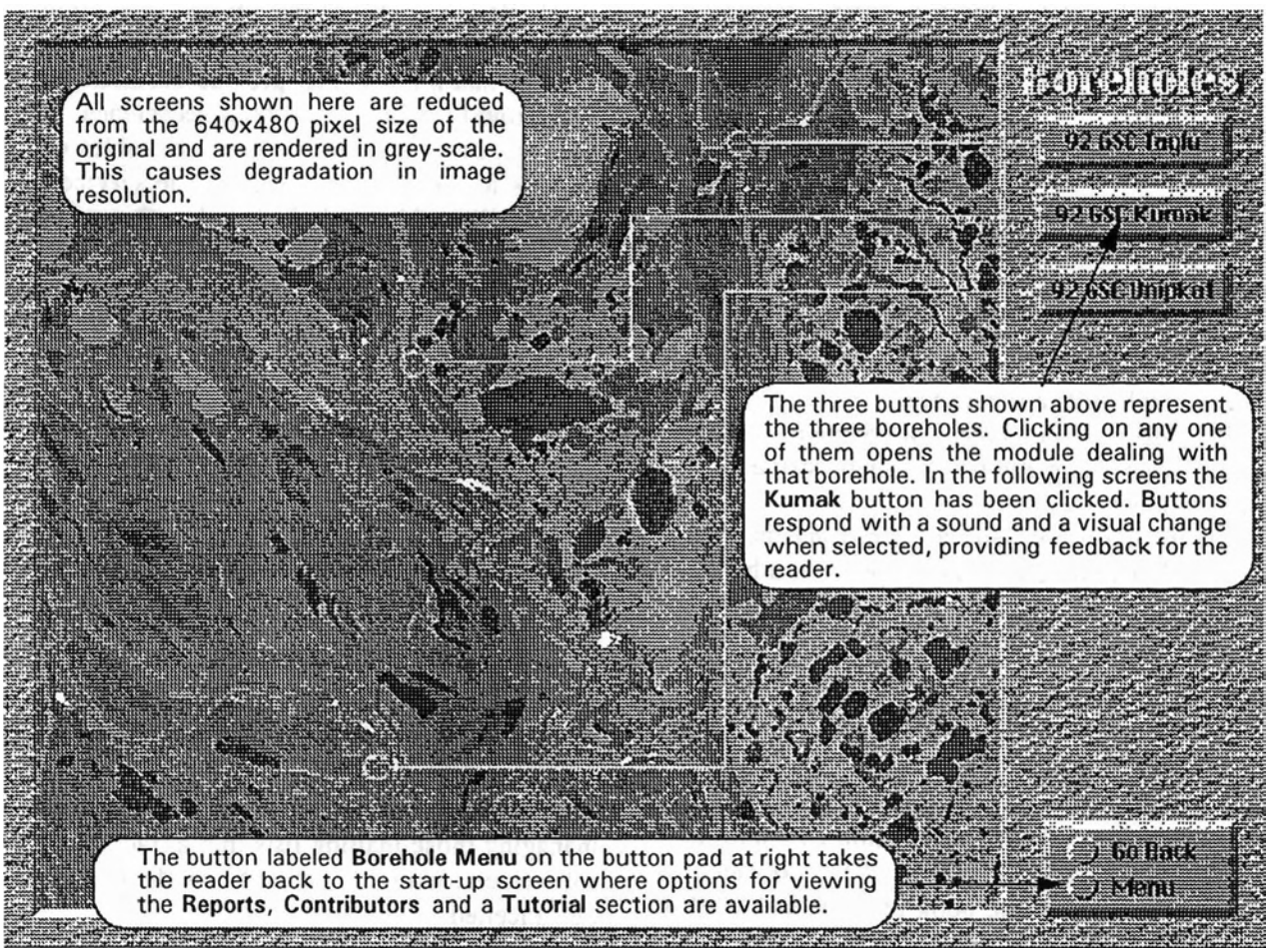
Dr Wei points out that it is only worth managing those mailing lists that attract many subscribers; mailing lists with low demand may be cancelled.

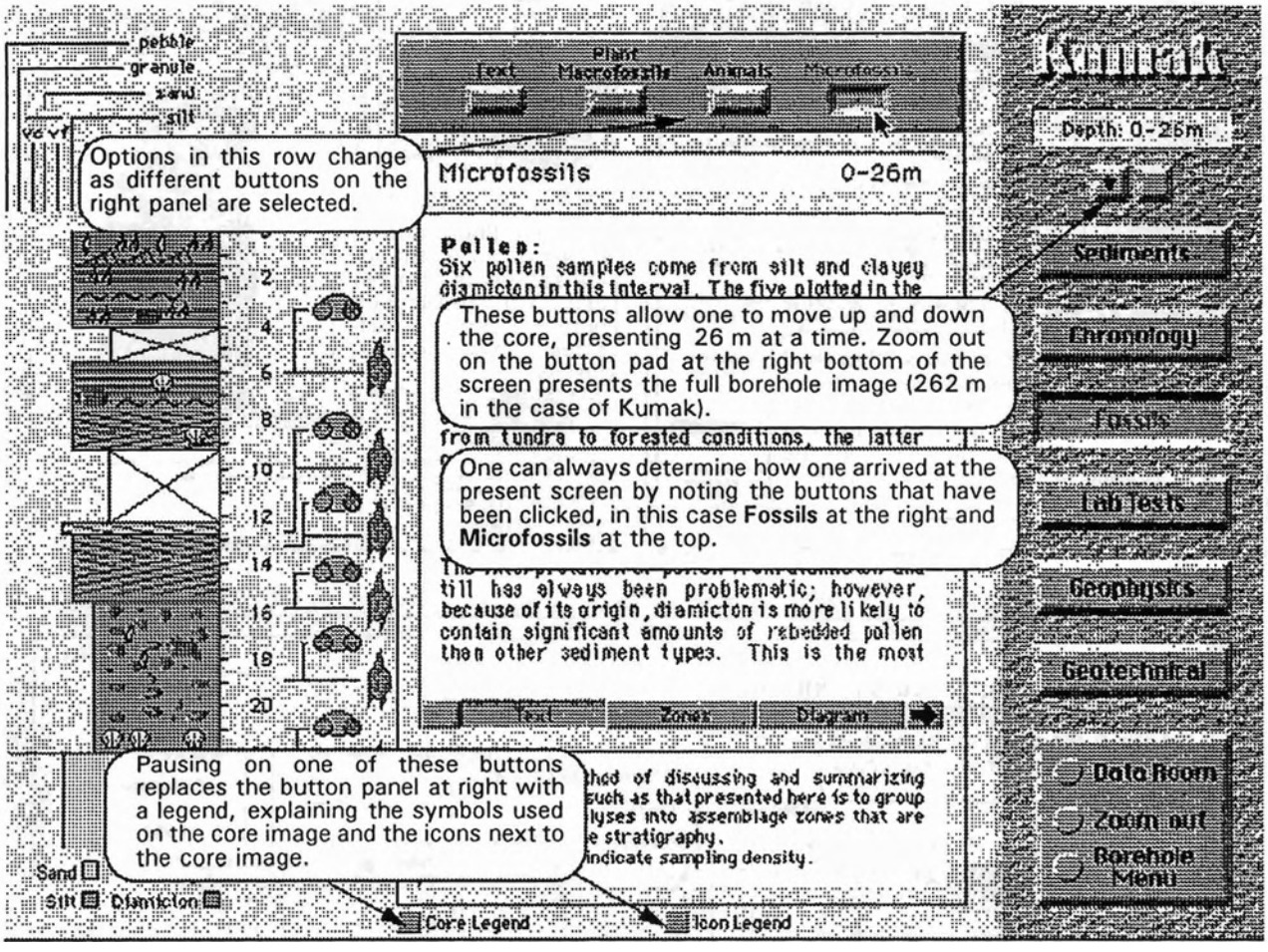
MULTIMEDIA SCIENCE PRESENTATIONS AND TEACHING AIDS

Over the past several years the author, a paleoecologist in the Terrain Sciences Division of the Geological Survey of Canada, has participated in the creation of several multimedia CD productions. All are designed to present large science projects in a manner that is suitable for the layperson as well as useful to the specialist. To achieve this goal, they employ several software applications not often used by scientists, at least not in concert. The approach is unique and because of this has been the subject of an article in one of the trade journals on digital publication (*Electronic Link Magazine*, Volume 2, No. 4, 1996)

The following pages contain sample screens from these presentations as well as examples of how similar multimedia techniques could be used for CD presentations of databases. One of these proposed database presentations — **a Digital Pollen Reference Collection** — will likely be of special interest to *CAP Newsletter* readers.

