CANADIAN ASSOCIATION OF PALYNOLOGISTS
ASSOC. CANADIENNE DES PALYNOLOGUES

NEWSLETTER

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1987-88 EXECUTIVE

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FROM THE BUREAUCRAT'S DESK

NEW MEMBERS.

On behalf of CAP, I would like to welcome new members Debbie Yamamura and Mike Melchin (both of Univ. of Toronto). Debbie has recently completed an undergraduate research project on the palynology of the upper Bearpaw and lower Mary River Formations (upper Campanian/lower Maastrichtian?) of southern Alberta, under the supervision of Geoff Norris. She plans to start a Masters project under Geoff, later in the year. Mike has recently joined the U. of T. palynology group as a Post Doctoral Fellow, and is a "born again" CAP member. Mike's Ph.D research was on upper Ordovician and lower Silurian graptolites from the Canadian Arctic, and he is presently working on the chitinozoa extracted from his graptolite samples.

NEW CORRESPONDENT.

On behalf of CAP I would also like to welcome Dave Batten (Univ. of Aberdeen, Scotland) as a correspondent. Dave is well known for his extensive work on Late Cretaceous miospores (particularly of the Normapolles group) and palynofacies studies. Dave was recently convenor of the seminar on Paleobotany of Pollen and Spores at the annual meeting of AASP at Halifax, last fall.

DUES DUE.

The following members and correspondents please note that their membership fees or subscriptions were due at the start of 1988: A. Achab, A. Audretsch,

S. Barss, P. Binda (since 1986), W. Brideaux, J. Bujak, D. Cameron, L. Costa, E. Davies (since 1886), S. De Gasparis, L, De Verteuil, A. Dyer, M.-J. Feller-Demalsy (since 1987), M-A. Geurts, R. Hebda, R. Heise (since 1987), S. Jacobson, W.A. Jenkins (since 1987), H. Kutluk (since 1987), C. Labelle, H. Leereveld, W. MacMillan, R. Mathewes, NZGS(DSIR), D. McIntyre (since 1986), M.G. Parsons, S. Piasecki (since 1987), W. Sarjeant, E. Simons, H. Sullivan, J. Terasmae, Thompson, R. Turner, W.S.G.S. Library, D. Wall (since 1987), G. Williams, M. Wilson.

C.A.P. membership dues are $5 per year, payable for up to 3 years in advance. Members each receive two copies of the C.A.P. Newsletter and two copies of PALYNOS per year. Funds should be sent to:

Martin J. Head
CAP Secretary/Treasurer
Dept. of Geology
University of Toronto
Toronto, M5S 1A1
Phone (461) 978-5080
(or 3022)

MINUTES OF GENERAL MEETING
- A CORRECTION -

The penultimate sentence of paragraph 9 is incorrect and based on a misunderstanding at the AGM. It should be replaced by "Wayne Brideaux(President) and Bert van Helden (President-Elect) will continue their 2 year terms (as laid down in the by-laws)". This should <u>follow</u> the sentence "Neither of these positions were contested".

New IFPS councillor
- CALL FOR NOMINATIONS -

The CAP executive position of IFPS councillor allows CAP's views and interestes to be represented within the International Federation of Palynological Societies. The position also enables CAP to receive feedback from the IFPS in addition to the receipt by individual CAP members of "Palynos" (the IFPS newsletter). The IFPS councillor serves a 4 year term (from one International Palynological Conference to the next) and after four years of excellent service John Utting, our present councillor will be stepping down in August 1988. Dave Jarzen (presently the IFPS secretary-Treasurer) has been nominated for this position (proposed, Rob Fensome, seconded, Geoff Norris). If there are any other nominations for this position please send them to Martin Head as soon as possible so that a ballot may be arranged.

HELP WANTED

The Nomination Committee has been unsuccessful in locating any candidates for the positions of President Elect and Newsletter Editor. C.A.P. cannot continue to function without these offices being filled. Would any individual willing to accept the responsibility for either of these offices please contact Wayne Brideaux - URGENTLY !!

C.A.P FINANCIAL STATEMENT
(for the period 19th September to 19th May, 1988)

Credits:	
Balance forward (18 September, 1987):	217.21
Other credits:	
Dues and subscriptions	260.00
Interest	3.16
Total credits:	480.37
Debits:	
I.F.P.S. dues (for 1987: US$87.00)	117.23
I.F.P.S. dues (for 1988: US$64.00)	80.41
Bank charges	5.50
Postage for November, 1987 Newsletter	105.99
Total debits:	309.13
BALANCE:	**171.24**

C.A.P. MEMBERSHIP

The following membership categories are currently paid up to 1988 or beyond: full members = 52; institutional members = 2; correspondents = 12. CAP thus presently has 66 members in good standing.

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The opposite of a correct statement is a false statement. But the opposite of a profound truth may well be another profound truth - Niels Bohr.

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C.A.P. ANNUAL MEETING ANNOUNCEMENT

The annual general meeting of the Canadian Association of Palynologists will be held on Thursday, November 10, 1988 at 5:30 PM in the Westin Oaks Hotel, Houston Texas. The room location will be announced in Houston

NEWS FROM POLAND

by Anna Sadowska
Univ. of Wroclawski
Inst. Nauk Geologicznych
50-205 Wroclaw, Poland

Last year two important paleobotanical and also palynological events took place in Poland.

