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A.A.S.P. NEWSLETTER

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J.K. Lentin, Editor

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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 third in 1993, is July 15. Please send all information on computer disk in IBM - ASCII or Word Perfect format, if possible, if not - send a typed manuscript. We look forward to contributions from our membership. FAX number for the AASP NEWSLETTER is as follows:

FAX: (403) 262-1629

MESSAGE FROM THE PRESIDENT

TWO CAUTIONARY TALES OF DATA AND INTERPRETATION

Something in the dark broom closet of my brain tells me that these two incidents are related. This first one doesn't involve palynology, but represented an instructive event to me when it happened: Way back when I was an aspiring young palynologist, I got invited to sit in on the presentation of an exploration prospect before the Grand High Exalted Exploration Manager of the company for whom I toiled diligently, without complaining, and so forth. Being young and aspiring, I was not about to miss the opportunity for such exposure, no matter how minimal, and besides, they promised free doughnuts. So I crammed into the back corner of a conference room, overcrowded with aspiring young geologists and panicky middle-aged middle managers, to wait for the arrival of the Great Man. Arrive he eventually did, a path parted before him by a lackey, who was laden with the shield and sword and helmet with the horns on it as the Man sat down.

"Rarl," He commanded, and lo, the first presentation did begin.

An aspiring young geologist rolled out in front of

Him a gorgeous regional map of the exploration play, resplendent with bright yellows where the distributary channel sands were supposed to be and rich earth-tone browns where the interdistributary bays and lagoons were supposed to be. In the midst of one of the bright yellow patches was a red polygonal outline of the exploration prospect. The geologist meandered and anastomosed, much as the streams on the map did, through an explanation of what the map meant, why the sands were supposed to be where he said they were supposed to be, why they were supposed to contain the vast volumes of oil and gas they were supposed to contain, and why we ought to sink twenty million dollars into a well to get at them.

There was a loud grunt. "How much sand?" the Man demanded.

There was a very silent pause. Then came the explanation that this really wasn't a sand thickness map, because no wells in the area actually penetrated through the base of the sands, and therefore the thickness was unknown, but it was very large.

There was a snort. "How much sand?" the Man demanded.

There was another silent pause. Another explanation ensued, involving the statement that the yellow areas represented areas of "more sand" and the brown areas represented areas of "less sand."

There was neither grunt nor snort, only a slow, ominous predatory breathing. Then the aspiring young geologist's supervisor spoke up.

"You see, because of the problem of no well penetrations, this is kind of a - a conceptual map."

"I HATE CONCEPTUAL MAPS!" came the roar as with one wipe of a paw the Great Man swept the map off the table onto the floor.

Surely, the aspiring young geologist was going to wither on the spot and blow away like dust. But no! An amazing thing happened. He reached down, retrieved the map and rolled it back out on the table as if nothing had happened.

"This," he said, pointing at a yellow area, "is 80% sand. This," pointing at a brown area, "is 10% sand."

The presentation continued from there with nary a grunt or snort to be heard. When it was over, the Great Man arose, took his shield and sword and helmet with the horns on it, and left the room, smiling. All the doughnuts had been eaten before I arrived.

A couple of years later, another frantic young aspiring exploration geologist called me about a problem he was having in trying to correlate two wells using palynology. "Doesn't make sense," he complained. When I asked him what data he had on the two wells I got a muddled reply that suggested more than anything else that he didn't have the faintest idea what I had asked him. Now, this all happened in San Francisco. He was on about the 40th floor of one building and I was on the 24th floor of another two blocks away. But, it being San Francisco (in contrast to some other cities in which I have toiled diligently, without complaining and so forth), I didn't have to worry too much about being eaten by a bear on the way, so I made the journey to his office (the Red Sox would win the World Series before he would come to mine). It only took about an hour because the protest demonstration passing on Market Street was relatively small.