Our initial exploration of the potential of the CD medium for presenting large science projects dealt with **The Mackenzie Delta Borehole Project**, a large multidisciplinary effort involving three deep boreholes drilled in the Mackenzie Delta region in 1992. The longest of the boreholes bottoms out in the mid-Miocene. All three have yielded a wealth of data–too much for reasonable presentation as a traditional paper publication. Our goal was to



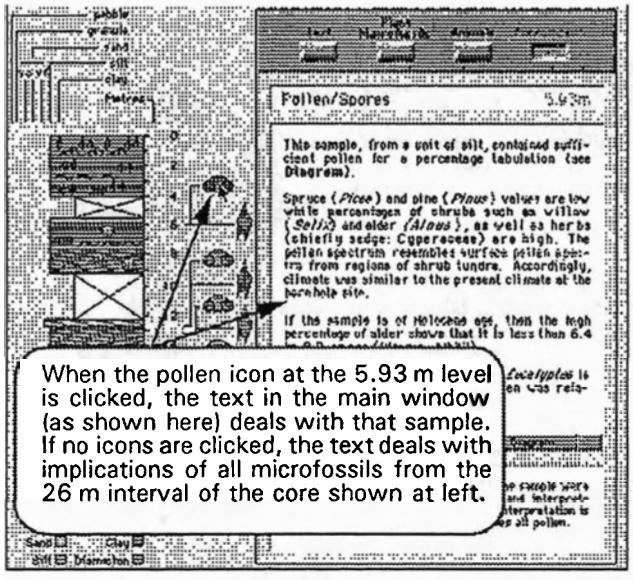


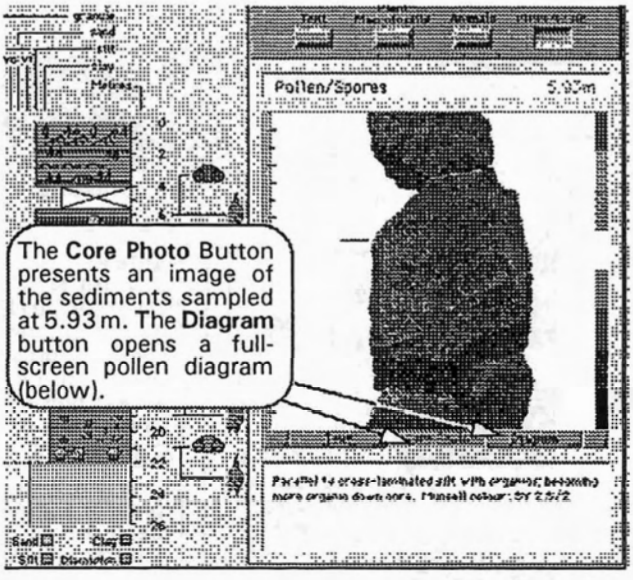
design a multimedia presentation that allowed the reader to extract snippets of information from various levels in each core while at the same time preserving a journal-style presentation for the technical reports. We also deemed it essential that the user have access to all of the raw data associated with the project as well as to background documents, such as those normally appearing only as titles in the reference section of a printed monograph.

Furthermore, after examining existing science-based CDs, we recognized the need to construct the presentation in such a manner as to allow it to run on all of the popular computer platforms without requiring the reader to possess any special software other than that provided on the CD.

The screen on the previous page is one of the first seen by the user of the Borehole CD. The three buttons are entry points for examination of the results and data from each of the boreholes. The screen shown is actually not the first one of the presentation. It follows an introductory section with options for viewing (1) reports, (2) a tutorial on how the information is presented and (3) information on contributors and sponsors.

The Screen on this page is the one that appears when the **Fossils** and then **Microfossils** buttons are clicked. If one of the icons next to the core image is clicked (e.g., the pollen icon at 5.93m level–next page), additional information becomes available via the buttons at the bottom of the central window. **Core Photo** shows the sediments that were sampled.


Pollen/Spores
5.93m
When the pollen icon at the 5.93 m level is clicked, the text in the main window (as shown here) deals with that sample. If no icons are clicked, the text deals with implications of all microfossils from the 26 m interval of the core shown at left.


Pollen/Spores
The **Core Photo** Button presents an image of the sediments sampled at 5.93 m. The **Diagram** button opens a full-screen pollen diagram (below).

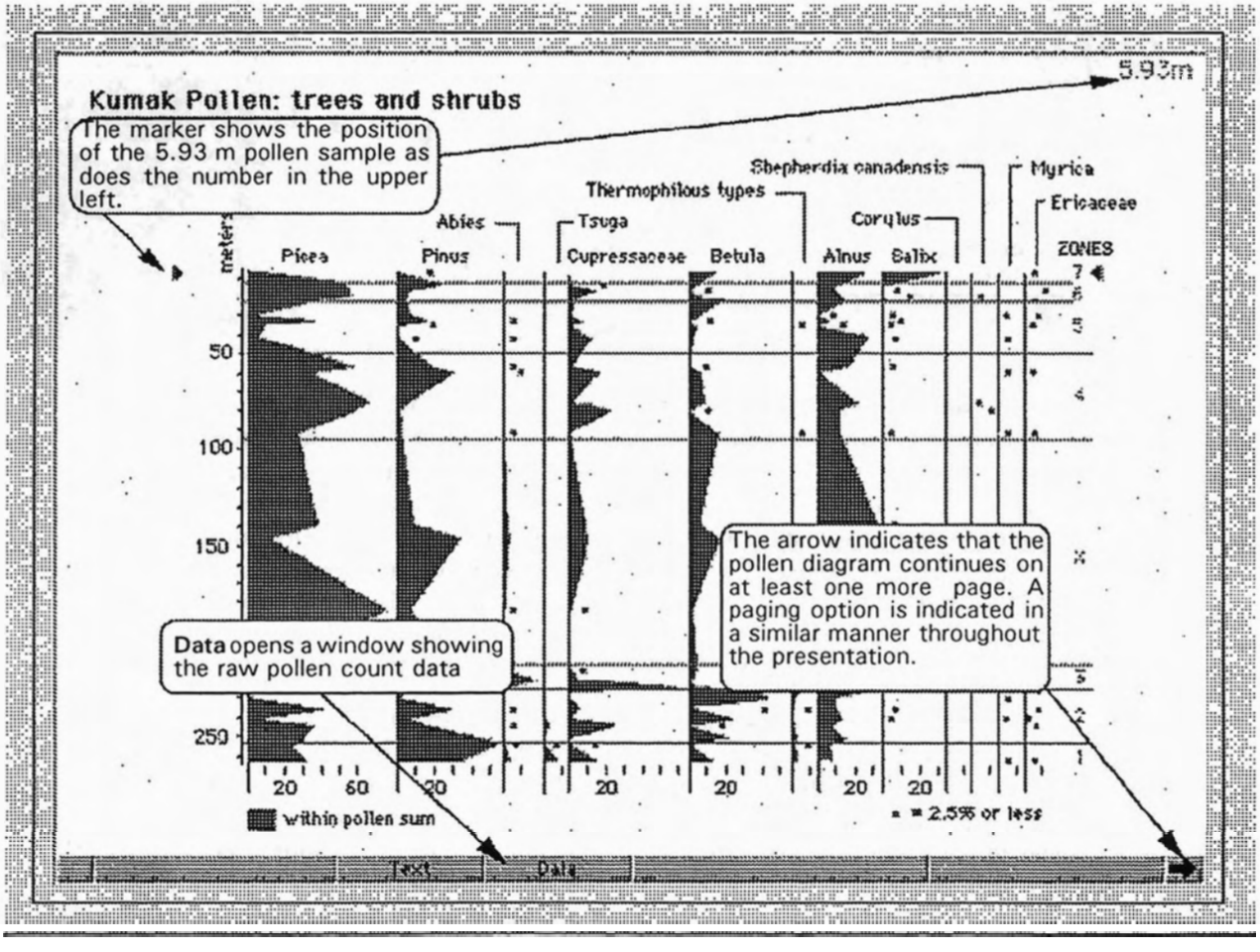
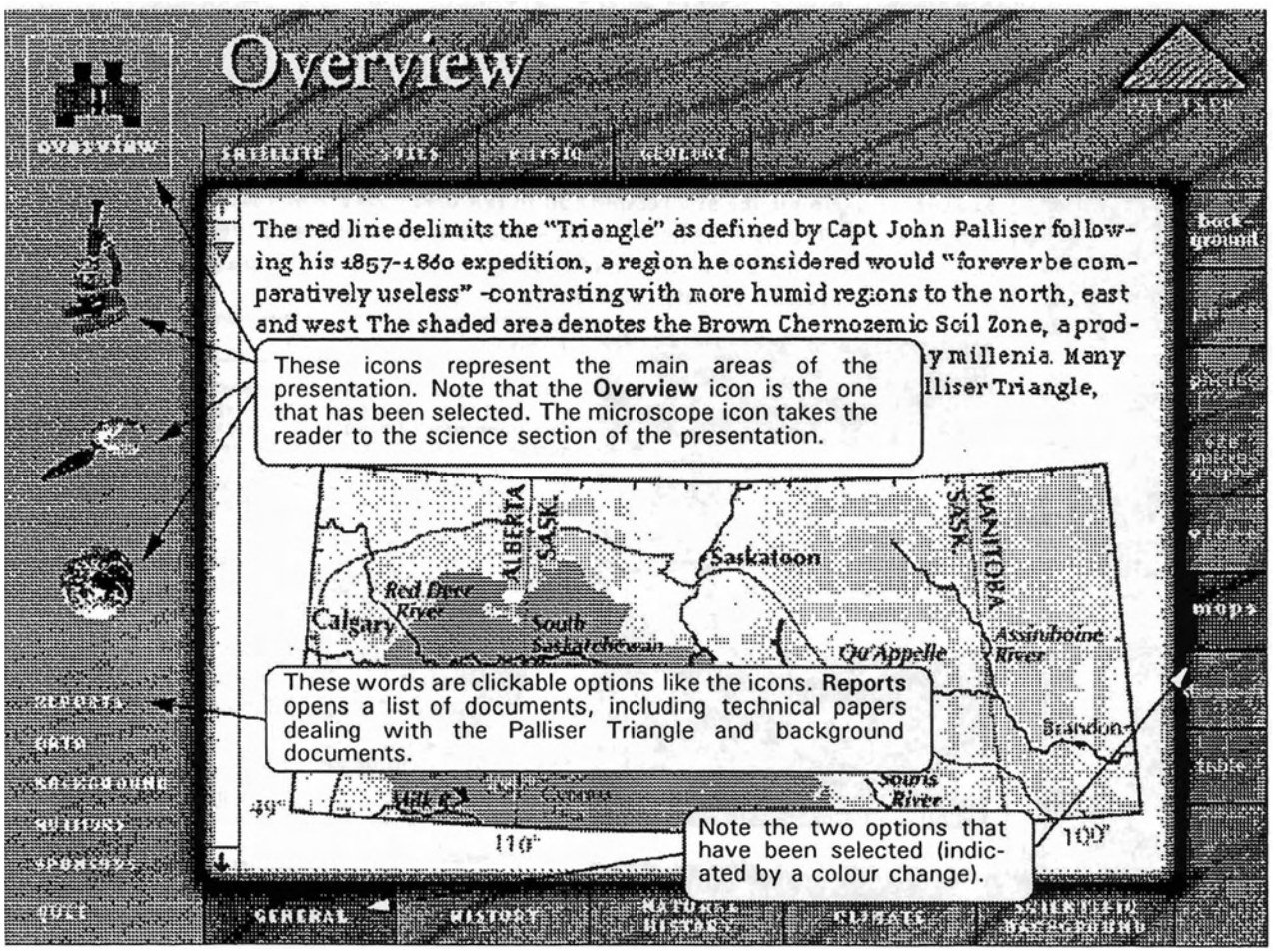