From the 2nd to the 11th of August paleobotanical excursion no. 24 of the XIV International Botanical Gongress in Berlin was held in Poland. It was devoted to the study of outcrops with plant macro- and microfossils, its topic was: "From the Jurassic to the Holocene: the paleoflora and paleoecology of W. and S. Poland." The excursion was organized by palynologist Prof. L. Stuchlik and macropaleobotanist Dr. M. Reyman. I was one of the guides. We were honored by the participation of such famous people as H. Arnott, J. Canright, M. Dettmann, W. Freidrich, H.J. Gregor, F. Scaramuzzi and Ch. Smiley. Most of the participants were accompanied by their charming spouses.

We visited the localities with fossil macroflora- mainly of Neogene and Quaternary age- which were also palynologically investigated. Of course the fossil flora was not the only subject of this excursion, we had some excellent sight-seeing of our country, especially the old monumental architecture of Warsaw and Cracow. Our guests from the United States were

delighted at the chance to photograph a stork's nest. One of the excursion's stops was at a unique, world famous salt mine with wonderful underground chapels and sculptures carved in salt. A nice evening was arranged by the Botanical Institute of the Polish Academy of Sciences in Cracow. Participants of the excursion were also guests of the Museum of the Earth in Warsaw.

Although the long distances between fossil flora localities was none too comfortable in the mini-bus, the atmosphere of the field trip was very pleasant. The only complaint of our guests was that the meals served by the Polish Travel Office (Orbis) were far too copious. We look forward to the return of our guests.

September 23 - 25 the Polish Palaeontological Conference was held in Wroclaw at our University. It was organized by paleozoologist Prof. Czyzewska and me with some of our younger colleagues. It was the first joint meeting of paleobotanists, paleozoologists, geologists and stratigraphers. The main topic of this conference was: "Problems of the continental Neogene in SW Poland". Two field trips to fossil flora and faunal localities also took place. All of the participants stated that the idea of a combined meeting was profitable for scientists in all disciplines to understand the interdependence between plants and animals. The reconstruction of plant communities and all the environment based on palynological investigations is especially important for all paleontological and geological investigations.

It is obvious for everybody, that only palynologists are able to say what the dinosaur used to eat for dinner or if the forest where the Miocene bear was accustomed to walk with Mrs. Bear, was a *Taxodium* swamp-forest or a deciduous forest.

(Editors note: Anna Sadowska was a guest at the VI-IPC held in Calgary and regularly receives our newsletter. A special thanks is sent to her for her contribution.)

The Ocean Drilling Program - A VITAL CHALLENGE FOR CANADIAN PALYNOLOGISTS.

by

Dr. Martin Head, UT

In 1985 Canada became a full member of the Ocean Drilling Program, at a cost of U.S. $3 million per year, providing Canadian palynologists with unparalleled opportunities for investigating both shallow and deep marine sediments from the worlds oceans. Canadian palynologists have responded extremely well to the challenge of ODP membership and to the rigors of life on an ocean wave. At least three Canadian palynologists have participated in cruises on the JOIDES Resolution over the last three years and others have been active in shore based studies. Opportunities have yet to be maximized, however, and the purpose of this article is to unravel some of the mysteries of the DSDP/ODPin the hope that more palynologists will become involved. In particular I shall address the following questions: Should I feel intimidated by ODP/DSDP jargon (including a plethora of bewildering acronyms, abbreviations and technical terms)?; how can I get to work on ODP samples?; how do I get onto a cruise and what levels of commitment are involved?; can I propose future drilling sites for the JOIDES Resolution? As a ship-board palynologist on ODP Leg 105, I have developed some familiarity with the ODP "system". The following answers to these questions thus contain some of my insights as an insider. I hope to show that cutting through the apparent red tape is much easier than meets the eye and that much is to be gained by the involvement of palynologists in ODP.

Should I feel intimidated by ODP/DSDP jargon (including a plethora of bewildering acronyms, abbreviations and technical terms)?

DSDP, IPOD, ODP, CEPAC, WPAC, SOP, HPC, XPC, moonpool, heave compensator, etc. The list, I promise you, is endless and produces a feeling of helplessness and dehydration. The antedote is to understand what it all means. Here is a good place to briefly review the history of ocean drilling, since many acronyms can be placed within its framework.

A BRIEF HISTORY:

1872: HMS Challenger - spent four years sampling the seafloor - sailed more than 68,000 miles, and established the science of oceanography.

1964: JOIDES (Joint Oceanographic Institutions for Deep Earth Sampling) was formed originally as a consortium of four American institutions with strong interests in marine geology, with the purpose of establishing a concerted national program to obtain deep sedimentary cores from the oceans floors. In the summer of 1965, the drillship Caldrill 1, located over the Blake Plateau off Jacksonville, Florida, recovered the first core for the JOIDES program. This provided the impetus for a more extensive deep sea effort, and the drillshop Glomar Challenger with its deep-water drilling ability was chosen as the drillship for the newly established Deep Sea Drilling Project (DSDP)

1968: DSDP (Deep Sea Drilling Project) went into operation, organized by JOIDES (now five oceanographic institutions), funded mainly by the NSF (the U.S. National Science Foundation) and overseen by Scripps. The Glomar Challenger began a series of 96 voyages (over 375,000 miles and 624 Sites).