In the rarefied air there, I examined his "data". These wells were relatively close together, and should by all reckoning have contained quite similar stratigraphic intervals. On Well A, he had a proprietary in-house report done by a palynologist no longer with the company, but whose work was familiar to me. On Well B, he had a summary report from an external consultant, which contained only chronostratigraphic age interpretations. The geologist was right. Didn't make sense. The most obvious palynostratigraphic horizon picked in Well A involved the extinction top of a particular dinoflagellate which as yet remains without a published name, but is widely used in the region of these wells and which was indeed used in the internal report as a marker for the top of the Turonian Stage. No Turonian pick was made on the summary for Well B, but the geologist (and me, as well) could plainly see a conspicuous lithologic unit in the well that looked for all the world like the one in Well A where the top Turonian horizon was indicated. On the well B interpretation, this same unit was cited as Coniacian/Santonian in age.

The major problem, as I patiently explained, was the fact that the report on Well B contained no data; all it was an interpretation, based presumably on some data somewhere, but not available to us. This explanation drew a Dan Quayle stare from the geologist. I left the situation unresolved, and returned to my office, a journey which took most of the afternoon because of the counter-protest demonstration then passing between his office and mine. So I had to stop at a nearby shop and have the doughnut I didn't get in the Conceptual Map meeting two years before.

Upon return, I called the consultant who had done the work on Well B, and asked him what taxa he had used to make the Coniacian/Santonian age interpretation. Without hesitating, he gave me the same widely-used informal name used by the in-house palynologist to make the Top Turonian age interpretation for Well A. I called the geologist back with this good news, that the data matched and only the two separate interpretations didn't. I resolved the problem, at least to my satisfaction. A few weeks after this, the geologist was challenged with the opportunity to experience negative employment retention, so I never found out if I resolved it to his. He never did come to my office. The Red Sox, to this day, haven't won the World Series. And they won't this year, either. (Neither will the Cubs.)

These incidents are among several similar ones that I have encountered in which the failure to understand the difference between "data" and "interpretation" has created major problems in solving geological problems. In the first case, all that had to be done to rectify the matter was to attach numbers to the map. Numbers are impressive, even

if they represent bald fabrication; just ask any engineer. In the second instance, I never cease to be amazed by the amount of literature, published as well as proprietary, that treats terms like "Top Campanian" attached to a particular depth in a well or position in an outcrop as "data". In palynology (in fact, in paleontology in general) our basic data consist of the observed positions of individual taxa in time and space (presuming, of course, that we have been diligent about our examinations and accurate in our identifications). Reasonable people can disagree about what these patterns of occurrence mean, i.e., does the basal occurrence of *Yahoodinium obnoxius* mean we are in the Barremian or Hauterivian, but what is ultimately important for correlation is its position in comparative sections. There is nothing reprehensible about changing an interpretation based on the appearance of new comparative data; just ask any geophysicist.

So I'll conclude my sermon with this ongoing plea. In writing papers or submitting reports, include your data. Even if you know that those on the receiving end will never look at it. There's always the possibility (and this has happened to me more than once) that you will get called upon to review your work at some later date. Reviewers, examine manuscripts thoroughly; make sure that the interpretations and conclusions are supported by observational data (and not contradicted, as I have occasionally seen). We do ourselves no favors when we sow unnecessary confusion by permitting our interpretations to masquerade as data. I'd much rather see a thorough range or occurrence chart, with no interpretations at all, than see an interpretational summary unattached to supporting data. Then again, I've made a living for quite a while straightening out such problems, so maybe I should leave well enough alone.

Robert Ravn,
President, AASP

LETTER TO THE EDITOR

(TROPICAL) POLLEN AND SPORE PHOTOGRAPHS

Dear Editor,

At the Hugo de Vries-laboratory of Amsterdam University we have a long tradition in Quaternary tropical palynology. Especially for the (sub)tropical areas, additional identification tools are highly necessary in order to reduce the number of unidentified pollen type and to build better groups of pollen types that provide us with meaningful (palaeo)ecological information. Therefore, as stated in AASP NEWSLETTER 25(4), pollen atlases, such as those of Roubik & Moreno (1991) for Panama, Bonnifille & Riollet (1980) for East Africa and Caratini & Guinet (1974) for tropical Africa are very important. indeed, Quaternary palynologists are indebted to the above mentioned authors very much.

