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# A.A.S.P. NEWSLETTER

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J.K. Lentin, Editor

## AASP 25th ANNIVERSARY YEAR

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The AASP NEWSLETTER is published 4 times annually. Members are ENCOURAGED to submit articles, "letters to the editor", technical notes, information about "members in the news" and information about job openings in the industry. Every effort will be made to publish all information received from our membership.

Deadline for the next newsletter, the second in 1992, is April 15. Please send all information on computer disk in ASCII or Word Perfect format, if possible, if not - send a typed manuscript. 1992 is our Silver Jubilee - celebrating our 25th anniversary as an organization. We look forward to contributions from our membership.

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PLEASE NOTE: NEW MEMBERSHIP FORMS ARE ATTACHED TO THIS EDITION OF THE NEWSLETTER. YOU MAY NOW USE VISA OR MASTERCARD TO PAY YOUR ANNUAL DUES!

### MESSAGE FROM THE PRESIDENT

There are two important matters that I have brief comments on. First, the AASP Palynology Marketing Committee is up and running. It consists of Don G. Benson, John E. Bennett, Vaughn M. Bryant, Jr., Bob T. Clarke, Peter H. Griggs, Dennis R. Logan, Doug J. Nichols and myself. The Marketing Committee is open to any and all suggestions on how to approach the difficult and critical task of educating our potential customers on how palynology can benefit them in their jobs. If you have some thoughts on this issue, please send them to the Chairman (that's me, for the time being) or any member of the Marketing Committee. Your suggestions will be seriously considered for inclusion in the marketing strategy we are developing. In addition, the committee is seeking examples of where palynology has made a significant difference in an oil exploration play. The examples may be either positive or negative.

A positive example would be the upgrading of a play as a result of palynologic data providing new insight into the stratigraphy, regional history, timing of the trap formation, etc. A negative example would be a case where a well was drilled thousands of feet beyond its target horizon because of faulty palynology. [Actually, in the example I have in mind, the original sample processing was

faulty--- resulting in 15-20 million dollars being spent seeking a target that had already been passed, thousands of feet higher in the hole!]

It would be great if such examples could be cited with full particulars of the well or play name, location, geologic setting and, of course, the economic contribution of palynology to the well or play. However, even examples which have been "sanitized" to the point where it is impossible to identify the well or location will be welcomed and probably quite useful in our marketing effort.

I urge you to sift through your experiences or what you have read, and help us find examples that can be incorporated into the marketing program being developed. Please take some time out of your hectic schedule and invest in the future of your profession. Your help is needed, and it will benefit your fellow palynologists (present and future) as well as yourself.

The second important issue is the Endowed Chair in Palynology at the Center for Excellence in Palynology at Louisiana State University, Baton Rouge, Louisiana. As you know, the search for candidates has been reopened and the new, initial deadline for applications is March 15, 1992. (See the announcement in the October, 1991 issue of the NEWSLETTER, p. 18.) This is a great opportunity to build a program that can positively impact the future of palynology. If you are interested, but haven't quite got your application material in the mail, it is time to do so.

We all know that the oil industry, a major employer of stratigraphic palynologists, is continuing to change rapidly. The profession of stratigraphic palynology will have to keep up with its changing market place, or will be left behind in the dust that it studies. The Center for Excellence in Palynology at LSU can serve as a catalyst in North America for the needed change in our profession. I urge you to help bring CENEX into being with a tax deductible contribution. Please contact Ken Piel (AASP CENEX Finance Committee Chairman) concerning contributions.

I would be very interested in hearing your thoughts on the future of our profession and what AASP should be doing to help assure that it will be a bright future. Drop me a line or give me a call. Your thoughts and advice are important to me and all of the officers of this organization.

Cheers,

John H. Wrenn, AASP President

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## FROM THE FIRST AASP PRESIDENT

Twenty-five years!! Reminiscences must be in order.

Well, perhaps just a bit. As during the organizational meeting and the formulative years of AASP, the subsequent vibrant activity and applied abilities of the membership has advanced and is advancing the science and application of palynology. I thank - and toast us all - past, present and future members of the AMERICAN ASSOCIATION OF STRATIGRAPHIC PALYNOLOGISTS.

With best wishes for the next quarter century,  
Paul W. Nygreen, Past-President

## LETTER TO THE EDITOR



Judith Lentin, AASP NEWSLETTER Editor

Dear Editor,

Volume 24, Number 4, of AASP Newsletter was thoroughly entertaining, as well as informative, to read; I am pleased to see you filling the vital task of editing AASP's most effective communication link with its members. I would recommend, however, that you stick to the "news" and leave editorial comment aside, at least unless you have the facts straight. I refer to the piece entitled "Dinosaur Palynology" (p. 8-9).

Spelling errors aside, it contains a totally unacceptable statement. You speculate (p. 9) that dinosaurs became extinct as a result of "constant sneezes, drippy nose, swollen eyes and perhaps even unconsciousness due to angiosperm pollen." This is not a novel idea (refer to AASP Newsletter, vol. 13, no. 2, p. 4 April 1980), but you are entitled to your opinion, regardless of its basis in fact. However, you follow this rampant

speculation with the assertion that, "This may not have the appeal of extraterrestrial influence, but it is certainly backed by, at least, as much real evidence as the impact theory." This contention falls into the category reserved for the eight-letter barnyard expletive!

Whether or not one agrees with the conclusions drawn from the physical evidence pertaining to the Cretaceous-Tertiary boundary, one should distinguish between physical evidence and fanciful speculation. The physical evidence is extensive. It includes data from nuclear geochemistry, mineralogy, stratigraphy, impact-crater studies, and several sub-disciplines of paleontology (perhaps especially germane, abundant data come from palynology). Untestable, and therefore non-scientific, notions cannot possibly equate with real data. Draw your conclusions as you see fit, but base your conclusions on science, not science fiction.

D.J. Nichols

Dear Doug,

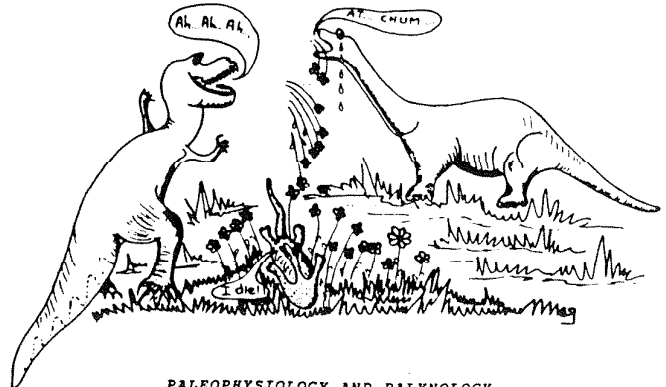
Thank you for offering your opinion on my article from the AASP NEWSLETTER Vol. 24, no.4. I am convinced that as a past editor of this newsletter you are aware of almost everything that can go wrong in putting together articles. You suggested I get a spell-check program to avoid my numerous spelling errors. I have, and I thought I did. My usual way of working is to run spell-check on each individual article. I keep each article in a separate file until the newsletter is formatted. I have found that running spell-check on a fully formatted newsletter results in all sorts of problems. That, however, is no excuse and I will try to get it together a little better in this issue.

Regarding your comments on the article, I was very surprised that you found it offensive because it was not intended to imply that palynologists are not doing their jobs properly. However, it is not difficult to get angry about comments if only one or two phrases are taken out of context. The paragraph which includes the "offensive" statements refers to the proliferation of the angiosperms (or at least, I thought it did).

The comment which particularly raises your anger was meant to imply that the palynological and paleobotanical information (including your own work) regarding the diversification of the angiosperms during the Cretaceous is a vast resource which gets little notice.

You are well aware that there are at least two schools of thought regarding the cause and effect of the turbulent times about 65 million years ago. You are also aware, from our many years as friends, that I do not agree with the hypothesis that bolide impact was the "cause" of dinosaur extinction. The trouble is, gradual extinction of the glamorous dinosaurs isn't "sexy". How could an insignificant speck of dust like a pollen grain compare to the ominous specter of *T. rex* in the process of finding his supper. (Didn't you read *Jurassic Park*? I mean, what he

did to that golf cart was incredible!) I spoke of pollen reactions as a possibility because we study pollen. I certainly didn't imply that it is a new idea, I think Claude Caratini first suggested this in print when he submitted the following cartoon to the AASP NEWSLETTER in 1980. The editor who published the non-news opinion was a guy named Doug Nichols!



PALEOPHYSIOLOGY AND PALYNOLOGY

I do not disagree with the published proofs regarding bolide impacts. As you state, there is very clear evidence that extra-terrestrial objects have come into collision with Earth. I have never seen conclusive proof that these collisions have "caused" extinctions. I do believe that the allure and hype involved with stories of world wide extinctions on a massive scale which have appeared in the popular press are much more suited to science-fiction movies. To refer to the end of the Cretaceous as "the great dying" and other such suggestive phrases is simply silly.

About scientific facts I prefer to quote someone with a special way with words:

"...the history of many scientific subjects is virtually free from... constraints of fact for two major reasons. Firstly, some topics are invested with enormous social importance but blessed with very little reliable information...."

Secondly, many questions are formulated by scientists in such a restricted way that any legitimate answer can only validate a social preference."

Stephen J. Gould, 1981  
The Mismeasure of Man

You suggested that I stick to the "news" and leave editorial comments aside. Not a chance, my dear! The AASP NEWSLETTER is a forum for all members to provide news and opinions. PALYNOLOGY and the publications of the AASP Foundation are the scientific part of our organization. All opinions, yours, mine and those of all our members, are the grist for the mill that produces the NEWSLETTER. All opinions are welcome. - the editor.

Dear Editor,

Re: MORE ON PALYNOLOGY AND  
DINOSAUR SUFFERINGS

If you wish to draw the general public's attention to a paleontological subject, you will have greater success if you can in some way associate it with dinosaurs. The last NEWSLETTER contained a good example of how dinosaurs may help palynology by sneezing as a result of angiosperm pollen allergy.

A journalist recently opened my eyes to another, albeit somewhat more indirect but not less interesting, palynological link with dinosaur suffering. I was giving an interview about distinctively leech-like cocoons which are particularly common in limnic Early Cretaceous sediments. They have been recorded by palynologists and often classified as "megaspores". My interviewer asked whether dinosaurs are known from the same formations. I was a bit confused, but could give an affirmative reply. The journalist went on to ask if leeches could have been bloodsuckers on dinosaurs, and if so, how could they have penetrated their thick skin.

There is indeed every reason to believe that Mesozoic beasts were victims of parasitism by creatures related to leeches. Dinosaurs had at least two soft-skinned openings that leeches would find, just as they do on elephants and hippopotami. - S. B. Manum

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Dear Editor

The American Geological Institute (AGI) Geosciences Advocacy Program (GAP), with the support of the AGI Member Societies, has begun a program of activities designed to improve the exchange of geoscience information between legislators and the geoscience community.

Several AGI GAP groups have been established: the GAP liaisons to each member society (nominated by each society), the AGI GAP Advisory Committee (selected from nominated liaisons by the AGI Executive Committee), and a mailing list of key Congressional and federal legislators and staff members. Enclosed are lists of the liaisons and the advisory committee.

I encourage you to alert your membership of the participation of American Association of Stratigraphic Palynologists (AASP) in this program, and of the identity and contact information of your liaison.

The liaison for the American Association of Stratigraphic Palynologists (AASP) is Barbara Whitney, UNOCAL S & T, P.O. Box 76, Brea, CA, 92621. The telephone number is 714/528-7201 ext. 1624.

Thank you in advance for your support.

Marilyn J. Suiter,  
Director of Special Programs

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Dear Editor,

John Wrenn wrote a provocative address in the October issue (V. 24, No. 4) of the A.A.S.P. Newsletter, calling for an offensive in marketing our services. But an offensive requires a good strategy.

I would be interested in serving on the AASP Marketing Committee. I also wish to make some comments regarding my perception of the plight facing palynologists, both in industry and in academia.

Below is a contribution for the Newsletter that I hope you will publish. I enclose a floppy disk with this letter copied in ASCII.

I spent four years working for the Majors in Houston, Texas during the boom years of the late 1970's. Then I struck out on my own, formed my own exploration company, and started an exploration trend in the Newark Supergroup Triassic of the East Coast, which is still being continued by Texaco and EEI with the spudding of the Gouldman No. 1 in Westmoreland County, Virginia. I also headed the palynology laboratory for Superior Oil Company for almost three years during the early 1980's before Mobil Oil consumed the company. From my experience I gained first hand knowledge and understanding of what geologists need from palynologists, and the kinds of palynological information they will most likely use. It is not the kind of data and reports that I used to generate for a comfortable chair, good microscope, and regular paycheck.

Most palynology reports for industry provide distribution graphs of individual taxa, and pick tops or datums of major change for correlation. Age information provides catch word stage names, but that is all that geologists usually expect from palynologists. Correlation horizons that correspond with formation boundaries or facies changes are datums that add little to what the geologist already knows from studying lithologic change. If I were just a geologist, I would have as little use for palynologists as management seems to have these days. What makes matters worse is that the composite sampling interval for cuttings, which are the materials of most palynological studies in industry, is usually too large (e.g. 90 ft.) to provide anything more meaningful than long term trends. More data and more meaningful results are needed that add to the geologists portfolio, making palynologists an indispensable part of any exploration team.

Another problem is time and the perception that management has that palynological reports are usually the last to be received and the most expensive of any biostratigraphic service. You might be anticipating that I am going to tell to find faster ways of doing our trade. Instead, I tell you to properly educate management to the requirements of the palynologist, and that haste makes waste. More importantly, we need to direct our effort toward results that help geologists and geophysicists do a better job by providing different kinds of information.

Charts with hundreds of taxonomic names are impressive, but do little to bridge the communication gap with geologists. Most of the time we over kill, and in the end hurt ourselves.

At Superior Oil in 1984 I went to the geologist working on a North Sea prospect. He wanted to know if palynology could help him resolve an important problem concerning reservoir continuity. I enthusiastically said, yes, without knowing the consequences. He said he had cores, and I said, Oh boy! Then I asked him if there were any shales in the sequence, and he told me the cores were all sandstone. My heart was in my mouth! But then I was saved. After looking at the cores I realized that the sandstones were clay laminated, and discovered that these laminae were full of dinoflagellates and pollen. I did an in-depth correlation between wells, and was able to answer their questions. I provided a solution by being able to internally correlate sandstone units of the wedge-shaped reservoir that showed that the entire reservoir could be drained using just the up-dip wells. I felt that I had made a major contribution, only to find out that the head geologist in England had made a decision a week before receiving my report - the wrong decision. How could they abandon such a reservoir after reading my report? The problem was perception and expectation of what palynologists can provide, and the necessary time needed to do a reliable study.

In the Newark Supergroup basins spores and pollen are the only palynological tools available for broad as well as focussed correlation. There are no marine strata onshore in these continental basins. At one time it was thought that the Newark was mostly barren of palynomorphs, but that belief was far from the truth. The study of two wells in the Richmond basin of Virginia changed my views of palynology and what is needed to satisfy the needs of the geologist. Because the 7000 feet of section in the Richmond basin was deposited in less than four million years, there is hardly any significant change in taxa from the oldest to the youngest strata. If conventional methods were applied to these wells (i.e. 90 ft. composite cuttings samples and taxonomic identifications), nothing useful or meaningful would have been discovered. An early to middle Carnian age would be the only possible conclusion. Such a conclusion and effort would be analogous to a football team punting on first down! Yet, such an effort was made on a wildcat well in a neighboring basin by a Major oil company, and such a result was obtained. The study of a hundred samples may seem like a lot of work, but if only a single age determination is the result, it is a waste of money and time. Don't bother to do the study!

Taxonomic studies, even with relative percentages of each taxon, result in cumbersome graphs that cannot be easily interpreted. The objective of palynology is to characterize distinctive palynofloras by the recognition of zones or intervals of relative uniformity. But many times there are changes or excursions in composition within ones, the significance of which is overlooked or minimized. These excursions may provide key biostratigraphic markers, even though they are not as obvious as datums or

boundaries between zones.

Two wells in the Richmond basin were studied by me using 20 to 30 foot composite cuttings intervals. Instead of recording each taxon separately, taxa were grouped according to morphotype. In this particular study eleven morphotype categories were created that characterized the major sources of pollen and spores. In other areas and time periods different categories can be applied based on the spectrum of palynomorphs present. With these eleven categories I was able to generate curves or graphs that had significant palynofacies character. In many cases I was able to distinguish intervals of 21,000 years that were caused by orbital forcing or the precession of the equinox. I have also been able to recognize 100,000 yr., 400,000 year, and 2 million year cycles that would have been invisible with conventional distribution graphs of individual taxa.

The reason this method works is that I was studying palynofacies rather than taxonomic distribution. Palynofacies composition is influenced not just by the plants living at that time, but by sedimentological as well as preservational factors, which are characteristics of the paleoenvironment. That is why palynofacies study comes closer to paleoenvironmental study than does pure taxonomic analysis. Lithofacies correlation is the backbone of oil exploration. By grouping morphotypes, trends that might not be evident at the species level are reinforced and become apparent. Certain morphotype categories are more environmentally sensitive than others, but their utility depends on how they are defined. Each study may require a slightly different method.

In many cases I can make a precise interpretation of paleoenvironment using palynofacies, distinguishing between swamp, alluvial fan, floodplain, delta margin, shallow lacustrine, and deep lacustrine environments. I can even recognize times that deltas are building nearby by the appearance of characteristic morphotypes (i.e. plants that preferred deltaic environments). I can recognize unconformities and diastems, and document lithofacies with very different rates of accumulation. Conventional or taxonomic palynology can do much of this also, but it cannot be used to generate graphs that the geologist will easily understand and use. Remember, an index for the value of a publication or report is how often it is referenced in subsequent papers or reports by other authors.