1975: IPOD (International phase of Ocean Drilling). Membership outside the U.S.A. was extended to the United Kingdom, France, W. Germany, USSR and Japan. Throughout the period of DSDP and IPOD, a complex array of advisory panels evolved under the auspices of JOIDES, to oversee varous aspects of drilling, to assess drilling proposals, and to provide and reviewn long term planning proposals. They include EXCOM (executive committee), PCOM (planning committee), LITHP (lithospheric panel), SOHP (sediments and ocean history panel), ARP (Atlantic regional panel), CEPAC (central and eastern Pacific panel), IOP (Indian Ocean panel), SOP (southern oceans panel), and WPAC (western Pacific panel).

1985: ODP (Ocean Drilling Program). After ten years of almost continuous operation the Glomar Challenger was retired from service with the DSDP. A restructured version of DSDP, known as the Ocean Drilling Program was spawned, and the following are presently members: U.S.A, France, West Germany, Canada, Japan, United Kingdom, European Science Foundation (Sweden, Norway, Denmark, Iceland, Italy, Holland, Spain, Finland, Greece, Turkey, Belgium, and Switzerland).

THE JOIDES RESOLUTION:

ODP's new drillship is the JOIDES Resolution (named jointly after (1) HMS Resolution - the flagship of Captain Cook's second voyage to the Pacific Ocean in the late 1700's, and (2) with reference to the flood of "resolutions" passed by the JOIDES panels and committees, a feature which, I am told off record, characterized the planning stages of ODP). It is a state-of-the-art vessel, built in Halifax, Nova Scotia in 1978 by Hawker Siddeley (Canada) Ltd., and refitted for scientific operations in 1985. Features include dynamic positioning and the capability to handle nearly ten kilometers of drillstring which is suspended by a large sliding block within the derrick (the heave compensator). The centre of the hull is occupied by a large hole (the moonpool) through which the drillstring passes. Core is recovered by three main types of drilling method: rotary drilling (the main method for highly consolidated sediments and is fast but may produce low quality core in poorly consolidated sediments), XCB (extended core barrel method, slow but produces

high quality core through poorly consolidated sediments, HPC (hydraulic piston corer, used for unconsolidated sediments, literally shooting a 9.5 meter core barrel under hydraulic pressure), APC (advanced piston corer - an improvement upon the HPC in which spiraling of the core barrel, as it penetrates the sediment, is reduced). Useful explanatory notes on drilling techniques are found in Init. Repts., DSDP 94 (1): 8-9. The operating institution for the ODP is Texas A&M University (TAMU).

How can I get to work on ODP samples?

It is apparent from articles in recent CAP Newsletters, that the cost of obtaining samples through fieldwork, both in Canada and abroad can be costly. ODP and DSDP samples are free to successful applicants in member countries, and there are plenty of sites across the globe to choose from. For example, look at the inside cover of a later volume of the DSDP Initial Reports to find out which leg relates to which area, and then browse through the respective Initial Reports volume to identify suitable cored intervals. Be selective. I would recommend a section with good biostrat. and/or magnetostrat. control. You should request at least 10 cc's (preferably 20cc's) per sample since organics may be lean in deeper water sediments. Beware also that while continuous coring is a routine practise in ODP, many DSDP Legs cored only through selected drilled intervals. Palynologists interested in high-resolution studies (particularly of Quaternary sediments) should know that ODP commonly recovers unconsolidated sediments by using two closely spaced APC holes which are depth offset to provide a combined continuous record of sedimentation. This may be a recent policy but in any case the APC was not used prior to DSDP Leg 94 (1983) and earlier soft sediment cores will be of lower quality. A final word of advice: upon receiving samples from ODP or DSDP, be certain to look carefully for, and remove, a contaminating rind (up to 8mm thick) of dried drilling slurry which may be present on samples. This rind can be very hard to distinguish from the sample proper, other than by a slight differece in fabric. DSDP/ODP samples are deposited at several repositories in the U.S. (Lamont-Doherty and Scripps). Upon approval of your sample request, curatorial staff will mail samples to you, or you may arrange a visit to preside over sampling, where lithology is critical. Normally, the selection of samples is made by examining core description sheets (called "barrel sheets") and core photographs contained in the DSDP Initial Reports/ODP Proceedings. As from June, 1988, however, a complete colour photographic record of the entire DSDP/ODP core collection (DSDP Leg 1 through ODP Leg 120) in a choice of 35 mm slides (the set costing U.S.$4,500) or video disk (U.S.$12.75 plus postage) will be available from ODP. This will greatly aid in the selection of samples. For further details of this, contact:

John Beck
Ocean Drilling Program
1000 Discovery Drive
College Station, Texas 77840
Telephone: (409) 845-1183

Sample application forms and a useful pamphlet entitled "Sample Distribution Policy" are available from: The Curator, Ocean Drilling Program, 1000 Discovery Drive, College Station, Texas 77840. Telephone: (409) 845-4819.

