Canadian Association of Palynologists
Association Canadienne des Palynologues
NEWSLETTER
Volume 24 Number 2 December 2001

SEASON'S GREETINGS

President's Message

Palynologists have been treated to two important publications in recent months. The long awaited Proceedings of the 9th International Palynological Congress, Houston, Texas, 1996 (published by the American Association of Stratigraphic Palynologists Foundation) is now out. Flicking through the more than 600 pages, one cannot help but be impressed by the range of material covered. This book is well worth obtaining (registrants at the Congress have been sent a free copy) and copies can be ordered from CAP member Vaughn Bryant (Palynology Laboratory, Texas A&M University, College Station, Texas 77843-4352, Email vbryant@neo.tamu.edu) for US $90.00, surface postage included.

The other publication is a special issue of the *Journal of Quaternary Science*, entitled "Dinoflagellate Cysts and Paleoceanography of High Latitude Marine Environments" (edited by Jens Matthiessen and Anne de Vernal, Volume 16, Issue 7, 2001: available online in pdf format at http://www.interscience.wiley.com). This issue, which has a high Canadian content both in terms of subject matter and contributors (see this Newsletter: New Books, p. 18, for details), shows how palynologists can preach to the unconverted, in this case the Quaternary geology community who broadly think that palynology means no more than pollen analysis. We need specialist journals in palynology and micropaleontology, but if we really want to broaden the market for palynology, then publishing in special issues and thematic sets of general geology/ecology/archeology journals is an excellent way to increase awareness of our subject.

It was partly with this thought in mind that Alwynne Beaudoin and I embarked on editing the CAP sponsored "New frontiers and applications in palynology and micropaleontology: a Canadian perspective", a special issue of *Palaeogeography, Palaeoclimatology, Palaeoecology*. This special issue, which arose from the CAP sponsored symposium held in Calgary 2000, is due to be published in the spring of 2002. It contains 10 top-rate papers on most microfossil groups whose subjects range from the Paleozoic to present day. Encouraged by this endeavor, we have proposed a CAP-sponsored symposium in Saskatoon during May 26-29, 2002. Dr. Norman MacLeod (Keeper of Palaeontology, Natural History Museum, London, UK) will be our invited speaker, having published extensively on the K-T boundary and boundary phenomena in general. We also plan to publish a symposium volume, again probably a special issue of *Palaeogeography, Palaeoclimatology, Palaeoecology*.

ISSN 1188-3596

We hope you will consider presenting your research at this symposium (**abstract deadline JANUARY 15, 2002**: see http://www.usask.ca/geology/sask2002 for online submission of abstracts), and would also like to remind everyone that **we are willing to include manuscripts NOT included in the Symposium**. Please contact me or Alwynne if you are interested in contributing either to the symposium or the special issue.

Organizing CAP sponsored symposia seems a useful way to promote the awareness of CAP and palynology within Canada and beyond. But the core mission of CAP is to produce a Newsletter for those palynologists interested in the Canadian scene. Full membership in CAP used to be restricted to Canadians and those resident in Canada. But that was in the past—CAP is no longer a closed shop! Membership is now open to anyone who wishes it, and we actively encourage overseas palynologists to join and thereby receive one of the best newsletters in the business. So please tell your overseas colleagues that they too can join CAP for a nominal fee.

I'd like to end my final President's Message by thanking the CAP executive, and its stalwart helpers, notably Rob Fensome, for their good-humoured dedication during my term of office. Francine McCarthy has kept us legal and in the black for many years, and is officially replaced by Marlow Pellatt in the New Year. Gail Chmura and now Rolf Mathewes have given us a voice and ears within the IFPS. Alwynne Beaudoin has not only maintained the CAP website for more years than I can remember (I think CAP/Alwynne found the earliest palynological website), she has even found time to give it a new face: see CAP's new-look website: http://www.scirpus.ca/cap/cap.shtml

CAP owes Mary Vetter a huge debt of gratitude for her dedicated editing of the CAP Newsletter. Please keep those excellent reports, essays and announcements rolling in. Finally, it is a great pleasure to welcome Alwynne Beaudoin as CAP's incoming President, a post she will occupy for two years. Alwynne brings much experience to the presidency, having served as Newsletter Editor from 1989 to 1998, as Website Editor from 1995 to present, and as President-Elect from 1999 to 2001. In closing, it has been a privilege to serve on CAP's executive, and I hope to see many of you at the Geological Association of Canada Annual Meeting (GAC/MAC 2002) at Saskatoon in May 26-29, 2002.

Martin J. Head
President, CAP
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From the Editor

Once again, thank you so much to everyone who contributed items to this newsletter, especially Alwynne Beaudoin, Jim Cane, Gail Chmura, Gail Crick, Konrad Gajewski, Martin Head, Jan Jansonius, Peter Johnson, Isabelle Larocque, Steve Porter, Pierre Richard, Mike Saweda, and John Smol. It is your contributions that make the newsletter possible! Special thanks again go to Rob Fensome and Nelly Koziel for printing and mailing the newsletter, especially at such a busy time of year—thank you!

Highlights of this edition include a review of the new edition of Ronald O. Kapp's *Pollen and Spores* by Alwynne Beaudoin and a detailed report on the AASP meeting in Texas by Jan Jansonius. Special thanks to both of you! It is also a pleasure to call your attention to the *Thesis Abstracts* section of the newsletter where four recent graduates are featured.

I hope that you enjoy reading this newsletter, perhaps over a much-deserved Holiday break. Best wishes to all of you in the New Year, and thank you for your support of the Newsletter throughout this past year!!

Mary Vetter
CAP Newsletter Editor
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Special Announcement CAP Annual General Meeting

CAP's Annual General Meeting will be held at the Geological Association of Canada Meeting (GAC/MAC 2002), Saskatoon, Saskatchewan, Canada, May 26-29, 2002. Members and non-members are welcome. If members have any particular items they would like to see on the agenda, please contact CAP Secretary/Treasurer Marlow Pellatt (marlow_pellatt@pch.gc.ca). The day, time and room number of CAP's AGM will be posted on the CAP website as soon as we have details.

FROM THE BUREAUCRAT'S DESK

New Member

We are very pleased to welcome **Hans Asnong** as a new CAP member! Hans is with the Département de Géographie, Université de Montréal, Québec.

WELCOME!

Dues Due

If your name appears below, here is an urgent reminder that **your membership subscription expired at the end of 2000:**
Batten, Chmura, dos Santos, Garneau, Hopkins, Koppelhus, Tiffin, Traverse, University of Toronto Serials, Yazvenko.

Due to the high costs of mailings, we are unable to send newsletters to lapsed members, so please take a few minutes to send in your renewal form now (see the last page of the newsletter)!

If your name appears below, **you are paid through 2001 but your membership for 2002 is now due**—see the last page of the newsletter for the renewal form:
Beaudoin, Boyd, Braman, Cumming, Fensome, Ford, Gostlin, Hall, Hallett, Hartkopf-Fröder, Head, Heinrichs, Helby, Kalgutkar, Lacourse, Lentin, Mathewes, McAndrews, Mott, Richardson, Sarjeant, Stancliffe, van Helden, Vardy, Wicander, Whittmire, Yu.

Dues Payment

Please note that CAP membership dues are CDN $10 per year, payable annually or up to three years in advance. Membership is open to all. Please make cheques or money orders payable to "CAP".

Following a reminder notice, lapsed members are removed from the CAP mailing list after one year.

The membership form is on the last page of the newsletter. Funds and address changes should be sent to:

Marlow Pellatt
Parks Canada
Western Canada Service Centre
300 – 300 West Georgia Street
Vancouver, BC V6B 6B4
Canada

CAP-BASED RESOURCES HAVE MOVED!

The web-based resources that I have compiled and manage have moved from their location at the University of Alberta to a new location at http://www.scirpus.ca/

All resources can be reached from the URL above or from direct URLs as given below:

The Canadian Association of Palynologists Home Page now at http://www.scirpus.ca/cap/cap.shtml

A Dictionary of Quaternary Acronyms and Abbreviations now at http://www.scirpus.ca/cgi-bin/dictqaa.cgi

The Dung File (on-line bibliography) now at http://www.scirpus.ca/dung/dung.shtml

E-SCAPE (Edmonton component of SCAPE project) now at http://www.scirpus.ca/escape/escape.shtml

The SCAPE File (on-line bibliography) now at http://www.scirpus.ca/escape/bibintro.shtml

Please update your links and bookmarks. The pages at the University of Alberta will remain available for some time but will not be maintained or updated. I welcome comments on any aspects of these presentations.

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⊙ 부산 지하철 ⊙

SPECIAL ANNOUNCEMENT

THE PALYNOLOGY AND MICROPALEONTOLOGY OF BOUNDARIES

A CAP-SPONSORED SPECIAL SESSION (#22) at the GAC/MAC meeting in Saskatoon, Saskatchewan May 26-29, 2002 co-convened by Alwynne Beaudoin and Martin Head

Boundaries in time and space can leave distinct signatures in the palynological record. Diffuse or sharp, gradual or abrupt, boundaries can tell us much about the response of biotic systems to environmental change in both marine and terrestrial realms. Sponsored by the Canadian Association of Palynologists (CAP), this Special Session explores the identification and characterization of boundaries through palynology and micropaleontology. DR. Normal MacLeod (Keeper of Palaeontology, Natural History Museum, London, UK) is the guest speaker for this symposium.

The session is being co-convened by Alwynne Beaudoin (Provincial Museum of Alberta, Edmonton, e-mail: abeaudoi@gpu.srv.ualberta.ca) and Martin J. Head (University of Cambridge, UK, e-mail: mh300@cam.ac.uk). Anyone interested in participating is invited to contact either of the convenors.

A symposium volume is planned. Please indicate whether you wish to contribute to this volume. **Papers not presented at the symposium may also be considered for inclusion.**

Further details about the GAC/MAC meeting, abstract submission, registration etc., may be found at the conference web-site at http://www.usask.ca/geology/sask2002 and on p. 25 of this newsletter.

Abstracts in digital format will be accepted **until January 15, 2002**. Please monitor the conference website for additional information about the meeting.

For additional information please see the new CAP website at http://www.scirpus.ca/cap/cap.htm On-going details of this Special Session will be posted there.

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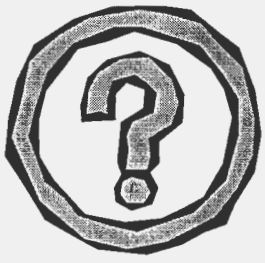

HAVE YOU CHECKED THE DUES LIST? SEE PAGE 3!

BOOK REVIEW

R. O. Kapp, O. K. Davis, and J. E. King (2000) *Ronald O. Kapp's Pollen and Spores*. Illustrated by R. C. Hall. Second edition. American Association of Stratigraphic Palynologists Foundation. vi + 279 pp. ISBN 931871-05-0. Paper cover. $15 (USD). To order, contact V. M. Bryant, Anthropology Department, Texas A&M University, College Station, Texas 77843, USA, E-mail: vbryant@tamu.edu

Reviewed by: Alwynne Beaudoin.

It is over a quarter of a century since I first sat down at a microscope to try and do pollen analysis. It was a sunny September afternoon. I well remember the feeling of bewilderment verging on panic as I peered through the eyepieces and saw the array of peculiar objects on the microscope slide. What *was* all this stuff? Which bits were the pollen grains? How on earth was I ever going to learn how to identify these things? In these moments of alarm, when I could see my prospects of completing a thesis disappearing into the mists of impossibility, Kapp's "Little Red Book" became a constant companion. Indeed, it might almost have had those comforting words, "Don't Panic", inscribed on the cover. In authoritative terms, with clear line drawings and easy-to-follow keys, it imposed order on a complex subject. By diligent study and hundreds of hours at the microscope, I gradually came to recognize a few of the palynomorphs that I saw, and greet the appearance of yet another pine grain as an old friend.