But what about the amount of work involved? What is the cost in time and money to do such a study?

Because I reduce the time spent identifying taxa by recording morphotypes, such as large bisaccate pollen versus small bisaccate pollen, monosulcates versus circumpollen pollen, sculptured spores versus psilate spores, and articulate spores versus lycopod spores, I can count a very palyniferous slide in less than 15 minutes, and a sparse one in 30 minutes. I count a minimum of 50 grains, which seems to be the statistical cut off for reliability in this type of study, and try to count at least 200 grains per slide. I also record the genera of most taxa present in each morphological category so that I have a cross check with

similar looking palynofacies in other wells. Some slides with as few as 20 grains can still be used, which is not the case for most taxonomic studies. Not only can I count a slide faster than my colleagues who identify each and every taxon, but I can keep a running check on the distribution of key or index taxa as well.

On the one hand the time spent studying a slide is decreased, while on the other hand the number of samples counted is increased. Instead of counting one hundred 90 foot composite samples, I will count three hundred 30 foot composite samples, which increases my resolution of palynofacies at least three fold. The overall amount of work is increased, but the time needed to do such a study does not increase proportionately because the number of categories that are identified is reduced from 60 to 100 in a conventional study down to just 11 in the study cited above. In addition, the graphs that are generated now can be interpreted and understood by geologists, because they have character that mimics electric logs and lithologic change! Changes in the relative percentage of different morphotype categories can be correlated with other variables, such as average grain size and kerogen composition, to better understand environments of deposition.

By increasing palynofacies resolution, age resolution is enhanced. Palynofacies X in one well can be correlated with palynofacies Y in another well by palynofloral composition at both the morphologic and generic levels. And yet the relative age can still be determined from tracking the distribution of index taxa when doing the counts. By reducing taxonomic complexity the geologist is able to grasp the significant contributions that palynology offers, and he will become your friend and steady customer.

Correlation by age is limited by the placement of stage boundaries and turnover datums. Such correlation works when the sequence is condensed and there are numerous stage boundaries present in a well. In an expanded sequence, however, stage boundaries and turnover datums may be few and far between. Correlation by high resolution palynofacies gives both age information and substage datums or palynofacies changes. In fact, my results for the Richmond and Taylorsville basins were reproduced in wells spaced as much as 50 miles apart. In a condensed sequence a smaller sampling interval can resolve palynofacies changes and can give the geologist more to work with than just an age.

Before working Triassic well and outcrop samples at different sampling intervals, I had assumed that any given sample will contain enough taxa for regional correlation. How wrong I was. Palynofacies changes are sometimes so strong that had I sampled randomly the same sequence twice, I might have ended up with two distribution graphs that looked very different both morphotypically and taxonomically! Such results argue for composite sampling intervals. Yet when correlating palynological results of cores with those of cuttings I was able to recognize anomalous palynoflorules in the cores and compensate for them. Many times these anomalous palynoflorules helped

me in evaluating the type of paleoenvironment.

Another reason for graphing morphotypes is that palynofacies can correlate in unexpected ways. For example, the spore to pollen ratio is now recognized by me as a powerful tool for correlation of climatic or temporal events. The composition of the spore population may change depending on the local environment (e.g. alluvial fan versus floodplain), but the relative percentage of spores remained virtually the same from well to well over a distance of at least 50 miles. Taxonomically this spore dominated interval had a low correlation coefficient in one well that had a different lithofacies, but based on the sequence of palynofacies above and below the interval, there was no doubt that these spore dominated facies were contemporaneous. Conventional palynology would have miscorrelated them!

But the most important lesson learned was that too large a sampling interval can destroy any useful palynofacies information by averaging too many changes. Some averaging is desirable, however, to reduce the amount of palynoflorule variation, which can look like erratic noise. Sample results can always be averaged or combined to produce comparable results in different wells, but a sampling interval that is initially too coarse or large cannot be corrected except by doing the work over again at a finer level of resolution.

Perhaps the most rewarding response to using morphotype categories that graphically show both major and minor changes in overall composition has been from geologists and geophysicists. Once the information was put into a simple format, geologists and geophysicists at Lamont-Doherty had no trouble spotting trends and recognizing correlations. For the first time I was getting feedback from non-biostratigraphers that helped me. This line of communication is something that we all too often disconnect by focusing on taxonomic changes rather than facies changes.

You might ask why go to all this trouble and additional time and expense when the way we have been doing industry palynology is accepted? The answer is that we need to do more to preserve our profession and bring it up to the level of importance of lithologic analysis and sequence stratigraphy. If palynology is to survive these hard times, we need to adopt new and better techniques of evaluating wells. When we can give the geologist information that makes him able to do a much better job, our services will become indispensable and palynology will thrive. A comment from an oil company executive stands out in my mind: What palynologist ever found any oil? The same can be said of seismic processors. But are we just microprocessors, or can we give geologists data and interpretations they can focus on to unravel complex geologic problems? Can we show them that palynomorphs are like grains of gemstones in their sequences?

Bruce Cornet, M.S., Ph.D.



## NOTICE

### Microfossil Working Group Shut Down:

The Microfossil Working Group of the I.U.G.S. International Subcommittee on Jurassic Stratigraphy (I.S.J.S.), which encompassed all microfossils including organic-walled microfossils, was abolished during the last Jurassic Symposium (3rd International Symposium on Jurassic Stratigraphy in France, September 1991). The activities within the working group will continue under the stage working groups under I.S.J.S.

### Newsletter:

The palynologists and other microfossil workers present at the last Jurassic Symposium agreed not only to abolish the Microfossil Working Group, but also for the need of a Newsletter on activities within I.S.J.S.

Donna Meyerhoff Hull (University of Texas at Dallas, Programme in Geosciences, P.O. Box 830 688, Richardson, Texas 75083-0688, U.S.A.) undertook the job as coordinator (mailing address) and newsletter editor. Those of you, who may want the upcoming newsletter or other information are welcome to contact Donna.

**NB:** Please circulate to interested colleagues, who do not receive this information.

Niels E. Poulsen  
Geological Survey of Denmark  
8, Thoravej  
DK-2400 Copenhagen NV  
Denmark

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Dear Colleague:

Dave Batten, Martin Farley and I are convenors of a symposium for the 8th IPC in Aix-en-Provence (September 6-12) on the subject "Palynofacies, Modern Analogs and Ancient Examples". We intend to highlight the differing views of what a palynofacies is and to present as complete a set of examples as possible.

The differing views of palynofacies, in case you are unaware of them, are what can be called the Traverse view (as expressed in his textbook, *Paleopalynology*) and the Combaz view. The Traverse view: "the assemblage of palynomorph taxa in a portion of sediment representing local environmental conditions and not typical of the regional palynoflora". The Combaz view: "the assemblage of plant debris found in a certain kind of sediment" [this view is more directed towards a petroleum source, ed.]. It is not our position to support one or the other definition but to highlight that there are differences in usage, and to try to show what value both approaches can present.

If you plan to attend the IPC and your present work can be thought of in a palynofacies context, you may consider submitting a paper or poster to this symposium. Plans are being made for the publication of papers from the palynofacies symposium in an appropriate journal. If you would like to contribute to this symposium, send a copy of your abstract directly to the convenor before March 1, 1992: Dr. Jean-Pierre Suc; Palynologie, Universite de Montpellier II; F-34095 Montpellier Cedex 5, FRANCE [tel. (33)67 14 32 69; fax (33)67 04 20 32]. A second copy should be sent to: Gail Chmura; Dept. of Geography; McGill University - Burnside Hall; 805 Sherbrooke St. West; Montreal, Quebec, CANADA H3A 2K6 [tel.(514) 398-4111, fax. (514) 398-7437].

Gail Chmura,  
Assistant Prof.

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## COMPUTERS AND PALYNOLOGISTS

The microcomputer has revolutionized how palynologists think and work. From simple acquisition and storage of raw pollen counts, computers have come to provide extensive, diagnostic identification keys. They now allow sophisticated statistical analysis of large arrays of data, and their help even extends on to writing (and often transmitting) the final report. A symposium on "COMPUTERS AND PALYNOLOGISTS" will be held



allow sophisticated statistical analysis of large arrays of data, and their help even extends on to writing (and often transmitting) the final report. A symposium on "COMPUTERS AND PALYNOLOGISTS" will be held at the 8th International Palynological Congress, Sept. 6-12, 1992, Aix-en-Provence, France. Selected speakers will cover the range from simple aids for collecting and manipulating pollen counts to those studies that integrate the synoptic view of pollen changes across a continent or across an era of geologic time. The aim will be to present the hazards of electronic data-bases as well as the benefits.

- A. Software and hardware for recording counts, data storage, process control, automated sediment-measuring and recording devices: K.D. BENNETT, Univ. of Cambridge, UK. [Computer-Acquired Raw Data.
- B. Computerized palynomorph identification keys, both text based and graphics based: J.K. LENTIN L.I.B. Consultants, Calgary, Canada. [Palynology Keys] and D.K. GOODMAN, Arco Oil and Gas, Midland, Texas [PALCAT visual system].
- C. Databases from simple spreadsheets to complex relational types, and including how to keep databases from being corrupted by users: B. HUNTLEY, Univ. of Durham, Durham, UK. [Pollen databases]; R. CHEDDADI, Centre Univ. Espace Van Gogh, Arles, France [European Pollen Databases]; E.C. GRIMM, Illinois State Museum, Springfield, Illinois [American Pollen Databases].
- D. Statistical and correlation software: general purpose, or types written especially for palynological needs: E.C. GRIMM, Illinois State Museum, Springfield, Illinois [Tilia; Diagrams by Computer]; C. GOEURY, Labo. Bot. Historique, Fac de St Jerome, Marseille, France [Gpal3; a program for Pollen Data Acquisition and Management Including Displaying and Correlation Analysis]; L.E. EDWARDS, U.S.G.S. Reston, Virginia [Programs for Correlation of Sites]; W.L. KOVACH, Univ. College of Wales, Aberystwyth, Wales [Multivariate Techniques for Correlation].
- E. Computer graphics programs for study of individual sites and for comparison between sites; both for stratigraphic applications and for area mapping of trends in time and space: G.L. JACOBSON, JR., Univ. of Maine, Orono, Maine [Display of Spatial Data]; L.J. MAHER, JR., Univ. of Wisconsin, Madison, Wisconsin [Desk-top Displays of Pollen Data].
- F. Statistical methods for paleoecological interpretations from palynological data: J. GUIOT, Labo. Bot. Historique, Fac de St Jerome, Marseille, France [Transfer Functions in Interpreting Past Environment]; H.J.B. BIRKS, Univ. of Bergen, Bergen, Norway [Impact of Computer Intensive Procedures in the Testing of Palaeoecological Hypotheses].

#### CO-CHAIRS:

L.J. MAHER, JR.  
J. GUIOT  
E.C. GRIMM



#### NOTICE

The 25 annual AASP Meeting will be held this year at the International Palynological Congress in Aix-en-Provence, September, 1992. Please note that registration and abstracts are to be sent before March 1, 1992.

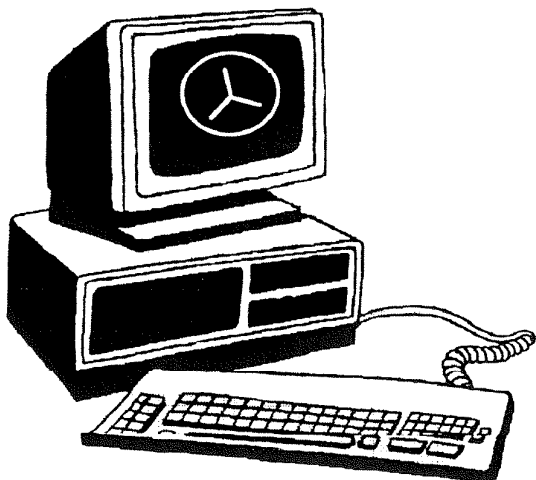
#### NOTICE

The 1992 AASP annual mid-year board of directors meeting will be held in Denver, Colorado, April 10-11, 1992 at the Hampton Hotel (Dillon Inn). All interested members are invited to attend. For reservations telephone (303) 388-8100, be sure to ask for the AASP meeting rate.

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M. Kedves from the Cell Biological and Evolutionary Micropaleontological Lab of the Dept. of Botany of the A.J. University, P.O. Box 657, H-6701 Szeged, Hungary as three available publications for scientific exchange.

*Transmission electron microscopy of fossil angiosperm exines; Plant Cell Biology and Development* part 1 & 2 are now available. Prof Kedves is particularly anxious for more scientific exchange.



### COMPUTERS IN PALYNOLOGY

We would like to announce the formation of an ad hoc committee on computer applications in biostratigraphy (CAB!). This committee will attempt to compile, update, review and disseminate information about desktop computer software utilities which facilitate the everyday task of biostratigraphers and help improve their personal performance. Certain commercial Software packages which are targeted for industry applications are adequately viewed in technical computer magazines and advertisements. These types of softwares will not be included in our reviews, but may be compiled in a database for reference.

The initial members of the committee are Abolfazl (Masoud) Jameossanaie (chairman), Pierre Zippi, and Judi Lentini. Anyone interested in serving in this committee is certainly welcome and warmly invited to join us.

This is a great opportunity for all you AASP members anywhere in the world to contribute to this effort by sending information about public-domain or low-cost software utilities you have come across or have developed yourselves!

We ask all contributing individuals or parties to provide the following minimum information about a given software:

Author, mailing address, telephone number, FAX number and Network ID (if available), name of the software, version number and year, hardware platform, hardware requirements (RAM and ROM memory, monitor type, CPU type, graphic board, etc.), environment requirement (format, operating system, etc.), and finally a brief description of what the program does, its price and how it can be obtained.

We are looking forward to receiving your contributions. Please send demo disks, working copies, running modules and pertinent literature about the softwares to:

Dr. Abolfazl (Masoud) Jameossanaie  
Exxon Exploration Company  
440 Benmar  
Houston, TX 77060-3105  
Tel. (713) 951-5196  
FAX (713) 951-5500

### STRATIGRAPHIC RANGE CHARTS ON A MACINTOSH COMPUTER

#### SOFTWARE REVIEW

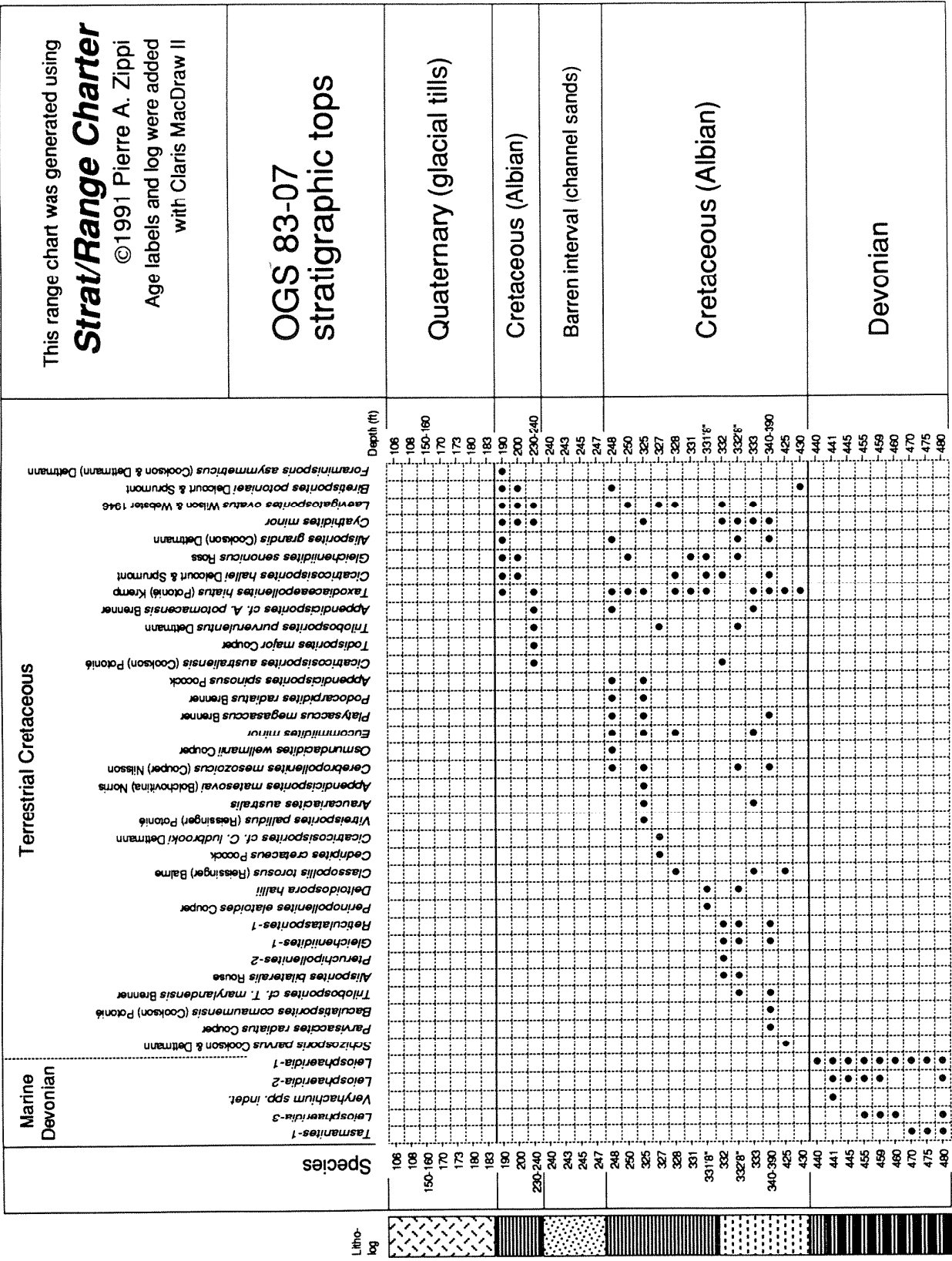
In his role as chairman of the newly formed CAB (Computer Applications in Biostratigraphy) committee, Masoud Jameossanaie of Exxon Exploration Company asked me to review *Strat/Range Charter 1.0* for the AASP NEWSLETTER. Because I am the author of this software package and my opinions may be viewed with some suspicion, I will restrict the following article to essentially a product description. I will leave the accolades or criticisms to others who may be more subjective.