Palynologists wishing to obtain samples from upcoming cruises, shold note that the procedure is a little different from above. Sample requests must be received by the ODP Curator at least two months before the start of a cruise, so that a shipboard sampling program can be put together. There may be competing applications for samples required for the same research. If this is the case then the shipboard scientists decide (normally within the first few days of the cruise) which samples go where. Clearly the best way to ensure that your sample requests for an upcoming leg are successful is to have a shipboard colleague look after your interests - or better still, to be selected as a shipboard palynologist for that Leg (I shall return to this

later). Sampling of core for shore based studies is done onboard the JOIDES Resolution, and all shipboard scientists help with this rather tedious but vital activity. After the cruise, these samples are mailed to the requesting scientists who are required to submit their results for publication to the ODP Proceedings volume for that particular leg, within about 18 months. For a twelve monthe period following the completion of each leg, all sample requests are frozen except those from the shipboard/designated land-based scientists for that leg. After twielve months, however, the moratorium is lifted and samples can be requested by the general scientific community without any obligation to contribute to the ODP Proceedings volume. At time of writing, samples from all ODP Legs, up to Leg 113 are up for grabs.

How do I get onto a cruise and what levels of commitment are involved?

Throughout the history of DSDP, palynologists have played a relatively minor role in ship-based science, deterred partly I suspect, by safety restrictions limiting the routine use of HF. In fact, preliminary palynological results can be adequately generated on-board without using HF since sediments encountered are, in general, poorly consolidated, at most, or can be broken down with HCl and detergent. Palynologists can learn a great deal about oceanography and other microfossil groups from cruise participation, and at the same time contribute to ship-based biostratigraphic and ecological interpretations for that leg. ODP is very keen to have palynologists onboard some legs, especially where poor preservation of mineralized microfossils is anticipated (e.g. in high latitudes). Spores and pollen can have equal or greater importance than marine palynomorphs where paleoclimatic interpretations are needed. A number of palynologists have alreaedy participated on ODP cruises and the value of palynology to ship-based science is probably more highly regarded by paleoceanographers now than ever before. If you are considering cruise participation, be warned that cruises last for up to two months, and that you should subtract a good three months from your life for this. Take all your relevant reprints with you since palynology is not well represented in the JOIDES Resolution's library (though it does have a complete set of the DSDP Initial Reports and ODP Proceedings). All expenses are covered by ODP while you are on board the JOIDES Resolution but costs incurred in travel to and from the ship, and from required attendance at the post-cruise meeting at College Station, Texas, will also have to be covered by you. All cruise participants contribute to Part A of the ODP Proceedings for that Leg. This includess both Site reports and all preliminary data and interpretations accumulated during the cruise. In addition, you will probably be committed to one or more research contributions for Par]t B of the ODP Proceedings, which is published about 12 to 18 months after Part A.

Palynologists wishing to participate in an upcoming ODP Leg should obtain an ODP Cruise Participant Application Form,. which is available from:

ODP Secretariat
Centre for Earth Resources Research
Memorial University
St. John's, Newfoundland, A1B 3X5
Telephone (709) 737-4708

Since Canada, as a full member of ODP, is given a quota of two places per Leg, the Canadian ODP Secretariat (above) will be delighted to hear from you, and will be pleased to forward additional information which I have not covered. Ask them to put you on their mailing list for the "Canadian National Committee, Ocean Drilling Program

Newsletter". This contains lots of up-to-date information on upcoming legs, available ODP databases available samples, samples requested etc., all of which can now be accessed by Canadians and those working for Canadian institutions.

Can I propose future drilling sites for the JOIDES Resolution?

At least three or four Canadian palynologists are active in proposing future ODP drilling sites. Proposals are usually submitted by small groups of scientists with varied specialites and a common interest in a specific location or geologic feature or phenomenon. It can take up to about three years from proposal submission to actual drilling, but this may be worth the wait. Those interested in offshore Canadian locations, should know that several proposals have been submitted for drilling in late Cenozoic sediments off eastern Canada, and there is also a strong lobby to drill in Canadian Arctic waters, though technical difficulties have yet to be resolved. The JOIDES Resolution is at time of writing, in the Indian Ocean, will be drilling in S.E. Asia throughout 1988, and will spend most of 1989 drilling in the western Pacific, around Japan. It will then drill in the central and eastern Pacific though details ar not finalized. Where it goes after that could depend on you! Guidelines for proposal submission are given in the JOIDES Journal, v. 11(4): 62-67.

Concluding remarks:

Calcareous nannofossils and planktonic foraminifera (and to a lesser extent, siliceous planktonic microfossils) are the preferred biostratigraphic tool for marine upper Phanerozoic sediments in many parts of the world. This preeminence is the reward for persistent involvement by workers on these microfossil groups, in ocean drilling throughout the history of the DSDP and ODP. The high precision biostratigraphic utility of these groups is largely related to advances in magnetostratigraphy and isotope stratigraphy which have been pioneered by ocean drilling. The biostratigraphic potential of dinoflagellates may approach or even exceed that of nannofossils and planktonic foraminifera though it is far from being fully realized. In addition, dinoflagellates (together with diatoms) appear to offer greater biostratigraphic resolution than nannofossils and planktonic forams, in high latitudes. Certain dinoflagellate species are also potentially valuable indicators of marine paleoenvironments, and interpretations can be tested easily against the isotopic record. Palynologists are uniquely able to assess climates from terrestrial evidence by means of the transported spore and pollen which form a significant component of many marine assemblages. The calibration of spore and pollen occurrences with magnetic reversal chronology and marine isotope stratigraphy offers exciting research prospects of relevance to paleoclimates and land plant evolution.

