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NEWSLETTER

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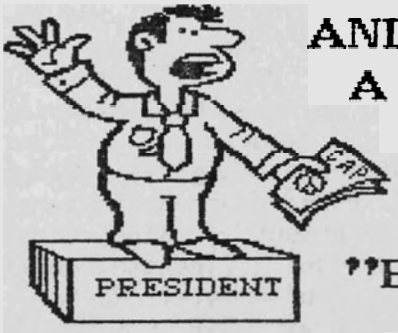


AND NOW A MESSAGE FROM THE "BIG GUY"

At the AASP meetings in El Paso last October, Bert van Helden confirmed that all incoming presidents of CAP are expected to provide an inspirational message to the membership in the first newsletter of the year. Not one to flaunt tradition, here is my effort for 1986, however brief.

It is a strange feeling indeed. Here I sit as president of a very select group of specialists, and I don't even know most of you personally. Perhaps this is not unexpected in a "newsletter organization" without formal meetings, and representing a diverse range of interests, many different from my own Quaternary emphasis. Whether you are one of the burgeoning new wave of "dino-philes" or a more classical palynologist, I look forward to making your acquaintance sometime. Please say "hello" if we should pass in the corridors of an IPC meeting sometime.

The sober tone of Vaughn Bryant's allegorical presidental address to the AASP (AASP Newsletter, Vol. 18(4) set me thinking about the long-term future of palynology. Others are also worrying about the future of paleontology as a whole. ("Is paleontology going extinct?" by K.S. Thompson, Amer. Scientist 73, 1985). After thinking about it, I am frankly optimistic. As in any discipline, support - both moral and financial, will ebb and flow according to the needs and interests of society as a whole, and according to the enthusiastic and visible exponents who will take it upon themselves to spread the message among the interested public, and at the same time continue to strive for excellence in their own research. It is always sad to read obituaries of such prominent scientists in any field, but heartening when they leave a legacy in their writings and in the memories of their students and colleagues. Thus, the passing last August of Sir Harry Godwin in Cambridge, England, saw Quaternary paleobotany lose an eloquent advocate, someone who was knighted for his contributions to understanding the "History of the British flora". Along with his other books, such as the semi-popular "The Archives of the Peat Bogs", Sir Harry contributed much to public understanding and support for his discipline - a model that deserves to be emulated. I feel confident that the long term future of palynology is very bright, as long as we strive for excellence, and are willing to convey our enthusiasm and understanding to others.

This is not to argue for repeating what the pioneers did before us - their reputations, after all, were made by taking new roads and trying new applications that advanced the discipline. We must do likewise, look to new technologies and new approaches to solving old and ever-present problems of better identification, dating, correlation, and palaeoenvironmental interpretation. In this vein it is gratifying to see palynology prominently featured in recent debates regarding the origin of "yellow rain" in Indochina, and in helping interpret vegetation and climatic changes associated with possible cometary impacts and dinosaur extinction at the K-T boundary!

Before me is the April issue of Science '86 that I picked up at the University CNIB stand earlier today (April 21). On page 13 is a photo of what appeared to be ancient lake sediments exposed in a Martian canyon. Since the deposition was likely in "glacial lakes", my imagination went into high gear. I wonder when the first samples will reach some lucky palnologist's lab? Whoever it is may solve one of mankind's greatest questions. Who knows, maybe the first evidence of extraterrestial life may even be a dinoflagellate!

Enough of these musings. I close this brief address with the hope that many of you will be able to attend the AASP meetings in the Big Apple this fall. I expect to be able to preside (that is what presidents are supposed to do) over a short but fruitful general meeting of CAP in New York. In any case, it wll be an opportunity to meet many colleagues. I for one will be there.

Finally, my personal thanks go to Jaan Terasmae for his able helmsmanship in 1985. Special thanks must go to Bert van Helden, who made our newsletter one of the best in the country over the past few years.

See you in New York.

Rolf Mathewes
Simon Fraser University

ACROSS THE BUREAUCRATS DESK

Well, another year is upon us and spring is springing up all over. I've received a number of ballots on the new constitution and, in general, there was overwhelming approval for the new by-laws. Practically all comments involved minor changes in wording or pointed out areas of ambiguity. The executive will assess these comments and make any changes deemed necessary in readiness for final ratification at our annual meeting (see below for details). Before moving on to other matters, I should apologize for the lack of explanation surrounding the by-laws balloting in the last CAP Newsletter; this was due to crossed wires between members of the executive. We now claim ourselves to be wired up properly (stringing up might follow if we're not), so "things" should run more smoothly from now on.

I'm still trying to tidy up overdue dues. Please refer to your address label; this indicates which year you are paid up to. Since many people like (need) to have an extra jog to the old memory, as a new service I will list the members whose dues have just become due. Let me stress, this is not intended to be a list of delinquents - although we have those too - just a memory jogger to be put in this column on a regular basis (unless I'm strung up in the meantime). Hence dues are now owed for 1986-1988 by the following members: E.H. Davies, D.J. McIntyre, M.J. Melchin, R.J. Mott, R.P.W. Stancliffe and J. Utting. If they wish to renew, the following corresondent members owe dues for the period 1986-1988 (or in some cases 1985-1987 - check label): H. Achilles, T.L. Beach, J.M. Benson, D.K. Cameron, W.C. Cornell, G.O.W. Kremp, A. Leblanc, H. Leereveld, R.A. Morgan, C.F. Williams, and J.D. Wooten.

I would like to welcome the following new full members: Ramakent Kalgutkar (Calgary), Kazumi Matsuoka (Calgary), Glenn Rouse (Vancouver), Wang Xiacheng (Ottawa) and Judith Watt (Dartmouth). Also, the following correspondent (institutional) member: British Museum of Natural History.

As point of interest, CAP now has 70 full members (people paid up to and including 1985). We also have 23 individuals and 3 institutions.

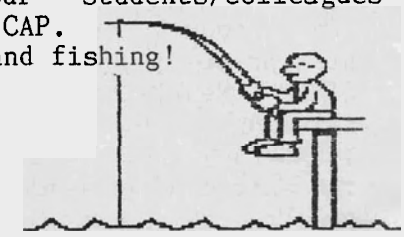
The CAP Annual General Business Meeting this year will be held in conjunction with the AASP '86 in New York. The exact time and place will be announced during the conference - please watch the notice boards (We do have AASP's blessing to piggy-back.)

A REMINDER: CAP dues for both full and correspondent memberships are $8 per 3 years- payable in Canadian funds only. Dues should be sent to me, Rob Fensome (cheques payable to CANADIAN ASSOCIATION OF PALYNOLOGISTS) at:

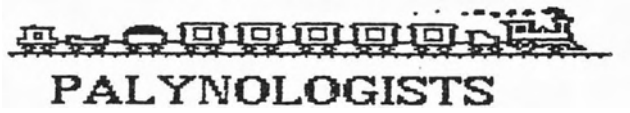
Rob Fensome
290 Willett St., # 212
Halifax, Nova Scotia
CANADA B3M 3R7

I also have application forms for new members so let your students/colleagues /friends know about CAP.

Happy sunning and fishing!