*Strat/Range Charter 1.0* was demonstrated from October 20-23 at the AASP Annual Meeting in San Diego along with hard copies of range charts printed on both a Laserwriter and Linotronic printers.

*Strat/Range Charter 1.0* was developed to prepare data for statistical analysis and provide range charts and species lists. The application was written as a standard Apple Macintosh menu driven, user friendly program. Output can be printed on a full range of printers, from the lowly dot-matrix to a Linotronic phototypesetter. Publication quality range charts can be produced in minutes. The application is designed to integrate with all existing Macintosh software.

Product description: *Strat/Range Charter 1.0* is a stratigraphic range charting computer application that can create large range chart diagrams and ordered species lists from text files containing lists of unique species numbers for each sample horizon. Diagrams can be saved as MacDraw PICT or transferred via the clipboard to any draw-type application. Text and graphic elements are MacDraw-like elements and can be edited with any PICT draw-type application.

*Strat/Range Charter 1.0* accepts data created with any word processor or text editor that is saved as an ordinary text file. A data file is a series of records, or sample horizons. A data record is structured as a sample label followed by a list of species (or other attributes) found in that sample. Sequence of samples are plotted in their order of occurrence in the data file. An option is available to reverse the sequence. This produces a relative or sequential scale. Arithmetic or equal spaced scales can



be easily created.

Diagrams can be sorted by tops, bases, or by unique species numbers. Presence/absence charts or total range (range-through) charts can be plotted. Grid lines can be added to the chart and the grid line spacing can be specified. Presence/absence data is plotted with the default bullet symbol, or any keyboard symbol that is specified. Individual symbols can be plotted to indicate abundance, questionable occurrences, reworked specimens or any other information about that occurrence by entering a single keyboard symbol with the data.

Diagrams can be scaled at nine sizes, from large poster-sized diagrams to very small charts that can be viewed entirely on screen. Any font (typeface) installed in the computer system file can be used to display charts and lists.

A list of species is compiled for each data file. Species lists can be ordered alphabetically or by unique species number. Multiple species libraries can be maintained for Foraminifera, dinoflagellates, spores, pollen, etc., or categories can be combined (e.g. all terrestrial palynomorphs in one library and marine palynomorphs in another). Species libraries can be used to create a database. Or, species libraries can be created or updated by exporting species names and numbers from an existing database.

*Strat/Range Charter 1.0* prepares presence/absence data matrices and ranked events data which can then be used with other statistical software packages. It is designed to be integrated with database and graphics applications. Along with a PICT (standard Macintosh) graphics application and database application, *Strat/Range Charter 1.0* is the keystone element of an integrated stratigraphic range charting computer solution.

Minimum system requirements: All Macintosh computers; Compatible with MultiFinder, System 6 and System 7; 1 MB RAM; 1-800K disk drive.

Recommended system configuration: Macintosh II or better; MultiFinder or System 7; 4 MB RAM; Hard disk.

Price: \$1250 US.

A digitizing tablet (point and click) data entry application is currently under development and a new, easy to read, fully illustrated, 60 page users manual is currently being rewritten and will be available soon.

For orders and information, call or write:

Pierre A Zippi  
60 Mountview Ave., #410  
Toronto, Ontario M6P 2L4  
(416) 766-4077

The example rangechart diagram on the previous page was created with *Strat/Range Charter 1.0*, *MacDraw II* and a postscript laser printer. The rangechart was generated in *Strat/Range Charter* and saved as a *MacDraw* file. Afterwards, *MacDraw II* was used to enhance the diagram by adding the litholog, age labels and an expanded title. Other PICT-graphics applications, such as *Canvas* or *DeskDraw* can also be used to manipulate and enhance the

graphic output.

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In future issues of this newsletter, I hope to provide information on three other Macintosh scientific software applications...Pierre Zippi

## Down-to-Earth Software Reviews

Robert B. Jorstad  
Geology/Geography Department  
Eastern Illinois University  
Charleston, Illinois 61920  
Internet: CFRB@UXL.CTS.EIU.EDU

*PALYDISK 1,2 and 3*; American Association of Stratigraphic Palynologists, Dr. Owen K. Davis, Department of Geosciences, University of Arizona, Tucson, AZ, 85721, telephone 602-621-7953, \$5.00 per disk covers shipping and handling with any extra proceeds going to the AASP.

*PALYDISK 1* contains a bibliography of Southwestern United States Quaternary palynology. The file is over 80 single-spaced pages long and includes references of use to palynologists, palaeontologists, archaeologists, anthropologists, and Quaternary geologists.

*PALYDISK 2* contains several ASCII II files; each contains a portion of the alphabetical reference list that will be most useful to palynologists, botanists, and paleobotanists. Williams Elsik initiated this bibliographic reference list on fossil and living fungi.

*PALYDISK 3* features a list of approximately 200 citations of Gulf Coast palynology in *WordPerfect* and *MultiMate* formats. The reference list is incomplete regarding Pleistocene work but offers an excellent place to begin a literature search for projects involving palynology, Quaternary geology, and botany.

These three disks are data files and are available in either MS-DOS or Macintosh formats and easily converted to ASCII II text files. Users of other computer systems should be able to find a way to convert the text files to other formats. Since the data files are readily convertible into ASCII II format, almost any word processor can open the files. After opening, users may notice some extraneous characters; users can either ignore or manually delete these imbedded character commands. References on a specific topic can be located using the find or locate command in a word processor; this type of use offers limited database functionality.

The references were compiled as part of the AASP Data Exchange Committee's efforts and are updated periodically. The references included are obviously intended for use by palynological researchers but include some references that may be useful to other workers. Some files are *dBase* text files, easily accessed with that

program on MS-DOS computers. The committee has placed instructions on the disks for data access via Macintosh computers using *MACBASE* software; however, the data files may be read and converted to documents in *MS WORD* or other word processor.

These disks will be of limited use to workers outside palynology and related circles. The disks begin to fulfill the need for computerized reference lists reasonably well.

- reprinted from the *Journal of Geological Education*, 1991, v. 39, p. 332

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#### EDITORS FAVORITE COMPUTER NEWS

"Dr. Marcia Peoples Halio, an English professor at the University of Delaware, has completed a five-year study of students who submit papers written on Macintosh computers and those who use IBM - or IBM-compatible - computers. She finds:

The average IBM paper ranks at 12.1 or college-level on the readability scale; Macintosh papers average a little below eighth grade;

IBM papers have about four spelling errors, Mac papers have 15;

IBM users are more likely to write about "serious" issues such as war, pollution, and teen pregnancy; Mac users pick topics such as fast food.

"The Geologic Column"  
GEOTIMES, November 1991

EDITORS NOTE: My computer programmer, Mike Johnson, has the following quotation above his computer: "Sure, I could compare the Macintosh & the PC, but I make a point of never arguing about religion."

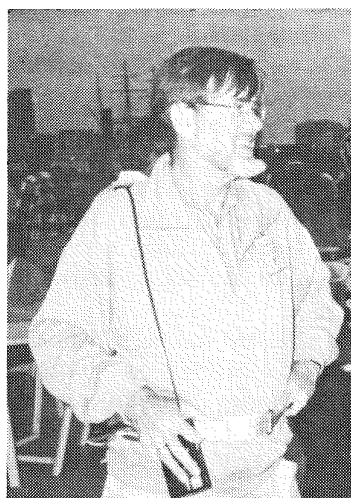
#### 24th ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF STRATIGRAPHIC PALYNOLOGISTS

San Diego, California  
October 20th-23rd, 1991

reprinted from the Canadian Association of Palynologists Newsletter. Vol.14, No.2.

San Diego is a beautiful city with a near-perfect climate. The site was a most pleasant one, and it was worth extending one's stay with a few days to see the sights.

For a city built up on such a narrow strip of flat terrain, there is a generous spaciousness in lay-out of the major city areas that is as refreshing as the breeze that keeps blowing off the Pacific. Marinas and boats everywhere, remind one of the unhurried pace of the wind that pushes the sails.

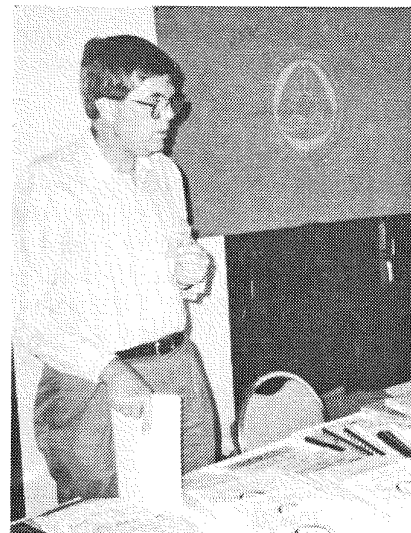


Jan Jansonius

There was more activity in the open-air mall Horton Plaza, where the locals were pushing the sales. The Zoo is large, and again all open-air (the polar bears did look a bit out of place amongst the palms, but not the two condors with their chick); yet, I was almost more impressed by the huge flights of pelicans along the beaches of La Jolla.

The annual meeting had been co-ordinated with the GSA meeting; however, there was not much evidence of interplay between the two groups. The venues were too far apart to allow a quick dash to the other place. Communications must have left something to be desired, because I (with many others) was under the impression that access to the GSA presentations required a separate registration; only on the morning of my departure did I learn otherwise. Conversely, I did not see many GSA members attending our sessions. The joint session on Wednesday afternoon, on Devonian nonmarine to marine correlation, drew a small, but interested, audience.

The technical sessions were well attended, and generally of good calibre. Monday morning was reserved for Symposium I on "Palynology and sequence stratigraphy", with Henri Posamentier as keynote speaker. This was a very successful and timely topic, demonstrating to what extent sequencestratigraphy has become common place throughout the



Bob Clarke, selling AASP Foundation publications.

geological world, including industry and academic. Dave Goodman delivered some good similes: seismic stratigraphers would not dream of discarding their photo-sections after they have transferred their coloured lines onto an overlay, and then continue their correlations with only those overlays. Similarly, palynologists should not file away their database of organic records and slides, and work only with the zonal boundaries as established at the end of their examination. There must be a continuous interplay between geologist and biostratigrapher to evaluate every last scrap of information. There is no such thing as a "bad sample", if even the absence of certain clues may fit in with the stratigraphic model being developed. And, especially with the increase in sequence stratigraphic modelling, the task of biostratigraphy does not diminish in importance; a model not confirmed by biostratigraphic checks may be entirely out of touch with reality. Steve Jacobson stressed that the sequence stratigraphic process is iterative, with many disciplines continuing to contribute their interactive data before a final model is possible; this process brings the palynologist out of his isolation.

The second theme symposium dealt with "Global climatic change", and had a number of interesting presentations. Milankovich got a good press; variations in past climates at times have shown extremes not too far distant to what we now may expect as a result of human activities. However, one fundamental difference makes predications very shaky; we are changing balances much more rapidly than happened ever before in geological history, and cannot predict how we may overwhelm some of the natural reservoirs (as ocean content of  $\text{CO}_2$ ) that act as balancing factors and safety valves.

In the general technical sessions, I found some papers more interesting than others. Norrie Robbins gave a very entertaining account of how a natural wetland area was preserved from land development; not by demonstrating that the clays would be an unsuitable substrate for buildings, but by showing that natural uranium deposits, now precipitated and bound to the reducing peat layers, would be remobilized when draining of the peat would result in oxidizing conditions, and thus cause redissolved uranium compounds to flow into a local water aquifer. I enjoyed Barry Dale's interesting account of the distribution of cold water dinoflagellate cysts in the North Atlantic.

John Wrenn, the new president, gave a serious speech, dealing with the future of palynology, in particular in the North American oil industry. He observed how many companies have been reducing staff in their biostratigraphy shops. (Yet, in Europe and other parts of the world this is not the case.) More work will have to be done out of house. This provides new opportunities for consulting

palynologists. He cautioned that loss of quality control may result from curtailing existing in-house capabilities. A palynologist can provide no better information that can be deduced from fossil remains present on the processed slides. Not necessarily do commercial labs produce inferior slides, but close control is needed to ensure that slides have the same aspect and quality as in the past. It is necessary to be familiar with the particular strength of each consultant, and to know where to go for certain information. More than ever, it is now necessary for company, university and consulting biostratigraphers, to cooperate and support each others' efforts.

Aside from all this serious business, it was a pleasure to meet old friends again after many years. The ice breaker was a good opportunity for this, and provided sufficient provender to entice the crowds to stay on. The boat ride through the harbour was not quite so generous, and set out a bit late; by the time

we were under steam, it was too dark to make out many of the interesting sites. All in all, the Organizing Committee did a good job; there were few snafus. The poster



Lucy Edwards & Gordon Wood

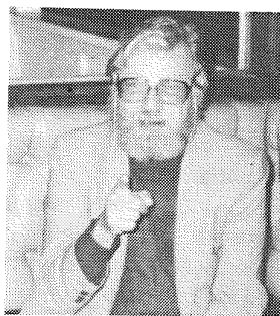
presentations were up for the full meeting, adjacent to the commercial booths, which was a good arrangement. Among these exhibits was an interesting presentation by Pierre Zippi, on his Scientific software for the Mac (ternary plot; vector rose; counter; strat/range chart; all at very attractive prices). I thought it was a pity that the program of technical papers was not publicized before the



Past Pres. Barb Whitney fiddling around.....

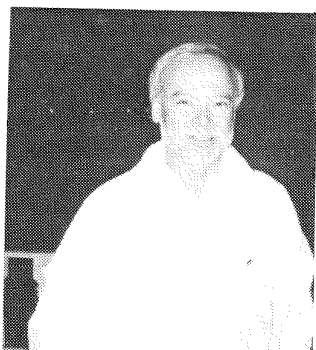
meeting started. There were some 120 registered delegates, with some from places as far away as Europe, Africa, South America and Taiwan. Wish you had all been there!

Jan Jansonius  
Calgary, Alberta



Virgil Wiggins

## PALYNOLOGY IN FUKUOKA



Doug Nichols

Doug Nichols delivered a keynote address at the international symposium on "Origin, Sedimentation and Tectonics of Late Mesozoic to Early Cenozoic Sedimentary Basins at the Eastern Margin of the Asian Continent" held in Fukuoka, Japan, in August 1991. The meeting included a workshop of the International Geological Correlation

Project 245: Nonmarine Cretaceous Correlations. Doug, who was a guest of Kyushu University, spoke on "Palynostratigraphy in reconstruction of tectonic history and basin evolution, western North America." His address was coauthored by William J. Perry Jr. and Janet L. Brown of the U.S. Geological Survey.

Doug admits that his research to date has not dealt extensively with the eastern margin of the Asian continent, but explains that his talk was a review of applications of palynology to problems in regional geology of the kind that can be as effective in Asia as they have been in North America. The symposium afforded the opportunity to introduce applied stratigraphic palynology to an audience composed largely of non-paleontologists. The trip also gave Doug a chance to see a bit of Japan: the city of Fukuoka and the geology of the islands of Kyushu and southern Honshu. He reports that the sashimi was great, and that there were Japanese cars everywhere! Doug was also impressed (and relieved) by the use of English, which has clearly become the international language of science. Symposium participants were from Japan, Korea, Taiwan, the People's Republic of China, the Soviet Union (it was still called that, back in August!), and seven other countries, and all spoke at least some English.

submitted by Doug Nichols

# NorFA

NORDISKA FORSKARUTBILDNINGSAKADEMIN (NorFA)  
utlyser stöd till forskaraktiviteter

## Report of the Nordic Council of Ministers Short Course

Upper Cretaceous-Tertiary  
Palynological Biostratigraphy

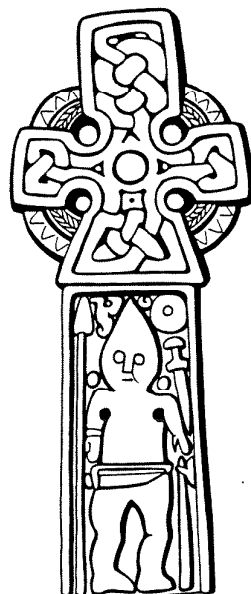
Denmark, October 27 to November 2, 1991

Submitted by M.J. Head on November 21, 1991

### The Nordic Council of Ministers

The Nordic countries comprise Iceland and the Scandinavian countries Denmark, Finland, Norway, and Sweden. They all share cultural roots and, with the exception of Finland, have similar languages thanks to the colorful heritage left by Viking ancestors - the fitting toast of this Nordic Council of Ministers Short Course icebreaker. The Nordic countries are individually small, with Denmark for example having a population of just 6 million. The Nordic Council of Ministers was conceived in 1971 with a mandate to promote cultural and scientific ties between Nordic countries. Under its auspices, peoples of Nordic countries can now engage in cultural and scientific activities on a larger scale than might otherwise be possible. On the academic scene, the Nordic Council of Ministers finances research students to spend extended periods abroad to gain experience - often in far flung institutions - as sabbatical leave. It also sponsors various short courses and symposia for students and other suitably qualified Nordic persons to gain specialized training. About 50% of all proposed short courses get funding.