Additional initiatives for other areas are welcome, but unfortunately, in general funding bodies do not realize enough, the importance of this kind of investments. The impressive pollen atlas of Maurice Reille (1992) about Europe and North Africa is a nice example that, apparently, also institutes can be able to publish such important works.

Last year, a list of major publication including photographs of Quaternary pollen, spores and micro/macro palynomorphs, was compiled by Henry Hooghiemstra and Bas van Geel. As a matter of fact, we do not pretend to have an exhaustive list. The objective is to serve especially students who are not so familiar with the pollen morphological literature that provide plates with photographs. At the moment we listed over 150 major publications, and this list will be updated from time to time.

Hooghiemstra, H. & Van Geel, B. (update 1992). List of major pollen and spore atlases and other photographical documentation of palynomoprhs of Quaternary studies. Internal Document, Hugo de Vries-laboratory, Amsterdam University.

Everybody who is interested to obtain a copy of this list is kindly invited to write to:

H. Hooghiemstra
Hugo de Vries-laboratory, University of Amsterdam,
Kruislaan 318, 1098 SM Amsterdam, The Netherlands.

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Dear Editor,

Re your note in the last AASP Newsletter, and Norrie's plea for a more universally appealing (or focused, as the case may be) title. [For the 25th Anniversary volume]

A Celebration of Dust

or

A Quarter Century of Dust

or

One Person's Dust is Another's Treasure:
Celebrating a Silver Jubilee

Otherwise, I was happy with the title already in hand.

Sincerely,
William C. Elsik

AASP 1993 ELECTIONS

THE CANDIDATES

The AASP Board of Directors have provided the following list of candidates for consideration before the ballots are mailed out.

PRESIDENT:

Owen K. Davis
Reed E. Wicander

SECRETARY-TREASURER:

David T. Pocknall

MANAGING EDITOR:

David K. Goodman

DIRECTOR-AT-LARGE:

Farley R. Flemming
Sharma L. Gaponoff
Joyce Lucas-Clark
Michael S. Zavada

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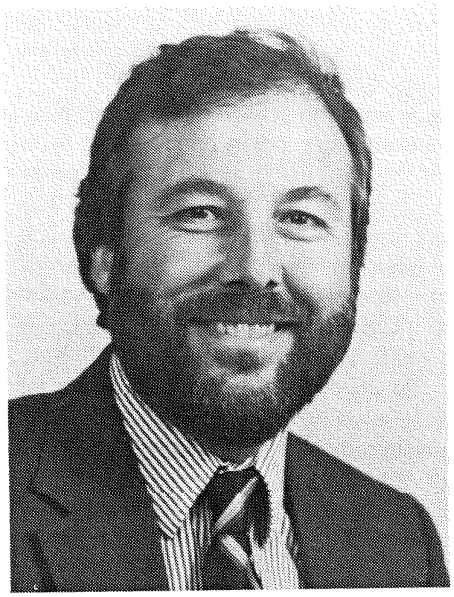
OWEN K. DAVIS

[President Elect]



Owen is an Associate Professor in the Department of Geosciences, and Director of the Palynology Laboratory at the University of Arizona. He teaches classes on Palynology, Climate Change, and Quaternary Environments. He was born March 13, 1949, in Nampa, Idaho, received his B.S. in Biology in 1971, M.S. in Botany in 1974, and his Ph.D. in Ecology in 1981. He is married and has two children.