Kumak Pollen: trees and shrubs
5.93m
The marker shows the position of the 5.93 m pollen sample as does the number in the upper left.
Shepherdia canadensis
Myrica
Thermophilous types
Ericaceae
Abies
Tsuga
Corylus
ZONES
meters
Picea
Pinus
Cupressaceae
Betula
Alnus
Salix
50
100
150
250
The arrow indicates that the pollen diagram continues on at least one more page. A paging option is indicated in a similar manner throughout the presentation.
Data opens a window showing the raw pollen count data
20
60
20
20
20
20
20
within pollen sum
= 2.5% or less
Text
Data

Diagram opens the full-screen pollen diagram. It is generalized and modified for a screen presentation; however, a more complete version, similar in style to a published pollen diagram, is found in the **Reports** section, which is reached by going to the **Borehole Menu** page. This redundancy illustrates one of the unique features of the Borehole presentation and others discussed below: information is presented in traditional document format as well as in small doses via icons, buttons and other links.

The **Palliser Triangle Global Change Project** is another large multidisciplinary effort that is ideal for a multimedia CD presentation. It deals with the past **climate** of a **critical** part of western Canada. Unlike the Delta Borehole presentation, the target audience for the Palliser CD is very broad, including laypersons, residents of the Palliser region, students, teachers and research scientists.

The Palliser presentation has benefitted from lessons learned in the construction of the Borehole CD. For example, the reader moves through the presentation by selecting icons or text labels rather than buttons. Also, much more attention has been devoted to the artistic style of the presentation, resulting in a product which is much more pleasing to the layperson and students.

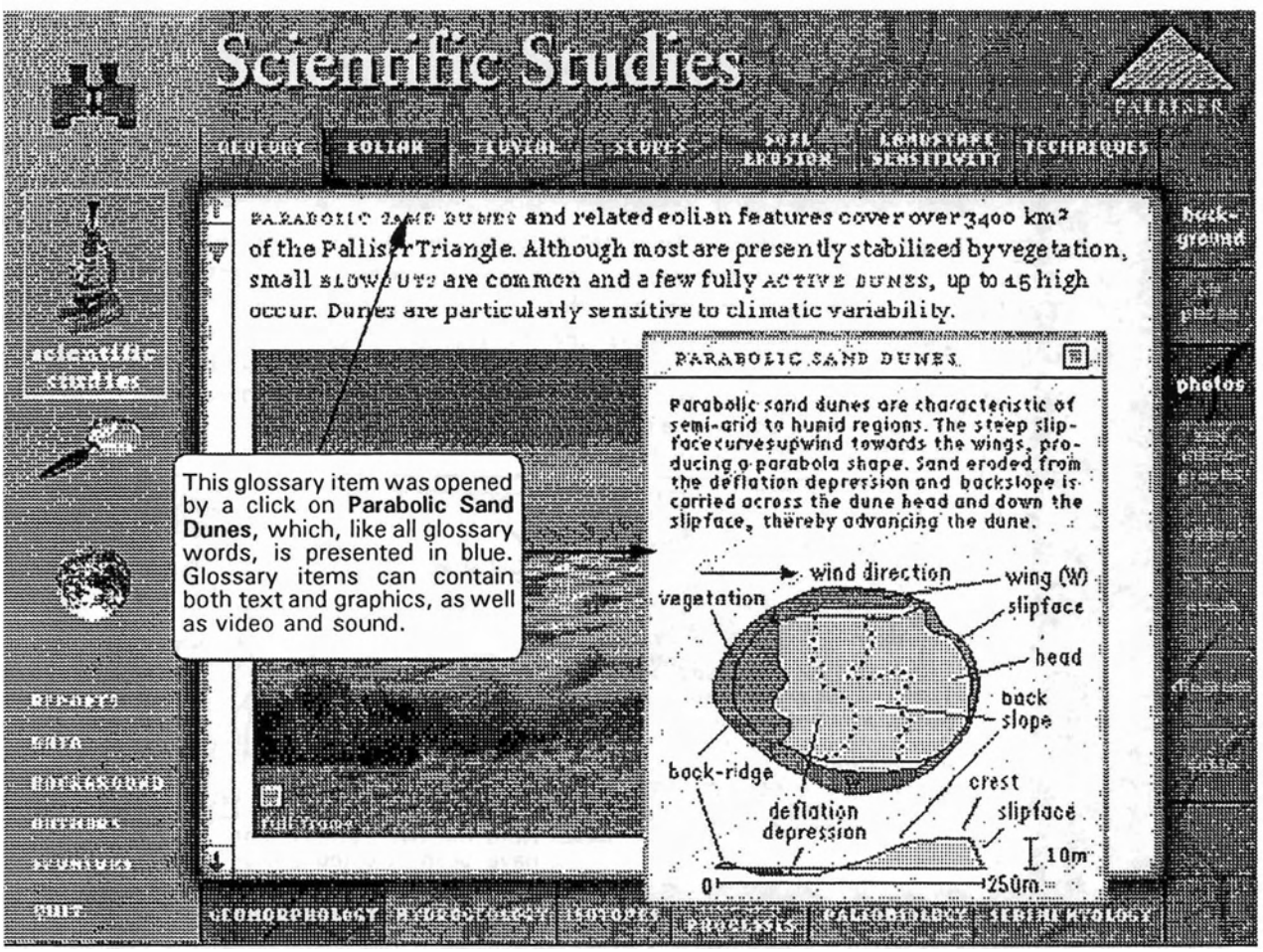
The Mackenzie Delta Borehole CD project also taught us the importance of producing a self-