I still have my original copy of Kapp's book, entitled *How to Know Pollen and Spores*. Now it is rather battered, the pages are yellowed and extensively annotated, but the cover remains intact and I still consult it regularly. It has probably been one of the books I have used most in my career. I remain amazed at the amount of work that went into the book's development, especially because it was produced long before the era of desktop computers with word processing and database software. Through this book, Kapp, who died in 1990, made an outstanding and continuing contribution to the discipline. Originally published in 1969, it has been out of print for years. Every time I teach, I recommend it to students. But, other than chance finds in second-hand bookstores, it has not been readily available to new generations of novice palynologists. So I was pleased to learn that AASP was publishing a new edition. The preparation of the second edition was undertaken by two senior palynologists with excellent credentials for the task—James E. King, retired Director of the Cleveland Museum of Natural History, and Owen K. Davis, Department of Geosciences, University of Arizona, and past President of the International Federation of Palynological Societies.

The new edition retains many of the features of the old version. It has the same size and layout, with a similar card cover and coil binding so it lies flat on the laboratory bench. The organization of the book is the same, with taxa arranged according to major morphotypes (e.g., tricolpate, periporate, etc.), as they are encountered under the microscope. The book covers the same geographic area (temperate and boreal North America). Because it focusses primarily on "pollen and spore types routinely encountered by pollen analytical workers" (p. 5), it features mainly types that are wind-transported. Many common tree and shrub taxa are included. Temporally, it focusses on Quaternary palynology, that is, pollen and spores that can be extracted from non-lithified sediment or collected by air sampling and that can be referred to extant plant taxa. The original illustrations have been included. So what are the differences between this and the earlier edition? Overall, differences are comparatively minor, mainly relating to some rearrangement or expansion of the keys, with a few new illustrations and descriptions, and some updating.

The introduction and opening sections (including discussions of pollen formation and function, structure, preparation and sampling techniques) have been revised and updated, reflecting some of the research and including references to some regional pollen and spore guides that have appeared since 1969. Of the 82 references in this edition, only 12 have carried over from the first. These sections remain, however, a "once over lightly" view of their subjects. The sample preparation and sediment sampling sections are particularly scant. The book is focussed on identification of palynomorphs from unlithified sediments, yet the extraction of palynomorphs from coal is still outlined, although other more relevant techniques are not. I would have liked to see a broader reference list here, for example, inclusion of Cushing and Wright (1965), with specifications for the Livingstone sampler, the useful review article by

Wright (1991) on coring, and the extensive discussion of preparation techniques for Quaternary sediments by Moore *et al.* (1991), a widely-used textbook. Undoubtedly, each of these sections could have formed the basis for an entire chapter! And this is not a "What is Pollen" or "How to do Palynology" manual. But I was disappointed that Davis and King did not take the opportunity to revise these sections more comprehensively.

The heart of the book remains, however, the drawings and accompanying descriptions. The drawings are deceptively simple in appearance, yet remain the most useful ones of pollen that you are likely to find. In many instances, the illustrations are reproduced somewhat larger than in the first edition. My impression too is that the font is slightly larger. In some cases the reproduction of the drawings is crisp and clear. Overall, however, the reproduction is so light that parts of drawings have disappeared. This has especially affected those drawings that have extensive shading. The reproduction is often so poor that the critical characteristics cannot be distinguished. These cases include *Trifolium pratense* (p. 110) where the reticulate surface cannot be seen, the equatorial view of *Glandularia bipinnatifida* (p. 115) where almost all features of the complex colpus are not visible, the image of *Prunus virginiana* pollen (p. 122) on which the striae and colpus can barely be distinguished, and *Ptelea trifoliata* (p. 155) on which colpus and pore details cannot be seen. The generally poor reproduction of many drawings is by far the least satisfactory aspect of this book, and must be disheartening for Davis and King.

Going through the book section by section, some changes are evident. The first section, showing objects that might be confused with pollen, has been considerably enhanced and expanded. It now describes 20 types, including algae, dinoflagellates, and phytoliths, as opposed to 13 in the first edition. Here, however, it would have been useful to have a reference to work of Bas van Geel (see, for example, 1978) who has produced very helpful illustrated documentation of the "other stuff" that may be found in pollen preparations.

This is followed by a "Key to Major Spore and Pollen Groups", which divides palynomorphs into categories based on readily observable morphological features (number of colpi, number of pores, etc.). These categories form the basis for the remaining sections of the book, with subtleties of surface features and wall structure used to distinguish the various types. The use of morphotypes as an initial organizational method provides a sound and usable framework. Within each section, dichotomous keys guide the user to the most likely pollen types. The keys focus on features that can usually be seen even in poorly preserved material.

The Dicolpate (3 types), Stephanocolpate (8 types), Pericolpate (3 types), Heterocolpate (1 type), Diporate (4 types), Triporate (27 types), Stephanoporate (12 types), Periporate (23 types), Dyad (3 types), and Lophate and Fenestrate (5 types) sections cover the same taxa as before. The Stephanocolporate section (4 types) has been expanded with an entry for *Sanguisorba canadensis*. In the Tetrad section (14 types), the illustration for *Asmina triloba* (p. 217) is a duplicate of one of the drawings of *Berberis fremontii* (p.102). The discussion of the complexities of ericaceous pollen would have been enhanced by reference to Warner and Chinappa (1986) and Cwynar (1982). An entry for *Sporormiella* has been included in the Polyad section (15 types), though the name is misspelt in the caption and description. The accompanying key has been rearranged accordingly.

The Vesiculate section (11 types) has been expanded slightly, with a distinction made between Diploxylon and Haploxylon pine pollen and the addition of an entry for *Tsuga mertensiana*. These revisions will be helpful to people working with material from western Canada. The Polyplicate section (5 types) includes one new illustration and description (*Ephedra torreyana*). The Trilete section (24 types) covers the same taxa as before. Most choices in the keys are based on measurable or observable characteristics, things that you can actually see under the microscope. However, in the Trilete section, the distinction between *Cyathidites minor* and *Sphagnum* is still made on the basis of age (Cretaceous *vs.* Recent). This always puzzled me in the first edition and I am still unclear as to how you are supposed to know the age just from looking at the spore! The discussion of *Selaginella* (p. 53), focusses on *S. kraussiana*, an introduced species, but it does now mention *S. selaginoides*, an indigenous species. The latter is not uncommon in some pollen preparations from suitable areas, such as the Rockies in Alberta.

The Inaperturate section (46 types) includes many fungal spores, which can be quite common in some preparations. Here, the Cupressaceae category has been subdivided on the basis of size and the arrangement of verrucae and gemmae. These descriptions have also been expanded. Some descriptions (e.g., for *Taxodium*) in the Monoporate section (15 types) have been expanded. In the Monocolpate/Monolete section (36 types), there is a re-arrangement of categories at the initial level, with addition of *Isoëtes muricata*, and,

towards the end of the key, re-arrangement and addition of *Brasenia schreiberi*.

Students struggling to identify pollen grains will spend much time perusing the Tricolpate (52 types) and Tricolporate (94 types) sections. Together, these sections dominate the book, in line with the frequency of these pollen types in many pollen preparations. Often, especially when the material is poorly preserved, just figuring out whether a "mystery grain" is tricolpate or tricolporate can be a difficult task! Indeed, some pollen types are keyed out in both categories.

The Tricolpate section is where I noticed most changes. Initial parts of the key (dealing with *Salix* pollen) have been re-arranged. In the course of this, the illustration and description of *Catalpa* pollen appear to have been dropped. However, there is still an index entry for *Catalpa*, which gives its page assignment as p. 97, where it appeared in the first edition. The section includes a new entry for *Pedicularis* (p. 114). In the Tricolporate section (94 types), the illustrations for *Philadelphus inodorum* and *Mitchella repens* appear to be reversed (pp. 150-151) in comparison with the first edition, i.e., the *Philadelphus* entry has the *Mitchella* drawing and vice versa.

Throughout, the descriptions have been re-arranged slightly, with the taxa identified first by their Linnean rather than their common names. Family names have also been included for most entries. Parts of the nomenclature have been updated. Some taxa have been re-named between the first and second editions. For example, *Yucca mohavensis* is now *Y. shidera* [p. 93], and *Verbena ciliata* is now *Glandularia bipinnatifica* [p. 115]) although the illustrated specimens are the same as in the first edition. *Trillium flexipes* and *Polygonatum canaliculatum* have been reassigned from the Liliaceae to the Trilliaceae and Convallariaceae respectively. On the other hand, Davis and King have mostly kept the same family names as in the first edition (Gramineae, Leguminosae, Compositae, etc.), despite changes in botanical nomenclature (Poaceae, Fabaceae, Asteraceae, respectively). This is a thorny issue. Sticking to superceded nomenclature lowers the credibility of palynology in the eyes of botanical purists. Yet, these names are well-entrenched in the literature. Still, it would be helpful to have included equivalencies for families in the taxonomic listing (pp. 235 – 256) since this is how they can be found in the current botanical or ecological literature. The source followed for the plant taxonomy should also have been cited.

A geological time chart - a useful new addition - follows the descriptions, references, and taxonomic lists. However, there is no source given for this chart. The glossary (pp. 258 – 269) is enhanced and is now separate from the index, making it a valuable stand-alone feature. For detail on some of these entries, however, Punt *et al.* (1994) will be found a useful supplement.

Regrettably, the text contains distracting spelling and typographical errors. There are some inconsistencies between names in headings, descriptions, and captions. For example, the genus *Clarkia* has been changed in the heading (p. 190), though the description refers to the same genus as the first edition (*Godetia*); *Shrankia occidentalis* has been renamed *Mimosa quadrivalvis* in the header and text but not the figure caption (p. 221); *Rhus glabra* appears as *Rush glabra* in the figure caption (p. 154). One amusing textual infelicity has been carried over from the first edition: "From the earliest days of pollen analysis, there has been great interest in boring [sic] peat bogs and lakes" (p. 23). A rather revealing slip perhaps!

Davis and King are to be commended for undertaking a difficult task, to take a classic and prepare it for a new edition. Clearly, one of the decisions they had to make was how much to revise and update it. As they point out in their introduction, the pollen types haven't changed over thirty years, and the heart of the book has worn well. Although I would have liked to see more extensive revision of some of the ancillary information, this does not detract from the usefulness of the book as a whole. It remains a valuable resource and I have no hesitation in recommending it. Indeed, I am delighted to see it back in print. With its modest price, it is within reach of students as a textbook. It should become a fixture next to their microscopes. I do urge the AASP Foundation, however, to undertake a second printing and try to improve the quality of the images and correct the text. This single step would turn a good book into a great one.

References

Cushing, E. J., and H. E. Wright Jr. (1965) Hand-operated Piston Corers for Lake Sediments. Ecology 46:380-384.

Cwynar, L. C. (1982) A Late-Quaternary Vegetation History from Hanging Lake, Northern Yukon. Ecological Monographs 52:1-24

Moore, P. D., J. A. Webb, and M. E. Collinson (1991) *Pollen Analysis*. 2nd edition. Blackwell Scientific Publications, Oxford, England, U.K. 216 pages

Punt, W., S. Blackmore, S. Nilsson, and A. Le Thomas (1994) *Glossary of Pollen and Spore Terminology*. LPP Contributions Series No. 1. LPP Foundation, Utrecht.

Van Geel, B. (1978) A Palaeoecological Study of Holocene Bog Sections in Germany and the Netherlands, Based on the Analysis of Pollen, Spores, and Macro-microscopic remains of Fungi, Algae, Comophytes and Animals. Review of Palaeobotany and Palynology 25:1-120.

Warner, B. G., and C. C. Chinnappa (1986) Taxonomic Implications and Evolutionary Trends in Pollen of Canadian Ericales. Canadian Journal of Botany 64:3113-3126

Wright Jr, H. E. (1991) Coring Tips. *Journal of Paleolimnology* 6: 37-49

FAR AND WIDE

American Association of Stratigraphic Palynologists (AASP), 2001 Annual Meeting, San Antonio, Texas October 21-24, 2001

The AASP Annual Meeting in San Antonio was entirely successful. About 68 registrants (concerns about terrorist action may have kept the number of walk-in participants down) were unanimous in a positive evaluation of both the meeting (thank you, Tom, Dave and Don!) and the quality of the papers presented. As someone noted, each paper was attended by anywhere from 55 to 65 persons; for the last afternoon there were still better than 45 in their seats. Not only had many papers significant scientific interest, but not a few of them were presented in highly entertaining fashion (thank-you Yow-yuh, Carlos and Oscar, and Eddie!). Training in palynology may be a good foundation for stand-up comedy!