A short course on Permian and Triassic Palynology, also held at Hirtshals in 1988 and organized by Niels Poulsen of the Geological Survey of Denmark, was the first palynological short course to be sponsored by the Nordic Council of Ministers. The latest short course, on Upper Cretaceous-Tertiary Palynological Biostratigraphy, was the second. A third, on Jurassic palynology and to be organized by Niels Poulsen and Robert Williams (Norwegian Petroleum Directorate, Stavanger), is planned for the future.



### The Venue

Hirtshals is a small town on the northern tip of Jutland with convenient ferry links to Norway and Sweden. The



Hotel Fyrklit specializes in hosting conferences and both Short Course practical sessions and lectures were housed in its large conference room. Meals were excellent with herring plentiful and varied. Chilled bottles of smooth Danish beer appeared regularly at lunch and dinner to wash everything down. Accommodation was comfortable with one-up-one-down bedrooms in shared suites with staircase and rope ascending at about 80° to the open-plan upper bedroom, and a sofa strategically placed at the stair's base in the event of a forced landing in the lounge. Each suite also had a bathroom, and kitchenette with full cooking facilities. The hotel is situated on the beach near massive sand dunes and some excellent Quaternary exposures. Use of the hotel's indoor pool substituted mercifully for a November dip in the North Sea. Low clouds filled the skies but were unproductive until the last day.

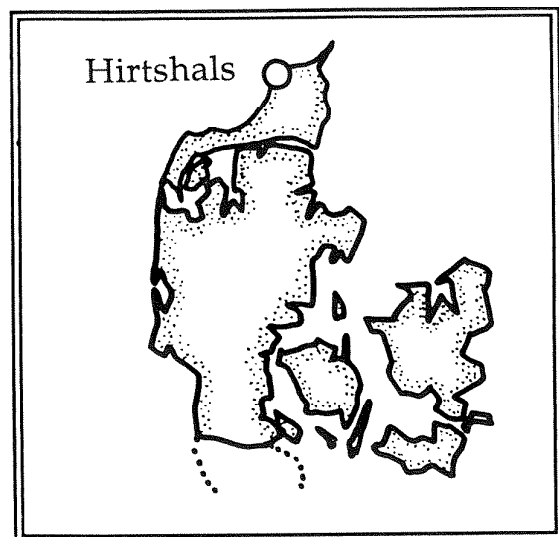
### The Course

The course lasted six days and was attended by 31 participants including five instructors and Lars the three-month-old baby who inexplicably slept through every presentation. The participants were mainly from Norway, Denmark, and Sweden, with two-thirds from industry and the remainder split equally between research students and professional academics. The course was in English and socializing was also frequently in English as a courtesy to the two non-Scandinavian-speaking instructors. Each participant received a thick binder of notes and reprints and a 150-photo slide set of Neogene dinoflagellates. Also included was a helpful biography and photo of each registrant. The course organizer was Niels Poulsen (Geological Survey of Denmark) and the program coordinator was Claus Heilmann-Clausen (University of Aarhus). The course instructors were:

Martin J. Head (Univ. of Toronto, Canada)  
 Claus Heilmann-Clausen (Univ. of Aarhus, Denmark)  
 Stefan Piasecki (Geol. Survey of Greenland, Denmark)  
 David Renshaw (Statoil, Stavanger, Norway)  
 Bruce Tocher (Univ. College of Wales, Aberystwyth, U.K.)

The Short Course program was divided into one to two-and-a-half-hour practical sessions interspersed with one-hour lectures. Most participants brought their own microscopes but spare ones were also on hand. Practical sessions allowed participants to examine sets of microscope slides provided by the instructors. These sessions were really invaluable in relating theory to practice. The course was structured as follows:

Upper Cretaceous dinoflagellate stratigraphy of NW Europe, Late Cretaceous provincialism, and oceanic anoxic events (Bruce Tocher); Paleogene of Denmark and northern Germany (Claus Heilmann-Clausen); Paleogene biostratigraphy of the northern North Sea and Haltenbanken, with emphasis on range tops (Dave Renshaw); Miocene dinoflagellates of Denmark (Stefan Piasecki), and Neogene and Quaternary dinoflagellates



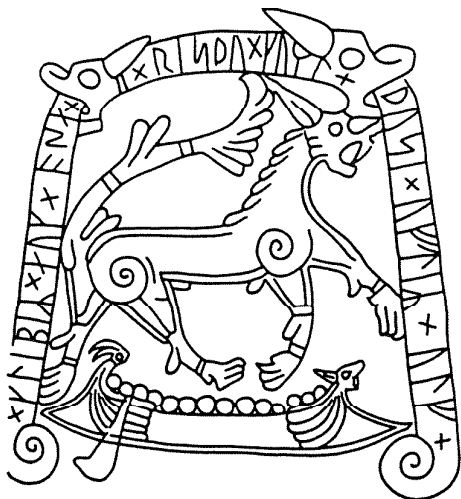
mainly of North Atlantic and contiguous areas dealing with their morphology, taxonomy, biostratigraphy, and ecology (Martin J. Head). In addition students completed on paper an absorbing graphical exercise on some hypothetical but realistic Paleogene well sequences in the North Sea. This exercise, set by Dave Renshaw, reinforced his instruction on Paleogene biozones and demonstrated just how effective North Sea dinoflagellate biostratigraphy can be in resolving equivocal electric log correlations. And after all that memorizing, it was fun to have to work out a problem on paper.

Students had all been asked to bring along poster presentations of their current work and these were displayed in the hallway leading to the main conference room. A two-hour slot early each evening was allotted to continuation of practicals and to brief, informal talks and slide shows and a video by participants. Then it was time to socialize-speaking of which the farewell party revealed some interesting Nordic habits such as the drinking of aptly named bitters with notorious elephant beer, both of which go together surprisingly well (hic!#!\*). Professor Annik Ayhre, a geophysicist from the University of Oslo, dropped in for one day as representative of the Nordic Council of Ministers. So impressed was she with this course that she encouraged Niels Poulsen to apply for Nordic Council funding for a future palynology short course. One on Jurassic Palynology, as mentioned above, is thus in the pipeline.

At the closing ceremonies and on behalf of the students, Eva Koppelhus (Geological Survey of Denmark) presented instructors, course organizer, and program coordinator with bottles of Chateau Chatain 1985 and everyone received an attractive certificate outlining the scope of the course and attesting to their participation. Written student evaluations of the Short Course were all very positive indeed and will be submitted to the Nordic Council along with the course report. Students particularly appreciated the chance to make contacts with other



palynologists through both the scientific program and social activities. They liked the alternation between lectures and practicals, the latter also providing opportunities for general discussion. It was also noticed that *all* the instructors were present *throughout* the course. On the negative side it was felt that a short introduction to dinoflagellates would have been helpful to those students not familiar with dinoflagellates. Some students thought the course could have been longer given the 100 million years covered. For the record, the course was originally proposed to stretch over 10 days with a mid-course field trip. Financial constraints reduced it to six.



The course was educational and fun. It was an enriching, concentrated, and challenging experience to engage so much of the geologic column in such detail in so little time, and it was spiriting to see palynology so vibrant and valued in the Nordic countries. The Nordic Council of Ministers financed the Short Course including the cost of registration packages and hotel and travel expenses for all participants. The Geological Survey of Denmark also gave generous support. Niels Poulsen orchestrated the whole thing smoothly and unobtrusively and was always on hand to cheerfully expedite last-minute requests. Not only did he handle the daunting task of arranging travel for all participants, but even supplied the icebreaker with his home-grown Danish grapes (which I helped pick).

In closing, it was a pleasure to instruct such enthusiastic students in so congenial an atmosphere.

Submitted by:  
Martin J. Head  
Department of Geology  
University of Toronto  
CANADA

## UNIVERSITIES IN THE NEWS



Palynology Laboratory  
Department of Anthropology  
Texas A&M University  
College Station, Texas 77843  
Tele. (409) 845-9334  
FAX (409) 845-5663

### GRADUATE PROGRAM

At Texas A&M University graduate students can major in Biology, Botany, Geology, Geography, Anthropology while they pursue their academic interests and conduct research in palynology. The course requirements for each of these disciplines will differ, yet within each the primary focus of either a Masters or Doctoral degree may be research in palynology.

General requirements of Texas A&M University include 30 hours of graduate work for a MA or MS degree and an additional 64 hours of course work for a doctoral degree. Those electing to bypass the MA or MS degree are required to take 94 hours of course work beyond a BA or BS degree. Often, many of the graduate hours are fulfilled while receiving credit for thesis or doctoral research. The availability of graduate fellowships and assistantships will vary from department to department. In addition, some of the palynology students are able to earn salaries while participating in grants and contracts awarded to the Laboratory.

Students interested in pursuing palynology as part of their graduate studies at Texas A&M University should contact Dr. Vaughn M. Bryant, Jr. at the Palynology Laboratory.

### RESEARCH FACILITY

The Palynology Laboratory at Texas A&M University is located in a newly renovated facility and

contains 1,500 square feet of space. The facility consists of a core of two wet labs and a complex of offices and research areas. Each wet lab is sealed from outside contamination, has large fume hoods, hot and distilled water outlets, acid resistant plumbing, fume scrubbers to remove toxic chemicals, and telephones. Included in the lab complex are four offices each with computer lines and phone outlets, a fireproof chemical storage room, a sediment core and sample storage room, a microscope analysis room, and a large open work area equipped with several 40 MB HD desk top computers and printers. The microscope room has built in sand-filled counters for stability and microscopic photographic work. It is equipped with the latest JENA, WILD, and NIKON dissecting and compound microscopes. The microscopes have interference phase, light and dark field contrast, Nomarski Phase, polarized light, and epi-illumination capabilities. Three of the microscopes are equipped with built-in cameras for photographic work and one is connected directly to a TV monitor for taping VCR images for classroom use. Each wet lab has large sink areas, vortex stirrers, large and small centrifuges, hot plates, metric balances, and large counter top work areas with shelving and cabinets. A large, five gallon capacity Delta 5H sonicator is shared between the two labs.

#### SUPPORTING FACILITIES

Next door to the Palynology Laboratory is a fully equipped photographic and darkroom facility. Several buildings away laboratory personnel have access and full use of Jeol T-330A and Jeol 6400 Scanning Electron Microscopes with image analysis, a new Zeiss LMS Laser Scanning Confocal Microscope, a Zeiss 10C Transmission Electron Microscope, and electron x-ray probes. In addition, the laboratory has direct computer lines to the Data Processing Center and can take advantage of the large Cray Y-MP2 computer. The S.M. Tracey Herbarium housing over 180,000 plant specimens is less than one block from the lab and is available for use by lab personnel. FAX facilities are available a few doors away.

#### LABORATORY COLLECTIONS

Exceptional laboratory reference and library collections enable the staff to research a wide range of topics. Specific collections include: 1) the Eric O. Callen Coprolite Collection containing over 6,500 slides and samples prepared by Dr. Callen, the scientist who pioneered coprolite research during the 1960s; 2) the Kathy Cushman Wood and Seed Collection containing over 100 taxa of charcoal and wood and nearly 300 seed taxa from the American southwest and west; 3) the Mobil Oil Corporation Modern Pollen Reference Collection containing 7,000 pollen taxa of modern plants from all areas of the world but with special emphasis on tropical taxa and pollen types of the Southern Hemisphere; and 4)

the William Elsik Fossil Fungal Spore Collection consisting of a wide variety of slides of fossil and modern fungal spore types covering time periods from the early Mesozoic through the Quaternary era. Other special collections maintained by the laboratory include a herbarium of vouchered plant specimens, a collection of over 1,500 floral and raw pollen samples, extensive modern reference collections of wood and charcoal taxa native to North and Central America, a working seed collection of over 500 taxa, a modern pollen collection of over 3,500 taxa mostly from North America, a collection of over 2,000 fossil coprolite samples from North and South American archaeological sources, and an extensive reprint and library collection. The pollen reference collections are entered in dBase programs for easy informational retrieval and we use software programs for wood identification and statistical quantification. We are just beginning to build a phytolith reference collection of modern plant taxa.

#### STAFF

**DIRECTOR:** Dr. Vaughn M. Bryant, Jr. (PhD 1969) is director and department head of Anthropology. He is a palynologist with extensive experience in paleoenvironmental analyses, archaeological palynology, and prehistoric coprolite analysis. His current research emphasis includes melissopalynology, forensic palynology, and entopalynology.

**ASSOCIATE DIRECTOR:** Dr. John G. Jones (PhD 1991) is responsible for the laboratory operation of the facility and plays a key role in grant writing. Dr. Jones has worked for nearly a decade in Central and South America and is most noted for his Peruvian coprolite analyses, phytolith studies of cacti, fossil pollen studies of Tertiary lignites, and his current fossil pollen studies of archaeological and paleoenvironmental records in Belize, Central America. Dr. Jones is currently on leave working at the Smithsonian Field Research Station in Panama.

**ASSOCIATE DIRECTOR:** J. Philip Dering (MS 1979) is responsible for the day-to-day activities and coordinating applied and contract work undertaken by the laboratory. Phil has worked for more than a decade in palynology and paleoethnobotanical studies. His specialties include: charcoal and wood identification, seed and plant macrofossil analyses, coprolite and privy analysis, and pollen studies of Quaternary sediments. He has conducted extensive research in the coastal regions of Peru and most recently is working on the excavation and analysis of botanical materials from prehistoric sites in Jamaica.

#### LABORATORY PERSONNEL:

Hope Camper (MS 1991) is a palynologist who recently completed a 20,000 year paleoenvironmental record of central Texas sediments. Judith Gennett (MA 1983), a

doctoral student, has focused her research on a reconstruction of Texas Tertiary-age vegetation. Gretchen Jones (MS 1987) is a doctoral student using pollen to determine floral types of Texas honeys. She is also formulating a pollen verification table for use in Texas honey production and marketing. Robert E. Murry (MA 1983) is a doctoral student using pollen to examine the food economy of prehistoric puebloan groups like the Anasazi. James Parrent (PhD 1990) is a researcher who is preparing the first melissopalynology study of Jamaican honey types. Michael Pendleton (MA 1980) is a doctoral student pioneering new ways of using pollen to track and trap agricultural pest insects. Kristin Sobolik (PhD 1991), a paleonutritionist and palynologist, recently completed a study of prehistoric diet patterns spanning the last 10,000 years for areas of west Texas and the American Southwest. Peter Warnock (MA 1991), recently used plant macrofossils and pollen to reconstruct records of early plant usage during the Bronze and Iron Age in the Middle East. Eri Weinstein (MA 1985), is a doctoral student developing techniques for the recovery and analysis of pollen from submerged archaeological sites and shipwrecks. Laurie Zimmermann (MA 1985), a doctoral student, recently returned from field studies in Ecuador where she conducted fossil pollen studies of the paleoenvironment.

## BASIC RESEARCH

On-going research projects include:

Reconstruction of Texas Paleoenvironments: For over 20 years personnel at the laboratory have been examining fossil pollen from a variety of archaeological sites, peat bogs, and lake deposits in Texas. Additional fossil data have come from seeds, wood, and charcoal specimens recovered from a wide range of Texas archaeological sites. These combined data have enabled us to propose a 30,000 year record of vegetational cycles for most regions of Texas.

Coprolite Studies: Using the Eric O. Callen collection and specimens from the laboratory's collection, personnel have conducted pollen studies of coprolites ranging from the first studies of prehistoric coprolites recovered from Andean sites in Peru to an examination of ancient Eskimo coprolites collected from sites at Point Barrow, Alaska. Other coprolite studies have focused on analyses of specimens from: 1) coastal archaeological sites in Peru and Chile, 2) rockshelter sites in arid regions of northern Mexico, 3) open sites in southern Canada, 4) Neanderthal cave sites in southern France, 5) a Homo erectus site at Nice, France, 6) a single sample from an Early Man site in South Africa, 7) multiple studies of coprolites from sites throughout west Texas, 8) coprolites from numerous pueblo sites in the American Southwest, and 9) privy deposits excavated at colonial sites in eastern North America and from pre-Civil War plantations in Louisiana. Through these studies we have been able to develop and refine

techniques used in coprolite analyses and have broadened our knowledge of prehistoric dietary and paleonutrition patterns.

### Nautical Palynology and Paleoethnobotany:

For nearly a decade personnel from our laboratory have been in the forefront of studies of underwater paleoethnobotany and have pioneered many of the recovery techniques now being used to sample and collect fossil pollen samples, seeds, wood, charcoal, phytoliths, and sediment soil samples from underwater archaeological sites and shipwrecks. These efforts have helped underwater archaeologists recognize the vast wealth of information potentially available from botanical materials recovered from submerged sites and shipwrecks. Recent discoveries by lab personnel include the first records of plant materials used as cargo in Arab, Greek, and Byzantine ships that sailed the Mediterranean Sea, and the identification of woods used in the construction in one of the earliest diptychs (wooden book) ever recovered. In North America, other pollen studies of sunken shipwrecks are uncovering some of the dietary reasons responsible for the defeat and eventual surrender of the British forces at Yorktown during the Revolutionary War. Another study, still in progress in Jamaica, involves the search for pollen and other botanical evidence that might indicate the diet eaten by Christopher Columbus and his sailors while marooned on the island of Jamaica during his last voyage to the New World in 1503.

### Melissopalynology:

The United States is the third largest producer of honey in the world yet it is alone in lacking data that could be used to quantify and verify the contents of domestically produced honey. This absence of data has hampered export of U.S. honey and has enabled unscrupulous merchants to market honey without legal need to prove the floral type indicated on the label. A study now in progress by lab personnel is designed to correct this problem. Using over 650 honey samples from locales in all 50 states, we are conducting extensive chemical and pollen studies to produce the first comprehensive data base of compositional information about U.S. domestic honey. Once completed, these data will enable the enforcement of strict labeling laws and will promote the export of domestic U.S. honey to other nations.