ODP involvement is a viable alternative to working on those grubby and poorly constrained samples that a colleague who, recently returned from the field, begs you to date (as upper, middle or lower Phanerozoic). Avoid the flies, swamps and expense associated with sample collecting trips. ODP/DSDP samples are free and all background work has been done for you. Your results can be plugged directly into the paleoceanographic big picture and you will be helping palynology to attain its deserved potential. Cruise participation is an exciting adventure (I speak from experience). It provides a crash course in marine geology and the opportunity to make useful international contacts with scientists outside your speciality. Industrial palynologists and acadamics with teaching commitments may have to pick a timely cruise. Professors should consider ODP related projects for their students. ODP/DSDP projects are very "fundable", provide excellent training and experience for graduate students and ODP is happy to accept suitably qualified students as cruise participants.

Useful references:

Canadian National Committee, Ocean Drilling Program Newsletter - three (or more) issues per year, and available (free of charge) from:

ODP Secretariat
Centre for Earth Resources Research
Memorial University
St. John's, Newfoundland, A1B 3X5
Telephone (709) 737-4708

JOIDES Journal - three issues per year, and available (free of charge) from:

Robin Smith
Joint Oceanographic Institutions (JOI), Inc.
1755 Massachusetts Ave. N.W.
Suite 800
Washington, DC 20036
Telephone (202) 232-3900

JOIDES Journal, v. XI (4) - Guide to the Ocean Drilling Program. This special issue, sometimes known as the "ODP bible", contains a wealth of basic information on the ODP, and is also available, free of charge, from the above address.

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The most merciful thing in the world is the inability of the human mind to correlate all of its contents.

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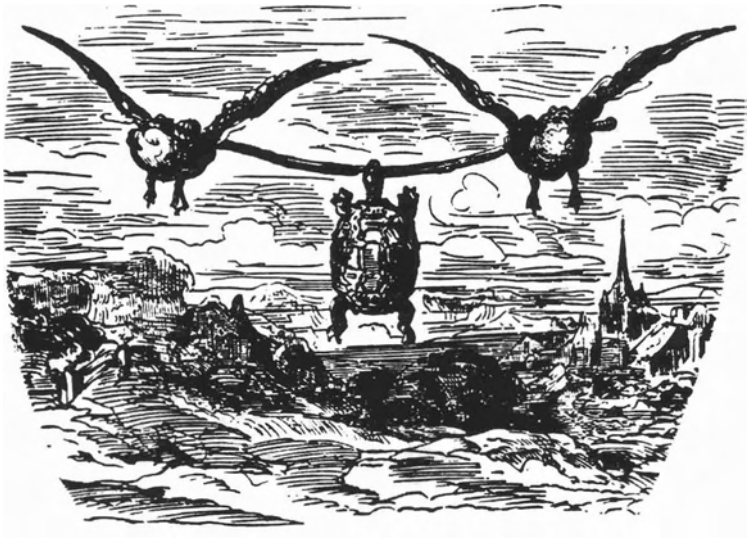

THE NUMBER OF BEASTS

(from THE ECONOMIST Jan. 30, 1988)

Creation's 100m species of plants and animals are far from evenly spread. The tropics are home to a wild profusion of species, there are a good few in temperate regions, and hardly any at the poles. How did this come about? New research has not only come up with an answer, it has come up with two; one for plants and, perhaps surprisingly, a different one for animals.

One way to find out about the population of a region is to count all of the species. This is simple but time-consuming. So most studies content themselves with seeing how many different species there are in a particular region. Generalizing from one family of species has its perils. You have to pick the right sample.

Dr. David Currie and Miss Viviane Paquin, from the biology department of the University of Ottawa, think trees are a good bet. Trees are easy to identify and there are not too many species. So they divided North America into 336 squares to see how many of the 620 species of indigenous trees appeared in each one.

If it had just been the latitude which determined the number of species, their diversity map should have been a simple affair. However, although Canada seemed to fit that pattern, America is more complicated. South Carolina and Georgia in the south-east had the most diverse population of trees. In general, diversity drops the further north-west you look; although it is also low in some parts of the mid west.

Dr. Currie and Miss Paquin tried to find a factor that varied together with the number of species- such as latitude, rainfall, temperature or height above sea level. They found that the diversity map looked most like a map of levels of "evapotranspiration". This is a measure of the amount of water moving through an ecosystem, both in the form of evaporation through soil and transpiration through leaves.

Dr. Currie thinks the tally between maps is evidence that the more energy that is available for plants,

the more types of plants there will be to exploit it. Evapotranspiration is greatest when there is both plenty of water and plenty of sunshine. The more sunlight and water, the easier it is for plants to make the sugars they live on.

Since plants are eaten by animals, and plant-eating animals are eaten by other animals, the diversity of animals might be expected to go hand in hand with the diversity of plants. The more types of plants, the more types of animals to eat them. But when the two scientists counted the mammal, amphibian, reptile and bird species in their 336 squares, they found that arid New Mexico and Arizona came top of the league, not the lush Carolinas.

When they tried to find a map to match with this - as they had for trees - they found that the best fit was with the amount of sunlight. Dr. Currie thinks this supports the energy theory. If a mammal lives in a sunny climate, perhaps it needs less energy to keep itself warm. This is particularly true for small animals, and most mammalian species are little: mice, voles and shrews. More sun means that more energy can be spent on producing offspring. For shrews, the quality of life is determined by the quality of sunbathing.