At least eight registrants were from the Latin Americas, five each from the United Kingdom and Canada, and one each from Denmark, Switzerland, Australia, Taiwan, Indonesia, and France. The remaining 40 or so were from the USA.

President David Pocknall voiced concern over the steady increase in average age of the membership, as well as the erosion of its numbers. The latter reflects a vicious circle where few major companies offer new permanent positions, so few students are motivated to select palynology as their field of study, wherefore few professors can meet the administrative requirements for teaching (advanced) courses in applied palynology, while the undergraduate curricula become increasingly stuffed with courses in newfangled (sub)disciplines, which leaves hardly any or no timeslots for elective subjects like palynology. Thus, as older practioners retire, the remaining staff of (even major) organizations become ill- or un-informed about the capabilities of applied palynology, and do not know when, or whom, to involve in solving perceived, or overlooked, (bio)stratigraphic problems.

Furthermore, many corporations that in the past supported AASP in kind (e.g. by absorbing mailing costs) now have discontinued that practice. In the last two years, AASP has produced a *ca* $35+ value for a yearly fee of $30. Even non-profit organizations cannot operate in that manner for very long. Thus, the executive decided to raise the regular membership to $45 per year, ($30 for students for up to 3 years). Also, as the mailings of the newsletter cost in the order of $4000 per year, the members can really help the budget by downloading the electronic version off the web, and informing the Secretary that they do not need a paper copy sent by snail mail. At the business luncheon Ken Piel announced that Paul Wesendunk willed a large part of his estate to the Center of Excellence (indeed becoming the single largest donor to that program). Louisiana State University has agreed to some changes in its agreement with AASP that are very beneficial to our undertaking. We now need only some $20,000 more, to establish a permanent chair in palynology – a goal that all members should try to support and make a reality before there are further, less favorable, changes in Baton Rouge. [Piel and his committee deserve recognition for the efforts that have brought this undertaking so close to success.]

After dessert, Al Traverse got his just desert, as he was awarded the second AASP Medal of Excellence in Education. Some of his old students testified to Al's dedication and wide influence on burgeoning palynologists, and Al showed slides to document his

trail-blazing techniques, as well as how many hats he wore in his career.

Below, I capsulate most of the papers given. This will indicate the subject matter, and will give a clue to someone interested in the topic as to which author he should approach for further information.

I mentioned earlier the reduction in corporate sponsorship and employment. Nevertheless, there was the thoroughly documented paper by Paul Sikora & Jeff Stein who, on behest of BP Exploration, are engaged in developing a microfossil-based recalibrated time scale for the Aptian through Maastrichtian interval, the current subdivisions of which are based on macrofossils. They are integrating the ranges of various groups of microfossils (including dinocysts and pollen) with magnetostratigraphy, radiometric dates and cyclostratigraphy, which also allows terrestrial to marine correlations. Their aim is to build an integrated microfossil zonation that exceeds the age resolution of the macrofossil biozonations, and they demonstrated the potential of this method through the preliminary results from the study of Conacian and Santonian stages in the Niobrara Chalk in western Kansas.

Mats Eriksson, with a solid training in preparing scolecodont assemblages and/or reconstructing them from dispersed jaw elements in the Baltic region, now does similar work in the North American Upper Ordovician (Cincinnatian) strata. Although natural assemblages are not uncommon when the processing is adjusted for optimum recovery, Eriksson also ventures confidently in reconstructing assemblages "de novo", using a finely honed eye for mentally fitting together dispersed disparate jaw elements. The results inspire confidence, even if the method seems hazardous to the uninitiated. The end result, it is hoped, will be a single, apparatus-based systematics and phylogeny, as well as improved biostratigraphic utility.

Paul Strother talked us through his work in progress on correlating the changes in CO_2 concentration in ancient ('aragonite' and 'calcite') seas with phytoplankton diversity. The calcite seas had high CO_2 levels in Cambrian-Devonian and mid-Triassic-Paleogene seas, but the latest Vendian-Lower Cambrian, Carboniferous-early Triassic, and Neogene-Recent (aragonite) seas were low in CO_2. The changes in ocean chemistry are thought to result from varying refluxing of hydrothermal brines from mid-ocean ridges that affect the concentrations of Mg^{2+}, Ca^{2+} and HCO^{3-}. The two Phanerozoic calcite seas had quite different phytoplankton: the early one (with atmospheric CO_2 pressure 16x that of Recent) had all acritarchs, the later one a mix of coccoliths, diatoms and dinoflagellates. This difference is puzzling, as diatoms and dinoflagellates now are thought to have quite ancient origins. The mid-Triassic re-radiation occurred under much lower CO_2 concentration, which will have required more efficient Rubisco (the enzyme catalysing the fixation of CO_2 in photosynthesis) and carbon concentration mechanims.

Francine McCarthy reported on ODP Leg 191, site 1179, at 5586 m depth in mid-latitude, which is >1 km below CCD (carbon compensation depth), resulting in <1% mean $CaCO_3$ concentration. Still, in two intervals $CaCO_3$ came in at *ca* 7%, in association with abundant, well preserved calcareous microfossils, and protoperidinioid (round brown) cysts and pollen grains. The age of these two samples is ~2.5 Ma and ~900 ka. Round brown cysts are highly susceptible to oxidation. Apparently, the combination of increased sea surface productivity and rapid burial allowed calcareous microfossils to be preserved. Round browns are rare in the non-calcareous sediments. Some other similar anomalous deep calcareous samples had significant links to the global climate system.

Vera Pospelova & Gail Chmura demonstrated the utility of dinocyst study in estuarine systems, as the cysts serve as indicators of environmental conditions (temperature, salinity, ice cover, distance to shore-line). In paleoconditions the modern distributions can help to reconstruct past environmental conditions in estuarine systems. Cyst species diversity and abundance can vary strongly between estuaries, and even within the same one. Salinity gradients are reflected in cyst morphologies. Cyst distributions can be used to monitor (sources of) pollution, levels of nutrients and salinity.

Jim Riding studied the northern and southern lineages of the species of *Wanaea*, and rationalized their assignment to this genus, and some others. In a revised and emended sense, several species appear to have well defined stratigraphic ranges. Those with lacey paracingular flanges are consistently younger than the 'energlynioid' species. The latter are largely confined to the mid-Jurassic (esp. Bathonian), whereas the more evolved flanged ones range from mid-Callovian to early Oxfordian. In *Wanaea zoharis*, there is a solid extension of the antapical horn/protuberance; the term antapicular structure is proposed for this feature. *Wanaea indotata* is the only cosmopolitan form; it may be intermediate between the energlynioid and flanged species.

Vaughn Bryant & Gretchen Jones discussed the PC (pollen coefficient) values in a number of premium (single species) types of honey. The PC values are

meant to indicate the purity of source of such honey. However, weak pollen production, pollen removal (in the honeybee's 'crop') and even inappropriate lab processing of such honey before a pollen count, can lead to various numerical results, and do not yet provide a dependable objective index for the authenticity of such prized honey.

Jennifer Hopkins & Francine McCarthy reported on lab studies on marine sediments, where the resistance to oxidation of various types of fossils was quantitatively assessed by exposing them to H_2O_2. Round browns cysts are most susceptible to decay, those of autotrophic taxa are very resistant, but still less so than the walls of pollen grains. The skewing of assemblages through taphonomic oxidation, especially in continental margin settings, must be considered to avoid errors in interpreting preserved assemblages.

Patrick Moss *et al.* investigated pollen transport and deposition in tropical northeast Australia, where they found no evidence in the estuaries for fluvial sorting into sand- and silt-sized pollen types (as reported elsewhere).

Rolf Mathewes reported on the deposition of a thick 10,100-10,500 years old 40-50 cm silty clay layer in Saanich Inlet on Vancouver Island. Clay minerals and reworked Paleocene spores and pollen indicate that this bed resulted from an outburst flooding event triggered by the collapse of (an) ice dam(s) on the Fraser river in mainland British Columbia. The sediment plume was carried across the Georgia Strait, and over the sill that protects the anoxic bottom sediments in Saanich Inlet.

Tuesday was filled with a symposium on Central and South American Palynology. Hernandos Duenas showed well preserved palynological assemblages from 15,000' thick strata of Vendian, Cambrian, Ordovician and Middle Devonian - Lower Carboniferous age, that fill the lower part of the Venezuelan Llanos Basin and by some still are considered, from seismic evidence, as representing metamorphic basement strata. The TAI indicates that these strata are mostly in the oil window, appearing similar to assemblages from northern Africa (Libya).

Wolfgang Volkheimer, Quattrocchio & Cabaleri presented a detailed analysis of the Jurassic Canadon Asfalto sequence in central Patagonia, consisting of basalts and tuffs at the base, overlain by cyclic lacustrine beds that alternated between paludous flooding (*Botryococcus*) and dry sabkha-like (gypsum, desiccation breccia) conditions.

W.A.S. Sarjeant & Volkheimer presented a study of Late Valanginian - Hauterivian dinoflagellates, many of the Ceratiaceae family, from the Neuquen Basin in Argentina. The authors "proposed" the new genus *Neuquenia*, emended *Odontochitina* and introduced the binomials of some associated dinocysts, none of which were validly published in the abstract volume.

Susana Palamarczuk analyzed the dinocysts of a 90 m Maastrichtian interval of mud-/claystones of the Jaguel Fm., Neuquen Prov., Argentina. Changes in species diversity and abundance clearly track fluctuations in sea level, that are in concert with similar changes observed in the Western Interior Seaway of the USA, and other northern localities.

Javier Helenes & A. del Valle-Reyes defined four dinocyst assemblages in the > 3000 m thick strata deposited in the southern part of the Gulf of Mexico since the Late Oligocene, each of which has a distinct environmental signature. The *Polysphaeridium* assemblage (Upper Miocene-Pleistocene; inner to middle neritic) also contains common *Lingulodinium* and *Spiniferites*. The *Impagidinium* assemblage (Middle - Upper Miocene; middle to outer neritic), normally sparse, also contains *Nematosphaeropsis* and *Operculodinium*. The *Selenopemphix* assemblage (Lower Miocene; inner to middle neritic), normally sparse, also contains *Polysphaeridium*, *Lejeunecysta* and *Operculodinium*. The *Homotryblium* assemblage (Upper Oligocene; shoreline to inner neritic) also contains *Cordosphaeridium* and *Glaphyrocysta*.

Cristian Vallejo, Peter Hochuli & Wilfried Winkler reported on an analysis of the Late Albian - Campanian Napo Group in the Oriente Basin of Ecuador. This shallow marginal marine packet of strata represents a sedimentary sequence, and includes source rocks, sandstone reservoirs and limestones. Spore/pollen, dinocysts and nannoplankton analysis reveals several hiatuses. Fossil evidence, with other data, allows reconstruction of a sequence stratigraphic framework. The hydrocarbons found in this well are more mature than the in-situ immature source rock, and must have been generated elsewhere.

Oscar Yepes correlated dinocysts from 6 Upper Campanian-Maastrichtian sections in Colombia and western Venezuela, and discussed the biostratigraphic and sequence stratigraphic implications of that study. The boundary between these two stages is at the highest occurrence of *Trichodinium castanea* and the lowest of *Phelodinium tricuspe*, *Yolkinigymnium lanceolatum* and *Hafniasphaera fluens*. The K/T boundary is not exposed in these sections. Dinocysts

tended to be more abundant at the base of each of several upwards coarsening cycles.

Jason Crux *et al.*, all employees of PDVSA (Venezuela), revised and calibrated Muller *et al.*'s pollen/spore zones of the Paleogene of Venezuela, many of which were based on more than one datum – which resulted in overlap of zones. The revised spore/pollen zones then were tied to the marine time scale and some magnetostratigraphy. This correlation demonstrates that there is a hiatus between Paleocene Zone 16 and early Eocene Zone 17, with much of the Late Paleocene missing over most of western Venezuela.