### Entopalynology:

Pioneering efforts by our laboratory personnel, in cooperation with USDA scientists, are perfecting methods for tracing the migration and feeding habits of two major agricultural insect pests. Using pollen analyses we are examining the diets of insects (i.e., the boll weevil and corn earworm) for clues about their life cycles, feeding habits, and migrational patterns. The resulting data are already

being used to develop new techniques for controlling these pests.

#### Forensic Palynology:

A funding grant from the U.S. Customs Agency has enabled laboratory personnel to perfect palynological techniques for verifying the geographical origin of goods imported into the United States. These techniques were recently incorporated into a one-week short course for forensic specialists from each of the U.S. Customs Agency labs. Our laboratory personnel are also helping other agencies (FBI, DEA, state and local police) learn how to use forensic palynology to detect the origins of illegal drug shipments and how to use pollen evidence to link criminals to the scene of crimes or with stolen goods. Most recently, laboratory personnel have used pollen data to assist Texas authorities in a homicide case.

#### Pollen and Plant Macrofossil Analyses:

For 20 years our laboratory personnel have played an active role in the recovery and analysis of fossil pollen and plant macrofossils recovered from archaeological sites. These include pollen, wood samples, charcoal, phytoliths, and plant fibers. These studies have provided insights about prehistoric vegetational conditions and environmental changes as well as clues about the diets and nutritional standards of ancient cultural groups. Several studies under investigation include an examination of food resources used by early settlements in the Middle East, a detailed look at 10,000 years of plant use by ancient cultures in southwest Texas, and a reconstruction of plant cargos carried by storage ships used to resupply the British forces at Yorktown during the Revolutionary War.

#### Phytolith Analyses:

Although a new research area for our lab personnel, we are developing a modern phytolith reference collection and are beginning to conduct research studies in this field. We are finding that a significant interpretive advantage is possible when we use both pollen and phytolith data from the same deposits.

#### STUDENTS AND RESEARCH

During the past 20 years, 13 Texas A&M students have used the laboratory's facilities to conduct research leading to doctoral degrees. Currently, there are 10 additional graduate students working in the laboratory.

Laboratory staff are interested in working on collaborative research efforts with other scientists. In addition, we also perform a wide range of applied and contract services for various agencies and companies. These include:

1. Processing pollen, kerogen, and phytolith samples from archaeological sites or geological sediments

ranging in age from the Devonian through the Tertiary. Slides and vials of the residues are then returned for analysis by other personnel.

2. Our personnel are also available to conduct field sampling and complete laboratory analyses of all types of palynology samples from the Quaternary. We also have limited experience working with Tertiary palynomorphs.



## AMERICAN ASSOCIATION OF STRATIGRAPHIC PALYNOLOGISTS

### 25 YEARS OF SERVICE

#### THE BACKGROUND, ORIGIN, AND EARLY HISTORY OF THE AMERICAN ASSOCIATION OF STRATIGRAPHIC PALYNOLOGISTS

This article is taken from *Palynology*, 7:17 (1983) where photographs of our founding members can be seen - and do they ever look young!

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#### INTRODUCTION

The history of any organization is of interest to its members and to others for many reasons, not least of which is the fact that the developments of the past often

have considerable impact on the present and future. Furthermore, if the nature of an organization is influenced by its past, it is important that the understanding of that past be based on correctly reported and correctly understood facts. History has also a not insignificant responsibility to credit the contributions of individuals of the past correctly, in the spirit of truth. Too often are later generations fed legend instead of truth. The history of science and scientific association is no less important than the history of other important human endeavors. The authors of this short history of the origin of the American Association of Stratigraphic Palynologists intend to record the significant facts, while their memories are still clear and their records still intact.

## PREHISTORY

The history of formation of scientific organizations by persons studying fossil spores/pollen and other palynomorphs follows rather closely the general history of the subject. Although Ehrenberg, Goeppert, and others looked at pre-Quaternary palynomorphs well over a century ago, the early history of palynology belongs to the students of post-glacial (Flandrian) sediments and of modern spores and pollen. The beginning of "pollen-analysis" is usually set at 1916, with the publication of L. von Post's peat studies. The name palynology was introduced in 1944 by Hyde and Williams, two "actuo-pollen" investigators. In North America, though Thiessen and others had looked at spores/pollen in coal and other thin sections in the early 1900's, the majority of palynomorph (as we would now say) studies were in the direction of late Neogene pollen analysis along von Postian-Erdtmanian lines until well into the 1940s. Beginning in the late 1920s, and continuing into the 1940s, pollen analysis researchers met more or less informally to exchange information, and published their formal papers in a great variety of journals. Beginning in 1943 and off and on until 1954, there appeared in North America a somewhat informal little journal, the *Pollen and Spore Circular*. Nowadays we would call it a "newsletter". It was produced at first under the auspices of Paul B. Sears (Oberlin College; later at Yale University). From 1948 on, Sears and L.R. Wilson (Coe College, later in this period at University of Massachusetts and New York University) got out the *Circular* jointly. To be on the mailing list of the "PSC" was as close as one could come to belonging to a palynological society at the time! "PSC" included information about pre-Quaternary spores/pollen, but its emphasis was mostly Quaternary. Some Quaternary spores/pollen analysts, such as J.E. Potzger, were active in the Paleobotanical Section of the Botanical Society of America, and that organization, from its foundation in 1936 (Traverse, 1960), included pre-Quaternary spore researchers, such as James M. Schopf, among its membership. In February 1953 Stanley Cain of the University of Michigan organized a meeting at Yale of palynologists, mostly from the northeastern U.S. This meeting became known as the "First National Pollen

Conference" met in December 1953 in Boston, under sponsorship of the American Association for the Advancement of Science. Later, in 1956, Kathryn Clisby, as associate of Sears, hosted the "Third National Pollen Conference" at Oberlin College, attended by about 50 persons working in various aspects of palynology, including pre-Quaternary work. (One of us-A.T.-roomed with James M. Schopf at this session.) The Paleo-botanical Section of the Botanical Society of America had held special sessions on palynological systematics at its 1955 and 1956 meetings. Mostly at the behest of Alfred Traverse (then an officer of PS-BSA), the Section then sponsored special palynological programs labelled the "Fourth" and "Fifth National Pollen Conferences," as part of the annual meetings of 1957 and 1958, respectively. The idea was to provide a forum under the aegis of the Paleo-botanical Section of the "Bot.Soc." for palynological meetings and to keep micro- and megafossil people together. These fond hopes were not realized. As one of us has already noted elsewhere (Traverse, 1974), most palynologists of the late 1950s did not regard themselves as paleobotanists. Many were in fact geologists. Increasingly they were employed by oil companies, and the aims of their research were mostly stratigraphic. Further, some of the megafossil paleobotanists were unhappy about the prospect that the Paleobotanical Section would be dominated by palynologists if it became the primary organizational focus for paleopalynology in North America. In a way, this was related to an early sampling of opinion of spores/pollen researchers that might have led to formation of an American palynological society a decade earlier than occurred. John F. Grayson, an oil company palynologist, in 1957 polled over 60 palynologists as to their desires on palynological organization, stating in his report on the study that he personally was "... very much in favour of a separate palynological organization." Forty-eight of the 62 respondents to Grayson's questionnaire favoured a separate palynological organization. Grayson stated in a discussion period at the Paleobotanical Section's Fifth National Pollen Conference in 1957 (Palo Alto, California) that part of his motivation was concern that it was not fair to either the Paleobotanical Section, or to the palynologists, for the Paleobotanical Section to become a *de facto* palynological society. Grayson was probably right. Traverse had hoped to have a "palynological committee" as part of the structure of the Paleobotanical Section, and what he had in mind was not unlike the organization of the present *Arbeitskreis für Paläobotanik und Palynologie* in Germany. However, the increasing numbers of people becoming paleopalynologists in North America, and their prevailingly non-academic orientation, pointed in another direction. At the same time, Grayson's questionnaire did not result in the birth of a society, partly because some of us who might have helped were still hoping to avoid just that event!

A little later, well attended international meetings such as the First International Conference on Palynology held in Tucson, Arizona, in 1962, made it clear that palynology, especially paleopalynology, was growing so

rapidly that the time for formal organization was ripe. Among other things, there was a real possibility that a truly International Society would come into being from the International Committee established at the Tucson Conference to arrange for the Second International Conference at Utrecht. Indeed, this International Committee did evolve into the International Commission for Palynology, the present sponsoring body for the International Conferences. ("ICP" is now a Federation of about 20 palynological societies worldwide and is a constituent body of both the International Union of Biological Sciences, and the International Union of Geological Sciences.) Curiously, it was the move toward an international organization that brought about the formation of the American Association of Stratigraphic Palynologists!

### THE SULLIVAN CIRCULAR

The improbable location of the early discussions which led up to the next attempt to form a North American palynological society was Krefeld, West Germany. A group of palynologists assembled at the Krefelder Hof on 26 August 1966, to consider P.K.K. Nair's proposal to establish a World Palynological Organization headquartered in Lucknow, India. Four North America-based palynologists were present at the meeting: G.O.W. Kremp, L.E. Stover, H.J. Sullivan, and L.R. Wilson. During the deliberations, which centered on the relative merits of regional and specialist groups, as opposed to international organizations, it was suggested that perhaps this was an opportune time to resurrect the concept of a North American palynological society. Herb Sullivan volunteered to prepare and distribute a questionnaire to determine the measure of support for such a society.

During the following six months, Sullivan made informal contacts with a number of palynologists, and there appeared to be strong support in North America for a palynological society which emphasized the biostratigraphic aspects of the science in pre-Pleistocene rocks. Individual mailing lists solicited from colleagues were consolidated into a comprehensive register, and this formed the basis for the first mailing of the questionnaire to 151 palynologists on 30 March 1967. A further 111 persons were later contacted as a result of a request in the circular to submit additional names. Recipients were asked whether they were in favour of participating in an association of stratigraphic palynologists, and their views were sought on the name, affiliations and function of the proposed society. Of the 262 copies of the circular distributed, 155 were completed and returned. The tally showed that 140 voted in favour of a society, nine were opposed, and six elected not to commit themselves at that stage. The strong measure of support for the proposal provided the mandate to organize a business meeting, and invitations were extended to all palynologists who had replied to the questionnaire.

### THE FOUNDING MEETING

Thirty-two palynologists gathered for the organizational meeting in a conference room of the Pan American (now Amoco) Petroleum Company's Research Center in Tulsa, Oklahoma, on 8 December 1967. In attendance were the following:

O. Ben Bourn	Kenneth M. Piel
Robert R. Clarke	Delbert E. Potter
Fritz H. Cramer	William A.S. Sarjeant
William C. Elsik	Mart P. Schemel
George R. Fournier	Bernard L. Shaffer
John F. Grayson	Howard M. Simpson
George F. Hart	Lewis E. Stover
Richard W. Hedlund	Herbert J. Sullivan
William S. Hopkins, Jr.	Robert L. Tabbert
Arthur E. LeBlanc	Mel W. Thompson
Dennis R. Logan	Alfred Traverse
D. Colin McGregor	Charles F. Upshaw
William C. Meyers	Logan L. Urban
David R. Mishell	James B. Urban
Paul W. Nygreen	William F. Von Almen
Earl T. Peterson	Graham L. Williams

Bob Tabbert was elected chairman of the meeting, and Herb Sullivan was appointed recording secretary. The first item of business was the proposal to form a society and a statement of its aims. The motion, "The objects of this society are to promote the science of palynology, especially as they relate to stratigraphic applications and to biostratigraphy; to foster the spirit of scientific research among its members; and to disseminate information relating to palynology," was carried by an overwhelming majority.

A name was now required for the new society. In the March 1966 circular, it was suggested that the Society of North American Palynologists (SNAP) might be appropriate, and this name received a majority of the votes (18) in the first ballot at the founding meeting. However, because of the voting procedures agreed upon at the meeting, only the name receiving the lowest number of votes in each ballot was eliminated, so that by the third ballot the name "American Association of Stratigraphic Palynologists" emerged the victor by a 17 to 14 vote (one abstention). The debate on the duties and mode of election of officers then took most of the rest of that day, and it is a testimony to the quality of the deliberations that the composition of the executive, and the definition of its duties remain generally unaltered to the present day.

The voting for officers took place in the late afternoon and the following morning. Elected were:

President	Paul W. Nygreen
Vice-President	D. Colin McGregor
Secretary-Treasurer	Alfred Traverse
Editor	Lewis E. Stover
Councillors	Robert L. Tabbert
	Charles F. Upshaw
	George R. Fournier

All present were accorded the status of "Founding members." Paul Nygreen concluded by announcing that those at this meeting had "witnessed the birth of a new

society." (by coincidence, 8 December is recognized by the Roman Catholic Church as the Feast of the Immaculate Conception) and that he was going to appoint several committees to help in the organization of the association. The first meeting of the new Executive Committee was called for the afternoon of 9 December.

#### AFTERMATH OF THE TULSA MEETING

Despite newly-elected President Nygreen's sanguine estimate of the situation, the first several years of AASP's existence were not absolutely problemless, as one of us (A.T.), the first Secretary-Treasurer, can attest. First, the original membership of less than 40 was obviously not large enough for an effective society to operate and, although AASP began to grow fast immediately following the formal announcement of its existence, the growth did not provide for several years the threshold membership necessary for a secure, healthy society. By the end of the first "post-Tulsa" Executive Committee session in Dallas, 28-29 March 1968, the paid-up membership stood at 83. By the time of the First Annual Meeting (=Convention) at Louisiana State University, 17-19 October 1968 the total membership was 188 personal members, plus one institutional member, and by the end of 1968 there were over 200 members on the books. This represented a dramatic, almost 700% increase in one year, but that is partly a comment on the small founding membership. For some time after the rapid rise to around 200 in 1968, new memberships barely balanced lapsed memberships, so that at the Second Annual Meeting at the Pennsylvania State University, 18-22 October 1969, the fully paid-up membership was only 201. It was to be some time before the total membership increased much beyond the 200-300 level.

Furthermore, during the critical years of formation, 1967-1970, the names of a number of the most prominent paleopalynologists in North America are not to be found on AASP's membership roster. Several of them were, in fact, opposed to the formation of AASP, and did not wish it well, let alone join! The reasons were diverse, for example that the founders of AASP allegedly did not sufficiently consult with or fully inform the persons concerned about the birth-procedures for the new organization. Other persons adopted a wait-and-see attitude and did not in fact join AASP until years later, when it was a going concern with a proven "winner" in a Proceedings volume worth more than the dues. Still other persons either feared that AASP was and would be dominated by a clique, or would be oil-company dominated, or they felt that such an organization should not be independent, but should be affiliated with one of the larger scientific organizations, or with the nascent International Commission for Palynology.

It is clear that the biggest boosts to AASP in the formative 1967-1970 years were the very well-attended and scientifically productive Annual Meetings at LSU, Penn State and the University of Toronto in 1968, 1969, and 1970, respectively. The appearance of thick and useful

proceedings volumes devoted mostly to papers and abstracts from the AASP conventions was also a major factor in signalling that AASP was to be taken seriously. The proceedings volumes appeared at first as issues of the LSU-based journal *Geoscience and Man*. It proved confusing to many (the Penn State librarian is still puzzled, that AASP Proc. 1 is *Geoscience and Man* Vol. 1, but AASP Proc. 2 is *Geoscience and Man* Vol. III, AASP Proc. 3 is *Geoscience and Man* Vol. IV, AASP Proc. 4 is *Geoscience and Man* Vol. VII, etc. (After AASP Proc. 7, the Association established its own Journal, *Palynology*, and bibliographers sighed with relief.)

The Secretary's minutes covering the period from the founding meeting in Tulsa, December 1967 to the Third Annual Meeting in Toronto, October 1970, reveal some quite interesting, easily forgotten things. First, the attitude of everybody at the founding meeting was very confident and forward-looking. We were sure that we had moved in the right direction in starting a paleopalynological society at this time and that it would "go". The Sullivan questionnaire had been a well-struck match to light the fire. Enthusiasm and commitment ran deep. (It was to be several years before there was a single absence at Executive Committee sessions, though the meetings were called for some unlikely places, such as O'Hare Airport - March 1970!) However, there was considerable opposition to the new organization, as the founding Secretary-Treasurer is doubtless in the best position to recall from countless contacts on behalf of AASP he made between the founding meeting and the end of his term, in October 1970. The inner circle of officers remained a quite small group for several years, as can be seen easily by comparing the officers for 1968-1970 with the above-listed slate of founding officers:

1968-69		1969-70
Charles F. Upshaw	President	George Fournier
George R. Fournier	Vice-President	Geoffrey Norris
Alfred Travers	Sec-Treasurer	Alfred Traverse
Lewis Stover	Editor	Richard Hedlund
Paul Nygreen	Past Pres. (Councillors)	Charles Upshaw
Marsha Winslow		Daniel Habib
Richard W. Hedlund		John W. Hall

There were those who viewed these lists as proof of clique-control. In fact, the cohesiveness and commitment of this group of people helped to assure the survival in good health of the infant organization.

The minutes of the early Executive Committee meetings are very informative reading after an intervening decade and a half, during which AASP has become a solid, prosperous society with about 800 members, its own journal and an endowed foundation. Doing things properly, and good communication were recognized as important from the beginning, and thus the first *Newsletter* and the constitution of the Association were circulated to the membership in 1968, even before the first annual



convention! Cooperation with other groups of scientists was another early focus of attention, and one of the first checks ever drawn on an AASP account was for \$25, sent from the tiny post-Tulsa treasury to the 1969 Paleontological Convention in Chicago, to make AASP an official supporting organization of that session. However, opposition was expressed from the very beginning to AASP being a formally affiliated section or division of any other society - an independent society was desired.