Why is available energy so important? Dr. John Turner from the department of genetics at Leeds University may have an answer in his studies of British butterflies and moths. Every so often a colony of European butterflies, such as the Blue Underwing, gets a precarious toe-hold in southeast England. Until it builds up a large population, the colony is vulnerable to small fluctuations in its numbers - caused by, eg, bad weather. In a really bad year the Blue Underwings will disappear. But if the population can grow large quickly it will be harder to wipe out. Where there is plenty of energy to go round, species can quickly build a large population and gain a secure base in a new place. So lots of energy allows new species to prosper.

Such theories undermine an old idea that is often used to explain Britain's paucity of wildlife. Dogma has it that the advancing ice-age drove animals southwards. They migrated to find sunlight and rain until they were blocked by the alps, running across Europe like a barrier. There, their backs to the wall, they turned and met their doom. When the ice sheets retreated, there were few species left to reclaim their heritage in the northern wastes. Dr. Currie has a less dramatic explanation. When he applied his theories to Britain he found that his predictions of the number of species tallied with what is found. So the paucity of species is yet one more thing to blame on the British weather.

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ON THE UNIVERSITY FRONT

(from U of T Geology Newsletter, Dec., 1987)

Michael Melchin is a new NSERC Post-doctoral fellow in the U. of T. palynological group. Mike recently compleded a Ph.D. at the University of Western Ontario entitled UPPER ORDOVICIAN AND SILURIAN GRAPTOLITES, CAPE PHILLIPS FORMATION, CANADIAN ARCTIC ARCHIPELAGO. His thesis identified and described over 200 graptolite species and subspecies and 13 graptolite zones in the uppermost Ordovician and Llandovery (Lower Silurian). Among the interesting conclusions of this thesis is the fact that, as in many other parts of the world, the strata spanning the Ordovician-Silurian boundary are either missing entirely (without obvious evidence of a major erosional hiatus) or else unfossiliferous. This is apparently the result of the latest Ordovician glaciation event which caused regression and, probably, major changes in oceanic circulation systems worldwide.

Another interesting finding is that in many respects, the Canadian Arctic graptolite faunas show closer faunal affinities with those of Siberia and China than with most of Europe. This is in keeping with paleogeographic reconstructions of the Ordovician-Silurian continents which show North America, Siberia and much of China arranged along a circum-equatorial belt.

Mike has also completed a detailed morphologic study of exquisitly preserved, uncompressed graptolites extracted from calcite concretions which are common in the Cape Phillips calcareous shales. Detailed analysis of the early stages of graptolite colony growth show that the previously existing classification schemes for graptolites (for the generic level and above) do not adequately represent the phylogenetic history of the graptolites. Applying a classification scheme recently erected for the Ordovician to the Early Silurian graptolites, a radically different picture of the latest Ordovician extinction event and the Llandovery radiation emerged.

Rather than at least six or seven genera and three families spanning the O-S boundary, the new classification scheme shows that only one or two genera of a single family actually survived the extinction event. The evolutionary pathways which resulted in wide diversity of the Llandovery faunas was probably different than previously suspected.

Mike's mission at the U. of T. is to begin study of the Chitinozoa from the same samples as his Ph.D. graptolites, from the Canadian Arctic Islands. Mike explains that Chitinozoa are flask-shaped, organic walled microfossils which existed from Ordovician to Devonian times and were probably the egg capsules of some marine invertebrates. They are an, as yet, underdeveloped biostratigraphic tool for Paleozoic studies. Mike has done a M.Sc. on Ordovician Chitinozoa from southern Ontario at the U. of Waterloo.

This will be the first major chitinozoan study undertaken on Canadian arctic samples and the existing graptolite zonation will provide a good framework for the chitinozoan stratigraphy. Of particular interest is the fact that many of the same chitinozoan species occur in shallow-water carbonate and graptolite facies and they should prove to be very useful in cross correlating between these facies.

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MAJOR WORKS

STUDIES IN AUSTRALIAN MESOZOIC PALYNOLOGY: P.A. Jell, editor. Australian Association of Paleontologists Memoir 4.

Memoir 4 provides the most comprehensive study of Mesozoic palynology in the Australasian region. Integration of a spore-pollen zonation with a largely new and original dinoflagellate zonation in 95 pages, including 50 figures, is backed up by 13 taxonomic papers introducing many new genera and species. This 340 page work is principally derived from Northern and Western Australia. It appears as a commitment to further scientific knowledge through making public much commercially significant petroleum company information.

This memoir may be purchased from:

Dr. P.A. Jell
Queensland Museum,
P.O. Box 300,
South Brisbane,
Queensland 4101,
AUSTRALIA