TRAVELING



PALYNOLOGISTS

PALNOLOGIE A LA CANTONESE

It's nearly noon on a Saturday in early May, the second day of my consulting assignment in China. Six of us from the new China Corelab joint venture have just been deposited at one end of the Beijing Lu bazaar in Canton. We have exactly an hour and a half to equip two laboratories: one for paly prep, and the other for micropaleo processing. Then we must be back at the office to meet the microscope salesman from Hong Kong. We have good reason for all this urgency: our first well is in, and our final biostrat report is due in six weeks. For this shopping expedition, we are equipped with the equivalent of US $120 in local currency, and a bilingual shopping list.

Our list was laboriously compiled the day before. As we lacked a common language, an English-Chinese dictionary, sketches, pantomine, and chemical formulae provided our only means of understanding each other. While we were working on our list, my Chinese colleague, Mr. Li, and I had taught each other three phrases: "Follow me!" "Wait a moment!" and "No problem!" These remain the mainstay of our verbal communication for the next several weeks.

Overhead the tropical sun, hidden for months, is burning directly down, visibly evaporating the last puddles of rainwater in the street, producing the atmosphere of a steambath. Every square inch of pavement, and much of the road itself, is occupied by a slowly moving tide of humanity - in which Jim Scott (a Micropaleontologist formerly from Calgary) and I find ourselves the only Caucasians. On either side of Beijing Lu, small shops overflow their wares onto the sidewalk, casually displaying everything from plastic sandals in fluorescent green and pink to dusty Brunton compasses. Here and there, plastic awnings of red, white and blue stripes provide welcome shade - and the only vivid colour in the street. The tantalizing smell of greasy, fried dumplings fills the air, and our eardrums are assailed with a medley of screeching Chinese opera, hooting horns, and, amazingly, jazzed-up fragments of Beethoven's Ninth Symphony from one of the more popular disco tunes of 1985. Following our Chinese colleagues, we wend our way to the first shop.

The six of us squeeze into the shop, filling all the available floor space. Along the side walls are shelves on which samples of glassware are sparsely and dustily displayed: beautifully hand-blown retorts and dewar flasks, coils of glass tubing, and thick specimen jars amongst the more mundane beakers, flasks, and test tubes. The owner greets us casually from behind the tiny corner counter; his wife continues cooking in a wok fired by coal-dust briquets in a small alcove at the back. We place our order. After some negotiation, money changes hands. Five minutes later we are shooed onto the pavement: our order is being carefully lowered with rope from the loft above in a large, musty-smelling, wicker basket. A few weeks later I have difficulty finding the shop; half of it has been transformed into a ladies clothing concern!

Next door, we find test tube racks, cleaning brushes, and pipette bulbs. As we progress down the road, we acquire a hot plate, then microscope slides, then brushes and glue for mounting forams, lab coats, lens paper, forceps, rubber gloves, sieves, microscope slide boxes, tweezers, face masks, covered enamel storage boxes, and a hydrometer. Soon nearly everything on the list has been checked off, and all of us are laden with newspaper parcels tied with pink plastic string and dozens of undecipherable receipts. We have only the centrifuge left to purchase, and then the company van will collect us to transport us back to the office. This afternoon it will journey into the country to pick up the chemicals.

As we approach the centrifuge shop at the other end of Beijing Lu, I point out a dead rat lying at a street corner, four stiff legs pointing heavenward. Scott turns slightly green, so I refrain from directing his attention to the half carcass of skinned pig being dragged across the main road by its forelegs.

Finally the centrifuge is procured and crated. We still have ten minutes to wait for the van, so we find seats on other wooden crates outside the shop and drop our packages with relief. One of our Chinese colleagues disappears, but returns in a few minutes gleefully bearing opened bottles of sticky, violent-orange softdrink. Then Mr. Li remembers something else, and runs off down the street. Sitting here in the semishade, sipping sweet warm soda pop of dubious hygienic history, I try to remember whether I have ever enjoyed consulting palynology so much. Of one thing I am certain: I have laughed more in the last six hours than in the preceding six years combined.

The van pulls up punctually at 1330 hours to collect us, but we are still missing Mr. Li. Just as we have all clambered aboard, he arrives running with a small paper parcel. On the long drive back to the office he pulls out some brilliant white cotton gloves, and hands me a pair. I try them on. They are indeed a perfect fit, but I am somewhat bemused: does Mr. Li consider white gloves a requisite of appropriate foreign-devil-woman attire? Only during the following week do I find that, in the humidity of Canton, they are indispensable as liners for our rubber gloves.

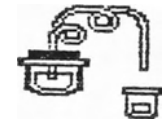
Exactly a week later, our first 48 samples have gone through acid digestion, and I have already taught Mr. Li (who has never used a typewriter) how to enter our South China Sea species into the database of our new IBM-XT computer. We have had difficulty obtaining zinc bromide, so now, heavily masked and rubber aproned, we are following directions in a Chinese chemistry book for the manufacture of zinc iodide to serve as a heavy liquid. Pellets of elemental zinc are bubbling away violently in a flowered enamel basin. Hydrogen iodide is staining the pristine walls of our new fume hood nicotine brown. Various members of the staff have predicted we will not emerge alive; I am beginning to believe them.

Suddenly I am hailed from outside. Mr. Chui Gin is here from Hong Kong. Our microscopes have arrived! By the time we can leave things to take care of themselves in the lab, we find the office buried in cartons and styrofoam peanuts. Three brand new Leitz microscope, straight from Germany, are in various stages of assembly on the desks. Mr. Chui Gin, a Geotechnical Engineer who has never seen brightfield 'scopes before, is puzzling out how they fit together.

He calls me over. "Here Madame, please sign here. I show you. Everything is here. Special ice pieces. Extra bombs. Extra fumes." He points to the high-point eyepieces. The bulbs. The fuses. I struggle to to keep a straight face.

Indeed, everything is here. Well, nearly everything . . . we could still use a few minor items. Proper chairs, for example. And space. (With new arrivals, five of us are now working in an area of less than 12 square metres; within three weeks that number will have grown to nine!)

By late Monday afternoon, propped on stacks of cartons, legal pads, and reprints, we are looking at our first mounted samples. And then, naturally, the power flickers and dies. "Mo mon ti!" (No problem!) There's plenty of other work to do. "Gung ngo lei!" (Follow me!) "Dung yut tchung!" (Wait a moment!) We move outside to the washing trough. Sitting in the sun, surrounded by red hibiscus blooms and sweet-smelling jasmine, we scrub test tubes.



Mary Lynn Richardson
Calgary

REFLECTIONS OF AN EXOTIC PALYNOLOGIST IN CANADA

Palynological assemblages often contain elements which have originated from afar. Such exotic pollen grains are known to travel considerable distances and may be used to infer prevailing wind directions. Palynologists may also drift on the winds of fortune over large distances. Indeed Canada has a considerable number of "exotics" among its palynological fraternity.

I arrived in Canada just over a year ago to begin a post-doctoral fellowship with Geoff Norris at the University of Toronto. Job opportunities back in Britain were quite good but the chance to work on an interesting research project in a new country was irresistable. Within a few months of my arrival, the benefits of a multicultural society were revealing themselves. The Toronto "Caravan" is an annual charity extravaganza lasting a week and consisting of forty or so pavilions, each representing a city of the world. One can enjoy "local" food, drink and entertainment (cossack dancing at the Kiev pavilion was a notable attraction) until the early hours - and all performed by volunteers. For those of us with a finite capacity for high culture, there was always the Aussie Pavilion in which to finish the evening (this was when the real fun began).