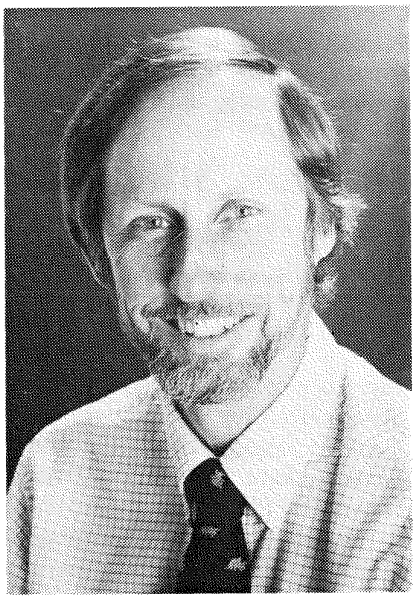
He first joined AASP in 1976. His service to AASP includes Director-at-Large 1988-1990; Chair of the Awards Committee, 1989; Awards Post Card Committee, 1989-present; Chair of the Nominating Committee, 1990; Chair of the Data Committee 1988-Present; and Chair of the 25th Annual Meeting Committee. He organized or chaired symposia at the 24th, 21st, and 19th AASP annual meetings; and at IPC 6 and 8. He co-edited AASP Contribution Series 13, and is editing two more volumes intended for the Contribution Series, one on Archeological Palynology, the other on Quaternary Palynology of California.

Owen's service to other organizations includes Secretary-Treasurer, International Federation of Palynological Societies (1992-); North American Coordinator for International Geological Correlation Program 252 (1989-1991), and the Numerical Methods Working Group of INQUA (1988-).

REED E. WICANDER

[President Elect]

Reed is a professor in the Department of Geology Central Michigan University and has been an AASP member since 1978. He has served on the Publicity Committee (1981-1986) as both a member and chairman, the L.R. Wilson Outstanding Student Paper Committee as a member (1980, 1983, 1985), been a Director-at-large (1984-1986), chairman of the Ballot Committee (1985), Book Review Editor (1985-present), Nomination Committee member (1989), and Best Poster Award Committee member (1989, 1992). He also has served on the Editorial Board of the Micropaleontology since 1979.



Reed is a member of many other organizations including the American Association of Petroleum Geologists, National Association of Geology Teachers, Society of Economic Paleontologists and Mineralogists, The Society for Organic Petrology, and the Paleontological Society.

Reed received his Ph.D. from U.C.L.A. in 1973 and his research interest include Paleozoic acritarchs, spores, and chitinozoans.

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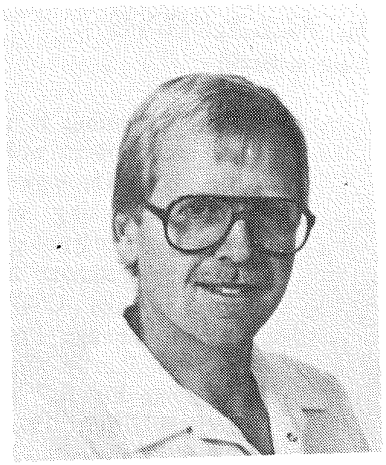
DAVID T. POCKNALL

[Secretary-Treasurer]

David received his Ph.D from University of Canterbury, Christchurch, New Zealand in 1979. For almost 13 years he worked as a palynologist for the New Zealand Geological Survey (latterly DSIR Geology and Geophysics) in Lower Hutt, New Zealand. In 1991 he joined Amoco Production Company in Houston as a stratigraphic palynologist working on Cretaceous and Tertiary palynofloras from Egypt, Trinidad, and Venezuela.

David joined the AASP in 1985 while on study leave at the US Geological Survey in Denver, Colorado. Since 1985 he has attended four annual meetings of the AASP and served on the 1992 nominating committee. He was co-editor of the Geological Society of New Zealand Newsletter for 2 years prior to moving to the United States and remains a member of that society. He stands unopposed for the position of Secretary-Treasurer of the AASP.



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DAVID K. GOODMAN

[Managing Editor]

David became a member of AASP in 1975 and is the current Managing Editor. He served as Assistant Editor of PALYNOLOGY from 1985-1986 and Editor from 1987 to the present. He was also a Director-at-Large (1986-1987).

David is a member of numerous societies and was Chair of the Fourth International Conference on Fossil and Modern Dinoflagellates at Woods Hole. He has recently transferred from very warm Midland, Texas to the cold of Anchorage, Alaska where he works as a palynologist for Arco Oil and Gas Company. Those of us who know Dave well, consider that he has grown more handsome over the years. However, he has failed to provide proof in the form of a new photograph. This picture has been used for the past 5 years. It is possible that it was his Student ID mug-shot at Stanford University.