Carlos Jaramillo, F. Oboh-Ikuenobe and G. Obi studied the Paleocene-Eocene transition in southern Nigeria and central Colombia. Diversity, composition and structure of pollen/spore floras were analysed with a number of different techniques. Lower to middle Eocene strata contain much higher diversity than upper Paleocene strata, and have higher alpha and beta diversities. During this period, the equatorial climate became wetter; which apparently resulted in tropical floras very similar to the present tropical rainforests. No earlier tropical rainforests have been documented so far.

Javier Helenes & Iraida Paredes documented the late Middle Eocene age (NP 16;42.5-40.5 Ma) of the Gobernador and Pague formations in western Venezuela with well preserved palynomorphs and nannofossils, and placed the underlying regional unconformity and subsequent rapid deposition, into the sequence-stratigraphic cycles, as these are affected by the collision of the Caribbean plate with the northwestern border of South America.

Alan Graham analyzed a 6-7 Ma old (Miocene-Pliocene) assemblage of fossil spores/pollen and leaf fossils, from a 3600 m high locality in the Eastern Cordillera in the Bolivian Andes, which indicated that from 1/3 to 1/2 of the uplift of the Eastern Cordillera had occurred by the beginning of the Pliocene.

The Wednesday session started off with the presentation by Sikora & Stein, mentioned earlier. Jeffrey Richardson applied palynology to solve a long-standing problem in the correlation of prograding wedges of deltaic facies in the (Lower Carboniferous) Borden Fm. in Kentucky and Indiana, which is subdivided into different members in different areas. He subdivided the study area into four Primary Depositional Centers, which were sampled for microspores. These can be correlated with Carboniferous biozones. In PDC-I (northeastern Kentucky) the PC zone (Tn3a) is defined by the FAD of Spelaeotriletes pretiosus. In PDC-II (Tn3b; south central Kentucky) the miospores represent the upper part of the PC Biozone. In the westernmost localities (PDC-IV; Tn3c) the miospores represent the CM and Pu Biozones. In south-central Indiana most sections represent the CM and Pu biozones (the CM zone is defined by the FAD of Schopfites claviger). The Pu Biozone if defined by the FAD of Lycospora pusilla, which also marks the base of the Visean (Vn1). These PDCs are part of a single sequence, but represent different time-transgressive progradational phases. Jeffrey combined sequence stratigraphic concepts with miospore stratigraphic data to resolve the spatial relationships of the different units of the Borden Formation.

Jim Riding reported on the incoherence of the total stratigraphic ranges of each of a number of cosmopolitan dinocysts. For example, the range tops of *Nannoceratopsis pellucida* and *Rigaudella aemula* are significantly younger in Australia than in Europe. Macrofaunal correlations are significantly more problematic than palynological ones (e.g. molluscs exhibit more endemism than palynomorphs). New methods, like generic ranges and statistical analyses of assemblage characterization may be useful in long-distance palynological correlations.

Doug Nichols, M. Matsukawa & M.Ito analysed deposits in the Choyr Basin in the Gobi Desert, and concluded that the currently recognized three formations are but different facies of a single basin-fill event. The presence of a primitive *Asteropollis* and rare tricolpate angiosperm pollen indicate a middle to late Albian age for this formation, which, for clarity's sake, should receive a new name.

Peter McLaughlin & Richard Benson presented an application of spore/pollen biostratigraphy that improves the correlation of aquifer units in non-marine facies of the Potomac Fm. (Barremian-Cenomanian), Delaware coastal plain. The new palynological framework (mostly based on angiosperm pollen, including many forms defined by Doyle & Robbins 1977) includes a major Cretaceous unconformity that was never recognized in the seismic-based model so far applied, as well as a new log correlation datum that represents a major shift in depositional systems.

Yow-yuh Chen demonstrated a lineage of eight species of *Amphorula* from the Valanginian of the Morondova Basin, that resembles a lineage of the same age from Australia. Six zones are recognized, reflecting the rapid evolution in this group (seven new species will be proposed). *Amphorula palmula* should not be

transferred to *Systematophora*, as it has semi-circular processes, which is a trait restricted to *Amphorula*.

James Eldrett, Ian Harding & John Firth reported on a high-resolution study of (cores) from Sites 913B and 338 in the Norwegian-Greenland Sea, where calcareous microfossils are dissolved, but magnetostratigraphic data allow correlation with the standard NP zonation. Several age-diagnostic assemblages are present, and will allow better understanding of the nature and timing of the climatic and environmental changes around the Eocene-Oligocene boundary, and its precise biostratigraphic position.

John Wrenn & J. DiBenedetto described a scant assemblage of spores/pollen from the Scenic Member, Brulé Fm., Badlands National Park, South Dakota, which represents a riparian setting in a dryland region; the few palynomorphs studied were mostly derived from animal coprolites and ephemeral lacustrine limestone, and date back to Chron N13 (N3).

Grace Parsons, James White & Geoff Norris are in the process of defining the biostratigraphic utility of a small number of (very) small triprojectate pollen species that occur in the (late) Paleogene strata of the Mackenzie Delta region of northern Canada.

Robert Cushman made a detailed study of the paleoenvironment of the upper unit of the Fossil Butte Member, Eocene Green River Formation, Wyoming. The lake was filled in an evaporitic, fairly dry climate. Yet, the occurrence of *Platycarya* suggests a climate of high humidity. A closer examination of the geological context of the sedimentation indicates high-frequency alternating dry-wet cycles, resulting in a typical under-filled lake deposition. *Pterocarya* would migrate into the area during the wet cycles.

Francisca Oboh *et al.* are investigating evidence for the existence of seaway links between the Tethyan (Gulf) and Boreal (Arctic) seas, during the several Upper Albian to Lower Cenomanian transgressive-regressive cycles. A multidisciplinary approach (sedimentology, micropaleontology, palynology and chemostratigraphy) is employed to four stratigraphic sections in New Mexico, Colorado and Wyoming. Palynofacies helps to recognize sequence boundaries in these well-layered rocks that extend laterally for up to 200 kilometers.

Daniel Michoux (of TotalFinaELF) *et al.* shared initial results of a comprehensive study of the dinocysts from well calibrated sections of the Late Paleocene to Miocene (Langhian; NN5) strata in the Aquitaine Basin. These will be compared with assemblages of similar age from other parts of Europe.

John Wrenn, Mike Hannah & Graeme Wilson presented two consecutive progress reports on the Cape Roberts Project, which is designed to investigate the tectonic and climatic evolution of eastern Antarctic from latest Cretaceous to Oligocene time. There were several surprises: the presence of numerous dinoflagellates (more than 20 endemic new species, mostly of the *Lejeunecysta* type); a strong unconformity (Oligocene overlying Devonian); the fact that the known Eocene Antarctic dinocysts are autotrophic, whereas those from CRP are from heterotrophic species -- indicating a major change in the trophic structure near the Eocene-Oligocene boundary. Though the species are different, a bipolar distribution among these protists is now appearing.

Eddie Robertson went back to his old graduate sections, and found more information, this time around, for a firmer foundation of the Paleocene-Eocene section. He listed a large number of species to support his zonations.

Aureal Cross had a steady stream of visitors to his poster plotting the more significant highlights of progress in palynology from 1833 (Witham) and 1836 (Ehrenberg) to the present.

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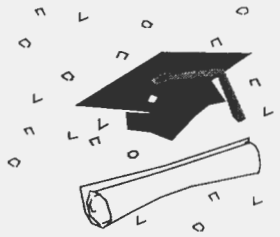


THESIS ABSTRACTS

C. Beth Beecher. 2001. Modern Pollen - Vegetation Relationships in Bay of Fundy Salt Marshes. M.Sc. Thesis, Dept. of Geography and Centre for Climate and Global Change Research; McGill University. Supervisor Dr. Gail Chmura.

Abstract: This study examines modern relationships between salt marsh plant species and their pollen in three salt marshes located on the northwest coast of the Bay of Fundy, New Brunswick. Linear regression analysis of pollen in 35 surface sediment samples and vegetation cover on small (<15 m) and broad (>15 m) scales show that, with the exception of Poaceae and Cheno-Am, pollen corresponds well with fine-scale patterns of salt marsh vegetation. Scatter diagrams of paired pollen and cover data illustrate that cover of *Triglochin* is over-represented by its pollen, *Glaux* is under-represented, and Poaceae, Cheno-Am, and *Plantago* are inconsistent. Tidal mixing and differential inputs from local, regional, and extra-regional sources with elevation limit the establishment of plant-pollen relationships for Cheno-Am and Poaceae but not for other taxa. Comparison of 35 modern analogs from five vegetation zones using squared chord distance show that zones are distinct such that the marsh-terrestrial interface can be tracked with the highest degree of certainty in a salt marsh paleo-ecological record and other marsh zones can be tracked when a conservative threshold of dissimilarity is used.

Résumé:

Cette etude examine les relations modernes existant entre les espèces floristiques de marais salant et leurs pollens dans trois marais salants situés sur la côte Nord-Est de la Baie de Fundy, au Nouveau Brunswick. Les resultats des régressions lineaires entre la composition du pollen de 35 échantillons de surface et la composition floristique à petite (<15m) et grande (>15m) échelles démontrent, à l'exception de Poaceae et Cheno Am, l'abondance de pollen correspondent bien à la composition floristique à petite échelle. Les graphiques de l'abondance de pollen en fonction de la composition floristique démontre que *Triglochin* est sur-representé par rapport à son pollen, *Glaux* est sous-representé et Poaceae, Cheno Am, et *Plantago* sont inconsistents. L'action des marées ainsi que la contribution différentielle des sources de pollen locales, régionales et extra-régionales en fonction de l'élévation du marais limite l'établissement de relations plantes-pollens de Cheno Am et Poaceae, sans toutefois limiter l'établissement de telles relations pour d'autres espèces de marais salants. La comparison avec 35 analogues modernes représentés par cinq différentes zones de végétation en utilisant la méthode du 'squared chord distance' démontre que les differentes zones ont une signature palynologique distinctes de sorte que l'interface marais-terrestre peut être identifiée avec un grand degree de certitude pour les données paleo-écologiques de marais salants. Les autres zones de marais peuvent également être identifiées si des des critères de dissimilarité plus conservateurs sont utilisés.

Serge D. Muller. 2001. Conditions de l´accumulation du carbone dans une tourbière du Québec mériodional: l´influence des facteurs autogènes et des contrôles allogènes soutenance (Conditions of Carbon accumulation in a peatland from Southern Québec: the share of autogenic factors and allogenic controls). De thèse de doctorat. Département de géographie, Université de Montréal. Supervisor: Dr. Pierre J.H. Richard.

Contents:

Abstract

1. Aim: This work explores the postglacial plant migration patterns at a regional scale.
2. Location: St. Lawrence lowlands and adjacent highlands, southern Québec.
3. Methods: The postglacial plant dynamics in the St. Lawrence lowlands are reconstructed based on fifteen pollen diagrams and seventy-four radiocarbon dates.
4. Results: Migratory trends are shown for the first established plant formations (tundra, boreal forest and mixed forest), while the later subsequent onset of deciduous forests shows no particular pattern.
5. Main conclusions: Several factors are involved in this contrasting behaviour. First, the palaeogeographic

context, principally determined by the location of the ice sheet and Champlain Sea, played a major role during the initial stages. The Champlain Sea constituted a barrier to seed dissemination between the Appalachians and Laurentians, favouring the development of *Populus* instead of *Picea* in the latter region. Second, ecological processes partly determined differences in establishment between conifer-dominated forests and deciduous forests. The former resulted from the successive onset of dominant species (*Picea* and *Abies*), while the deciduous forest stages resulted from domination shifts between already established taxa. Third, physiographic traits explain local departures to the general migratory pattern. The major departure comprises the onset of tundra, boreal forest and mixed forest on Monteregian hills (most of which which constituted islands within Champlain Sea) before their establishment in Appalachians.

Chapter 2: POSTGLACIAL CLIMATE DYNAMICS IN THE ST. LAWRENCE LOWLANDS, SOUTHERN QUÉBEC: POLLEN AND LAKE-LEVEL EVIDENCE, by Serge D. Muller, Pierre J.H. Richard, Joël Guiot, Jacques-Louis de Beaulieu & David Fortin, submitted to Palaeogeography, Palaeoclimatology, Palaeoecology.