My chance to see a different part of Canada came last summer where a trip to the Bedford Institute of Oceanography in Nova Scotia found Graham Williams and Rob Fensome making videos (of dinocysts, naturally). After watching a full length feature video of Paleogene Labrador Sea dinos, it was decided unanimously that this was the ONLY way to do palynology. And so, having unglued my briefcase from a chair (a typical Bedford Institute trick) it was back to Toronto before heading out east once again, this time to St. John's, Newfoundland (via Saint John, New Brunswick - accidentally!) where I was to join the JOIDES Resolution for Leg 105 of the O.D.P.

St. John's is a quaint, historic town (a sign on the 'quay proclaims "the British Empire began here") with warm, friendly people and dozens of bars where one can experience that onomatopoeic local beverage - "screech". The JOIDES Resolution had developed problems with its heave compensator (this decouples the ships up/down motion from the drillstring) and many a last drink was had by the "ship-board" party during our six day delay in St. John's. The inspiration behind the name "JOIDES Resolution" incidentally came not just from Clerk and Cook's famous voyage but also from all the resolutions that were generated by the various committees of JOIDES during the early planning stages of ODP - not many people know this.

Palynology on board the JOIDES Resolution was a challenging experience, especially as HF could not be routinely used onboard due to safety regulations. Anne de Vernal (my palynological colleague) and I found that by boiling samples in 1% Calgon, wet seiving at 15 or 20um, heating in 10% HCl and swirling/gravity settling, concentrated palynomorphs to a workable level. Zinc bromide was used on occasion but with new core coming up every hour, there was little time to depart from our usual procedure.

Despite occasional clashes between cruise participants (inevitable with the overlapping of interests) during our 2 months in the Labrador Sea and Baffin Bay, a good time was had by all and many lasting friendships were made. Participation on an ODP cruise is a must for any palynologist with the chance to go.

My next major assigned, following a brief visit to Woods Hole, MA (as part of Leg 105 followup) was an excursion south of the border with Pierre Zippi to provide scientific assistance for our boss, the intrepid Geoff Norris who had forsaken the invigorating winter of Toronto to labour selflessly under the hot sub-tropical sun of Florida. Geoff is studying the ecology and thecal relationships of recent dinocysts in Tampa Bay. Much is known of the ecology of the thecate stage in this area (due largely to the efforts of Karen Steidinger) but little has been done on the cysts. This all makes for interesting, albeit thirsty work.

So palynology in Canadian academia is alive and well and has certainly offered me lots of exciting opportunities, both cultural and professional. And as the Toronto "Caravan" comes round for another year, at least one exotic palynologist will be found during the early hours at the Australian pavilion.

Martin Head
University of Toronto

WANTED SUPERIOR RATS

"What Canada needs isn't a good five-cent nickel, or a chicken in every pot, or even a latenight talk show with a funny opening monologue. What it needs is a hardier breed of rats.

"Canadian rats are absolutely the puniest, sickliest, the all-around crummiest rats in the entire world. Stuff a Canadians rat with the equivalent of 400 tins of diet pop a day and what does he (or she) do? Keel over, that's what, and develop bladder trouble. It's the same story if you ask a Canadian rat to puff three packs of non-filter tips a day, heap cyclamates on its din-din, take it out on the town for 10 or 12 martinis before beddy-bye for 500 or 600 nights running, or do any of the other things that fun-loving rats should do.

"In fact, you can't seem to do anything with a Canadian rat without its going belly-up, coughing its lungs out, or wandering around with a liver that's in tatters. As a result, we all suffer. Every time a Canadian rat comes down with the nasties, or has its nose fall off, some scientist comes along, attributes the trouble to something the rat has done, and wants to take away from us another of life's little pleasures.

"So far, we know the Canadian rat can't handle saccharin, butter, Bloody Marys, excessive TV watching, homemade blueberry pie with ice cream for dessert, fried eggs for breakfast, bacon and heaven knows what else.

"Why is it the Canadian rat is such a limp-wristed, party-pooping drag? Why can't he enjoy a double order of lasagna, some artifical sweetener, a good smoke or anything else without whinning about a sore stomach or dropping dead? Is the Canadian rat really that frail, or is he a hyprochondriac? Is he in such sickly health because of a misspent youth in the garbage dump, or is he faking to make life miserable for human beings?

"No one can say, but obviously Canadians must develop a sturdier strain of rat or there is nothing left in life for us but nuts, berries and mush made from the bark of trees. We need a rat with a stomach like cast iron, one that can toss back junk food and wash it down with a big beer without so much as a burp . . . a rat with clear eyes, teeth that are impervious to decay, and a system that can handle the Pill with no ill effects. Is that too much to ask of our scientists?

"Instead of feeding banana cream pie to a rat that looks as if it would fall over if you blew on it, let them come up with a lab animal that can stand up to the stress and strain of modern life. If the rat can't handle whipped cream, get rid of the rat, not the whipped cream, I say!

"If my future is in the paws of a rat, I don't want it to be sway-backed, knock-kneed and narrow-chested. What I want going for me is a rat built like Bobby Hull, not Don Knotts, especially if something as important as T-Bone steaks or sex is involved.

"As far as I'm concerned the Canadian rat hasn't shown enough stamina in the nation's laboratories and should be fired from its present position as watchdog of the country's health."

Reprinted from The Manitoba Engineer, Bulletin '84.

PALYNODATA, INC. OFFERS COMPUTER SEARCHES OF THE PALYNOLOGICAL LITERATURE

Description of the Datafile

PALYNODATA, INC. is now offering public access to the palynological datafile produced by the Kremp Palynological Computer Retrieval Research Project. This database contains information from over 8,000 published palynological documents of pre-Quaternary age. By the end of 1986 this number should exceed 12,000 documents.

This unique datafile is unlike any other available for the geological and micropaleontological disciplines. While other databases may offer retrievals of reference citations, summaries or keywords, this datafile provides access to the following types of information:

1. the stratigraphic age and geographic locality of each palynomorph occurrence in a document;
2. whether a taxon of interest is newly described, a new combination, emended or synoymized in the document;
3. the author and title (both English and original language);
4. the reference citation;
5. the type and number of samples studied, and whether the document contains paleofloristic maps, range charts, comparisons with other areas, megafloral evidence, faunal evidence, microplankton studies, zone fossils, or quantitative data;
6. the main aspects of the document (stratigraphic, ecologic, taxonomic or morphologic).

Search Capabilities

Inititally programmed search capabilities include those for TAXON SEARCH and AGE/LOCATION SEARCH. The software employs simple procedures to search the datafile, and in practice the user need only enter the search parameters in the spaces provided on "panels" or "screens" which appear on the monitor.