David stands unopposed for the position of Managing Editor.

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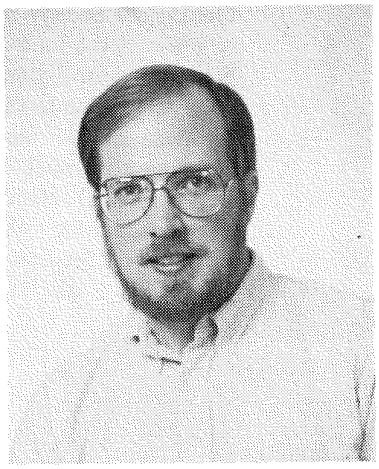
FARLEY R. FLEMMING

[Director-at-large]



Farley Flemming is a research geologist with the U.S. Geological Survey working on Pliocene palynology and paleoclimate as part of the USGS Global Change Program. Shortly after receiving his B.S. in zoology from Texas Tech University in 1974, he began processing palynology samples for Citgo's Research Laboratory in Tulsa, Oklahoma. He learned about palynomorphs while working with Bill Meyers and Bob Bergad, both palynologists who worked for Citgo. This experience piqued his interest and he returned to school and obtained his Ph.D. in geology from the University of Colorado at Boulder, specializing in palynology. His dissertation research, guided by Doug Nichols, examined the palynological record of the Cretaceous-Tertiary boundary in Colorado and New Mexico. After a post-doc at the University of Colorado at Denver, he took his present position with the U.S. Geological Survey.

He has been a member of AASP since 1980. During his association with the AASP, he received the L.R. Wilson Award for Best Student Paper at the Arlington, Virginia, meeting in 1984 and an AASP Student Scholarship in 1987. For several years, he worked with Doug Nichols as assistant editor for *PALYNOLOGY*. He has served on the judging committee for the L.R. Wilson Award (1990 Banff, Alberta, meeting) and the Public Relations Committee; he currently serves on the Type Repository Committee.

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SHARMA L. GAPONOFF

[Director-at-Large]

Statement of Purpose: Palynologists are an endangered species. I'm too young for this. AASP is an organization that can help to take us off the endangered species list only as long as there are membership, programs and palynologists that are proactive in reversing our present extinction trend. Economic times are hard, jobs are becoming fewer, students are wary of pursuing our science. Environmental stresses cause species to die or adapt. This is a time where we can have tremendous impact on our as well as future palynologist's fate. As a Director at Large for AASP, I will help in these efforts. Pedigree: Studied palynology under Dr. Janet K. Warter at California State University, Long Beach. MS, 1981. Palynology employment history: 1981-1989, Chevron Oil Field Research Company; 1989-present, Chevron Overseas Petroleum, Inc. Before becoming a palynologist, I was a science teacher for eight years in junior high school, high school and botany and biology part-time faculty at CSULB. I bring to AASP both industry and academia experience.

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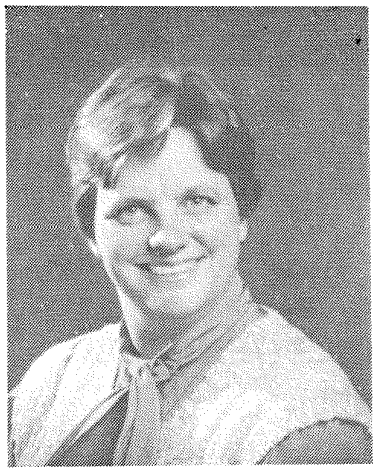
JOYCE LUCAS-CLARK

[Director-at-large]

Joyce is a consulting palynologist in Fremont, California. She received her B.S. and M.S. degrees in English and Geology, respectively, at the University of California at Santa Barbara, and her Ph.D. in Geology from Stanford University (1986).