Abstract

This study provides the first quantitative palaeoclimate reconstruction in southern Québec. Pollen and lake-level data are used to reconstruct past climate changes in the St. Lawrence lowlands, southern Québec. Past lake-level changes are assessed from sedimentological, pollen and macrofossil records from a single lateral core of Lac Hertel, which lies right in the central part of the studied area. Three low lake-level periods are recognised: for some time before 8000, 7600-6600 and 4800-3400 cal. BP. The modern analogues method is applied on pollen data from seven well-dated sites located in the St. Lawrence lowlands and adjacent mountain areas, constrained and unconstrained by lake-level changes. At a regional scale, the results confirm the general trends known for the eastern North America: a dry and cold late-glacial episode due to the presence of pro-glacial lakes and seas; a rapid climate improvement between 12 500 and 11 000 cal. BP possibly caused by increasing summer insolation; a dry period from 10000 to 6500 cal. BP; a brief, slight cooling event between 9000 and 8000 cal. BP, possibly related to a summer cooling of Arctic airmasses; a temperature optimum around 8000 cal. BP, which could represent a regional "Hypsithermal"; a dry climatic phase between 5000 and 3000 cal. BP; and finally, a progressive decrease in summer temperature and an increase in (winter ?) precipitation over the 4500 last years. These results point the importance of taking in account seasonal patterns in climate reconstruction, by the way of merging pollen and lake-level data.

Chapter 3: POSTGLACIAL DEVELOPMENT OF A BOREAL BOG (SOUTHERN QUÉBEC): A SPATIO-TEMPORAL RECONSTRUCTION BASED ON PACHYMETRY, SEDIMENTOLOGY, MICRO- AND MACROFOSSILS, by Serge D. Muller, Pierre J.H. Richard & Alayn C. Larouche, submitted to The Holocene

Abstract

This study examines the past relationships between autogenic processes during the postglacial development of a southern Québec bog. Local vegetation, surface moisture and peat accumulation were independently reconstructed from palaeoecological analyses (microfossils, macrofossils, sedimentology, loss-on-ignition and radiocarbon dating) conducted on seven profiles. The observed successional stages, from pond to marsh, rich fen, poor fen then bog, represents a typical hydrosere. The early wetland development provides an obvious illustration of the facilitation model: each community modified hydrological conditions by the way of peat accumulation and then favoured the onset of the following stage. Our results moreover highlight the difficulty for tackling past autogenic relationships from palaeoecological data. No direct link is evidenced between vegetation, moisture and peat accumulation, while all of them clearly reveal the initial influence of minerotrophic groundwater supply. Notably, the decrease in this allogenic influence is well translated by the increasing asynchrony of vegetation changes. Surface moisture was also highly asynchronous, especially since 7000 cal. BP. The integration of the seven profiles evidences several moisture fluctuations at the peatland scale but none seems to be related with climate. In contrast with moisture and vegetation, net peat accumulation presents similar trends in all marginal profiles and at the peatland scale. As a consequence of the initial minerotrophic supply, peat accumulation rates were high during the early Holocene and low during the mid- and late Holocene. However, the last centuries presented also an apparent increase in peat accumulation rate, which is attributed to the lack of compaction and decomposition in the acrotelm layer.

Chapter 4: CONDITIONS OF CARBON ACCUMULATION IN A BOREAL BOG (SOUTHERN QUÉBEC), by Serge D. Muller, Pierre J.H. Richard & Jacques-Louis de Beaulieu, submitted to Quaternary Research

Abstract.

This study examines the conditions of carbon accumulation in a southern Québec peatland, Mirabel bog, by confronting independent evidences of physiographic context, basal topography, climate, fire, local vegetation and surface moisture. A special

attention is paid to spatial and temporal scales, and to their relationships with the different factors. Notably, carbon accumulation only presents long-term trends, which reflect the interplay between minerotrophic groundwater supply and autogenic processes: the initially alkaline conditions enhanced plant productivity and peat accumulation, which, in turn, progressively isolated peat-forming vegetation from the groundwater influence. Other physiographic parameters strongly influenced the peatland development: the geomorphological context determined the location and extent of peat deposits, and the basal topography controlled the rate of lateral expansion, both in centrifugal and centripetal directions. Climate appears to have not influenced in any way the internal dynamics: precipitation shows no obvious correlation with surface moisture, and carbon accumulation, which approximates the vegetation productivity, was not related to temperature. Finally, fire has no more influenced the peat accumulation process, fire events occurring mostly during waterlogged early stages, unfavourable to peat burning.

Michael C. Sawada. 2001. Late Quaternary paleoclimates and biogeography of North America. PhD thesis. Department of Geography, University of Ottawa. Supervisor: Dr. Konrad Gajewski.

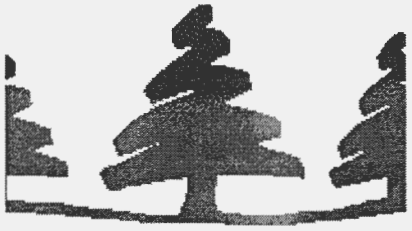
Abstract:
Pollen, spores, and dinoflagellate cysts are used with the modern analog technique (MAT) to provide paleoclimate reconstructions for terrestrial and marine environments in northeastern North America. Multivariate analysis of marine and nearby terrestrial pollen sequences from Hudson Bay, Labrador and the St. Lawrence, differentiate tundra, boreal and deciduous forest assemblages in time and space. These three regions had differing climate histories with respect to deglaciation and air mass boundaries. Prior to 6000 ^{14}C yr BP, cooler temperatures reconstructed along the Labrador margins agree with climate simulations indicating a persistent anticyclone over the Québec-Labrador ice sheet. A late Holocene cooling at forest-tundra sites suggests a recent southern movement in the mean position of the polar front. The degree to which those critical thresholds of dissimilarity, that are used to identify non-analog pollen assemblages, are due to limitations of the modern pollen database or critical decisions within the MAT are explored by means of stochastic simulation, spatial statistics and graphical techniques. Critical thresholds of SQD, as derived by the expected value under randomization, become greater as the number of taxa in the pollen set increases. Larger pollen sets, with continentally infrequent but regionally abundant taxa, better distinguish between continental vegetation zones. Global and local spatial autocorrelation within climate anomalies indicate where the modern sample network induces biases in the climate reconstruction using the MAT.

The spatial scale of terrestrial climate or vegetation reconstructions from pollen in lake-sediments is investigated through the study of pollen source area in southern Québec. Despite the different regional vegetation, estimated pollen source areas and relevant pollen productivity for *Pinus*, *Picea*, *Abies*, *Fagus*, *Quercus* and *Tsuga* are consistent with studies from Michigan, Wisconsin and Sweden. These estimates are robust with respect to various plant abundance distance-weighting schemes and imply that the same inferences can be made regarding plant abundance from pollen throughout a lake-derived fossil pollen sequence. Stochastic simulations illustrate that the definition of relevant pollen source area requires consistent within-site vegetation heterogeneity within a network of pollen sites.

Underutilized proxy-climate data from wetland taxa are demonstrated to contain climate signals at the continental scale and have the potential to further our climatic and biogeographic picture of North America over the past 21,000 years. Pollen and spores from modern wetland taxa conform to their geographic ranges and allow interpretations of their past range changes. The climatic tolerances that govern their geographic distributions are used to interpret past range changes in climatic terms. *Sphagnum* spore distributions suggest major peatland developments after 9 ka and 5 ka. *Sphagnum*, *Potamogeton*, *Isoëtes*, *Myriophyllum Typha/Sparganium*, and *Menyanthes trifoliata* were in Alaska during the last glacial maximum (LGM) and moved into the ice-free corridor by 13 ka. Since the LGM, four migration routes for aquatic taxa are identified in response to the climate changes of the late Quaternary.

Christina M. Whittmire. 2001. Vegetative and fire history of the area surrounding Keyhole Pond, Yukon Territory. M.Sc. Thesis. Department of Biology, University of Regina. Supervisor: Dr. Mary Vetter.

Abstract:
Keyhole Pond, a small lake in southwest Yukon Territory, is surrounded by small grasslands but located within the boreal forest. This lake was chosen to explore local grassland and forest changes over the Holocene, as well as the impact of fire on these communities. A 3-metre lake sediment core was retrieved from the deepest part of the lake using a modified Livingston piston-corer. The lake sediment core has a basal date of ~11,000 before present (BP). Samples were extracted at 3-centimetre intervals (~100 years between samples) and processed for both pollen and charcoal analysis. Only charcoal particles >150 µm in longest dimension were counted for analysis. At least 500 pollen grains were identified per sample, excluding aquatics. From deglaciation until 10,400 BP the vegetation was an open steppe/tundra with little fire activity. From 10,400 BP to 8,200 BP the vegetation was a poplar woodland and fire activity increased. By 8,200 BP *Picea glauca* (white spruce) had become the dominant vegetation type and remained so until the present. Fire activity peaked with the largest amount of charcoal found at ~5,852 BP, which coincided with a decrease in *Picea* and an increase in grassland and shrubby species. *Picea* populations and fire activity have fluctuated more in the last 1,500 years than at any other time during the Holocene. Further research needs to be done to determine the cause of these fluctuations. When doing macroscopic charcoal analysis, measuring the maximum dimension and the area of each charcoal particle gave the same fire activity periods. Measuring the area of each particle did not provide any additional information as to the fire history of the area. Grassland composition has remained essentially the same throughout the Holocene, and the grassland area has not fluctuated much in extent. Increases in fire activity seem to coincide with grassland expansion at certain times, but this is not consistent throughout the Holocene. This suggests that grassland extent in this region is topographically controlled.



ON THE SHELF

RECENT PUBLICATIONS BY CANADIAN AND OTHER PALYNOLOGISTS – 16

(CAP Members are denoted by *)

*Bourgeois, J, K *Gajewski and R Koerner. 2001. Spatial patterns of pollen deposition in arctic snow. *Journal of Geophysical Research - Atmospheres* 106(D6): 5255-5266.

*Boyd, M. 2000. Changing physical and ecological landscapes in southwestern Manitoba in relation to Folsom (11,000 - 10,000 BP) and McKean (4,000 - 3000 BP) site distributions. *Prairie Forum* 25(1):23-43.

Campbell, I.D., W.M. Last, C. Campbell, S. Clare and J.H. *McAndrews. 2000. The late-Holocene paleohydrology of Pine Lake, Alberta: a comparison of proxy types. *Journal of Paleolimnology* 24:427-441.

Carcaillet C.; Bouvier M.; Fréchette B.; *Larouche A.C.; and *Richard P.J.H. 2001. Comparison of pollen-slide and sieving methods in lacustrine charcoal analyses for local and regional fire history. *The Holocene* 11(4):467-476.

Carcaillet, C., Almquist, H., *Asnong, H., Bradshaw, R.H.W., Carrion, J.S., *Gajewski, K., *Haas, J.N., Haberle, S.G., Hadorn, P.,*Richard, P.J.H., Richoz, I., Sánchez Goñi, M.F., von Stedingk, H., Stevenson, A.C., Talon, B., Tardy, C., Tinner, W., Tryterud, E., Wick, L., and Willis, K.J. 2001. Holocene fires and global dynamics of carbon-cycle. *Chemosphere* accepté en septembre 2001.

Carcaillet, C., Bergeron, Y., *Richard, P.J.H., Fréchette, B., Gauthier, S., and Prairie, Y.T. 2001. Change of fire frequency in the eastern Canadian boreal forests during the Holocene: does vegetation composition or climate trigger the fire regime? *Journal of Ecology* 89 (6): xxx-xxx. à paraître en Novembre.

*Chmura, G.L.; Helmer, L.L.; Beecher, C.B.; and Sunderland, E.M. 2001. Historical rates of salt marsh accretion on the outer Bay of Fundy. *Canadian Journal of Earth Sciences* 38(7):1081-1092.

Cooper, S. 2001. BOOK REVIEW: Environmental Micropalcontology: The Application of Microfossils to Environmental Geology; R. E. Martin (ed.) *Journal of Paleolimnology* 26 (3): 351-352.

Duk Rodkin, A.; Barendregt, R.W.; *White, J.M.; and Singhroy, V.H. 2001. Geologic evolution of the Yukon River: implications for placer gold. *Quaternary International* 82(1):5-31.