The TAXON SEARCH is appropriate for those searches in which the user wishes to learn the stratigraphic ages and geographic localities from which one or more taxa have been reported. In addition to the age and location data, the search will retrieve and display any other information in the datafile concerning the taxa of interest: "NT", "NC", and "EM" indicate documents which contain the original description, a new combination or an emendation of the taxon; "SR", "JR", "CO" and "LS" indicate documents which contain senior synonyms, junior synonyms, comments on the synonymy or a list of synonyms; "UT" and "IT" indicate taxa of unpublished status (described in a thesis or dissertation) or informal status (nomenclature incomplete, but document may contain a description or photograph); and "CF" and "R" indicate taxa which are "comparable to" or reworked. Examples of these notations can be found in the searches included in the benchmark studies in Appendix II.

A scrolling feature permits the user to scan the information retrieved by the search prior to printing, and if printouts are desired they are available in several ways.

The search also retrieves all of the reference citations for the documents containing information requested in the search. These are not available for scrolling, but are included in the printout of the search retrieval.

If, while scrolling through the retrieval output, the user wishes to examine the total assemblage from one (or more) of the documents which appeared in the output, this can be done easily by entering the document number in the appropriate spot on the screen and depressing a single key on the keyboard.

It is also possible to limit the retrieval in a TAXON SEARCH to only those instances where a taxon was first described, combined with another taxon, emended, placed in synonymy, or reworked; also, to taxa which the author characterized as "CF", taxa described in theses and dissertations

(undescribed taxa), and taxa listed informally but sometimes figured (informal taxa: i.e. Abies sp. 1 Roma., 1956).

The AGE/LOCATION SEARCH is employed when the user wishes to know all of the palynomorphs which have been reported from a specific stratigraphic age(s) and geographic area(s). If desired, the retrieval for the AGE/LOCATION SEARCH can be confined to a single palynomorph type (i.e. spores and pollen, dinocysts, acritarchs, etc.).

As in the TAXON SEARCH described above, the retrieval output can be scanned by scrolling, individual documents of interest examined, and references are retrieved and will be printed when the retrieval output is printed.

The AUTHOR SEARCH permits the user to retrieve those references in the datafile by a particular author and, as in both the TAXON and AGE/LOCATION SEARCHES, it is possible to examine the assemblage from any of the couments by that author. There is no print capability provided for this search, but users with a "screen print" capability on their PC can print this (or any other search output) one screen at a time.

Objectives of Public Acess

The sponsors who have supported the project for 16 years have agreed to make the datafile available for the benefit of the worldwide palynological community. The funds required to maintain the datafile in its online condition must be derived from users other than the sponsors, through the Annual Users Fees. If this source of funds grows, the datafile will retain its online availability and software upgrades will be considered. If the level of funding required to maintain the datafile online is reduced or eliminated, then the datafile will no longer be publicly available. It is our intent, to the degree permitted by economic considerations, to be responsive to user suggestions on software enhancements. In that manner we hope to provide the types and combinations of information most desired by the user community.

Funds derived from public use of the datafile will be used to maintain the datafile in the public domain, assist in updating and expanding the datafile, assure the continuation of the project, and provide additional services to users. None of these funds will be returned to any of the sponsors (past or present) who have financed the project to date. PALYNODATA, INC. is a nonprofit California corporation.

Location of, and Method of Entry to, the File

The datafile will be placed on a mainframe computer at Market Compilation Research Bureau/Service Bureau (MCRB/SB) in North Hollywood, California, USA (see Attachment for hours of operation). It will be accessible from nearly any country in the world, seven days a week, as per the schedule shown in Appendix I. The datafile system will be entered by dialing an MCRB/SB telephone number. Users will require no more than a personal computer (with terminal emulation program), a modem, and a modular telephone to gain access to the system and run searches.

Interested users can obtain more detailed information from PALYNODATA, INC. Please contact:

Ralph A. Morgan
Chevron USA, Inc.
935 Gravier Street
New Orleans, Louisiana 70112

or

PALYNODATA, INC.
14381 Galy Street
Tustin, California 92680
USA

Those wishing to contribute copies of their publications to Palynodata may send copies to:

Sedley Barss
Atlantic Geoscience Center
P.O. Box 1006
Dartmouth, Nova Scotia
B2Y 4A2

SCIENCE

The following note is excerpted from a short paper by H. Brinkhuis IV and S.L. Khouw in the journal of the palynological society of Utrecht - "STUIFMAIL" v. 4, no. 1.

THE MESOZOIC-CAINOZOIC BOUNDARY AT EL KEF (TUNISIA)

Introduction

No stratigraphic boundary draws and has drawn so much attention than the Cretaceous-Tertiary boundary, in short: the C-T boundary. "The great extinction", known to everyone between schoolboy and old aged pensionaries, killed not only the giant dinosaurs, but also many other representatives of the animal and plant kingdoms. Subject of fantasy and imagination, many theories concerning the nature of this boundary have been published in the last two centuries and many will be launched in the near future.

One of the latest theories concerning the C-T boundary, based a.o. on the disappearance of genera and whole families of calcarous plankton (foraminifera and nanno's, Smit, Romein, 1975-1980) and the presence of an iridium-enriched layer at the boundary, was the famous extra-terrestrial asteroid impact theory.

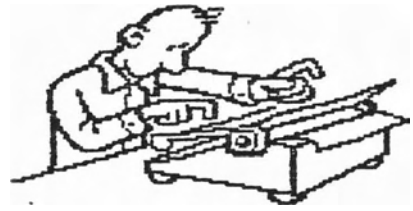
This theory, launched by Smit (1980), suggested a relatively short, sudden event. The resulting enormous heat and immense amounts of dust in the atmosphere, would have caused large forest-fires and a total black-out, long enough to kill nearly all photosynthetic life on the surface and . . . in the oceans. Nowadays this phenomenon is labled "nuclear winter".

Other authors observed only minimal changes in fauna, flora and climate. The one question remained: was it really a sudden, global event (one datum plane) or was it a gradual development, induced by plate-tectonic volcnics (India, Atlantic Ocean)? The international community of stratigraphers is since then divided into "impact" and "non-impact" scientists. No answer is yet available, probably because no one was there at the time.

1985 was the time for the Laboratory of Palaeobotany and Palynology to drop in. One of the present authors (H.B. red.) received a grant from The Netherlands organization for the advancement of pure research (Z.W.O.), primarily to investigate Late Cretaceous-Paleogene sediments of the Western Mediterranean realm palynologically, establishing a dinoflagellate cyst zonation for this area. By that time, the co-author (S.L.K. red.) initiated the work on samples of the so-called "El Kef" section of Tunisia, kindly provided by the micropaleontological department of the State University of Utrecht.

The El Kef section is located in NW Tunisia, and comprises some 200m of presumed continuous uppermost Maastrichtian (Cretaceous)-Danian (Tertiary) clays and marls of pelagic origin. From this section, the nanno's were studied by Romein (internal report micropal.dept.) and the foraminifera by Zachariasse, Poort and Zevenboom (in prep.), giving an excellent opportunity to calibrate dinocysts with these microfossils. In particular, the C-T interval was closely sampled, with sample distances ranging from 50 to 5cm. From the interval 5m below to 5m above the boundary, as placed by Zachariasse et. al., 65 samples were taken, of which 37 equally divided samples were included in the present study.