That AASP survived its birth and infancy despite opposition is mostly attributable to three factors. First, a broadly based group of palynologists shared enthusiasm for the new venture, and the time was ripe. Second, cooperation and financial encouragement was forthcoming from oil company management. This made possible large attendance at the early annual meetings and perfect attendance at early Executive Committee sessions. Likewise facilitated were such other critical matters as very low dues (\$5.00 *per annum* far below the real cost of providing members with a Proceedings Volume, Newsletters, and a Membership Directory useful to any palynologist and alone worth the dues payment. All of these publications were made possible by *de facto* subsidies from most of the major oil companies. Third, a few university palynologists participated from the beginning, and they hosted on campus the first three, well-attended, stimulating and informative annual meetings - at Louisiana State University, the Pennsylvania State University and the University of Toronto. These meetings gave indisputable scientific-academic credibility to AASP.

## WHERE ARE THEY NOW ?

### 25 YEARS LATER

Many members of the AASP recognize the names of most of the founding members from the literature and may be curious about what they are doing now and what they look like now. Each of the founding members of the AASP was invited to send a photograph and write a short discourse on their current life styles - 25 years post-Tulsa. During our 25 year celebration - a "Where are they now" column will feature the founding members.

#### **Paul W. Nygreen** First AASP President

Looking back over 25 years, I recall supervising a small group of dedicated palynological personnel in the Chevron Oil Company Oklahoma City office; after starting the first Chevron operational palynology activity in

Amarillo, Texas ten years earlier. I transferred to Chevron Overseas Petroleum in 1971. In addition to overseas assignments (4 years in Australia and 7 years in Saudi Arabia), I mapped source rocks worldwide with stratigraphic studies and paleoclimatological and paleoceanographic research.

Since "retirement" in 1986, I monitor stock market and other investments and dabble in petroleum exploration, development and production. But the most important and satisfying activity is the contemplation of the being of nature and the nature of being.

#### **Dr. Alfred Traverse** First AASP Secretary-Treasurer

What have I done since 1967 - - - ?



Dr. Alfred Traverse in his office, Pennsylvania State University, 1989

Well, I've given the introductory palynology course at Penn State every year since 1965, teaching it one year at the University of Texas, without a single break, to an average of ten students per year - - - could be a record. (I've also taught the palaeobotany course since Bill Spackman retired.) I've signed off about 30 graduate degrees for various talented men and women. I've expanded the palynological lab at Pennsylvania State University to six rooms and built up our collections of literature, slides and specimens of various sorts, to a point where it is a really useful installation. I've been on-board palynologist on the Glomar Challenger and guest professor for a year at ETH-Zürich, and am about to be a Fulbright Professor in Germany in 1992. I've authored the first comprehensive text in English about paleopalynology. Any more of this sort of thing would be idle bragging, and besides, I've failed utterly to get palynology-palaeobotany accepted as a permanent part of the Pennsylvania State University scene, which was my aim here. When I go, it goes. I have no plans to retire, but even Methusaleh didn't



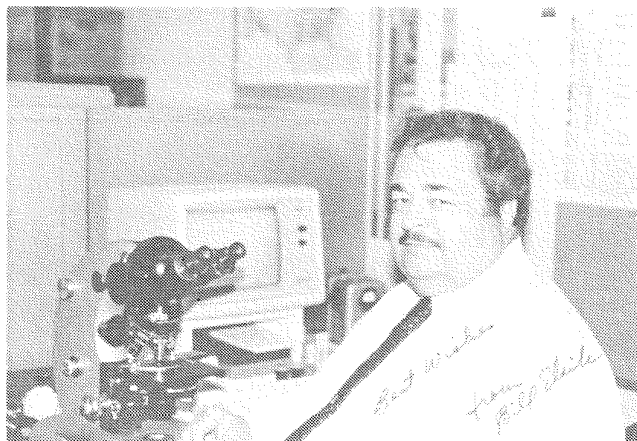
succeed in achieving immortality.

In 1967, I was curate of an Episcopal Church, and I later became vicar of another one, and I think I was a good priest, but I now have no church connection whatsoever. In a way these two stories have points in common, but I digress.

I do want to wish AASP all the best on its 25th birthday! I guess the first Secretary-Treasurer could claim to be at least one of the midwives at the original birth!

## Dr. William Elsik

Bill was employed by Humble Oil and Refining Company when he attended the founding meeting of AASP in 1967. He was assigned at different times to Humble, Esso Production Research Company, and finally, after the name change, to Exxon Company, U.S.A. Bill worked mainly on Cenozoic and Mesozoic service projects through the time of his acceptance of an early retirement offer in 1990.



Dr. William C. Elsik at his microscope... ca. 1990

Since helping to forge the organization in its infancy, Bill has served AASP in several capacities and is one of the past presidents of the organization. In addition, he has presented over 70 talks, seminars, lectures, workshops, shortcourses and published papers to the the palynological community.

Bill and his wife Mary Lynn still reside in Houston. They spend their time traveling to Chama and Santa Fe, New Mexico, visiting two grandsons, writing and planning a country home. Bill spends some time painting with watercolors and playing the accordion, but is still active in palynology. His AASP short course on Fungal Palynomorphs will be held in February 1992 in Houston.

Bill is available as a consultant or lecturer on any aspect of palynology, but prefers to deal with fungal palynomorphs and Cenozoic pollen. Special interests include fungal spores in modern soils and sediments, pollen

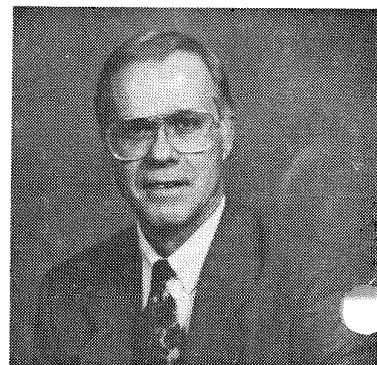
of the Monterey Formation of California and Compositae pollen of the Neogene of the Gulf of Mexico.

## Dennis R. Logan

In 1967, at the time of the founding meeting of the AASP, I was working as a palynologist at Phillips Petroleum Company in Bartlesville, Oklahoma. For the most part, I was doing palynological biostratigraphy of Alaska. A bit later I got more involved in various other exploration basins around the world. In 1970, during a Phillips belt-tightening purge, I was asked (ultimatum!) to serve my company as a Methods/Procedures Analyst for two years. I spent those years living out of a suitcase while studying the companies petroleum products marketing operations in the Eastern U.S.A.

I returned to the world of oil and gas exploration in '72 and have been doing palynostratigraphy and source rock potential analyses of prospective basins around the since that date. During the past 20 years, this has been especially interesting because it involved a good bit of travel to do well-site work and to present "dog and pony" shows for our overseas offices. I have also helped in the development of our computerized AI Source Rock Advisor program.

Today I am still doing palynostratigraphy of Alaska, as well as West Africa, South America and a little bit of the Far East. So far I have managed to dodge the numerous lay-off "bullets" fired my through the years, but it remains to be seen if I'm will be so lucky during the next planned attack!



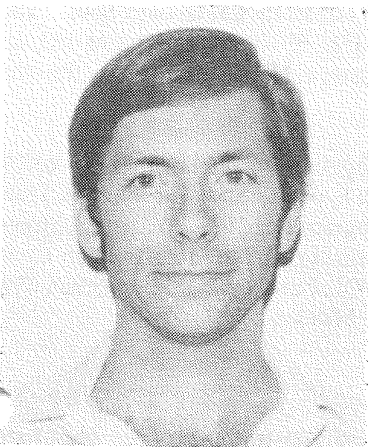
Dennis R. Logan, Phillips Petroleum...ca. 1990

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EDITORS NOTE: All founding members have been asked to send a photograph and a short article to describe their various current positions. I urge all founding members to get this information to me as soon as possible....JKL

## AASP STUDENT SCHOLARSHIPS

The AASP Awards committee is pleased to announce the winners of the 1991 Student Scholarships: Dale Beeson and Laurent de Verteuil. Scholarships are awarded in the amount of \$300 (US) and winners are chosen based on the qualification of the student, the originality and imagination evident in the proposed project, and the likelihood of significant contribution to the science of palynology.



Dale Beeson

Dale Beeson is completing his Ph.D at Penn State with the guidance of Alfred Traverse. Dale is a Washington state native and received his B.S. in geology from Western Washington University in 1978. He then spent four years doing coal exploration, from Alaska to the Dominican Republic. His M.S. in geology in 1984 is a cooperative study between

National Center for Atmospheric Research and the University of Colorado. He was first exposed to palynology through a course taught by Doug Nichols. That course was the key to landing a 3-year assignment in Southeast Asia as a palynostratigrapher with Core Laboratories International.

Dale's winning proposal is entitled "High resolution palynostratigraphy across a low latitude Cretaceous-Tertiary boundary horizon, Falls County, Texas." He will be studying qualitative and quantitative aspects of the palynomorph turnover and tying his results in with other biostratigraphic (foraminiferal and nannofossil), lithostratigraphic, magnetostratigraphic, and trace-element control.

Laurent de Verteuil is a native of Trinidad and Tobago. He is working on his Ph.D at the University of Toronto under the continuing tutelage of Geoffrey Norris and Martin Head. He received his early education at Fatima College in Port of Spain and Blackrock College in Dublin. He was awarded his B.Sc. degree in geology from the University of Toronto in 1987. Laurent spent the summer of 1987 with Trinidad and Tobago Oil Company and the summer of 1991 working as a student intern with the Global Tectonostratigraphic Framework Group within

Exxon Production Research Company.

"Dinoflagellate biostratigraphy and taxonomy of the Neogene Chesapeake Group in Maryland and Virginia: is Laurent's proposed investigation. Using outcrop and core samples from the Maryland and Virginia coastal plains, he expects to zone the Miocene and Pliocene based on dinoflagellate cysts. These zones will then be correlated with DSDP



Laurent De Verteuil

Sites 558 and 563 for ties with magnetostratigraphy, stable isotope signals, and calcareous microfossil zonations.

Lucy E. Edwards  
Chair, 1991 Awards Committee.

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## PALYNOLOGY AT THE OCEAN DRILLING PROGRAM

by John V. Firth

The Ocean Drilling Program has now been in operation for 7 years, and the drilling ship, JOIDES Resolution, has circumnavigated the world, drilling in a wide variety of geologic settings.

Micropaleontology has played a large role in answering many of the questions that provided impetus for ocean drilling (e.g., providing ages of tectonic events, stratigraphic correlations across ocean basins, depositional environments and histories of sediments, and paleoceanographic and paleoclimatic information related to the evolution of the Earth's oceans and climate). Although not as well studied in ocean cores as other microfossil groups (such as calcareous nannofossils, planktonic foraminifers, and radiolarians), palynomorphs are still being studied to a large degree in ODP cores, and the resulting information has made valuable contributions to the overall success of several ODP cruises.

Twenty three papers (listed below) on various aspects of palynology have been published in the iProceedings of the ODP, Science Results volumes to date. Thirteen other papers are in press or in prep for upcoming volumes (these numbers do not include organic geochemistry studies which occasionally also include some organic petrography, kerogen analysis, and brief comments

on palynomorph constituents). In addition, numerous shorebased studies have been done on ODP and DSDP (Deep Sea Drilling Project) cores, which are published in many different journals. Ongoing studies are also being pursued on dinoflagellate biostratigraphy of North Atlantic Paleogene sediments, dino biostrat of Cretaceous South Atlantic sites, and pollen analysis of many different regions. If you are interested in working on ODP/DSDP cores, or want to know what other palynological studies are being done on them, contact:

Assistant Curator  
Ocean Drilling Program  
1000 Discovery Drive  
Texas A&M Univ. Research Park  
College Station, Texas 77845

ODP has now recovered over 65 kilometers of core, most of which is oceanic sediments. Drilling has been conducted on continental margins (such as the Voring Plateau [Norway], Galicia Margin [Spain], Peru margin, Oman margin, Baffin Bay, northwest and northeast Australian margins, Antarctic margins [Weddell Sea and Prydz Bay]), carbonate platforms and oceanic plateaus (Bahama Platform, Kerguelen Plateau, Ontong-Java Plateau), and oceanic upwelling regions (northwest Africa and Peru margin), all of which have sediments containing palynomorphs ripe for study. In addition, some deep sea regions have also yielded good palynomorph assemblages (Labrador Sea, distal Bengal Fan). Beyond my own involvement on Leg 131, where I did a study of the palynofacies and thermal maturity of the actively accreting sediments of the Nankai Trough (presented as a poster at AASP's San Diego meeting), Shaozhi Mao recently sailed as a palynologist on Leg 139 which drilled into sediments and hydrothermal sulfide deposits in a young, fast spreading valley in the northern Juan de Fuca Ridge, offshore Vancouver Island. She is planning to do a pollen analysis of the Quaternary sediments. In spring of 1992, ODP has planned 2 legs to drill the Cretaceous drowned atolls and guyots of the west Pacific. I will be sailing as a palynologist on Leg 143. Here's hoping we can find some good material which will extend our knowledge of Cretaceous mid-Pacific palynology! A schedule of the planned drilling in 1992 and 1993 is enclosed. Staffing for legs up to Leg 145 have been completed. Leg 146 - Cascadia accretionary prism (offshore British Columbia and Oregon margins) is now being staffed, and palynologists may find this leg very interesting. The ship is scheduled to go into the North Atlantic for 1993. If you are interested in applying for participation on an ODP cruise, please send a letter to:

Manager of Science Operations  
Ocean Drilling Program  
1000 Discovery Drive  
Texas A&M Univ. Research Park  
College Station, Texas 77845.

If you want more information about upcoming legs, or about working on ODP/DSDP core material, please also contact me at the same address. My Bitnet address is

Firth@TAMODP, phone is 409-845-0507.

## PUBLISHED ODP PAPERS ON PALYNOLOGY:

### Leg 101:

Albian-Cenomanian Dinoflagellate Cysts from Sites 627 and 635, Leg 101, Bahamas -- Edwige Masure

### Leg 103:

Stratigraphic Implications of Early Cretaceous Spores and Pollen Grains at Holes 638B, 638C, and 641C, Leg 103, off the Iberian Margin, Eastern North Atlantic -- Josette, Taugourdeau-Lantz

Palynology of the Valanginian-Barremian in Hole 638B, Barremian-Albian in Hole 641C, and Turonian in Hole 641A, Ocean Drilling Program Leg 103 -- Warren S. Drugg and Daniel Habib Berriasian to Aptian Dinoflagellate Cysts from the Galicia Margin, Offshore Spain, Sites 638 and 639, ODP Leg 103 -- Edwige Masure

### Leg 104:

Palynology and Dinocyst Biostratigraphy of the Late Miocene to Pleistocene, Norwegian Sea: ODP Leg 104, Sites 642 to 644 -- Peta J. Mudie

Eocene to Miocene Palynology of the Norwegian Sea (ODP Leg 104) -- S.B. Manum, M.C. Boulter, H. Gunnarsdottir, K. Rangnes, and A. Scholze

Brito-Arctic Igneous Province Flora around the Paleocene/Eocene Boundary -- M.C. Boulter and S.B. Manum

### Leg 105:

Late Pliocene to Holocene Palynostratigraphy at ODP Site 645, Baffin Bay -- A. deVernal and P.J. Mudie

Pliocene and Pleistocene Palynostratigraphy at ODP Sites 646 and 647, Eastern and Southern Labrador Sea -- Anne deVernal and Peta J. Mudie

Palynology and Dinocyst stratigraphy of the upper Miocene and lowermost Pliocene, ODP Leg 105, Site 646, Labrador Sea -- Martin J. Head, Geoffrey Norris, and Peta J. Mudie

New Species of Dinocysts and a new species of acritarchs from the upper Miocene and lowermost Pliocene, ODP Leg

105, Site 646, Labrador Sea -- Martin J. Head, Geoffrey Norris, and Peta J. Mudie

Palynology and Dinocyst stratigraphy of the Miocene in ODP Leg 105, Hole 645E, Baffin Bay -- Martin J. Head, Geoffrey Norris, and Peta J. Mudie

Palynology and Dinocyst stratigraphy of the Eocene and Oligocene in ODP Leg 105, Hole 647A, Labrador Sea -- Martin J. Head and Geoffrey Norris

Leg 108:

First Palynological Results from Site 658 at 21°N off Northwest Africa: Pollen as climate indicators -- Lydie M. Dupont, Hans-Jürgen Beug, Hartmut Stalling, and Ralf Tiedmann

Leg 112:

Late Neogene to Pleistocene Palynological Facies of the Peruvian Continental Margin upwelling, Leg 112 -- A.J. Powell, J.D. Dodge, and Jane Lewis

Quaternary Dinoflagellate Cysts from the upwelling system offshore Peru, Hole 686B, ODP Leg 112 -- Jane Lewis, J.D. Dodge, and A.J. Powell

Leg 113:

Eocene and Oligocene Sporomorphs and Dinoflagellates Cysts from Leg 113 Drill Sites, Weddell Sea, Antarctica -- Barbara A.R. Mohr

Early Cretaceous Palynomorphs from ODP Sites 692 and 693, the Weddell Sea, Antarctica -- Barbara A.R. Mohr

Leg 116:

Pleistocene climatic changes as deduced from a pollen analysis of Site 717 Cores -- Y. Yasuda, K. Amano, and T. Yamanoi

Leg 117:

Pollen Transport into Arabian Sea sediments -- Elise Van Campo

A pollen analysis of the Indus Deep Sea Fan from Site 720 Cores -- Y. Yoshinori, N. Niitsuma, and A. Hayashida

Leg 119:

Late Cretaceous dinoflagellate cysts from the Southern Kerguelen Plateau, Site 738 -- B.A. Tocher

Leg 124:

Palynological aspects of Site 767 in the Celebes Sea. -- W.A. van der Kaars

IN PRESS:

Leg 120:

An Early Albian Palynoflora from the Kerguelen Plateau, Southern Indian Ocean (Leg 120) -- B.A.R. Mohr and C.T. Gee

Late Cretaceous Palynofloras (Sporomorphs and Dinocysts) from the Kerguelen Plateau, Southern Indian Ocean (Sites 748 and 750) -- B.A.R. Mohr and C.T. Gee

Late Cretaceous dinoflagellate cysts (?Santonian-Maestrichtian) from the Southern Indian Ocean (Hole 748C) -- S. Mao and B.A.R. Mohr

Leg 122:

First results of Late Triassic palynology of the Wombat Plateau, northwestern Australia -- W. Brenner

Dinoflagellate cyst stratigraphy of the Lower Cretaceous sequence at Sites 762 and 763, Exmouth Plateau, northwest Australia -- W. Brenner

Leg 123:

Neogene dinoflagellate cysts from the Exmouth Plateau and Argo Abyssal Plain -- A. McMinn

A preliminary report of early Cretaceous dinocyst floras from ODP Site 765, Argo Abyssal Plain, northwest Australia -- A. McMinn

Neogene pollen history from Site 765, eastern Indian Ocean -- A. McMinn, H. Martin

PAPERS IN PREPARATION:

Leg 127/128:

Neogene palynology of the Japan Sea: stratigraphic and paleoenvironmental implications -- Linda Heusser

Preliminary results of high-resolution pollen analysis of selected Pleistocene intervals from Site 798 -- Linda Heusser

Miocene pollen stratigraphy of ODP Leg 127 in the Japan Sea -- T. Yamanoi

Leg 129:

Early Cretaceous palynomorphs of the Pacific Ocean -- G. Ogg

Leg 131:

Palynofacies and thermal maturation analysis of sediments from the Nankai Trough -- J.V. Firth

EDITORS NOTE: The "Leg" number for these reports are equal to the volume number in *Initial Reports of the Deep Sea Drilling Program* (or *Ocean Drilling Program*), published in Washington DC. The author of this article did not provide the year for the publication of each leg volume.