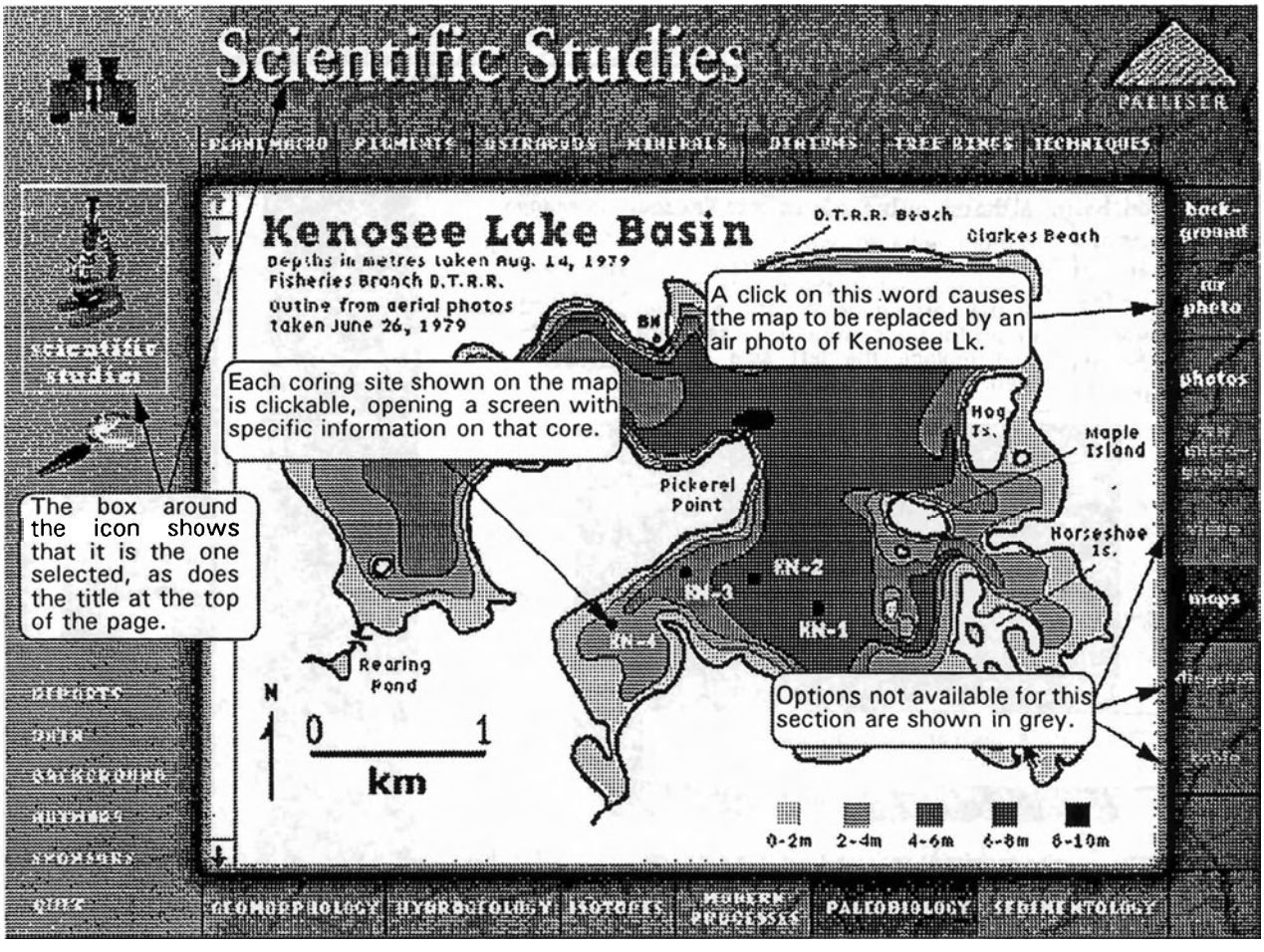


running demo of the presentation. This demo serves first as a very effective planning guide and storyboard. Its construction also provides most of the artwork required for the project. Finally, the demo provides a very effective tool for promotion of the fully interactive, final product. This last use is very important if one requires financial partners. We require such partners because it is our intention to distribute the final CD free of charge. In return for their contribution, each of the sponsors is offered space on the CD to advertise their activities/services.

Many users of the Palliser Triangle CD will explore no further than the **Overview** section, reached by the binocular icon. But it is our hope that a few readers will become curious enough to dig deeper and visit the **Scientific Studies** section. Use of jargon or references to reports not ordinarily available to the layperson pose the biggest barriers to such exploration. We deal with this problem in two ways.

First, the **Reports** section contains a number of background documents, among them some very general "how to" and "why" documents. Second, the presentation includes a comprehensive glossary. Clicking on the words **Parabolic Sand Dunes**, shown below, opens a glossary "tablet" containing a definition of the term. But note that the definition is not restricted to text. Like the example, it can also include diagrams or



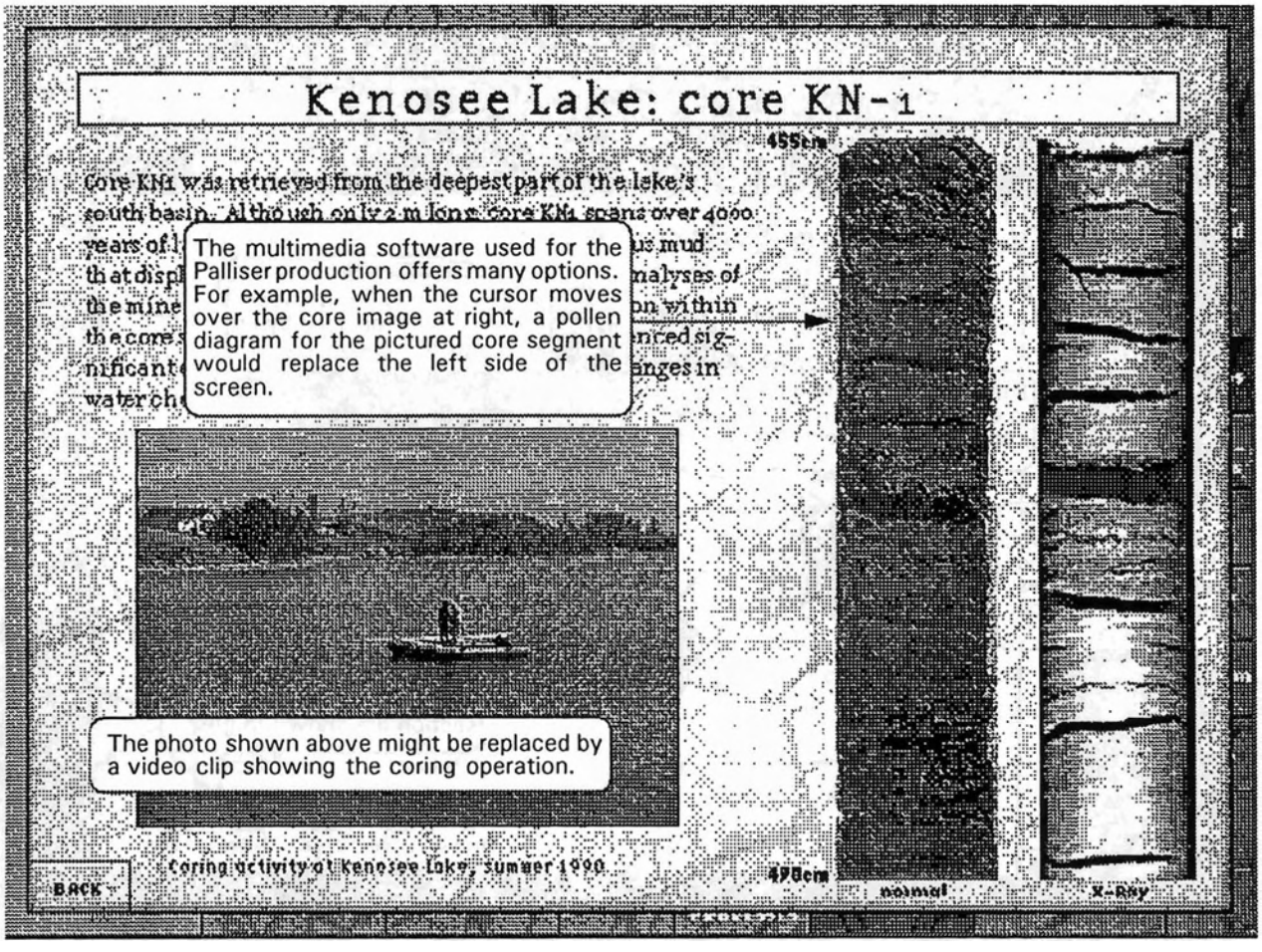


photographs, and some items might well be illustrated by voice-overs or video clips.