Flannigan, M., Campbell, I., Wotton, M., Carcaillet, C, *Richard, P.J.H. and Bergeron, Y., 2001. Future fire in Canada's boreal forest: paleoecology results and general circulation model - regional climate model simulations. *Canadian Journal of Forest Research* 31: 854-864.

Frolking, S., Roulet,N.T., Moore, T.R., *Richard, P.J.H., Lavoie, M. and Muller, S.D., 2001. Modeling northern peatland decomposition and peat accumulation. *Ecosystems* 4: 479-498.

*Gajewski, K and M Frappier. 2001. Postglacial environmental history from Prince of Wales Island, Nunavut, Canada. *Boreas* 30: 485-489.

*Gajewski, K., Vance, R., Sawada, M., Fung,, I., Dennis, L., Gignac, D., Halsey, L., John, J., Maisongrande, P., Mandel, P., Mudie, P.J., *Richard, P.J.H., Sherrin, A.G., Soroko, J. and Vitt, D.H., 2000. The climate of North America and adjacent ocean waters ca. 6 ka. *Canadian Journal of Earth Sciences* 37: 661-681.

*Gajewski, K, A Viau, M Sawada, D Atkinson and S Wilson. 2001. *Sphagnum* distribution in North America and Eurasia during the past 21 000 years. *Global Biogeochemical Cycles* 15: 297-310.

*Larocque, I., R.I. *Hall, and E. Grahn. 2001. Chironomids as indicators of climate change: a 100-lake training set from a subarctic region of northern Sweden (Lapland). *Journal of Paleolimnology* 26 (3): 307-322.

Laub, R.S. and J.H. *McAndrews. 1999. Beaver (*Castor canadensis*) and mastodon (*Mammut americanum*) in a late-Pleistocene upland spruce forest, western NewYork state. *Current Research in the Pleistocene* 16:139-140.

Lavoie, M. and *Richard, P.J.H., 2000. The role of climate on the developmental history of Frontenac Peatland, southern Québec. *Canadian Journal of Botany* 78: 668-684.

Lavoie, M. et *Richard, P.J.H., 2000. Paléoécologie de la tourbière du lac Malbaie, massif des Laurentides (Québec) : évaluation du rôle du climat sur l'accumulation de tourbe. *Géographie physique et Quaternaire* 54 (2): 165-181.

Lavoie, M. and *Richard, P.J.H., 2000. Postglacial water-level fluctuations of a small lake in Southern Québec. *The Holocene*, 10: 621-634.

*Head, M.J.; Harland, R.; and Matthiessen, J. 2001. Cold marine indicators of the late Quaternary: the new dinoflagellate cyst genus *Islandinium* and related morphotypes. *Journal of Quaternary Science* 16(7):621-636.

*Heinrichs, M.L.; Walker, I.R.; and *Mathewes, R.W. 2001. Chironomid-based paleosalinity records in southern British Columbia, Canada: a comparison of transfer functions. *Journal of Paleolimnology* 26(2):147-159.

Jackson, L.J., C. Ellis, A.V. Morgan and J.H. *McAndrews. 2000. Glacial Lake levels and eastern Great Lakes Palaeoindians. *Geoarchaeology* 15:415-440.

Karrow, P.F., J.H. *McAndrews, B.B. Miller, A.V. Morgan, K.L. Seymour and O.L. White. 2001. Illinoisian to Late Wisconsinan stratigraphy at Woodbridge, Ontario. *Canadian Journal of Earth Sciences* 38:921-942. (On Fig. 7 left side the pollen zone numbers are 1,3,5 and 6).

Levac, E.; De Vernal, A.; and Blake Jr., W. 2001. Sea-surface conditions in northernmost Baffin Bay during the Holocene: palynological evidence. *Journal of Quaternary Science* 16(4):353-363.

Lian, O.B.; *Mathewes, R.W.; and Hicock, S.R. 2001. Palaeoenvironmental reconstruction of the Port Moody Interstade, a nonglacial interval in southwestern British Columbia at about 18 000 14C years BP. *Canadian Journal of Earth Sciences* 38(6):943-952.

Lim, D.S.S.; Douglas, M.S.V.; and *Smol, J.P. 2001. Diatoms and their relationship to environmental variables from lakes and ponds on Bathurst Island, Nunavut, Canadian High Arctic. *Hydrobiologia* 450(1-3):215-230.

Little, J.L. and J.P. *Smol. 2001. A chironomid-based model for inferring late-summer hypolimnetic oxygen in southeastern Ontario lakes. *Journal of Paleolimnology* 26 (3): 259-270.

Morgan, A.V., J.H. *McAndrews and C. Ellis. 2000. Geological history and paleoenvironment. In: C. Ellis and D.B. Deller. (editors). An early paleoindian site near Parkhill, Ontario. *Mercury Series, Archaeological Survey of Canada Paper 159*. Canadian Museum of Civilizaton. Chapter 2, pages 9-30.

Muller, S. and *Richard, P.J.H., 2001. Postglacial vegetation migration in the St. Lawrence lowlands, southern Québec. *Journal of Biogeography* accepté en juillet 2001.

Paterson, A.M.; *Cumming, B.F.; *Smol, J.P.; Blais, J.M.; and France, R.L. 2001. A paleolimnological assessment of the effects of logging on two lakes in northwestern Ontario, Canada. *Proceedings-International Association of Theoretical and Applied Limnology* 27(3):1214-1219.

Quinlan, R. and J.P. *Smol. 2001. Setting minimum head capsule abundance and taxa deletion criteria in chironomid-based inference models. *Journal of Paleolimnology* 26 (3): 327-342.

St. Jaques, J.M., M.S.V. Douglas and J.H. *McAndrews. 2000. Mid-Holocene hemlock decline and diatom communities in van Nostrand Lake, Ontario, Canada. *Journal of Paleolimnology* 23:385-397.

Williams, J.W., Webb III, T.,*Richard, P.J.H. and Newby, P., 2000. Late Quaternary Biomes of Canada and the Eastern United States. *Journal of Biogeography* 27 (3): 585-607.

NEW BOOKS

Dinoflagellate Cysts and Paleoceanography of High Latitude Marine Environments. Special Issue edited by Jens Mattheissen and Anne de Vernal. *Journal of Quaternary Science*, Vol. 16 (7), October 2001. Available online in pdf format at http://www.interscience.wiley.com

Contents:

indicators for short-term climate variability in the eastern Laptev Sea (Arctic Ocean), p. 711-716.

Elena Voronina, Leonid Polyak, Anne De Vernal, and Odile Peyron. Holocene variations of sea-surface conditions in the southeastern Barents Sea, reconstructed from dinoflagellate cyst assemblages, p. 717-726.

Jens Matthiessen, and Jochen Knies. Dinoflagellate cyst evidence for warm interglacial conditions at the northern Barents Sea margin during marine oxygen isotope stage 5, p. 727-737.

Fabienne Marret, Anne de Vernal, Ferial Benderra, and Rex Harland. Late Quaternary sea-surface conditions at DSDP Hole 594 in the southwest Pacific Ocean based on dinoflagellate cyst assemblages, p. 739-751.

New Book Series: *Developments in Paleoenvironmental Research*
Kluwer Academic Publishers, in cooperation with book series co-editors John P. Smol and William M. Last, have established a new book series called: *Developments in Paleoenvironmental Research*.

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The first four volumes (a new series of handbooks for paleolimnological research) are now being published:

Last, W.M. and Smol, J.P. [Editors]. 2001. Tracking Environmental Change Using Lake Sediments. Volume 1: Basin Analysis, Coring, and Chronological Techniques. Kluwer Academic Publishers, Dordrecht.
Last, W.M. and Smol, J.P. [Editors]. 2001. Tracking Environmental Change Using Lake Sediments. Volume 2: Physical and Geochemical Methods. Kluwer Academic Publishers, Dordrecht.

Smol, J.P. Birks, H.J.B., and Last, W.M. [Editors]. 2001. Tracking Environmental Change Using Lake Sediments. Volume 3: Terrestrial, Algal, and Siliceous Indicators. Kluwer Academic Publishers, Dordrecht.

Smol, J.P. Birks, H.J.B., and Last, W.M. [Editors]. 2001. Tracking Environmental Change Using Lake Sediments. Volume 4: Zoological Indicators. Kluwer Academic Publishers, Dordrecht.

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http://home.cc.umanitoba.ca/~mlast/paleolim/monotitles.html

or contact: John Smol and/or Bill Last.

Charman, D.J., Hendon, D. and Woodland, W. (2000) The identification of peatland testate amoebae. Quaternary Research Association Technical Guide no.9, London. 147pp.

This is a new guide for the identification of testate amoebae (a group of protozoans) in peatlands. It provides an identification key and taxon descriptions illustrated with photographs, plus reviews of various aspects of systematics, sample treatment, data analysis and interpretation. Main chapter headings:
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2. Biology and ecology

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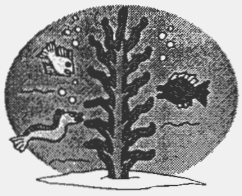
Price 9 pounds stlng (QRA members) or 17 pounds stlng (non-members). Post and packing: Included on non-members prices, QRA members add 20% (UK/EU). Orders should be sent to Simon Lewis, QRA publications Secretary, S.Lewis@qmw.ac.uk or at the address below: Dr Simon G. Lewis, Department of Geography, Queen Mary, University of London, Mile End Road, London, E1 4NS, UK

Diatom book now in paperback

Stoermer, E.F. and Smol, J.P. [Editors]. 1999. The Diatoms: Applications for the Environmental and Earth Sciences. Cambridge University Press. Cambridge. 484 pp. ISBN: 0 521 582814

In 1999 this book was published in hardcover. It has been reprinted again in hardcover, and it is selling for $120.00 US, according to the Cambridge University web site: http://www.cup.org/ However, a paperback version was recently released, selling for $44.95 US. The ISBN for the paperback version is 0-521-00412-8



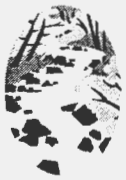
Jirí Komárek; Vlasta Jankovská: Review of the Green Algal Genus *Pediastrum*: Implication for Pollenanalytical Research (Bibliotheca Phycologica Band 108) 2001. IV, 127 pages, 47 figures, 21 plates. ISBN 3-443-60035-2, paperback, DM 90.00 (incl. Porto) [An overview of the volumes in *Bibliotheca Phycologica* can be found on http://www.schweizerbart.de/pubs/series/bibliotheca-phycologica-60.html]

Hynes, H.B. Noel. The Ecology of Running Waters is now available again from The Blackburn Press.

In this reprinted classic (originally published in 1971) Noel Hynes compiled a comprehensive, critical review of the literature pertaining to stream limnology. Included are physical and chemical characteristics of flowing waters, plantlife, the benthos, fish and finally, man's effects on watercourses. The book continues to be widely read and influential in the field.

For more information point your browser to http://www.blackburnpress.com/ecofrunwat.html or to http://www.amazon.com/exec/obidos/ASIN/1930665334/qid=999724491/sr=1-1/ref=sc_b_1/104-6015351-9969547

Frances Reed, Publisher, The Blackburn Press freed@blackburnpress.com



The following three diatoms books may be ordered from Koeltz Scientific Books, P.O.Box 1360, D-61453 Koenigstein, Germany; E-Mail: koeltz@t-online.de koeltz@attglobal.net Internet: https://www.koeltz.com
Their site lists over 40,000 botanical and zoological books

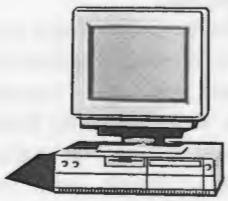
Lange-Bertalot, H. (editor). 2000. Diatoms of the European Inland Waters and Comparable Habitats. Edited by Horst Volume 1: K. Krammer: The genus *Pinnularia*. 217 plates. 703 p. gr8vo. Hardcover. DM 380.00 (Approx. US$ 190) ISBN 3-904144-24-3.