#### ODP DRILLING SCHEDULE FOR 1992-1993

Leg 142 - Jan. 18 - March 19, 1992 : Engineering, East Pacific Rise - development of diamond coring system for bare rock drilling in zero age crust. No paleontologists will sail on this cruise.

Leg 143 - March 24 - May 20, 1992: Atolls and Guyots A - drilling drowned atolls and guyots in the central Pacific, Marshall Islands region to study Cretaceous and Cenozoic volcanism, sea-level fluctuations, and atoll development. John Firth will sail as a palynologist on this leg.

Leg 144 - May 25 - July 20, 1992: Atolls and Guyots B - drilling drowned atolls and guyots in the central and west Pacific, Marshall Islands to Japan region, to study Cretaceous and Cenozoic volcanism, sea-level fluctuations, and atoll development. \*\* Palynology position open for this leg\*\*.

Leg 145 - July 25 - Sept. 21, 1992: North Pacific Transect - to study North Pacific Cretaceous and Cenozoic paleoceanography and paleoclimatology. No palynologists will sail on this leg.

Leg 146 - Sept. 26 - Nov. 21, 1992: Cascadia - drilling the accretionary prism on the margins of British Columbia and Oregon, so study the structural and hydrogeological development of the prism, and to study the development of hydrates. \*\* Palynologists should apply for this leg \*\*.

Leg 147 - Nov. 26, 1992 - Jan. 21, 1993: Hess Deep - hard rock drilling through the Mantle 2/3 layer boundary, Layer 3 (gabbros) and Layer 3/Mantle boundary. No paleontologists will sail on this leg.

Leg 148 - Jan. 26 - March 23, 1993: Engineering, Mid Atlantic Ridge. Development of the diamond coring system for bare rock drilling. No paleontologists will sail on this leg.

Leg 149 - March 28 - May 23, 1993: Iberian Abyssal Plain - timing and development of rifting of the Atlantic Ocean, drilling of the continental/oceanic crust transition. This is phase 1 of drilling conjugate non- volcanic rifted margins on both sides of the Atlantic Ocean. \*\* Palynologists should apply for this leg \*\*.

Leg 150 - May 28 - July 23, 1993: New Jersey Sea Level - drilling the continental shelf off of New Jersey to study mid Cenozoic sea-level fluctuations and seismic stratigraphy. \*\* Palynologists should apply for this leg\*\*.

Leg 151 - July 28 - Sept. 22, 1993: Atlantic Arctic Gateway - drilling the Greenland Sea north of Iceland and the Arctic Ocean and Fram Strait north and west of Svalbard. To study the development of ocean circulation, glaciation, and rifting of the passageway between the North Atlantic and Arctic Oceans. \*\*Palynologists should apply for this leg\*\*.

Leg 152 - Sept. 27 - Nov. 22, 1993: East Greenland Margin - to study the timing and development of a volcanic rifted margin. This is phase 1 of drilling volcanic rifted margins on both sides of the Atlantic Ocean. \*\*Palynologists should apply for this leg\*\*.

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#### Paly Time

Each day in time I travel  
into the years gone by.  
A half a billion years to me  
is but a twinkling of an eye.

I set the glass, and move the stage,  
for a new drama to appear.  
I know the life there was,  
so few can hold so dear.

I marvel at the beauty  
and even see it in its days.  
I walk along the pollen path  
in a myriad of ways.

Before a man, before a bird,  
before a single tree,  
but every Era, there it is,  
that same great mystery.

I do not know the reasons  
why this privilege is mine,  
but I'll not lose the blessings  
it bestows upon the mind.

I'll hold the images I see  
for they are all divine,  
then simply open up my eyes  
and transcend the cloak of time.

Daniel L. Pearson

# TECHNICAL NOTE

## SAVITRINA REVEALS HER SECRETS IN THE ORIENT

by Judith Lentin

One of the joys of being a palynological consultant is the variety of geographic locations, ages, and environments of deposition from which palynological samples are examined. One of the associated problems is that the details regarding information generated from the study of these samples must, unfortunately, remain strictly confidential. This problem is particularly annoying when an unusual palynomorph is present in the sample and needs elucidation.

I recently examined some samples from the subsurface, Yellow Sea. The Eocene-Oligocene sediments are lacustrine in origin and contain an impressive suite of non-marine dinoflagellates, many of which were originally described by He and other Chinese palynologists. Various species of *Pediastrum* are also extremely abundant in the samples. A good suite of lacustrine ostracods have been examined from the interval and provide good depositional environment control. The palynomorph which is of particular interest is *Savitrina*.

This genus was originally described in 1966 by Ester Nagy from some non-marine deposits from Hungary. She clearly states (p.42) that the genus is a good indicator of a non-marine environment of deposition. She also indicates that she believes that the palynomorph is some form of plankton. Lentin and Williams (1973 through 1990) have never listed it as a dinoflagellate. However, Fensome et al., 1991 do list it as an acritarch.

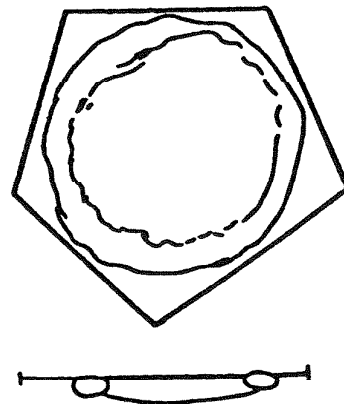
The genus *Savitrina* Nagy, 1966 was originally described as follows:

"Diagnosis - Central body from globular to polygonal, with an equatorial membrane, mostly polygonal, sometimes circular. The formations are composed of extremely thin membranes. Differential diagnosis - Owing to their shape assuming particular geometries, these forms cannot be included in any of the categories established so far for planktonic organisms."

Because this generic diagnosis could include almost anything, we might learn more from the description of the type species of the genus, *Savitrina miocenica*:

"Total diameter 42 $\mu$ . Central body of 37 $\mu$  diameter, surrounded by a polygonal, mostly pentagonal membrane 2-5 $\mu$  wide. Outer membrane situated not in the equatorial plane of the central body, but

in one of the circles close to the point admitted as pole. Surface finely folded. Edge finely granulate having a very unevenly undulated, finely-patterned outline. Membrane extremely thin, sculptured by fine granuli roughly perpendicular to the edge (Fig.2)."



Text-fig. 2 of Nagy, 1966

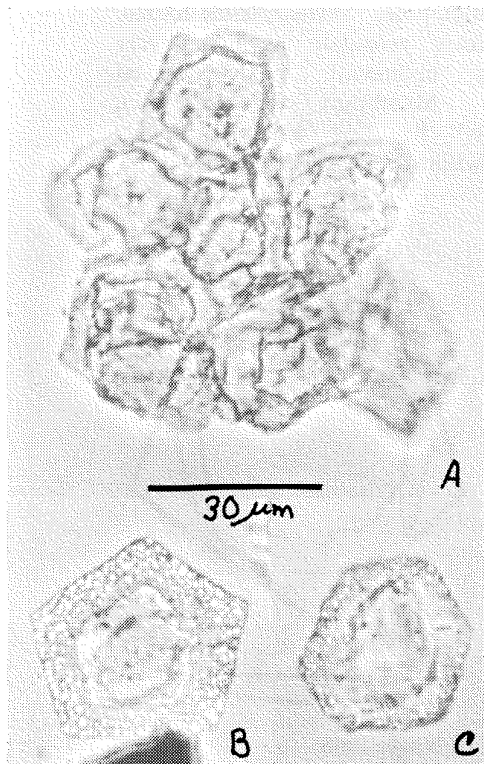
Were it not for Nagy's figure 2 (reproduced above) it would be impossible to understand the morphology of this strange fossil.

The forms recovered from my oriental samples are similar to *Savitrina miocenica*. However, Nagy's line drawing suggests a thickened area around the base of the "central body", like a hat band. My somewhat older oriental specimens show no sign of a thickened area and may represent a new species. The fossils are extremely abundant in my material, I have at least 100,000 individual specimens. Better still, I have some masses of *Savitrina* which provide a clue to its origin, form and function.

Although many of my specimens are 5 sided (see photograph B on the next page), their outline is variable, though always distinctly angular. Specimens with 5, 6, 7 and 8 sides have all been observed and there is no apparent dominance. *Savitrina* can best be described as resembling a hat with an angular brim. Like a hat, the crown is usually fully "inflated", but when flattened, there are numerous random folds which accommodate the original fullness.

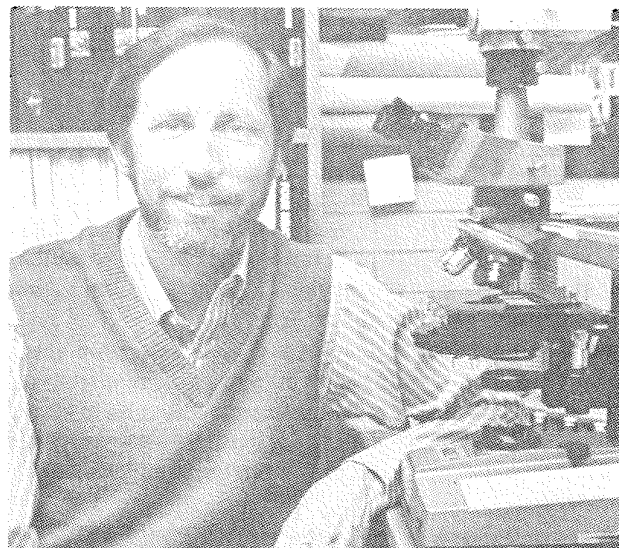
If only a few specimens were observed (Nagy had only 6 specimens) it would be easy to accept that this is a single celled organism. However, as shown in the following photos, *Savitrina* is actually a colonial organism which is very loosely assembled. The most logical supposition is that this form is a colonial algae. I can only speculate on this point because of my limited botanical library.

I sincerely hope that one of our AASP members is a fresh-water algae specialist or has a friend who knows the



*Savitrina* sp. [A] fragment of a colony; [B-C] individual specimens as most commonly observed.

subject. I would be delighted to know if there is an extant algae which forms such distinctive cells. I am sure they would be surprised and delighted to know that this organism evolved at least 50 million years ago in the massive lakes of the Orient and is also known from Hungarian lake sediments which were deposited 9-10 million years before the present.



Dr. Reed Wicander, Book Review Editor, AASP NEWSLETTER

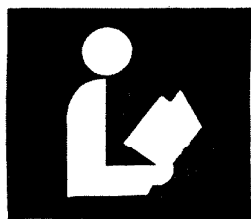
The Innocent Assassins is a collection 13 essays written by the noted paleontologist Bjorn Kurten. Combining numerous amusing anecdotes from his own research along with an engaging conversational style of writing, Bjorn Kurten provides the general reader with a look at how science works and how some scientists think. Each essay is further enlivened by the cartoon-like illustrations of Vikin Nystrom.

In this book, Kurten tells us what it would be like to actually be the "Incredible Shrinking Man," as well as the physical impossibility of a giant creature like King Kong. Kurten explains why the sabertooth tigers were called "the innocent assassins" (and hence the title of the book) and how a Miocene Argentinian bird, Argentavis, with a wingspan of 7-7.6 meters could fly. Kurten also writes on what it means to think biologically and why some people love the countryside. There even is reference to palynology with a full page illustration of Pleistocene pollen grains in his essay on "The Clock in the Rock."

This is an excellent book that is hard to put down. It brings science to the general reader in a manner that is both interesting and informative. I highly recommend it and hope that it receives the wide audience it deserves.

The Emergence of Animals. 1990, by Mark A.S. and Dianna L. Schulte McMenamin. Columbia University Press, 562 West 113th Street, New York, New York 10025. \$17.00 (paperback). 217 pages.

In this book the authors examine the Precambrian-Cambrian boundary, one of the major boundaries in Earth history. This boundary has always fascinated geologists and paleontologists because it



## REVIEWS OF BOOKS RECENTLY RECEIVED

by Reed Wicander  
Department of Geology  
Central Michigan University  
Mt. Pleasant, Michigan 48859

The Innocent Assassins. 1991, by Bjorn Kurten. Columbia University Press, 562 West 113th Street, New York, New York 10025. \$19.95 (hardcover). 206 pages.



traditionally marked the first record of macrofossils and the emergence of shelled animals. Prior to 1930 few geologists believed there was any good evidence for life before the Cambrian. In fact, Charles Darwin realized the problems presented to his gradual theory of evolution by the "sudden explosion" of life at the beginning of the Cambrian Period. An "age of discovery" for Precambrian paleontology began in the 1950's when S.A. Tyler and E.S. Barghoorn of Harvard University reported microfossils from the Gunflint Formation along the shore of Lake Superior. Since then many Precambrian microfossil discoveries from around the world have been made and the first conclusive proof of Precambrian animals (the Ediacaran fauna) was made by R.C. Sprigg in 1946 from the Ediacara Hills some 600 km north of Adelaide, Australia.

In the ten chapters of this book, the McMenamin's discuss the late Precambrian and earliest Cambrian fossil record to try and explain the Cambrian phenomenon. Liberally illustrated with photographs and diagrams, the major elements of the different faunas are examined. These include the soft-bodied Ediacaran fauna as well as the shelled microfossils *Cloudina* and *Sinotubulites* of the Late Precambrian. The microfossil shelly fauna of the earliest Cambrian as well as the more common Early Cambrian brachiopod, archaeocyathid, echinoderm, mollusc, and trilobite faunas are also discussed. The paleogeography and environmental aspects of the Precambrian and Cambrian are examined as well as the marine ecology of this time in an attempt to explain the major changes that occurred during this period of Earth history.

I can best sum up this book by quoting the authors in their preface where they state: "This book is for anyone interested in the dynamics of life during profound and perhaps chaotic change, and for anyone interested in the types of ecosystems which can exist (and have existed) on the Earth's surface."

Causes of Evolution. 1991, edited by Robert M. Ross and Warren D. Allmon. The University of Chicago Press, 5801 S. Ellis Ave., Chicago, Illinois 60637. \$24.95 (paperback), \$65.00 (hardback). 479 pages.

This book, with a forward by Stephen Jay Gould, examines from a paleontological perspective whether the various factors that influence evolution are intrinsic or extrinsic, abiotic or biotic. In the opening chapter on Specifying Causal Factors in Evolution: The Paleontological Contribution, Allmon and Ross introduce the question about the relative roles of intrinsic and extrinsic, or biotic and abiotic factors in evolution, particularly as it applies to different groups. One of their goals in editing this volume was to see if by examining these questions, whether paleontology could contribute new ideas and perspectives to evolutionary biology. In the 14 papers that follow, a range of causal factors are examined. The editors have

grouped these papers into two parts, those that examine evolutionary patterns across higher taxa (Part 1 - 5 papers), and those that examine patterns within individual taxa (Part 2 - 9 papers).

One theme that does emerge from these papers is that there is no consensus on causal factors in evolution. As the editors point out, there are two possible reasons for this. The first is that there are no general processes in evolution, but rather numerous small-scale processes. The second explanation is that general processes do exist, however, they are seen quite differently by different researchers, depending on their outlook.

This is a fascinating book for those interested in evolutionary thought and processes. The individual papers are by first-rate paleontologists and leaders in their field (David Joblonski, David J. Bottler, Karl J. Niklas, Steven M. Stanley, James W. Valentine, Jennifer A. Kitchell, and Anthony Hallam to name just a few) and cover a wide spectrum of topics and groups such as ostracodes, molluscs, hummingbirds, and Quaternary mammals.

The Sternberg Fossil Hunters - A Dinosaur Dynasty. 1991, by Katherine Rogers. Mountain Press Publishing Company, P.O. Box 2399, 2016 Strand Avenue, Missoula, Montana 59806. \$10.00 (paperback). 302 pages.