Kenosee Lake, shown in the map on the screen at the top of this page, is one of several that were cored during paleobiology studies in the Palliser region. Each of the coring sites shown on the map is a clickable item. Selecting one opens a screen describing the general features of the core at that location. Then, by selecting one of the options listed on the right, the reader can obtain additional information on that particular core. For example, clicking the **photos** option opens the screen seen at the top of the next page. It shows both normal and x-ray photographs of part of the core and a photo of the coring operation.

When we showed the Palliser Demo to school classes and teachers in western Canada, they had many suggestions on how the presentation might be made better for their use. Inclusion of a teaching guide was one suggestion. Another, was that we should make more and better use of voice-over and video. In the case of the screen shown here, we could add a "sound" button that activates a sound file of Robert Vance describing some of problems encountered during study of the lake.

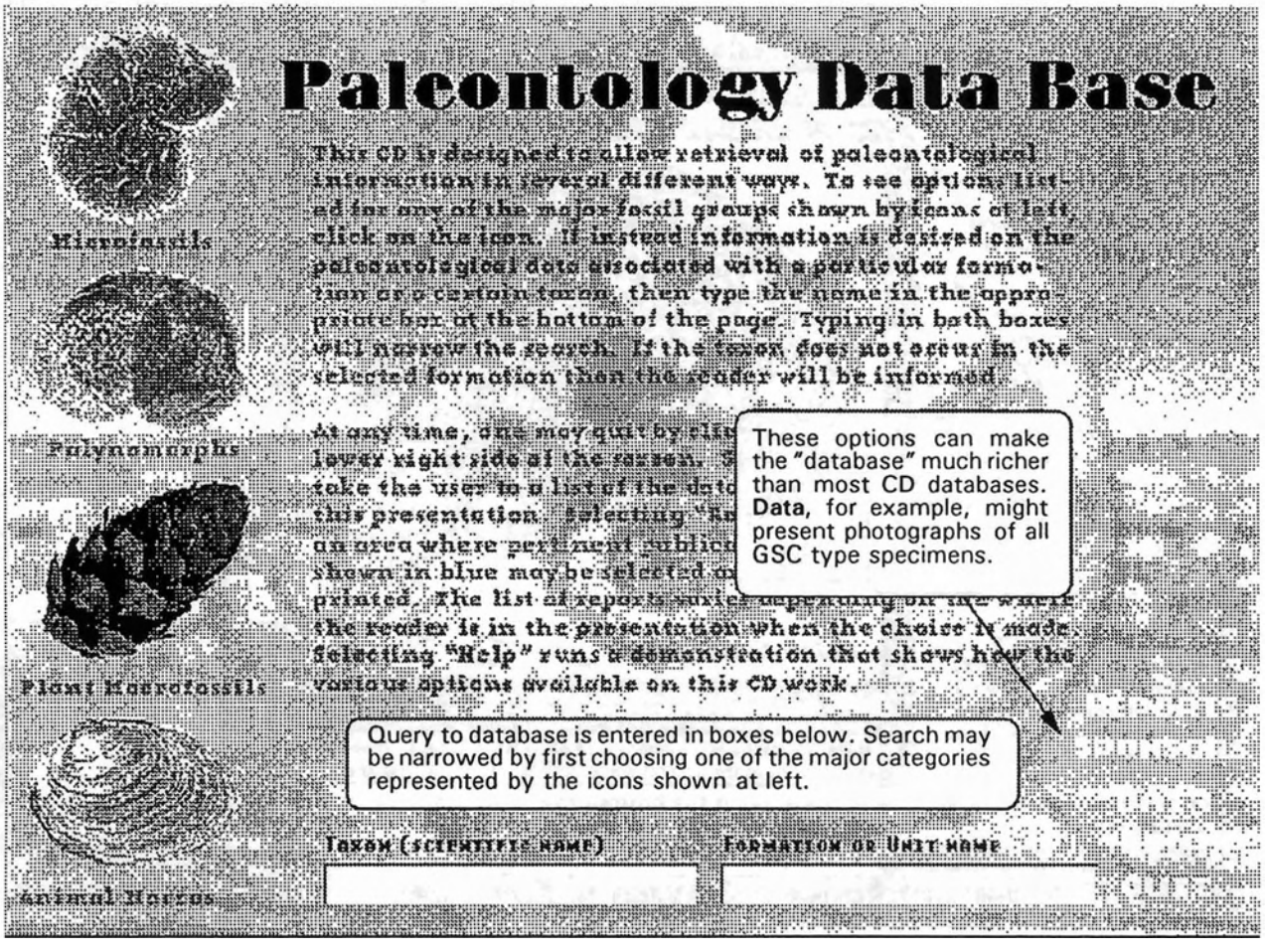
The Palliser Triangle and Mackenzie Delta borehole CDs are large and complex presentations involving many linked pages and considerable scripting. Multimedia techniques can



also be used very effectively and with little design effort to introduce a series of publications or a database. For example, the screen on the next page could be the opening for the Geological Survey of Canada paleontological database that is now in preparation.

The two windows at the bottom allow one to query the database by entering a stratigraphic unit name or a taxon name. The database can also be opened, and the search narrowed, via the icons presented along the left side of the screen.

The options shown on the lower right side of the screen offer extra features without significantly increasing the multimedia design overhead of the project. **Reports** would lead to a series of titles and because of the storage space on a CD, these could include all previously published CSC publications in paleontology. The papers would be in the Adobe Acrobat pdf format, meaning that they would contain electric bookmarks and links to other documents. **Sponsors** would be a link to a section on the activities of the Geological Survey and any other partners that contributed to the project, and **Data** would take the reader to a file containing images of all GSC type specimens. In other words, use of a multimedia interface opens the way for a much richer database than is ordinarily presented on CDs.