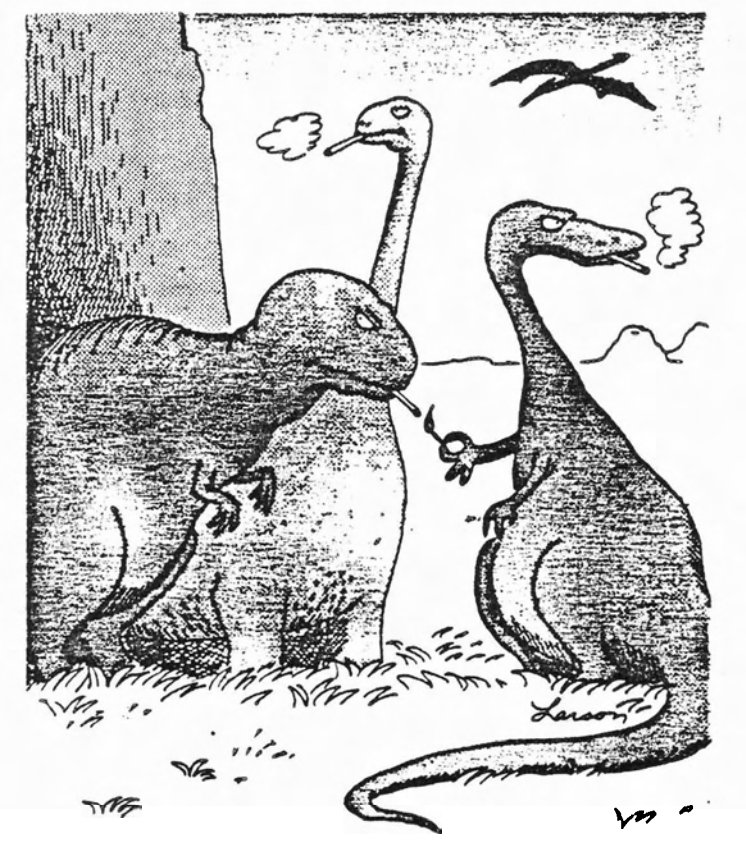
NEWS & VIEWS



A NEW YORK TIMES article recently cited palynologist Doug Nichols and some colleagues for their work on Cretaceous-Tertiary boundary strata in Saskatchewan. The article noted that the pollen record across the boundary indicated that plants similar to species living in the tropics today survived the boundary "event" even though the dinosaurs did not. The pollen evidence in Saskatchewan, much like the marine plankton record from Tunisia, suggests that an asteroid-impact "nuclear winter", often cited these days as the proximal cause of the demise of the dinosaurs, did not last long enough to destroy these warm-climate plants, if it did occur.

Further to the K/T boundary subject, there are two interesting articles in the May issue of GEOLOGY (v.14, no.5). The first suggests terrestrial, petrographic reasons for the mineralological events which have of late been given extraterrestrial impact origins. And the second suggests a possible impact site of the K/T extinction bolide.

It is the personal opinion of your editor that the following explains the whole thing!



The real reason dinosaurs became extinct.

PALYNOLOGY AT THE UNIVERSITY OF TORONTO

A number of laboratories are involved in palynologic research at the University of Toronto. These are in the Departments of Geology, Geography and Botany on the downtown campus; at the Scarborough College camus; and at the Royal Ontario Museum through curators cross-appointed to the university.

In the department of Geology, Geoff Norris is continuing his work on the Tertiary palnostratigraphy of the Beaufort-Mackenzie Basin. GSC Bulletin 340 on spores, pollen and dinoflagellates from an Eocene-Pliocene section is in press and due out shortly. In cooperation with Andrew Miall, he is examining a number of sections from the eastern Arctic to establish correlations amongst Teriary basins. Work continues on problems of classification of dinoflagellate cysts and thecae.

Pierre Zippi is working on his doctoral thesis in the Department of Geology on Palynostratigraphy of Lower Cretaceous Fluvial Sediments in the Moose River Basin, Ontario. Carbonaceous clastic sediments of the Mattagami Formation have yielded a well preserved and diverse terrestrial palynoflora. Palynostratigraphic zonations allow the delineation of the areal extent of Cretaceous sedimentation and provide for the basin-wide correlation of the vertically accreted (anastomosed) fluvial sediments. The areal distibution of the zones demonstrates that northward trending fluvial sedimentation began in the eastern portion of the basin and progressively rotated westward during the Albian.

Martin Head (Research Associate with Geoff Norris) is working on a number of Uppermost Cretaceous and Tertiary sections from Ellesmere and Axel Heiberg Islands, East Canadian Arctic. Research is continuing into the palynostratigraphy of the Paleogene of

Spitsbergen. He participated in the ODP cruise to Baffin Bay and the Labrador Sea (Leg 105). Research objectives include the dating of thick Cenozoic deposits and the integration of high latitude spore-pollen zonation with dinocyst stratigraphy.

Anthony M. Davis, Department of Geography, is investigating the cause, chronology and character of paludification in Newfoundland. Pollen analysis is complemented by plant and insect macrofossil data, elemental stratigraphies and by studies of contemporary vegetation dynamics. He continues to provide pollen a soil data to support archeological investigations in northern Newfoundland and Japan.

Les Cwynar, Department of Botany is working on the Migration and population expansion of trees in Alaska-Yukon. Where did the trees that grow in Alaska-Yukon come from? Pollen analysis of sites along coastal Alaska and throughout the Yukon will enable the mapping of migration patterns. Furthermore, detailed analysis permits the estimation of postglacial population growth rates. The focus is on lodgepole pine, alder, and black and white spruce, and on the extent to which their modern variation (genetic and morphologic) can be explained by their population history.

Climate-vegetation dynamics in the Yukon. Most paleoecological evidence from temperate and boreal areas suggests that the warmest time since the end of the last glacial period was between 8,000-5,000 years ago. In the Yukon and Alaska there is evidence for an early warm period (11,000-9,000 YBP) but no evidence yet for greater warmth between 8,000-5,000 YBP. By using pollen and plant macrofossil analysis to study the hydrological history of shallow alkaline lakes and changes in the altitudinal position of treeline, he hopes to determine the geography to which the Yukon was climatically out of phase with other northern hemisphere areas.

Selected Publications

MacDonald, G.M. and L.C. Cwynar. 1985. A fossil pollen based reconstruction of the late Quaternary history of lodgepole pine (Pinus contorta ssp. latifolia) in the western interior of Canada. Canadian Journal of Forest Research: in press.

Ritchie, J.C., L.C. Cwynar, and R.W. Spear. 1983. Evidence from north-west Canada for an early Holocene Milankovich thermal maximum. Nature: 305: 126-128

Cwynar, L.C. 1982. A late-Quaternary vegetation history from Hanging Lake, northern Yukon. Ecological Monographs 52 1:24.

Cwynar, L.C. and J.C. Ritchie. 1980. Arctic Steppe-tundra: A Yukon Perspective. Science 208: 1375-1377.