Her research interests are mainly in morphology, systematics and biostratigraphy of Cretaceous and Tertiary dinoflagellates. She has done consulting also in pollen, palynofacies, organic petrology, and mineralogy. Presently, she is primarily engaged in applications of palynology and organic petrography to hydrostratigraphy and environmental restorations at the Savannah River Site, South Carolina.

She assisted in organizing the AASP meeting in San Francisco in 1982 and has served as a reviewer for PALYNOLOGY.

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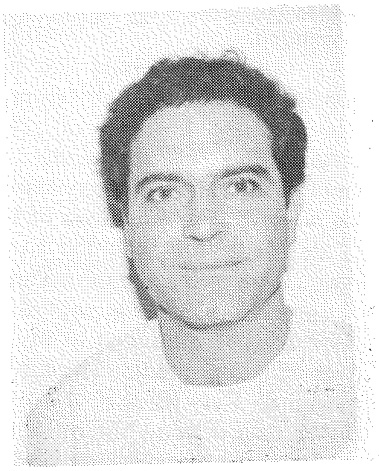
MICHAEL S. ZAVADA

[Director-at-large]

received my B.S. (Botany) and M.S. (Botany/Palynology) from Arizona State University and I received my Ph.D. from the University of Connecticut in Paleobotany/Palynology. I also have a B.A. in Slavic Languages from the University of Connecticut. I served as a post-doctoral research associate at Indiana University with David Dilcher and Ohio State University with Thomas Taylor. I spent 3 years as a lecturer at the University of the Witwaters Rand, Johannesburg, South Africa and am currently as Assistant Professor at the University of Southwestern Louisiana, Lafayette, Louisiana.

I have been a member of AASP since 1975 and produced over 40 publications dealing with various aspects of Pollen Biology. My primary interest is Pollen Development, Morphology Evolution and Function.



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AASP ANNUAL MEETING
- 1993-

OCTOBER 23-28, 1993
LOUISIANA STATE UNIVERSITY
BATON ROUGE, LOUISIANA

Be There!

Lewis E. Stover
1925-1993

Dr. Lewis E. Stover, Lew to his numerous friends, died on 13th March 1993 after a short illness. The sudden loss of this gifted scientist came as a shock to all his friends in the palynological and geological communities. His absence will have a profound effect on those colleagues who have worked with him closely and have come to appreciate his many qualities.

Seemingly insignificant events have a major impact on one's life. Lew was no exception. After serving in the U.S. airforce in the later years of World War II, he enroled at Dickinson College, in Pennsylvania, to take a degree in engineering. Finding biology and geology more to his liking he decided to major in the former, partly because there was only one geology professor. However, the enthusiasm of this professor convinced him that a geologist's lot was indeed a happy one, so after graduation he enroled in the postgraduate program of the Geology Department, Rochester University. At the same time, he enroled in a lifelong commitment to Nan, his wife. They married before moving to Rochester and together experienced the joys of living in the snow belt.

The focus of Lew's research at Rochester was on Devonian ostracodes and marine megafossil communities. His supervisor was Bill Evitt, at that time a trilobite specialist. Neither of them realized how much their interests would change in the succeeding years and what a major impact they would have on palynology.

How did the conversion occur? The chairman of the Geology Department had a brother, Bill Hoffmeister, who was a palynologist with Carter Oil in Tulsa, Oklahoma. The upshot of Bill Hoffmeister's talk to the graduate students was that, upon obtaining his Ph.D. in 1956, Lew was offered a job with Carter Oil. Lew's inquisitive nature and motivation soon led to his involvement in several major palynological studies, initially on Carboniferous spores. His

enthusiasm also convinced Bill Evitt that life with an oil company had advantages and soon the two were working side by side in the north Tulsa laboratory.

During Lew's professional career of thirty years, he stayed with the same company although the name changed, first to Jersey Production Research Company and ultimately to Exxon Production Research Company. Most of this time was spent in Houston, where the Stover family moved in 1965; the only major interruption was a three year posting to Australia from 1969 to 1972.