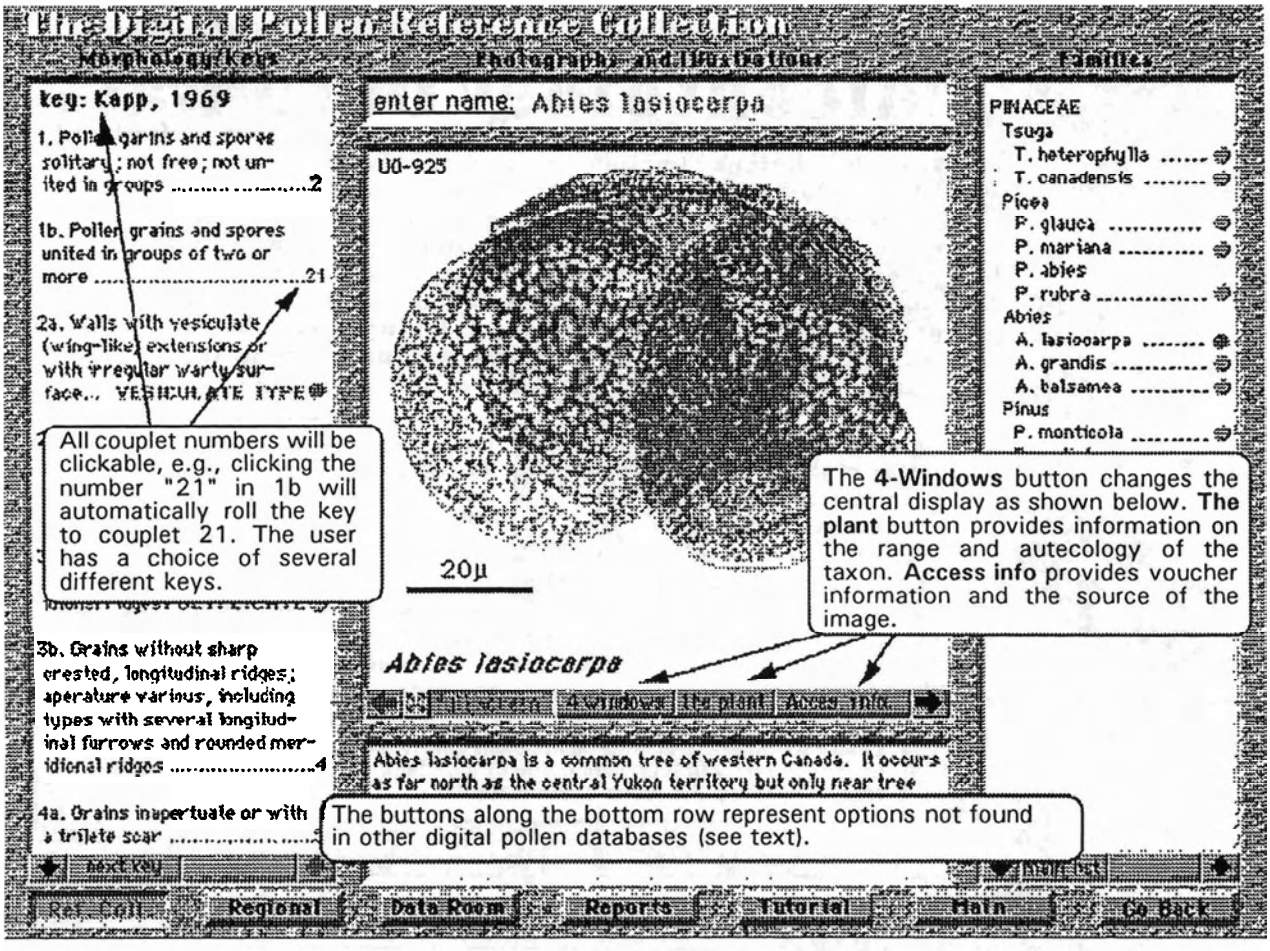


The same is true for another presentation now in the planning stages: the **Digital Pollen Reference Collection**. Almost all desk-top and many lap-top computers sold today have internal CD players. A CD pollen reference collection, running on a computer placed next to a counting scope, would be a powerful instructional and research tool. No longer would students and paleoecologists at small institutions be crippled by lack of an adequate reference collection. In fact, because a CD reference collection would drawn from a number of existing collections, it would be more complete than any single collection – even those at large institutions.

A digital pollen reference collection is not a new idea. Several have been constructed including one designed for the world wide web. However, what we are proposing here would be far more than a simple collection of pollen images.

A mock-up of one of the screens in the proposed **Digital Pollen Reference Collection** appears overleaf. Pollen images are presented in the central window, with additional comments in the smaller text box at the bottom.

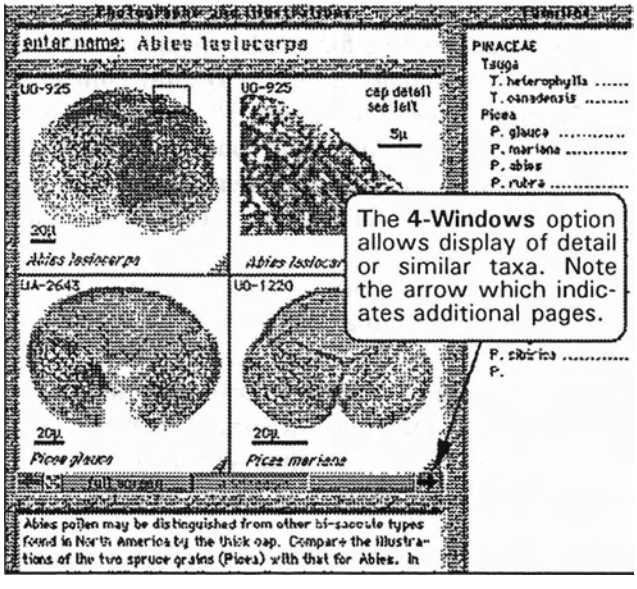
The user obtains an image of a pollen type in one of three ways: by typing the taxon name in the top window, working through the key on the



left or selecting the taxon name from the list presented on the right side.

One group of the options will simulate a microscope: use of "up" and "down" arrows on the computer key board will allow the user to focus up and down on the image in the center window and other keys will change magnification.

The buttons shown along the row at the bottom on the mock-up screen add features that make the **Digital Pollen Reference Collection** much more than a series of pollen photos. For example, the button labeled **Regional** allows the user to select the region from which the core



they are counting comes. Once this is done, a series of small windows show the 20 most common pollen types that have been found in other pollen studies in that region. In addition, this section will contain images of fossil pollen from selected sites in the region in order to illustrate regional preservation characteristics. We need suggestions on the appropriate number and location of regions for North America.

A toggle button will allow the user to switch to a count sheet designed for that region and to add to a count database, using the keyboard function keys or by clicking on pollen images shown on screen. These count data are then available for numerical manipulation using the various statistical methods presented in the **Data Room.**

In the **Tutorial** module, students will be able to test the various statistical tools in order to see how their output changes as a function of differences in the number of pollen types and pollen sums. This would also be the place where different processing techniques are presented, possibly accompanied by video clips. Another option would be to present a video of several traverses of a pollen preparation slide, with pop-up tags indicating which objects are pollen, which are fungi, trash etc.

Reports leads to a screen with a number of selectable titles. They might include papers of historical interest or even entire monographs, e.g., Erdtman's entire book on Pollen Morphology and Taxonomy of Angiosperms (with publisher's permission of course). If the reader clicks the **Reports** button while in one of the regional sections, the titles listed are studies conducted within that particular region.

We need suggestions. For example, assuming the regions are **Arctic/Subarctic, Northwest Coast, Interior, Desert Southwest, Northeast** and **Southeast**, what are the landmark publications from each? Are there pictorial atlases, applying to one or more regions, that should be on the CD?

To be useful for students, the **Digital Pollen Reference Collection** should be priced no higher than a typical text book. This means that sponsors will be required to help defray production costs. Sponsors will be offered space on the CD to say something about themselves or their programs. If they are institutions with an interest in selling the CD, they would be offered an agreed upon number of customized copies.

But even more critical than financial partners are the many collaborators required in order to amass a suitable collection of pollen images. We are at present looking for both types of partners but especially the latter. As indicated earlier, partners are also required for selection and acquisition of background documents. A CD offers abundant space. Given that, what documents, however obscure, should we plan to include?

The format used for the **Digital Pollen Reference Collection** might easily be adapted for presentations dealing with other types of fossils, such as plant macrofossils, insects, diatoms, forams etc. In fact, the first test of the presentation model will likely deal with marine molluscs.

Because the **Digital Pollen Reference Collection** is still in the planning stages, there is plenty of time to alter the method of presentation or to rethink the content and options. We welcome comments and suggestions on this project or any of the others discussed above from *CAP Newsletter* readers. A CD with demos of the Borehole and Palliser projects is available for viewing upon request.

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Hallett, Douglas J., 1996. Paleoecological Investigation into the Montane Ecoregion of the Kootenay Valley and Its Implications for Ecosystem Management. M.E.D. Dissertation, Faculty of Environmental Design, University of Calgary, Calgary, Alberta. 103 pp. Supervisor: Dr L. V. Hills.

Two lake cores taken from low elevation montane sites in the Kootenay Valley were analyzed for pollen, sediment charcoal and other macrofossils to investigate the relationship between postglacial vegetation changes, climate and fire in the Montane Spruce biogeoclimatic zone of the southern Rocky Mountains. Using high resolution sampling in laminated sediments, seven pollen zones with associated subzones are recognized in the Dog Lake core: *Juniperus-Betula-Alnus* from 9100-8600 years BP, *Pinus-Picea-Juniperus* from 8600-8000 BP, *Pinus-Betula-Juniperus* from 8000-6700 BP, *Pinus-Picea-Betula-Alnus* from 6700-5300 BP, *Pseudotsuga/Larix-Juniperus-Artemisia* from 5300-4600 BP, *Pinus-Picea-Pseudotsuga/Larix* from 4600-3800 BP, *Picea-Pinus-Abies* from 3800-2600 BP, *Picea-Betula* from 2600-1600 BP, *Pinus-Picea* from 1600-700 BP, and *Picea-Pinus-Abies-Tsuga* from 700 BP to present.