RESEARCH MUSCLE FOR MUSSEL RESEARCH

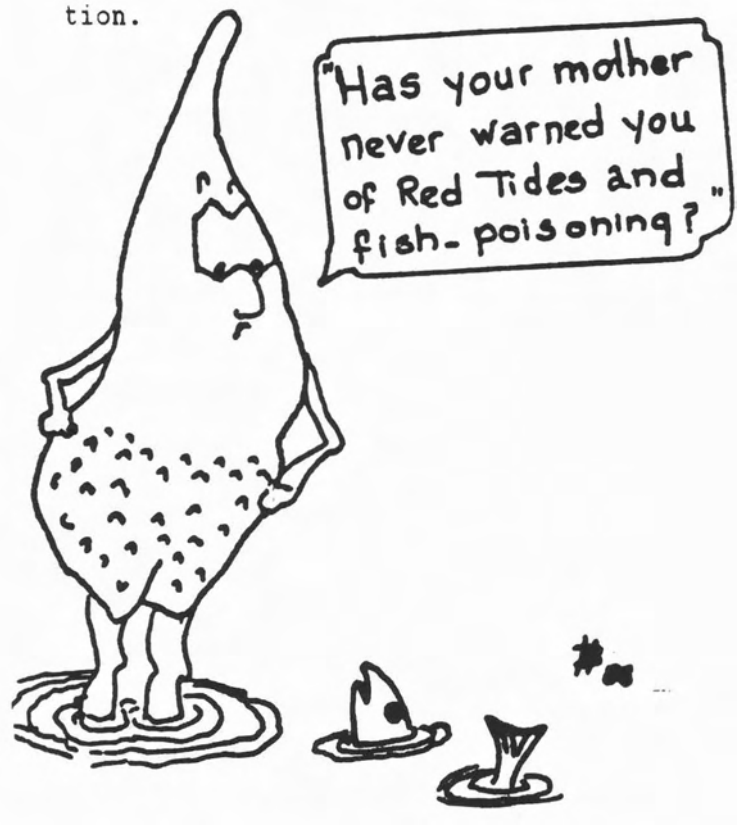
By Dr. Geof Norris, UT

As most Canadians are now aware, an outbreak of shellfish poisoning has recently affected the east coast, leading to the death of 3 persons (at the time of writing) in addition to many others affected in unpleasant but less severe ways, including the federal Minister of Health who has taken the rap

for - amongst other things - having advisory staff who do not know the difference between a shrimp and a mussel.

The shelly culprits in this latest toxic event are said to be mussels, clams, oysters and similar molluscs, when their soft parts are eaten fresh and in toto. No one yet knows for sure what is ultimately causing the problem, in spite of an intensive federal government crash program in research, a complementary public awareness program, and the collective media "nose" which is probably sensing another Contaminated Tuna Scandal. Some scientists suspect a link with paralytic shellfish poisoning (PSP) or diarrhetic shellfish poisoning (DSP). Both PSP and DSP are well known phenomena usually linked to red tides, which are cyclic and the natural ecologic results of proliferation of dinoflagellates (microscopic unicellular algae) in the marine water column. Bivalves acting as filter feeders become contaminated with PSP and DSP toxins from the briefly abundant dinoflagellates. (Ambient densities of dinoflagellate cells rise by several orders of magnitude during a red tide episode.) The toxins accumulating in the mollusc gut do not affect the bivalves but are extremely powerful nerve poisons to predatory mammals such as you and I (and to the mouse "volumteers" used as test subjects in government monitoring programs). Red tides typically last for several weeks to several months but occasionally for more than a year, and appear to be triggered by physical changes in the water mass promoting growth of dinoflagellate cysts resting in "seed beds" in bottom sediments on the shelf and adjacent coasts and estuaries.

Red tide events are well known in the stratigraphic column, with fossil dinoflagellates available by the millions in a typical handful of Phanerozoic mudstone or siltstone. The earliest dinoflagellate fossils occur in the Lower Paleozoic, but many biologists believe on the basis of cell chemistry and genetics that they must have a long evolutionary history extending back into the Precambrian. Dinoflagellates are curiously over-endowed with chromosomes, having hundreds to thousands of times more DNA per cell than other unicellular algae. This may be part of the reason why fossil dinoflagellates show such great morphologic complexity and evolution, and which is why they are so useful in biostratigraphy and petroleum exploration.



Plans are underway in the USA to set up a Center for Toxic Dinoflagellate Research as a joint venture between various universities in southeast USA, other invited participants, and the Government of Florida which has suffered severely over the years with red tides and PSP and DSP. The Center will undertake fundamental research on the physiology, toxicology, evolution and ecology of dinoflagellates. Geoff Norris has been asked to participate in this research thrust and plans to continue to investigate the paleobiology of dinoflagellates associated with toxic blooms in shallow marine environments, work started by him at the Florida Department of Natural Resources and the University of South Florida in St. Petersburg. This work will require close cooperation with marine biologists, palynologists, oceanographers, and remote sensing specialists. The Center will provide

an inter-disciplinary research environment, largely free of the pressures of public and political panic which are characteristic by-products of toxic shellfish outbreaks, as we have seen in Canada this December.

A fascinating aspect of dinoflagellate research at the University of Toronto has been the discovery that fossil dinoflagellates act as locations or focal points for the concentration of trace metals in their resistant organic wall. Collaborative work between John Rucklidge, Geoff Norris, Silvana de Gasparis and the IsoTrace Laboratroy - a tandem accelerator mass spectrometer facility- has demonstrated that amongst other metals, fossil dinoflagellates are notably enriched in platinum. Marine biologists have reported enhanced levels of other metals in living dinoflagellate blooms but have not tested for platinum as far as we are aware. The IsoTrace Laboratory is uniquely well-equipped to handle these analytical challenges (dinoflagellates are very small and seldom exceed much more than 100 microns in diameter) with a proven ability to analyze milligram samples to accuracies measured in parts per billion. With platinum prices currently at approximately $500 US per ounce, these tiny creatures may be a nuisance, but a potentially valuble one!