Jock McAndrews, Geobotany Laboratory of the Royal Ontario Museum, reports that most of their work is on late Quaternary of Ontario. Pollen diagrams have been completed from three peat cores from the James Bay Lowland in support of a search for modern analogs for Permian coal deposits in Australia. Three pollen diagrams from Woodland Caribou Provincial Park in northwestern Ontario show a mid-Holocene woodland suitable for bison with caribou habitat for only the past 4,000 years. Francine McCarthy is completing an M.Sc. thesis doing basin analysis on the sediments of Grenadier Pond in Toronto: the local pollen zones assist her in showing a 13m rise in the level of Lake Ontario over the past 4,000 years.

Work in the Prairies shows the impact of Euro-Canadians to be a Salsola (Russian thistle) rise in recent sediment: this pollen has been detected as far north as Churchill, Manitoba.

Last February, they lifted a 24m long core of detritus gyttja from a pond in Florida. The low pollen density was explained when the C-14 date at the bottom turned out to be 4,000 years; anybody know something clever to do with a rate accumulation of 7mm per year?

Jim Ritchie at the Scarborough campus reports that Dr. K.D. Bennett has completed detailed analysis of 4 lake sites in South-Central Ontario, each with several 14-C dates and complete, detailed Holocene pollen records.

Lynn Ovenden has completed pollen analysis (and macrofossil) of several mire sections from the Old Crow flates, N.W. Yukon (P.H.D. thesis).

Dr. Konrad Gajewski has begun to assemble on

computer file the modern and Late-Quaternary pollen record for Canada as part of a long term project in isopol mapping, palaeoclimatic constructions and modelling applications to pollen data.

Kate Hadden and J.C. Ritchie have completed a set of modern pollen spectra from western arctic lake sites on Banks Is. and the adjacent mainland, as well as two dated lake sites on Banks and two on the mainland.

J.C. Ritchie and Kate Hadden are continuing detailed pollencounts of samples of Holocene lake sediments from the Eastern Sahara (Nawture 314, p.352) and from a long Holocene-Pleistocene lake section from the Kopais Basin, Greece.

Genevieve Cambon (Montpellier and Toronto) and Christine Rogers are analysing atmospheric pollen samples from 5 stations in Ontario as part of a long-term investigation of aeropalynology in Ontario. This project is coordinated with a similar effort in Quebec from the Montreal laboratory.

G. Norris

JOINT CANADIAN-AMERICAN INVESTIGATION OF THE CENOZOIC GEOLOGY OF NORTHWESTERN NORTH AMERICA

In July and August of 1985 a field party composed of Canadian and American geoscientists examined the geology of the coastal lowlands in northern Alaska and in the Yukon and Northwest Territories of Canada. This field project was carried out as a result of a Canadian-American workshop held in Calgary in April, 1984 and hosted by the Geological Survey of Canada (Geoscience Canada, 1985, V.12, pp.68-69). At this workshop it was decided that certain problems of interest to both Canada and the United States could be best resolved with joint field studies. The most pressing problem was deemed to be the chronology and inter-relations of glacial and nonglacial deposits in the coastal lowlands of northwestern Canada and Alaska. Future investigations will focus on problems of central Alaska and the Yukon and the Canadian and Alaskan Cordillera.

The group, composed of Jean-Serge Vincent and John V. Matthews of the Geological Survey of Canada, David M. Hopkins of the University of Alaska and L. David Carter of the U.S. Geological Survey, began the investigation on Banks Island and continued west to Barrow and along the coast of the Chukchi Sea. Tertiary fluvial and marine deposits, Quaternary glacial deposits, marine deposits of eustatic and glacio-isostatic origin, eolian deposits and thermokarst deposits were examined and tentative conclusions were drawn regarding their significance for paleoclimate, tectonics and history of the Arctic ice cover. An interval when larch rather than spruce, formed the tree line in northwestern North America was found to be recorded in late Pliocene or early Pleistocene interglacial deposits in several places scattered along the northern coasts of Canada and Alaska. The Banks Glaciation - the oldest continental glacial event recognized in northwestern Canada - is probably recorded by glaciomarine deposits of latest Pliocene or earliest Pleistocene age in Alaska. The glaciomarine Flaxman Member of the Gubik Formation of northern Alaska, which records a rapid rise of eustatic sea level about 70 to 80 ka, was traced eastward to Kay Point on the Yukon Coastal Plain, which lies inside the limits of maximum Laurentide glaciation. The participants plan to elaborate on these and other findings in a short article to be published in an international journal.

Jean-Serge Vincent

Rob Fensome has received a letter from a company in Toronto which specializes in travel arrangements for Canadian associations who have deligates who wish to participate in international events. They are interested in coordinating travel arrangements for Canadian delegates to the International Palynological Conference in Brisbane, Australia, Aug. 27-Sept. 1, 1988.

All interested parties should contact Rob for further information.

THE ROBERTSON ROUTE

Several recent letters from British colleagues have come to me addressed in a manner that has perplexed me. My address is R.R.1, Okotoks, Alberta T01 1T0, but the address on the letters in question has lost the R.R.1 and gained in its place Robertson Research International. The latter baffled me because I have no association with that company.

My puzzlement ended when I realized that the acronym R.R.1, which in Canadian usage stands for Rural Route One, was unfamiliar to our colleagues in Britain. Each of them had decided independently that R.R.1 was R.R.I and that it stood for Robertson Research International rather than for five mailboxes along a country road south of Okotoks.

In view of how commonly R.R.1 appears among Canadian addresses one might wonder how many branch offices Robertson Research International is perceived to have set up here in Canada.

Tony Jenkins.

BOOK REVIEWS

Dinoflagellates. D.L. Spector (Ed.). Academic Press, 1984, 545 pp., US $75.00 (hardback), ISBN 0-12-656520-1.

The first attempt to produce an "up-to-date" treatise on the biology of dinoflagellates is a disappointing hotch-potch of papers with little evidence of editorial guidance or constraint. The book encompasses contributions of a greatly varying standard, length and style. A multi-authored volume with a title like "dinoflagellates" and a price of almost sixty pounds should provide a thorough coverage of all aspects of dinoflagellate biology including some reference to their fossil record. Instead, we are presented with an approach that concentrates on the minutiae of the dinoflagellate cell with a smattering of papers of a wider and more general interest. Serious gaps in coverage are patched over by short sections in the introduction. There is, for example, no chapter devoted specifically to cytology or "Unusual Inclusions" but a detailed exposition by the editor of "Unusual Inclusions". Other notable omissions from the text are reports on ecology, biogeography, motility, photosynthesis parasitism and symbiosis. I found it easier to read the book in discontinuous sections rather than from beginning to end as the text jumps from one unrelated chapter to another with little indication of any progression of ideas.

Palaeontology gets short shrift, an inexcusable imbalance considering the current importance of dinoflagellate micropalaeontology in biostratigraphy and petroleum exploration. A single sentence in the introduction is devoted to the role of dinoflagellate palynomorphs in the search for oil and gas. Throughout the book aspects of fossil dinoflagellates are briefly mentioned only on approximately six pages. As a contrast the chapter on cysts is illustrated by six plates of fossil cysts; an incongruous "stamp collection" which bears little or no relevance to the text which concentrates on recent cyst studies. There is no discussion of the age, attribution or origin of the illustrated cysts.