Early postglacial pollen assemblages represent a shrub dominated landscape with *Juniperus*, *Betula glandulosa*, *Alnus* and scattered stands of *Pinus contorta* and *Picea*. High percentages of xerophytic taxa such as Poaceae and *Artemisia* correspond to the "xerothermal" climatic phase of the early Holocene. *Pseudotsuga/Larix* enter the region at *ca.* 8600 BP and continue to increase until the mid-Holocene. Five charcoal-rich debris flows from the slopes of Mount Sinclair entered the Cobb Lake basin in the early to mid Holocene indicating that slopes adjacent the lake were sparsely vegetated and subject to erosion.

Minor increases in mesophytic pollen in the Dog Lake record such as *Betula* and *Alnus* prior to the eruption of Mount Mazama correspond to the moister "mesothermal" climatic phase. Charcoal accumulation rates during the early to mid-Holocene in an open shrub-dominated landscape are relatively low. Fire-adapted *Pseudotsuga/Larix*, *Pteridium*, and *Alnus* palynomorphs occur mainly in the early to mid Holocene; however, this vegetation association also appears periodically in more recent sediments suggesting oscillating periods of warmer drier climate and with increased fire activity.

Major vegetation changes begin *ca.* 5000 BP when with increases in *Picea* and *Abies* pollen percentages. This change along with higher overall pollen accumulation rates indicates a closing of forests in the valley. This change in montane vegetation is attributed to the cooler moister climate changes associated with the Neoglacial. Undisturbed organic sedimentation occurs in Cobb Lake after *ca.* 5000 BP indicting that a closed forest stabilized the slopes around this lake. Interestingly, there is an increase in charcoal accumulation rates from *ca.* 5000 BP to present and this is contrary to most pollen and charcoal studies which report higher charcoal accumulation rates in the early Holocene. Closed-forest montane landscapes have the potential to deposit greater amounts charcoal into a lake basin during and after fire events. *Tsuga heterophylla* pollen enters the region about *ca.* 2300 BP indicating a change towards a mature moist environment in regional forests. The most recent appearance of greater *Pseudotsuga/Larix*, *Pteridium*, and *Alnus*

pollen percentages along with higher charcoal accumulation rates occurs *ca.* 1200-700 BP which corresponds to the "Medieval Optimum" climatic phase. A return to the present day closed-canopy *Picea-Pinus* dominated forest with increased *Abies* and *Tsuga heterophylla* pollen occurs from *ca.* 700 BP to present, indicating these vegetation changes may correspond with the "Little Ice Age".

The vegetation mosaic in the Kootenay Valley has been sensitive to both climate change and fire activity throughout the Holocene. Tree and shrub abundances shift frequently as evidenced by ~40 year pollen and charcoal samples from *ca.* 9000 years of laminated lake sediments. This suggests that fire has and will play an important role in changing the forest mosaic of the montane ecoregion. Current vegetation is within its natural variability according to the paleoecological record and does not represent a divergence from "natural" conditions.

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Yansa, Catherine H., 1995. An Early Postglacial Record of Vegetation Change in Southern Saskatchewan, Canada. M.Sc. Dissertation, Department of Geological Sciences, University of Saskatchewan, Saskatoon, Saskatchewan. xiii +273 pp. Supervisor: Dr J. F. Basinger

The Andrews site represents one of the countless closed drainage basins found on the Missouri Couteau upland of southern Saskatchewan that have been infilled with sediments during late-glacial and Holocene times. Sediments from a depth of 5.8 to 3.1 m provide a detailed record of changes in vegetation from 10.2 to 5.8 ka. Plant macrofossil analysis of 67 samples were used to reconstruct 5 zones of environmental changes at the Andrews site following deglaciation.

Plant macrofossils recovered from till (Zone 1) are likely allochthonous; however, there is unequivocal evidence of an open white spruce woodland established by 10.2 ka (Zone II). A deep pond developed in the basin at 10.2 ka and persisted until at least 8.8 ka (Zone III). River birch, poplars and shoreline forbs surrounded a pond which supported abundant aquatic and emergent plants in a parkland setting. Brackish and alkaline conditions developed as waters began to shallow at the end of this zone.

The deep water phase was truncated at 8.8 ka by a *ca.* 1100 year period of weathering associated with a low water stand. Prairie fires and slopewash from unstable slopes were dominant processes until 7.7 ka (Zone IV). This arid period is interpreted as the Hypsithermal, like that reported from other sites in the region. Subsequently, water levels began to rise, and from 7.7 to 5.8 ka a semi-permanent slough was established (Zone V). The flora established during that time is typical of the Mixed-grass Prairie region of today. After 5.8 ka this wetland became emphemeral, to the point that plant macrofossils could not be preserved, a situation continuing to the present day.

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Announcements

AASP 1997 ANNUAL MEETING

Woods Hole, Massachusetts

Now that the excitement of IPC in Houston is beginning to fade, it's time to be thinking about the next AASP annual meeting, September 14-19 1997, in Woods Hole, Massachusetts, US. The meeting format will include an extended seminar series on the evolution of the marine phtyoplankton in addition to the regular technical sessions. The purpose of this will be to bring together scientists from the disparate disciplines that touch on this topic, such as: systematics of living and fossil dinoflagellates, stratigraphic history of phytoplankton groups, past and present relations between climate and phytoplankton, phytoplankton ecology and paleoecology, evolution of protists and the origins of phytoplankton groups, the physiology of cyst formation, etc. We hope to use this thematic style is to bring researchers from both inside and outside the immediate AASP active membership into a productive and rewarding setting. To this end we have invited researchers to attend the meeting and give keynote addresses. At present, these include: Life in the Precambrian Seas; The Evolution of Phanerozoic marine ecosystems; Dinoflagellate systematics; The evolution of the diatoms; Evolution and paleoecology of nannofossils; Phytoplankton diversity through time.

We invite the participation of researchers who are interested in the role of phytoplankton in marine ecosystems and the possibility of using the fossil record of the phytoplankton to study the evolution of oceanic/shallow marine ecosystems. The meeting will also include regular technical sessions on all aspects of palynology.

For more information, please check out the meeting website at http://www2.bc.edu/~strother/1997/1997.html. You can also link to this site from the CAP home page, under Conferences. For registration or further information please contact:

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FAX: (517) 774-2142

CANQUA 97 CANADIAN QUATERNARY ASSOCIATION 8TH BIENNIAL MEETING

May 22-24 1997
Montreal, Quebec

The Canadian Quaternary Association is holding its 8th Biennial Meeting in Montreal, Quebec, from Thursday May 22 to Saturday May 24 1997. A post-meeting Field Trip through the Eastern Townships and the Quebec Appalachians will be offered May 25-26. In addition to general oral and poster sessions on Quaternary Research, the meeting will host five special sessions on:

I. Integrating Worlds: Archeology, Environment and Native Knowledge (Convenor: Daniel Gendron, Avataq Institute, avataq@infobahnos. com)
II. Remote Sensing applied to Paleogeomorphology (Convenor: James Gray, Université de Montréal, grayj@ere.umontreal.ca)
III. Dating the Last Million Years (Convenor: Michel Lamothe, UQAM, lamothe.michel@uqam.ca)
IV. Deglaciation of the Appalachians and the St Lawrence Lowlands: from Pineo Ridge to St

Narcisse (Convenor: Gilbert Prichonnet, UQAM, prichonnet.gilbert@uqam.ca)
V. Timing of the North American Glaciations (Convenors: Michel A. Bouchard, Université de Montréal and Serge Occhietti, UQAM, bouchami @ere.umontreal.ca, occhietti.serge@uqam.ca)

Authors are encouraged to submit their abstract by e-mail or by postal mail on diskette. The abstract deadline is February 15 1997. Please indicate General Session or Special Session of interest. The main Meeting Announcement will be through the next *CANQUA Newsletter*. To submit abstracts via e-mail or postal mail, to receive a main announcement, and to give notice of intention to attend, please contact geologie@ere.umontreal.ca

For further information, please contact:

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PALYNOLOGISTS - CONTRIBUTE!