The economic loss for even one outbreak of PSP or DSP can be enormous, with closure of commercial fisheries leading to unemployment, and lost productivity for those unfortunate enough to be hospitalized. A modest investment in fundamental scientific research applied to understand dinoflagellates and the havoc they can cause would seem to be justified. The U.S. initiative to set up a Center for Toxic Dinoflagellate Research makes a lot of sense and will likely become a focal point for major advances in this fascinating interdisciplinary area.

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When choosing between two evils, I always choose the one I haven't tried before - Mae West.

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SECOND SYMPOSIUM ON NEOGENE DINOFLAGELLATES

FIRST ANNOUNCEMENT

SYMPOSIUM:
The Second Symposium on Neogene Dinoflagellates is to be held under the auspices of the Fourth International Conference on Dinoflagellates, at Woods Hole Oceanographic Institution, Woods Hole, Massachusetts (April 16-22, 1989). Papers on all aspects of Neogene dinoflagellates are welcome and papers on Quaternary dinoflagellates will also be considered. The half-day symposium will include two invited talks and as many as ten contributed presentations.

NEOGENE DINOFLAGELLATE VOLUME:
A summary volume of papers presented will be published after the conference. Poster displays and additional papers not presented at the Neogene Symposium will be considered for inclusion in the neogene dinoflagellate volume. The official language of the Symposium and the Neogene dinoflagellate volume is English.

NEOGENE DINOFLAGELLATE WORKSHOP:
A workshop on dinoflagellate cysts will also be held in conjunction with the Neogene Symposium. This will provide an opportunity to discuss taxonomy and to examine and compare palynological material under the microscope. All participants are encouraged to bring microscope slides for this scientific "show and tell" and also to bring, if possible, material (slides, residues, sediments etc.) for exchange.

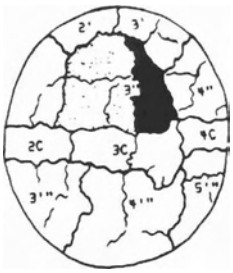
DEADLINES:

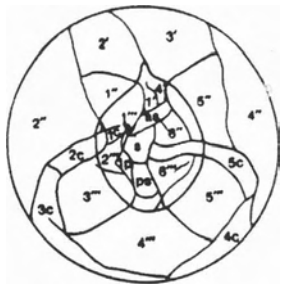
Titles:	August 26, 1988
Abstracts:	October 31, 1988
Manuscripts:	March 31, 1989

(first drafts for the volume)

Palynologists interested in contributing to one or more of these Neogene dinoflagellate events, **please complete and return the "CALL FOR PAPERS" form at the back of this Newsletter.**

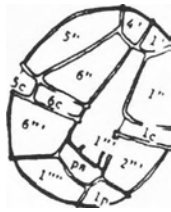
CO-CONVENORS:
Martin J. Head John H. Wrenn





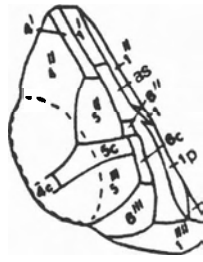
SECOND SYMPOSIUM ON NEOGENE DINOFLAGELLATES
Woods Hole, Massachusetts U.S.A, April 16-22, 1989

CALL FOR PAPERS



Symposium
The Second Symposium on Neogene Dinoflagellates will be held during the Fourth International Conference on Dinoflagellates, Woods Hole Oceanographic Institution, Massachusetts (April 16-22, 1989). This "Call for Papers"seeks ten contributions for the Symposium.

Neogene dinoflagellate volume
A Neogene dinoflagellate volume including summary papers of the talks presented, will be published after the meeting. All aspects of Neogene dinoflagellate research, including systematic contributions are welcome. Quaternary dinoflagellate contributions will also be considered. *Poster displays and additional papers, not presented at the Symposium, will be considered for inclusion in the Neogene Dinoflagellate Volume.* The official language of the Symposium and the Neogene dinoflagellate volume is English.



Workshop
A dinoflagellate workshop will also be held in conjunction with the Neogene Symposium. We encourage participants to bring microscope slides. Microscopes will be available for participants to examine and compare holotype/ topotype material. If it is not possible for contributors to bring material, we will try to arrange for viewing of 35mm transparency film or videotapes.
We also strongly encourage participants to bring microscope slides, residues, or sediment for exchange purposes.

Deadlines

The "Call for Papers" form (below):	As soon as possible please.
Titles:	August, 26, 1988
Abstracts:	October, 31, 1988
Manuscripts (first draft) for volume:	March, 31, 1989

Co-convenors
Martin J. Head (Department of Geology, University of Toronto, Toronto, Canada, M5S 1A1) and John. H. Wrenn (Amoco Production Company, P. O. Box 3385, Tulsa, OK 74102, U.S.A.).

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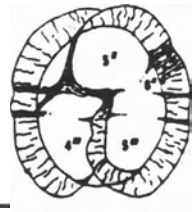
[ ] I hope to present a paper at the Second Symposium on Neogene Dinoflagellates

[ ] I hope to contribute to the Neogene Dinoflagellate Volume.

[ ] I hope to attend the Symposium Workshop.



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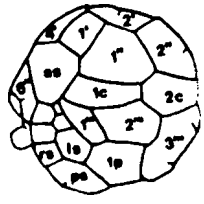

Please complete this form as an expression of interest and return to:

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