Individually most contributions stand out from this gloomy background; while primarily of a biological nature they offer insights into dinoflagellate structure and ecology which may be adapted to understanding fossil material. The chapter on taxonomy (Dodger) is disappointingly sketchy whereas the chapter on the cell cortex (Netzel and Durr) is a must for fossil dinoflagellate morphologists. This long paper is one of the highlights of the book, but be prepared for a long sitting as the prose is pedantic and difficult to read. While primarily reviewing the development of the cortex and plate patterns the authors have squeezed much new information out of previous literature to produce a new "ontogenetic clearage cell" model to explain plate pattern variation. They conclude that their results favour the late reduction model of dinoflagellate evolution, a view which they feel is supported by evidence from the fossil record.

Phylogeny determined from fossils is glossed over in the chapter on evolution by Loeblich which focusses on ultrastuctural and molecular evidence. This paper is padded out by unnecessary or repeated text irrelevant to the theme. The chapter on cysts by the same primary author is confused, rambling and out of date. Individual references are paraphrased with little attempt at synthesis. Loeblich is redeemed in his third contribution to the volume on physiology and biochemistry which is an authoritative and up-to-date review.

For those with only a limited background in modern biology the chapter on the nucleus (Spector), cell cycle and mitosis (Triemer and Fritz), and genetics (Beam and Himes) will prove difficult to understand as they are addressed to a specialized audience. They gave a good summary of the state-of-the-art in these new fields of dinoflagellate research drawing attention to the unique characteristics of the large dinoflagellate nucleus while confirming its basic eukaryotic nature.

Toxic marine dinoflagellates have been the subject of three major international conferences since 1974. The impetus of these meetings has stimulated much research on dinoflagellate ecology (with many new discoveries relevant to palaeoecology) so that Steidinger and Baden's comprehensive and very readable review is timely.

Because of the emphasis on laboratory studies in "Dinoflagellates" many sections could not have been written without advances that have been made in culturing and incubation in the last 20 years. Guillard has contributed much to this progress through his "green fingers" and presents with Keller an excellent summary of modern techniques for culturing dinoflagellates. Sweeney uses cultures in her analysis of circadian rhythms in dinoflagellates and also Pfiester in studies of sexual reproduction. One can only be thankful in our relationships with the female of our species that they do not behave like Ceratium cornutum. The female of this dino engulf, and dissolves the male. Trapdoor-like plates open as he approaches his mate and they close behind him. What a way to go!

P.C. Reid
Plymouth, England (reprinted from PALAEONTOLOGICAL ASSOCIATION CIRCULAR 123.

LOOKING AT PLANTS, Dr. David Suzuki (with Barbara Hehner) Stoddart Publishing Co. Ltd., Toronto, 96 p. (1985). ISBN 0-7737-5039-8 ($8.95 CDN, paperback)

Did you know that to make a single jar of honey, a bee had to make about 80,000 round trips to flowers? Did you know that some flowers may weigh up to 15 kilograms, and the largest fruit weights in at 23 kilograms?!

These and many more interesing and sometimes nearly unbelievable facts about our world of plants can be found in the recently published children's book LOOKING AT PLANTS.

David Suzuki wrote this easy-to-read, well-illustrated paperback because he was unable to find a book in print which gave children a "hands-on" approach to plant science. In response to his own children's keen interest in science, LOOKING AT PLANTS is the first of a series of elementary science books.

I bought the book because frequently when I present public lectures on botanical subjects, I often wish to incorporate a "bizarre" or unusual fact to spur audience participation and interest. LOOKING AT PLANTS contains within its 96 pages literally hundreds of interesting and somewhat unusual or little known botanical facts. Some of the section titles hint at this storehouse of facts: "seeds in space," "poison butterflies," "leaf skeletons", "killer leaves" and "super stinker" are but a few.

The text begins with a set of rules for nature lovers, providing the young reader (and the absent-minded adult?) with gentle reminders of the delicacy of nature and our obligation to preserve and protect our natural heritage. The individual chapters are arranged by anatomical stucture and include: roots and stems, leaves, flowers, fruits, seeds and a final chapter on trees.

Of special interst to the young reader, Suzuki has included with each chapter, simple to do, hands-on projects which clearly relate and explain via experimentation some of the principles and phenomena discused within the chapters. I found these "things to do" well written, easy to follow and safe for children,

inasmuch a Suzuki has flagged difficult or possibly dangerous procedures to be performed by an adult. Suzuki notes, "Most grownups will want to get involved in these nature projects anyways - why should kids have all the fun?"

I recommend this young readers book not only for those of us with young children, or those of us like myself who seek the simple yet fascinating facts necessary for public lectures and/or displays; but to those who can still appreciate a basic, well-written account of plants and plant life. A reminder perhaps that palynology is a botanical science - a science replete with fascination and fun. "Why should kids have all the fun?"

D.M. Jarzen
Paleobiology Division
National Museum of Natural Sciences
Ottawa K1A 0M8
March 9, 1986

A Research on Cenozoic Palynology of the Longjing Structural Area in the Shelf Basin of the East China Sea (Donghai) Region

by Song Zhi-chen, Guan Xue-ting, et al., 1985

Cenozoic - Mesozoic Palaeontology and Stratigraphy of East China, vol. 1; p.1-209, pls.1:55

Nanjing Institute of Geology and Palaeontology, Academia Sinica, Chi-ming-ssu, Nanjing, P.R. China.

Price: US $14.00 post paid (airmail: $6.00 extra); prepayment required

This volume is the first in a new series. It deals with a study of 3 Tertiary borings in the shelf basin of the East China Sea. The text is in Chinese, but an English summary (p.165-172) highlights the main conclusions and lists the characteristics of the 7 palynological zones ranging in age from (Late) Eocene to Pleistocene. Both terrestrial and marine forms are described. Of 172 genera, 6 are new; of 443 species, 74 are reported as new. The nomenclature is in Latin, and diagnoses of the new genera are included in the English Summary. Also, many new combinations are validly proposed. The book is printed on good paper, and the plates are of good quality (but not printed on the most modern equipment); I spotted relatively few typos.

The book appears to represent good value for the money, and would be a required item for all those involved with stratigraphic or systematic palynology in that part of the world.

The information necessary to order a copy of this book is given above; I copied it from one of a sheaf of order forms that I received with a complimentary copy. This indicates that enough copies are printed to satisfy orders from abroad. I will pass these order forms on at request.

Jan Jansonius
Calgary

LAST, BUT NOT LEAST

Rob Fensome and Bernie Crilley of the Atlantic Geoscience Centre, Dartmouth, Nova Scotia are preparing a World Directory of Palynologists (including aerobiologists and dinophycologists) which will be published in 1987. In order to expedite this project, would you please take five minutes to complete the attached form and send it to the address indicated.

In our next issue there will be an article by Dennis Braman at the new Dinosaur museum and another by Richard Hebda (you promised, Richard!). The rest of the space is blank, so every one has a chance. PLEASE HELP.