The first volume in this monographic series is a revision and synopsis of the *Pinnularia* taxa of the temperate zone with some remarks to taxa from the tropics and a large number of new taxa. The revision of the genus *Pinnularia* by Krammer (1992) contained only the European taxa. This new monograph contains in addition many new as well as already known taxa from North America, Asia, New Zealand / Australia, and South Africa. Consequently the geographical area covered by this volume is much broader than the title of this book would make believe. Research with modern methods and most recent knowledge unsually

show plenty of inconsistencies in traditional taxonomy and results in numerous new combinations and new descriptions. This proves to be true for 154 new species and varieties, 3 new genera and 42 new combinations in the present monograph. The next volume in this series is expected in the second half of 2001. This series is published by Messrs. Gantner / Ruggell and is distributed by Koeltz.

Lange-Bertalot Festschrift: Studies on Diatoms. Dedicated to Prof. Dr. Dr. H.C. Horst Lange - Bertalot on the Occasion of his 65th Birthday. Edited by Regine Jahn, John P. Kociolek, Andrzej Witkowski and Pierre Compère. 2001. 3 coloured plates. 120 b/w photogr. plates 633 p. Hardcover. DM 380 (US$ 190) ISBN 3-904144-26-X.
Published by Gantner Verlag, Ruggell and distributed by Koeltz Scientific Books

Diatoms of European Inland Waters and Comparable Habitats. Edited by Horst Lange - Bertalot. Volume 3: Krammer, Kurt: CYMBELLA. 2002. 194 photographic plates (micrographs). 584 p. Hardcover. DM 380 (US$ 190) ISBN 3-904144-84-7.
This third volume in the series deals with Cymbella sensu stricto of the temperate zone, with many remarks on taxa from the tropics, and a large number of new taxa. This book is in the press and we expect to have copies ready for sale in late January. Orders for this volume will be recorded for supply after publication. Please order now. Thank you.



PALYNOBYTES

Northwest European Pollen Flora

http://www.bio.uu.nl/~palaeo/Research/NEPF/nepf.htm
The main goal of the NEPF is to provide detailed keys to the pollen types (and when possible to pollen groups and species), to illustrate them by means of LM and SEM micrographs and to give a comprehensive description of the different pollen types.

Mycology Websites

http://fp.bio/utk.edu/mycology/nomenclature/nom-intro.htm
This is a mycology tutorial that explains a lot of the background of our system of nomenclature, with a hot link to the current edition of the ICBN. Further excursions in this area, with a bias to mycology, can be accessed at
http://fp.bio.utk.edu/mycology/techniques/tech.htm
If one explores this site a bit further, there is a lot of information on morphology and reproduction of fungi -- which makes it a good companion to Kalgutkar & Jansonius' "Synopsis of Fossil Fungal Spores" (AASP Found., Contrib. Ser. 39).

Jan Jansonius
Geological Survey of Canada – Calgary

Diatoms

New addresses for the Amphora and Diatcode web sites:
http://www.geog.ucl.ac.uk/ecrc/amphora/
Please let me know if you encounter any difficulties or have any suggestions for improvements to the pages.

Dr Helen Bennion
Environmental Change Research Centre (ECRC)
Department of Geography
University College London

ANNOUNCEMENTS

PAGES
PAST GLOBAL CHANGES

PAGES (Past Global Changes) is the IGBP (International Geosphere Biosphere Program) core project charged with quantifying past climatic and environmental changes. Its goal is to work towards a better understanding on the Earth's changing environment, especially these aspects that best inform our evaluation of current and future changes and their consequences for human population.

Although a great many projects have been launched within the PAGES framework, there remains a great deal to be done. There are, within the PAGES organization, activities that have not been adequately addressed. Anyone in the paleoscience community with expertise in various areas, willing to take part in formulating new **PAGES initiatives** should contact the PAGES International Project Office in Bern. Other ways of linking your project to this international group is to **join existing foci** that address research on Holocene to late Pleistocene time scales, with good chronological control as it is relevant to the future. To get a better idea about what PAGES is all about and how to join, please visit our website: www.pages-igbp.org

Our website is visited by about 100 persons per day from any of about 70 countries. It includes a section on how to join PAGES, information about paleoarchives, a calendar of workshop and meetings, back issues of PAGES News and **high-quality overheads** than can be downloaded and used in any of your presentations. The Science Highlight section is changed every four months with the publication of the last issue of PAGES News. In the future, we would like to change our **science highlights** as frequently as once per month. To do so, we would like to receive contributions from scientists. If you have exciting submitted or recently published results that would be interesting for a wide audience, please contact PAGES science officer at larocque@pages.unibe.ch. Showing up results for a month on the PAGES website may highly increase its visibility.

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William M. Last
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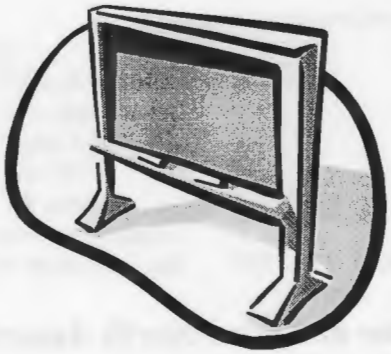
Decline of Native North American Invertebrate Pollinators

Some time during the first week of April, 2002, a Special Feature Issue will appear in the electronic journal, *Conservation Ecology*. The issue's general topic is given by the title of the introductory article, "Causes and Extent of Declines Among Native North American Invertebrate Pollinators: Detection, Evidence and Consequences". To access this electronic journal, go to the following web site:
http://www.consecol.org/Journal/index.html
From there, you will be able to access the issue, browse the contents, and generate reprints as you wish. The journal also offers opportunities for exchanges of letters and perspectives.
The titles of the papers that are included in this special issue are as follows:

--Causes and Extent of Declines Among Native North American Invertebrate Pollinators: Detection, Evidence and Consequences
--Ups and Downs in Pollinator Populations: When Is There a Decline?
--Variation in Native Bee Faunas and Its Implications for Detecting Community Changes
--The Native Bee Fauna of Carlinville, Ill. Revisited After 75 Years: A Case for Persistence
--North American Dipteran Pollinators: Assessing Their Value and Conservation Status
--Butterfly Species Richness Patterns in Canada: Energy, Heterogeneity, and the Potential Consequences of Climate Change.
--Habitat Fragmentation and Native Bees: A Premature Verdict?
--Population Genetic Aspects of Pollinator Decline
--Using Pollination Deficits to Infer Pollinator Declines: Can Theory Guide Us?
--The Economic Impacts of Pollinator Declines: An Approach to Assessing the Consequences

James H. Cane
USDA-ARS Bee Biology and Systematics Lab
Utah State University, Logan, UT
84322-5310 USA
web page: http://www.LoganBeeLab.usu.edu/



SPECIAL SESSIONS: CALLS FOR PAPERS

SPECIAL SESSIONS AT THE GAC/MAC 2002 MEETING, SASKATOON MAY 26-29, 2002

SEE THE ANNOUNCEMENT OF THE CAP-SPONSORED SESSION ON THE PALYNOLOGY AND MICROPALEONTOLOGY OF BOUNDARIES (SESSION #22) ON P. 4 OF THIS NEWSLETTER

SPECIAL SESSION 24: GLOBAL CORRELATION OF LATE CENOZOIC FLUVIAL DEPOSITS: PRESENT PROCESSES AND PAST ENVIRONMENTS WEDNESDAY MAY 29, 2002

Organized by
Alec Aitken (University of Saskatchewan; aaitken@arts.usask.ca)
Duane Froese (Simon Fraser University; dgfroese@ucalgary.ca)
Serge Occhietti (Université du Québec à Montréal; occhietti.serge@videotron.ca])

Contributors are kindly requested to send a copy of the abstract to occhietti.serge@videotron.ca

Session Description:

Fluvial systems are sensitive to small changes in climate. Our understanding of future responses of rivers to climate change must be tempered through underlying physical processes and the reconstruction of past fluvial records under different climatic conditions. This session is a Canadian contribution to IGCP 449 (Global Correlation of Late Cenozoic Fluvial Deposits) and seeks to highlight our understanding of Canadian rivers, in particular the role of cold climate and nival regimes to fluvial systems. We seek contributions detailing regional responses of small and large rivers, and the Quaternary record of rivers in Canada and other areas. We anticipate presentations, for example, on the St. Lawrence, Mackenzie, Yukon, James Bay Lowlands and Prairie systems at glacial-interglacial or Holocene timescales. This first special session aims to bring together researchers from various disciplines (sedimentology, dating methods, biostratigraphy, archaeology, geomorphology, stratigraphy, etc.), working on present and past fluvial environments. Both oral and poster presentations are welcome.

SPECIAL SESSION SS2 - GREAT PLAINS GEOMORPHOLOGY AND ENVIRONMENTAL CHANGE: SPONSORED BY CGRG, IGCP 413 AND GSC.

This full-day session, scheduled for Monday, May 27, will include presentations in colian, slope and fluvial processes, various proxy records of environmental change, and insights gained from geoarchaeology. The session will focus primarily on northern Great Plains issues, but contributions from the Central and Southern Great Plains are also encouraged. The session will include both oral and poster presentations. A keynote presentation will be given by Dr.
David Thomas, Sheffield Centre for International Drylands Research and co-leader of IGCP-413 (Understanding Future Dryland Changes from Past Environmental Dynamics). A set of papers from the meeting to be published in a peer-reviewed journal is presently being considered.
Stephen Wolfe: swolfe@nrcan.gc.ca

FIELD TRIP A4 - HOLOCENE GEOMORPHOLOGY, ARCHAEOLOGY AND

ENVIRONMENTAL CHANGE IN SOUTH-CENTRAL SASKATCHEWAN:
A two-day pre-meeting field trip (Sat. May 25 - Sun. May 26) examining geomorphological features and archaeological sites in the Saskatoon region. The trip includes observations of mass wasting, fluvial processes and cliff-top dunes along the South Saskatchewan River, recessional and hummocky moraines, spillways (Blackstrap and Last Mountain Lakes) and sand dunes at Douglas Provincial Park. Archeological interpretations will include Middle and Late Prehistoric culture, chipstone types and river crossings. The field trip will over-night at the Manitou Springs Resort and Spa to take in the "Healing Waters". Dr. David Meyer of the Dept. of Anthropology and Archaeology, University of Saskatchewan will provide an after-dinner presentation of an overview of the SCAPE project (Societal and Cultural Adaptations in Prairie Ecosystems) and archaeological investigations at the confluence of the North and South Saskatchewan rivers.
Preview the Field Trip tour at the following web-site, courtesy Jeff Ollerhead, Mount Allison University:
http://www.mta.ca/~jollerhe/trip_a4/trip_a4.html
*Estimated cost of $240 CDN will include taxes, meals, transportation, accommodation, guidebook and participation at the Wanusakwin Ice-Breaker. Field trip commences and ends in Saskatoon.

more GAC/MAC information...

Abstract submission information may be found at:
http://www.usask.ca/geology/sask2002/abstracts.html
Online conference registration will begin on March 1, 2002. Registration will also be possible by mail or fax, using the forms included with the Final Circular, which will be mailed in late February-early March, 2002, to all GAC and MAC members, and to others who have expressed interest in the meeting.
Delegates who register before April 18, 2002, will receive the lower early registration rate; delegates who register after this date will pay the higher late registration fee. Registration will be available at a reduced rate for GAC and MAC members. Students will be eligible for a special student rate provided that they are, or become, members of GAC or MAC. Membership forms are available through www,gac.ca or www.mineralogicalassociation.ca. Potential delegates who are not members are encouraged to join.

http://www.usask.ca/geology/sask2002/

Deadline for abstracts: January 15, 2002

2002 NE GSA Meeting

Mark Abbott (University of Pittsburgh) and I are chairing a theme session entitled "Holocene Climate and Lakes" during the 2002 NE GSA meeting to be held in Springfield, Massachusetts, March 25-27, 2002
http://www.geosociety.org/sectdiv/northe/02nemtg.htm
If you are interested in submitting an abstract (on-line only) or would like some additional information feel free to contact me (alini@zoo.uvm.edu) or Mark (mabbott1+@pitt.edu).
The abstract deadline is Dec 18!