The Sternberg Fossil Hunters - A Dinosaur Dynasty is another fine addition in the excellent series of geology books written for the general public and published by Mountain Press Publishing Company. The saga of the Sternberg family is the story of Charles H. Sternberg and his three sons, George, Charlie, and Levi, who together formed the first family-run fossil-hunting business. Their discoveries are now on display in major museums in at least 15 countries and 22 states. The author, Katherine Rogers, knew Charles's oldest son, George F. Sternberg for 40 years while he was curator at what is now Fort Hays State University and had access to all of his letters, records, and field diaries. What was originally to be the story of George's life, has evolved into a fascinating and very readable account of one of the most famous fossil collecting families of the late 18th and early 19th century.

Various members of the Sternberg family prospected throughout the American West, Canada, and the Patagonian region of South America in search of the most complete and best preserved fossils that could be found. Some of the most important fossil-bearing areas were discovered by the Sternberg's and these areas are still being worked today, yielding new and important fossils. Charles H. Sternberg also played an important role in the famous Cope and Marsh feuds of the late 1800s.

While not a definitive biography of the Sternberg fossil-hunting family, it is nonetheless, a very interesting and readable account of a family dedicated to the pursuit of knowledge during one of the most fascinating periods in



the history of vertebrate paleontology.

#### QUATERNARY ECOLOGY: A PALEOECOLOGICAL PERSPECTIVE

Hazel R. Delcourt and Paul A. Delcourt, 1991  
Chapman & Hall, 29 West 35th St, New York, NY 10001  
242 pp., \$65 cloth, \$29.95 paperback

Paul and Hazel Delcourt's latest book is an excellent compilation of recent paleoecological research. Quaternary paleoecology has moved from a largely descriptive field to a highly quantitative discipline in the last two decades. Without delving into the numerical methodology that permitted this transition, the authors outline the primary themes and findings of the best current research. Primarily the examples are limited to the palynology of eastern North America, but brief passages on other techniques (e.g., packrat midden macrofossils) also can be found. Certain topics, for example tree-ring research and oceanography, are notably absent, and there is little original material. The book is neither a general reference for Quaternary studies, nor is it a methodological guide. Rather, it summarizes the application of palynology (and associated techniques) to ecology.

Ecological processes such as succession, competition, and migration are time-dependent phenomena. Traditionally, the tools available to ecologists have limited the study of these processes to decadal timescales; but through stratigraphic pollen analysis and radiocarbon dating, vegetation dynamics can be followed in detail for centuries and millennia. Plant migration is the process most thoroughly studied through palynology. Following the last glaciation, the forest dominants of eastern North America migrated northward hundreds of kilometers to fill their modern ranges. The rate of migration varied among species, as did the migration routes. The response of vegetation to postglacial warming, which is comparable in magnitude to that anticipated in the next 100 years, is an example of how plants actually have responded. For example, the oak-chestnut "forest primeval" of the eastern United States had no analog in the glacial age environment. The vegetation dynamics accompanying postglacial warming produced a new forest type. The same warming had an even more drastic effect in the Arctic, where the entire mammoth-steppe tundra biom collapsed. These palynological findings can be used to predict the outcome of future warming. Some species may be unable to migrate quickly enough to avoid catastrophic population declines in the next century; and the resulting vegetation could look very different from that of today.

Competition is more difficult to study in the fossil record. Paleoecological research alone is not sufficient to demonstrate competition. Neo-ecological studies are needed to demonstrate interference among species, or utilization of a shared, limiting resource. If competition can be demonstrated in the modern environment, then its

outcome can be followed, over millennia, in the pollen record. For example, in Fennoscandia, pollen influx of tree birch declined after the immigration of pine, and in Missouri, ironwood/hornbeam influx slowly increased as black ash decreased following deglacial warming.

The spread of plant disease also is recorded in the palynological record. Just as the historic chestnut blight is registered in pollen diagrams, the earlier decline of elm 3885 B.C. throughout western Europe, and the decline of hemlock 3700 B.C. in eastern North America are widely recorded. Favorable climatic conditions are needed to promote pathogen outbreaks, and neolithic human activities were important in the elm decline, but the palynological record of past epidemics indicates their importance in vegetation change.

These are just a few examples of the ecological topics treated in the book. The text is easy to follow and the illustrations, taken from the primary references, are of good quality. The index is good, and there are 18 pages of references listed alphabetically. The survey is thorough, though not exhaustive, and it is a valuable reference for professionals and students involved in Quaternary research.

Review by Owen K. Davis.

#### AFTER THE ICE AGE: THE RETURN OF LIFE TO GLACIATED NORTH AMERICA

E.C. Pielou, 1991  
University of Chicago Press, 5801 Ellis Ave, Chicago, IL 60637  
366 pp., \$24.95 cloth

This work, like her recent "The World of Northern Evergreens" is written by a naturalist for a general audience. It presents an overview of the biotic history of Canada and adjacent U.S.A. following the last glaciation. The layout of the text is more suitable for general audiences than for the specialist. The illustrations are sketches, apparently drawn by the author; the references, unalphabetized, are organized by chapter at the end of the book; and the two appendices contain a translation of the Latin names used in the text. Nonetheless, the later chapters contain material that may be new to professionals not working in Canada.

Part one, "Preliminaries," is an extremely broad and somewhat superficial survey of Quaternary studies from Milankovitch to vegetation inertia - like R.F. Flint's treatise but without the details. Chapters 5 - 14 are summaries of the major environmental events of the last 20,000 years. During the late Pleistocene, the unglaciated portions of Canada were covered with arid steppe-tundra, which was populated by a diverse fauna, most of which is now extinct. Much of the land covered by this extinct biom is now beneath the sea - the broad Beringian isthmus that

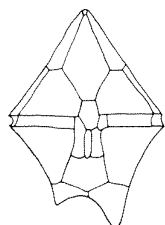
connected North America and Asia. This land bridge served as a migration route for many animals and for humans. From Beringia southward, however, the path of the first Americans is clouded in controversy. Did they travel along the west coast, or through an "ice-free corridor" between the Rocky Mountain and continental glaciers?

I found chapters 9 and 10 particularly interesting. During deglaciation, as the continental ice sheet shrunk northward past the continental divide, it impounded a series of giant lakes, at times larger than the present Great Lakes. The lakes significantly influenced the modern distribution of fishes and other aquatic organisms in central Canada; and their abrupt drainage, through the Mississippi River, Saint Lawrence Sea Way, and Hudson Straits profoundly influenced ocean circulation and global climate.

Chapter 12, "The Great Wave of Extinctions" is a general discussion of late-Quaternary extinctions. I know of no other general treatment of this momentous event - the sudden extirpation of most of the New World's large animals 11 - 12,000 years ago. The causes of this catastrophe remain one of the most controversial topics in Quaternary studies, with interested parties arrayed along a continuum of causations from rapid climatic change to overkill by immigrating humans. One of the spinoffs of this controversy has focused research on the timing of human arrival south of the ice sheets. Were the Clovis "big game hunters" the first immigrants 11,000 years ago, or were they preceded by peaceful vegetarians?

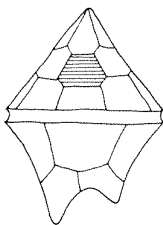
"After the Ice Age" is easy to read and relatively complete in its coverage. Despite its lack of detail in many areas, the information is essentially correct, so it is a valuable introduction for the general audience; and it has much to offer for the professional unacquainted with the Canadian Quaternary.

Review by Owen K. Davis



**Antarctic Science  
Vol. 4, No. 3**

**SPECIAL ISSUE**



*Palynology of the James Ross Island Area*

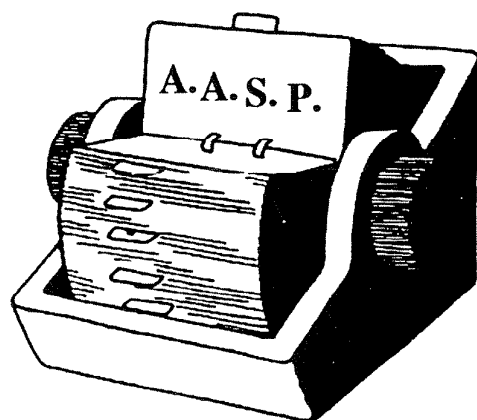
The James Ross Island area is recognized as one of the geological treasures of Antarctica. It exposes a section of over 6 km of Cretaceous and Tertiary marine sedimentary strata with an important content of reworked Upper Jurassic rocks near the base. This sequence has produced some of the most remarkable fossil finds in the Southern Hemisphere. The list is extensive and includes a

wealth of marine invertebrates, plesiosaurs, dinosaurs, land mammals and birds, giant penguins, whales, and fossil leaves and wood. The sediments record a long history of submarine fan, shelf and deltaic deposition in a back-arc environment, and the contained fossils provide valuable information on Cretaceous and Tertiary climates, and biological evolution at high palaeolatitudes.

Critical to the study of such a sequence is a firm biostratigraphical framework, in which palynology plays a major role. This **Special Issue**, to be published as the September 1992 part of the journal, will bring together a collection of papers, resulting from a joint research project by the British Antarctic Survey, the Centre for Palynological Studies of the University of Sheffield, and the British Geological Survey. The papers will describe the palynology (mainly dinoflagellate cysts) of the Upper Jurassic (Tithonian) and Early Cretaceous (Aptian/Albian) - Eocene. The floras contain several new taxa, plus existing species known from other Southern Hemisphere localities, such as Australia and New Zealand. The collection of papers will be introduced with an overview by the Special Issue editors, A. M. Duane, D. Pirrie and J.B. Riding. The volume aims to establish the major elements of the Upper Jurassic-lower Tertiary palynostratigraphy of the northern Antarctic Peninsula region. It is hoped that it will form an invaluable reference work for future stratigraphical studies in this key area.

Extra copies of this part will be available at £19.50/\$36.50 each post free.

Orders and enquiries to Anna Rivers at Blackwell Scientific Publications Ltd, Osney Mead, Oxford OX2 0EL, UK.



**ADDRESS BOOK CHANGES**

When the NEWSLETTER first began, all those years ago, changes of address were always printed in the NEWSLETTER so that we could keep up with our friends. Several years ago this service was discontinued, for

unknown reasons. Because it may be some time before the next membership directory can be produced, the following changes should be made to your current, 1991, MEMBERSHIP DIRECTORY:

NB: The following list represents changes made from August 26 - December 20, 1991. Additional new members and changes which were provided to the previous editor are not included. The next issue of the newsletter will include any changes prior to Aug. 1991.

#### NEW MEMBERS

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**New Addresses,  
Additions,  
Corrections, etc.**

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add: Palynology Lab.  
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Fax: 234-1-833400

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Environ. Restoration - Groundwater Tech.  
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Vork, David  
Unocal  
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Tel: (713) 287-7447

Villard, Debra A.  
U.S. Geological Survey  
MS 970

12201 Sunrise Valley Drive  
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Williams, V.E.  
Add... X-2361

## ANNOUNCEMENT

You may have noticed that the final 1991 AASP NEWSLETTER (Vol.24, no.4) did not have a Membership and Dues payment form attached. This omission was deliberate and was the result of awaiting a ruling concerning a recent AASP Inc. submittal (actually, the third) for a "Merchant's Approval" to accept Credit-Card payments. The AASP Board of Directors decided to apply for Credit-Card service because of the high cost of obtaining bank-drafts that our international members have suffered. The AASP now blithfully announces that approval has been granted for both Visa and Mastercard Credit Cards. The attached new membership and dues payment form has been modified to include the necessary information. Please note the following: (1) dues payments are still accepted in cash, check or bank-draft; (2) all pertinent information must be filled out legibly; (3) there is a \$1.00 US [one US dollar] surcharge for credit card payment; (4) at this time, credit card payment can only be applied to Membership dues and scholarship donations. Credit cards may not (as yet) be used to purchase AASP Foundation publications.

Now that the association has credit card service, perhaps in the near future the AASP Foundation (which is a different organization) will also be able to offer the same service.

We have high hopes that our new credit card service will make the job of paying dues easier for our members.

Kind regards,  
Gordon D. Wood,  
AASP Inc., Secretary-Treasurer

# Position Available for:

## Stratigraphic Palynologist

Amoco Production Company, the exploration and production subsidiary of Amoco Corporation, is currently seeking a stratigraphic palynologist for a position in its Houston-based Exploration Applications group.

The successful candidate should have expertise in tertiary pollen and spores; however, qualified candidates with experience in other palynological areas will be considered. Knowledge of sequence stratigraphy, computer data management and kerogen analysis (e.g., TAI, etc.) is desirable.

Responsibilities include integrated regional and field studies, age and depositional environment analyses, kerogen analysis and direct interaction with exploration teams.

Amoco offers a competitive salary and an excellent benefits package. For consideration, please send a resume and salary requirements no later than March 16, 1992 to:

Amoco Production Company  
Employee Office, Reply #001  
P. O. Box 3092  
Houston, TX 77253

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Principals Only: No phone calls please. An Equal Opportunity Employer, M/F/H/V.

# Final Announcement: A.A.S.P. Short Course

February 26-28, 1992 - Houston, Texas

## The Morphology, Taxonomy, Classification, and Geologic Occurrence of Fungal Palynomorphs

presented by: William C. Elsik

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Dr. W. C. Elsik will offer a short course on fungal palynomorphs February 26-28, 1992 in Houston under the auspices of AASP. The short course will run three days at the Adam's Mark Hotel, 2900 Briarpark Drive, Houston, Texas 77042 (west Houston), and will follow the South-Central GSA meeting (which meets in Houston at Rice University, February 24-25).

The course will consist of lectures and short exercises for the class under Bill's direction.

A general outline of topics is given below. Participants will receive a comprehensive course manual and 35mm slides of important taxa. The cost for the short course will be \$300 per person with a limit of 30 persons. The fee includes attendance; manuals, 35 mm slides, and other handouts; and refreshments during the course days.

If you have any questions, call or write Martin Farley at the address and telephone numbers listed on the registration form.

### Major Topics:

Introduction  
Fungal Spore and Hyphal Morphology  
Nomenclature  
Taxonomy  
Classification

Systematics  
Geologic Occurrence  
Geologic History  
Stratigraphy  
Paleoenvironments

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## Registration Form

### The Morphology, Taxonomy, Classification, and Geologic Occurrence of Fungal Palynomorphs

February 26-28, 1992 - Houston, Texas

Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Address: \_\_\_\_\_

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Hotel reservations should be made by the registrant (Adam's Mark Hotel, 2900 Briarpark Drive, Houston, Texas 77042; (713) 978-7400).

Make checks for the \$300 registration fee payable to A.A.S.P., Inc. and send to:

Martin B. Farley  
Exxon Production Research Company  
P. O. Box 2189  
Houston, Texas 77252  
Tel: (713) 965-4033 FAX: (713) 965-7279

## Membership Application Form

Please type or clearly print information. The AASP directory file is limited to 5 lines @ 29 characters.

Date: \_\_\_\_\_

Name:

\_\_\_\_\_  
(First) (Middle) (Last)

Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Telephone:

\_\_\_\_\_

Fax:

\_\_\_\_\_

Nature of work (graduate student, exploration stratigrapher, etc.)

Send to: Dr. Gordon D. Wood  
Amoco Production Company  
P.O. Box 3092  
Houston, Tx 77253 U.S.A.

Please send \$30.00 U.S./yr  
with you application.

## Change of Address Form

Date: \_\_\_\_\_

Listed Name: \_\_\_\_\_

### New Address

Name:

\_\_\_\_\_  
(First) (Middle) (Last)

Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Telephone:

\_\_\_\_\_

Fax:

\_\_\_\_\_

Send to: Dr. Gordon D. Wood  
Amoco Production Company  
P.O. Box 3092  
Houston, Tx 77253 U.S.A.

## ANNUAL DUES NOTICE

DUES MAY BE PAID UP TO THREE YEARS IN ADVANCE. OVERSEAS AASP MEMBERS (INDIVIDUAL OR INSTITUTIONAL) WHO WOULD LIKE TO RECEIVE THEIR NEWSLETTER AND PALYNOLOGY BY AIR MAIL, RATHER THAN SURFACE MAIL, NEED TO INCLUDE THE APPLICABLE POSTAGE SURCHARGE (NOTED BELOW). CREDIT CARD USERS MUST PAY A \$1.00 U.S. SURCHARGE PER-TRANSACTION.

Dues	Enclosed
Individual dues: \$30.00 U.S./yr	\$ _____
Institution dues: \$40.00 U.S./yr	\$ _____
 Air Mail Surcharge	
Europe & South America: \$ 9.00 U.S./yr	\$ _____
Africa, Asia & Australia: \$12.00 U.S./yr	\$ _____
 Credit Card Surcharge (\$1.00 per-transaction)	\$ _____
 Contribution to the AASP Student Scholarship Fund	\$ _____
 Total enclosed U.S.	\$ _____

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### CREDIT CARD PAYMENTS ALL INFORMATION MUST BE COMPLETED

☐ MASTERCARD      ☐ VISA

Credit card number: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

Signature: \_\_\_\_\_

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Send dues, surcharges (if applicable) and Student Scholarship contributions, with this form, to:

Dr. Gordon D. Wood  
AASP Secretary-Treasurer  
Amoco Production Co.  
P.O. Box 3092  
Houston , TX 77253 U.S.A.

**BE SURE YOUR NAME IS ON YOUR CHEQUE OR INTERNATIONAL MONEY ORDER**

Your cancelled cheque is your receipt. If you need a written receipt, advise the Secretary-Treasurer when you pay your dues.

All drafts should be payable through a U.S. based bank.

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Name: \_\_\_\_\_

Address: \_\_\_\_\_

City & State: \_\_\_\_\_

Country: \_\_\_\_\_ Zip: \_\_\_\_\_