Do you have pollen data? Would you like to have it curated and preserved for the benefit of countless future generations? The North American Pollen Database is now gratefully accepting contributions of original pollen data for North America and other regions. The preferred format for data is Tilia files, although any electronic form is acceptable. Paper count sheets will also be accepted but these obviously take much longer to process. Data contributions should be sent to:

Eric Grimm
Illinois State Museum
Research and Collections Center
1011 East Ash Street
Springfield, Illinois 62703, U.S.A.
Tel: (217) 785-4846
E-mail: grimm@museum.state.il.us

INTERNATIONAL PALAEONTOLOGICAL ASSOCIATION: LIST OF ENDANGERED FOSSIL SITES

Fossil sites of great importance are endangered around the world for numerous reasons. Some are being exploited by collectors/merchants, others are being used as waste dumps and still others are being obliterated by the encroachment of man and his activities. Little can be done to mitigate the problem if the endangered fossil sites are not made known to the public at large. Knowledge is power and until we as paleontologists have a full listing of those endangered sites, we can take very little coordinated action to ameliorate the problem. The International Palaeontological Association (IUGS) wishes to assemble a catalogue of worldwide endangered fossil sites, including specific information about their location, conditions, problems, their potential/ actual loss to science and mankind and other pertinent information. The IPA is asking those concerned to fill out a form and return it. For the IPA:

H. Richard Lane
Amoco Corporation
P. O. Box 3092, Rm. 786W3
Houston, Texas 77253, U.S.A.
Tel: (713) 366-4156
FAX: (713) 366-7416 or (713) 432-0139
E-mail: hrlane@amoco.com
and
D. L. Bruton
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[Editor's note: This announcement appeared on several discussion lists. For space reasons, the form mentioned above has not been included here. If anyone requires a copy, please e-mail me and I will forward one.]

CHANGE OF ADDRESS

Dr David M. Jarzen is leaving the Canadian Museum of Nature, Ottawa, to take up a position at the University of Florida, Gainesville, Florida, with the Florida Museum of Natural History, as a Senior Biologist. Effective January 15 1997, his professional mailing address will be:

Dr D. M. Jarzen
Florida Museum of Natural History
Department of Natural Sciences
University of Florida
P.O. Box 117800
Gainesville, Florida 32611-7800, U.S.A.

REGISTER OF CONSULTING PALYNOLOGISTS?

Many palynologists are now working as consultants. To facilitate communication between palynologists, and to provide information for those looking for a consultant in a particular field of palynology, I have undertaken to add this information to the on-line Directory of Palynologists in the CAP WWW presentation. If you would like to participate, please send details (name and address, areas of expertise (topical and regional)) to me via e-mail at abeaudoi@gpu. srv.ualberta.ca

DEADLINES

Please submit items for the next *CAP Newsletter* (Volume 20, Number 1, May 1997) by April 15 1997. I prefer to receive material on disk using MS-DOS WordPerfect 5.1 or 6.0; text files are also fine. Each item should also be submitted as hardcopy. Articles may include diagrams and photos; for photographs, please provide a glossy black-and-white print (3" x 5" or 6" x 4") from a picture with good contrast. Illustrations may be submitted on disk in CorelDraw 4.0 format. Text and illustrations may be submitted by e-mail. Please send material to:

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Meeting calendar

1997

March 29 - April 1 1997: International Union for Quaternary Research Commission on Palaeoclimate Working group on Milankovitch and Plio-Pleistocene vegetation succession from 2.6 to 0.9 Ma. Inter-INQUA colloquium, Ankara, Turkey. Theme: "Vegetation successions at the scale of the Milankovitch cycles in between 2.6 and 0.9 Ma". Details: Dr Suzanne A. G. Leroy, Centre for Palaeoecology, School of Geosciences, Queen's University Belfast, Belfast BT7 1NN, Northern Ireland. Tel: +44-1232-335 143 and 273 978, FAX: +44-1232-321 280, E-mail: s.leroy@qub.ac.uk.

April 1-4: The Late Quaternary in the Eastern Mediterranean. Symposium sponsored by INQUA. Ankara, Turkey. Details: Gill Giles, Department of Geography, Loughborough University, Loughborough, LE11 3TU, England, UK. FAX: +44 1509 223930, E-mail: g.giles@lboro.ac.uk. See also http://info.lboro.ac.uk/departments/gy/INQUA_symposium/index.html

May 19-21: GAC/MAC Joint Annual Meeting. Ottawa, Ontario. Theme: "New Horizons in Earth Sciences". GAC 50th Anniversary Celebrations. Details: Conference Secretariat, Ottawa '97, Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario, K1A 0E8, Tel: (613) 947-7649, FAX: (613) 947-7650, E-mail: ottawa97@emr.ca. See http://www.emr.ca/~ottawa97/

May 22-24: CANQUA 97 Canadian Quaternary Association 8th Biennial Meeting. Montreal, Quebec. See announcement, p. 40. Details: Michel A. Bouchard, Chair, Organizing Committee, CANQUA 97, Tel: (514) 343-6821, FAX: (514) 343-5782, E-mail: bouchami@ere.umontreal.ca

June 9-13: First International Conference - Applications of Micropaleonology in Environmental Sciences. Tel Aviv, Israel. Details: Prof. Valentina Yanko, Institute for Nature Conservation Research, Tel Aviv University, Ramat Aviv, Tel Aviv, Israel 69978. FAX: (972) 640-7304, E-mail: valyan@post.tau.ac.il

June 25-29: VIII International Conference on Harmful Algae. Vigo, Spain. Details: Beatriz Reguera, Conference Coordinator, VIII International Conference on Harmful Algae. Instituto Español de Oceanographía, Aptdo 1552 36280 Vigo, Spain.

August 24-31: GCTE/PAGES/IGAC/BAHC Workshop. Theme: "Spatial-temporal dimension of High-Latitude Ecosystem Change (Siberian IGBP Transect)". V. N. Sukachev Institute of Forest, Krasnoyarsk, Russia. Details: Dr Elena Muratova, V.N. Sukachev Institute of Forest, Russian Academy of Sciences, Siberian Branch, Academgorodok, Krasnoyarsk, Russia, 660036. FAX: +7-39-12-43-36-86, E-mail: dndr@ifor.krasnoyarsk.su

August 28-September 2: 7th International Symposium on Palaeolimnology. Heiligkreuztal/Riedlingen, Germany. Details: Dr Andy Lotter, Geobotanisches Institut, Universitaet Bern, Altenbergrain 21, CH-3013 Bern, Switzerland. Tel: +41 31-631 4932, FAX: +41 31-332 2059, E-mail: lotter@sgi.unibe.ch

September 9-10: Scientific Birthday Party for Herbert E. Wright Jr. Wengen, Switzerland. Details: Dr Brigitta Ammann, Geobotany, Altenbergrain 21, 3013 Bern, Switzerland. FAX: +41 31-332 20 59, E-mail: ammann@sgi.unibe.ch

September 7-13: Third Symposium of African Palynology. University of the Witwatersrand, Johannesburg, South Africa. Details: Dr Ann Cadman, BPI (Palaeontology), University of the Witwatersrand, PO WITS, 2050, South Africa. FAX: 27 11 403 1423, E-mail: 106caa@cosmos.wits.ac.za

September 7-12: Peribaltic Group of the INQUA Commission on Glaciation - A Field Symposium on Glacial Geology at the Baltic Sea Coast in Northern Germany. University of Kiel, Germany. Details: Dr habil. Jan A. Piotrowski, Institute of Geology and Palaeontology, University of Kiel, Olshausenstr. 40-60, D-24118 Kiel, Germany, Tel: +49 (0)431 880 2878, FAX: +49 (0)431 880 4376, E-mail: noe57@rz.uni-kiel.d400.de

September 14-19: AASP 1997 Annual Meeting. Woods Hole, Massachusetts, U.S.A. Includes an extended seminar series on the evolution of the marine phtyoplankton in addition to the regular technical sessions. See announcement, p. 40. Details: Paul K. Strother, Weston Observatory of Boston College, Department of Geology & Geophysics, Weston, Massachusetts 10293, U.S.A. Tel: (617) 552-8395, FAX: (617) 552-8388 or Reed Wicander, Department of Geology, Central Michigan University, Mount Pleasant, Michigan 48859, U.S.A. Tel: (517) 774-3179, FAX: (517) 774-2142. See: http://www2.bc.edu/~strother/1997/1997.html

September 26-30: Seventh Canadian Paleontology Conference. Saskatoon, Saskatchewan. Details: Brian Pratt, Convenor, address TBA.

October 20-23: GSA Annual Meeting. Salt Lake City, Utah. Theme: "Global Connections". Details: GSA HQ, Box 9140, 3300 Penrose Place, Boulder, Colorado 80301. Tel: (303) 447-2020, X133, E-mail: meetings@ geosociety.org

1998

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

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.

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

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

Name and title:_____

Affiliation:_____

Address:_____

_____

_____

Tel:_____FAX:_____E-mail:_____

Research interests:_____

_____

_____

Indicate: Renewal:_____New membership:_____Amount enclosed:_____

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