Dr. Andrea Lini
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University of Vermont
Burlington, VT 05405 U.S.A.
Phone: (802) 656 02 45, Fax: (802) 656 00 45
http://geology.uvm.edu/geowww/isogeochem.html

HOLOCENE ENVIRONMENTAL CHANGE IN THE GREAT LAKES REGION

Physical Geography Special Session
Canadian Association of Geographers Annual Meeting
Co-hosted by the University of Toronto, York University and Ryerson University
Location: Toronto, Canada
May 28 - June 1, 2002
Co-organized by Sarah Finkelstein and Matthew Peros, Department of Geography, University of Toronto

We invite papers for a special session at the CAG annual meeting which address any aspect of Holocene environmental change in the Great Lakes region. We welcome any paper dealing with climatic, hydrological, geomorphic or ecological change, using any biological, geophysical, geochemical or sedimentological method.

If you are interested in participating in this session by giving a 20-minute oral presentation or by presenting a poster, please contact Matthew Peros (matthew.peros@utoronto.ca) or Sarah Finkelstein (sarah.finkelstein@utoronto.ca) by December 15, 2001. Abstracts are due February 15, 2002.

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32nd ARCTIC WORKSHOP, 2002: INSTAAR, UNIVERSITY OF COLORADO

The 32nd Annual International Arctic Workshop will be held March 14-16, 2002, at the Institute of Arctic and Alpine Research (INSTAAR), University of Colorado at Boulder. This workshop has grown out of a series of informal annual meetings sponsored by INSTAAR and other academic institutions worldwide. In keeping with this tradition, there are no formalized topics, and the workshop is organized around themes developed from the abstracts submitted for presentation and poster display. We hope to build upon the increasing breadth and success of past years for a rewarding interdisciplinary meeting on a variety of Arctic research themes.
Information on submission of abstracts will be posted by December15th, 2001 on our www site http://instaar.colorado.edu/meetings/AW2002 (note that "AW" is capitalized). Deadline for abstracts will be February 22nd, 2001.

Indigenous Observations Of Climate Change 22.2.-24.2.2002 Workshop Announcement

A three day workshop will be organised in February 2002 in Tampere, Finland to document and discuss the observations and impacts of the Climate Change in the European and Russian North. The global warming is the worst environmental threat to all life in the North. Circumpolar communities will be in the frontline when the warming of the climate occurs. Organised by Tampere Polytechnic (Environmental Engineering) in cooperation with
Arctic Climate Impact Assessment (Alaska, US), Russian Association of the Indigenous Peoples Of the North - RAIPON (Russia), Aurora Reasearch Institute (Inuvik, NWT, Canada), Murmansk Humanities Institute (Russia)

The aim is to enhance the participation of the Indigenous Communities and Peoples in the North and bring their voices to one forum. Participants are free to submit abstracts of papers they wish to present by the end of November, 2001. The workshop is a part of continuing project "Indigenous Observations of Climate Change" around the Circumpolar North. The aim of this workshop is to bring together the Scandinavian and Russian Sàmi People and the various representatives of RAIPON from the Russian Federation. This project was started in Spring 2001 and a concluding workshop will be organised in Murmansk, Russia in early 2003. Participants have a chance to submit their documentations and discussions through written or oral submissions during this workshop.

Tampere Polytechnic Environmental Engineering
Tero Mustonen tero_mustonen@yahoo.com
tel. +358 40 7372424
fax. +358 3 2647222

Paleoecology Symposium at the 2002 Annual Meeting of the Ecological Society of America

The provisional title is 'Gasping for CO2: Ecological Effects of Low Atmospheric CO2 Concentrations', organized by Jack Williams. The general goals of the symposium are to highlight recent advances in plant physiology and paleoecology in relation to low CO2, to encourage a more interdisciplinary approach to understanding the interactions between glacial-interglacial variations in climate and CO2 on vegetation, and to encourage more collaboration between paleoecologists and plant physiologists.

Dr. Jack Williams (williams@nceas.ucsb.edu)
National Center for Ecological Analysis and Synthesis (NCEAS)
735 State St., Suite 300
Santa Barbara, CA 93101-3351
+1-805-892-2513 (office)
+1-805-892-2510 (fax)

Poster Session for the next INQUA Congress

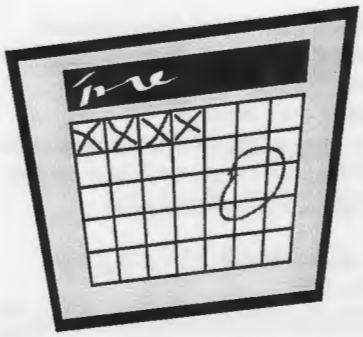
The Program Committee for the next INQUA Congress, which will be held in Reno in late July 2003, is seeking proposals for poster sessions. Poster sessions can be organized on any aspect of Quaternary science. They will be
featured at the Congress -- no other activities will take place during poster sessions. Some poster sessions will introduced by a 30-minute oral presentation by the conveners in a lecture hall immediately before the session.

If you would like to organize a poster session, please contact the Program Committee Chair, John J. Clague

John J. Clague
Department of Earth Sciences
Simon Fraser University
Burnaby, British Columbia
V5A 1S6
Bus: (604) 291-4924
Fax: (604) 291-4198
E-mail: jclague@sfu.ca
Web: http://www.sfu.ca/earth-sciences/faculty/NewClague/newClague.htm

FOR SALE

Hardcopy of: Past global changes and their significance for the future. Quaternary Science Review 19: 1-5. The price is 50$ US and includes mailing costs. To order: fill the form on the PAGES website www.pages-igbp.org or send an email to pages@pages.unibe.ch



MEETING CALENDAR

2002

Date: TBA. **7th International Association for Aerobiology Congress** Quebec, Canada

January 26, 2002 **Alberta Palaeontological Society Sixth Annual Symposium** (in conjunction with the Mount Royal College Geology Department and the C.S.P.G. Paleontological Division); Wayne F. Braunbeger; (403) 278-5154 e-mail waylynn@telusplanet.net

February 14-16, 2002. **International Conference Taphos 2002**, 3rd Meeting on Taphonomy and Fossilization, Valencia, Spain. http://paleopolis.rediris.es/paleontologia/Taphos2002/

March 3-6, 2002. NEW DATE! **The Society for Organic Petrology (TSOP), 18th Annual Meeting, Houston, Texas, USA (Postponed from September 2001).** Information: Dr. Coleman Robison, ChevronTexaco, Energy Research Technologies Company, 4800 Fournace Place, Bellaire, TX 77401-2324 USA; Phone: (713) 432-6828; Fax: (713) 838-4628; E-mail: ColeRobison@chevrontexaco.com; Further details: http://www.tsop.org.

May 26-29 2002. **GAC/MAC Meeting** Saskatoon, Saskatchewan, Canada Website: http://www.usask.ca/geology/

June 24-28 2002. **10th International Conference on Luminescence and Electron Spin Resonance Dating (LED2002)** University of Nevada-Reno, Reno, Nevada, U.S.A. Details: Conference Secretary, Ms. M. Jones, Division of Hydrological Sciences, Desert Research Institute, 2215 Raggio Parkway, Reno, NV 89512-1095, USA. Email: LED2002@dri.edu Website: http://www.dri.edu/DEES/LED2002/led2002-home.html

August 14-21 2002. **17th World Congress of Soil Science (WCSS)** Thailand. Details: The Secretariat, 17th WCSS, 17th WCSS Office, Kasetsart University, PO Box 1048, Bangkok 10903, Thailand. Tel: (662) 9405787, 9405707-8, Fax: (662) 9405788, Email: o.sfst@nontri.ku.ac.th Website: http://www.17wcss.ku.ac.th

August 28-31 2002. **4th International Meeting On Phytolith Research** McDonald Institute for Archaeological Research, University of Cambridge, England, UK

Aug. 31- Sept. 4, 2002 **"Emerging Concepts in Organic Petrology and Organic Geochemistry". Canadian Society for Coal Science and Organic Petrology (CSCOP)-The Society for Organic Petrology (TSOP), Joint Annual Meeting,** Banff, Alberta, Canada. Information: Dr. Martin Fowler, Geological Survey of Canada, 3303-33rd Street NW, Calgary, Alberta T2L 2A7 Canada; Phone: (403) 292-7038; Fax: (403) 292-7159; E-mail:

Mfowler@nrcan.gc.ca; Further details: www.cscop-tsop2002.com; Abstract deadline: January 31, 2002

August 29 - September 2 2002. **6th European Palaeobotany - Palynology Conference** Athens, Greece. Details: Prof. D. Evangelos Velitzelos, Organizing Committee, 6th European Palaeobotany-Palynology Conference, Department of Historical Geology-Palaeontology, Faculty of Geology, University of Athens, Panepistimioupolis, Zografou, 157 84 Athens, Greece. Tel./Fax: +30-1-7274162, E-mail: velitzel@geol.uoa.gr

September 1-6, 2002. **The Third International Congress "Environmental Micropaleontology, Microbiology and Meiobenthology", EMMM'2002** Vienna, Austria. Conference objectives: The main objectives of the Congress are: (1) to present innovative multidisciplinary research on recent and fossil micro- and meioorganisms, addressing environmental/ paleoenvironmental problems in the biological, geological, and environmental sciences, as well as in agriculture and industry; (2) to bring together specialists with biological and geological backgrounds for the enhancement of professional and public educational programs and research benefiting the environment, human health and welfare; (3) to increase public awareness of the importance and value of recent and fossil micro- and meioorganisms in the environmental sciences, in order to bridge the gap between science, industry, and regulatory environmental agencies. Details: Dr Irena Motnenko, Technical Director of the EMMM'2002 Congress, P.O. Box 60013, 110-2025 Corydon, Winnipeg, Manitoba, R3P 2G9, Canada. Tel: (204) 489-4569, Fax: (204) 489-5782 (Winnipeg), congress@isemmm.org Website: http://www.isemmm.org

September 5-7 2002. **CIMP Symposium and Workshops** Lille, France. Details: Thomas Servais (thomas.servais@univ-lille1.fr) or Ludovic Stricanne (ludovic.stricanne@univ-lille1.fr), University of Lille

September 11-13 2002. (Proposed) **Joint Meeting of AASP, BMS and NAMS (American Association of Stratigraphic Palynologists, British Micropalaeontological Society, North American Micropaleontology Section of SEPM)** University College London, England, UK. Details: James Powell, Dinosystems, 105 Albert Road, Richmond, Surrey TW10 6DJ,England, UK, Tel: +44 20 8948 6443; Fax: +44 20 8940 5917, E-mail: ajp@dinosystems.co.uk.

October 27-30 2002. **Geological Society of America, Annual Meeting**. Denver, Colorado, U.S.A. Theme: "Science at the Highest Level". Details: GSA HQ, Box 9140, 3300 Penrose Place, Boulder, Colorado 80301, U.S.A. Tel: (303) 447-2020, X133, E-mail: meetings@geosociety.org

2003

Date: TBA. **GAC/MAC Meeting** Vancouver, British Columbia, Canada

Date: TBA. **CANQUA Meeting** Halifax, Nova Scotia, Canada (proposed).

March 29 - April 2 2003. **3rd International Limnogeology Congress** Tucson, Arizona. Theme session proposals to Andrew Cohen, General Chair of the Congress (acohen@geo.arizona.edu). Field trip proposals to David Dettman, field trip coordinator for the Congress (dettman@geo.arizona.edu).

July 23 - 31 2003. **INQUA XVI Congress** Reno, Nevada, USA Website: http://www.dri.edu/DEES/INQUA2003/inqua_home.htm

September 1-5 2003. **18th International Radiocarbon Conference** Wellington, New Zealand. Details: 14Conf-info@gns.cri.nz Website: http://www.14Conference2003.co.nz

November 2-5 2003. **Geological Society of America, Annual Meeting**. Seattle, Washington, U.S.A. Details: GSA HQ, Box 9140, 3300 Penrose Place, Boulder, Colorado 80301, U.S.A. Tel: (303) 447-2020, X133, E-mail: meetings@geosociety.org

2004

Dates: TBA. **XI IPC (International Palynological Congress)** Granada, Spain Website: http://www.ugr.es/local/bioveg

2005

Date: TBA. **GAC/MAC Meeting** Halifax, Nova Scotia, Canada