Please mail to:

Judith Lentin
Suite 2110 - London House
505 - 4th Ave. S.W.
Calgary, Alberta
T2P 0J8
Phone (403) 264 0173

L	H	G	Z	A	D	A	N	A	C	T	P	N	K	N	S	B	M	W	P
N	R	W	X	S	N	E	X	O	T	I	C	O	E	C	K	P	R	I	Z
A	Z	E	B	D	S	T	D	S	M	D	A	D	O	K	N	I	D	N	S
I	Y	T	R	A	P	U	P	W	I	D	L	E	T	Z	K	N	P	R	K
N	O	K	V	H	W	O	N	F	N	E	L	L	O	P	Q	U	B	T	X
A	S	T	W	Q	R	H	N	L	H	I	O	W	C	S	V	S	I	H	S
D	U	T	N	E	D	P	F	N	A	M	D	W	R	R	L	K	P	C	S
J	P	O	S	O	J	S	A	Q	B	F	K	E	Y	T	W	I	Z	R	J
C	E	D	L	E	R	V	X	W	M	J	T	U	R	P	E	V	D	A	N
J	R	B	J	F	O	O	R	V	Z	U	O	S	A	Z	D	J	L	E	P
C	I	A	Z	A	C	H	T	J	P	D	A	T	I	V	B	G	E	S	S
P	O	X	J	R	R	W	T	M	T	T	X	A	T	V	V	T	I	E	E
A	R	K	I	M	M	Z	O	Q	E	H	V	T	R	K	B	V	F	R	N
L	O	R	X	B	E	C	P	K	D	L	F	I	E	V	S	E	N	F	A
Y	S	E	U	Y	E	S	E	J	A	N	R	C	T	E	C	X	C	G	S
N	W	M	O	L	M	A	O	U	N	I	V	E	R	S	I	T	Y	I	Z
O	E	P	J	A	C	X	K	Z	H	H	T	C	Y	N	T	H	P	Q	S
L	N	F	X	A	N	A	Q	E	O	Z	J	X	F	G	S	J	M	U	V
O	A	I	P	X	C	U	G	Q	R	I	S	Y	X	O	I	A	U	Y	F
G	S	L	H	G	V	V	A	T	D	S	C	L	B	O	T	A	N	Y	G
I	S	E	S	N	P	O	B	F	M	L	E	B	W	K	A	Z	S	D	T
S	O	E	I	F	A	N	W	D	T	O	N	A	W	T	T	U	O	M	E
T	C	U	U	E	L	A	U	D	B	O	T	M	B	J	S	A	P	C	Z
S	I	S	B	N	Y	U	V	E	S	T	R	X	O	R	V	B	C	H	U
T	A	S	S	S	N	M	G	E	U	U	I	Q	U	B	Y	T	A	I	C
D	T	R	T	O	O	K	H	P	O	V	F	Q	N	X	Y	B	E	N	D
Y	I	A	A	M	L	K	X	N	E	W	U	Q	D	I	K	O	V	Z	E
G	O	B	R	E	O	R	B	O	C	R	G	S	A	T	N	C	S	V	C
O	N	R	P	N	G	Q	N	K	A	H	E	R	R	L	A	J	A	S	N
L	O	G	P	A	I	F	H	U	T	G	V	T	Y	Z	I	L	C	O	E
O	V	Y	V	I	C	O	C	Y	E	L	O	R	B	V	D	E	I	Q	I
N	R	H	K	S	A	D	K	I	R	N	D	R	T	K	A	E	O	R	C
O	H	E	L	I	L	O	I	L	C	V	B	C	X	M	N	S	Z	R	S
R	V	C	D	N	G	I	D	A	T	U	M	T	S	L	A	A	O	Q	O
H	L	Q	C	U	W	N	O	R	R	I	S	A	A	G	C	B	N	M	E
C	A	U	F	T	V	E	O	B	N	J	R	F	K	V	R	A	E	N	G
S	B	E	A	L	U	T	E	B	H	E	Q	O	X	J	R	T	C	R	Y
N	L	P	I	E	S	E	N	O	T	N	A	C	P	M	T	A	D	K	J
K	L	S	P	W	I	K	V	L	U	G	O	M	Y	B	K	D	H	V	Q
W	D	M	S	E	T	A	L	L	E	G	A	L	F	O	N	I	D	V	N

Word List

CANADA
TORONTO
EXOTIC
VANHELDEN
COMPUTERS
CRETACEOUS
TERTIARY
BOUNDARY
UNIVERSITY
OIL
CANTONESE
BARSS
TERASMAE
CAP
BEAKERS
ACID
SLIDES
PALYNOLOGICAL
POLLEN
SPORES
DINOFLAGELLATES
STATISTICS
RESEARCH
CENTRIFUGE
DATABASE
CENOZOIC
MESOZOIC
FIELD
PARTY
GEOSCIENCE
CHRONOLOGY
EUSTATIC
YUKON
RATS
SUPERIOR
TUNISIA
DATUM
FAUNA
KREMPFILE
FENSOME
DANIAN
BOTANY
NEWS
CANADIAN
ASSOCIATION
OF
PALYNOLOGISTS
NORRIS
ALNUS
BETULA
PINUS

COMPUTER DRAWN PUZZLE CONTEST

This puzzle is presented as a challenge to a couple of old friends who, in less demanding times, found it enjoyable to pit their wits against the London Times cross word puzzle. Your editor realizes that such a little mind teaser as presented here can not begin to compare with a "proper" puzzle, but it is a beginning. It does contain many of the words we know and love so it should be a real snap. From Dolby and Utting, the afore mentioned old friends, I expect a bit of polite outrage that such a simple puzzle is offered and expect them to submit something more worthy of the great minds of our readers, before the next issue of the CAP NEWSLETTER comes out in November.

For those new at word games, each of the words listed below is found in the puzzle. For example, the location of the word FAUNA is illustrated. Simply find the other words on the list and mail your entry to the editor. Who ever submits the first completely correct entry will be declared the winner. The winner will receive an undisclosed prize and his or her name will be published along with the answers to this puzzle in the next CAP NEWSLETTER.

Name: _____

Full Address: _____

(if appropriate, include affiliation in full) _____

_____

_____

Postal Code: _____ Country: _____

(Please use no abbreviations. Also, give your address in the local language if this language is written using the Latin alphabet. If not, give your address in English.)

Suggested abbreviated address: _____
(if applicable)

_____

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_____

Postal Code: _____ Country: _____

My Telephone Number is: _____

I am a member of the following palynological societies: _____

_____

Principal Palynological Interest(s) (maximum of five):

- ☐ Acritarchs
- ☐ Actuopalynology
- ☐ Aerobiology
- ☐ Archeology
- ☐ Biostratigraphy
- ☐ Chitinozoans
- ☐ Environments/climate
- ☐ Evolution
- ☐ Fossil Dinoflagellates
- ☐ Living Dinoflagellates
- ☐ Kerogen/TAI analysis
- ☐ Pollen
- ☐ Spores
- ☐ In situ spores/pollen
- ☐ Mellitopalynology
- ☐ Paleogeography
- ☐ Morphology
- ☐ Scolecodonts
- ☐ Taphonomy
- ☐ Technology

Other (please specify): _____

Geological age (please specify): _____

Send questionnaire to: 'World Directory'
c/o R. A. Fensome (I.F.P.S. Ass't. Sec.)
Atlantic Geoscience Centre
Box 1006
Dartmouth, Nova Scotia
Canada B2Y 4A2

(Be sure to address the questionnaire to 'World Directory')

(As the directory will be updated periodically, please keep us informed if your address changes)

Thank you