Lew Stover's accomplishments while at Exxon were legion. He pioneered the use of Cretaceous calcareous nannofossils for biostratigraphic control; he described some of the ephedroid and elateroid pollen from the Cretaceous of west Africa; he demonstrated the similarities between Early Cretaceous spore and pollen assemblages of Maryland and England and postulated their close proximity in the Cretaceous, thereby anticipating the idea of the opening of the Atlantic Ocean; he, and his Australian colleagues, developed the accepted biostratigraphic zonation for the Late Cretaceous-Early Tertiary of the Gippsland, Bass and Otway basins, offshore southeast Australia; he provided biostratigraphic input for the Mesozoic-Cenozoic global cycle charts; and he consistently published outstanding papers on dinoflagellate morphology, taxonomy, stratigraphy and paleoecology. One such paper, "Analyses of pre-Pleistocene organic-walled dinoflagellates", published with Bill Evitt, is a classic.

What of Lew Stover the person? I first realized that Lew was human when he attended a course on Cretaceous dinoflagellates that Evan Kidson and I presented at Louisiana State University in 1976. He foolishly sat on the front row and was continually having to duck, because I would suddenly swing around while still holding a lethal wooden pointer. Probably to protect himself, Lew asked if I would like to help him present a course on Tertiary dinoflagellates the following year.

Preparation of the course material involved several trips to Houston, where invariably I was made to feel welcome by his wife, Nan. Like Lew, Nan has a mischievous sense of humour so I always had to be on my guard. I also met Nan and Lew's three children, Jim, Barbara and Virginia.

After Lew and I had given the Tertiary course in Baton Rouge in September, 1977, we had to drive back to Houston. Upon arriving at Lew's, he informed me that he had lost the key to the house and we would have to break in through a second-floor window, since Nan was out of town. What he hadn't told me was that he would climb the ladder while I stayed at the bottom and made friends with Mick, the Stover's exceedingly protective dog. As soon as Lew started on the ladder, Mick started on me, convinced that I was a threat to the safety of the family. Fortunately I could climb faster than Lew, even if we were both on the same ladder and he was on a higher rung. So, I arrived at the second-floor window first, much to Lew's surprise. And then he had the audacity to find the missing key in his jacket pocket.

In spite of this experience, Lew and I remained close friends and were involved in several projects at the time of his death. Lew never ceased to amaze me with his grasp of geology in general, his understanding of sequence stratigraphy, his unparalleled knowledge of dinoflagellate morphology and stratigraphy; and his meticulous attention to accuracy. As a microscopist he was superb but his motivation was more than the deciphering of a complex morphology. He wanted to use that understanding ultimately to more precisely establish biostratigraphic control.

The greatest lessons I learnt from Lew Stover were to look beyond the horizon and not to blindly accept dogma, even when published. On several occasions he demonstrated this, such as when he convinced me that several Southern Hemisphere species were not identical to coeval Northern Hemisphere taxa, as I had misguidedly concluded.

All of us would like to believe that we have a positive impact on our chosen profession and that we have expanded the horizons of scientific knowledge. Lew certainly did. He set standards which are impossible to emulate and always demonstrated the highest integrity in his research. A recognition of his standing was the award of its Medal for Scientific Excellence by the American Association of Stratigraphic Palynologists in 1989.

In 1989, Lew retired from Exxon Production Research but continued to work at the same demanding pace as a consultant. The following year, Nan and Lew moved to Kerrville. It was a relief being able to walk rather than drive to the office, which was located in or corner of the spacious back yard. But there was little othe evidence of someone in retirement. Lew worked hard, as always, and continued his commitment to publishing his scientific findings.

Lew Stover was one of the most dedicated members of the American Association of Stratigraphic Palynologists. There are many scientists who do not consider they have any responsibilities to the scientific community. Lew was not to this ilk. He worked tirelessly for A.A.S.P., commencing with his role as a founding member in 1967. He served as the first editor of the Association from 1967-1969, setting the consistently high standards that have been maintained to the present day. Further honours came in 1980 when Lew became President-Elect and in 1981 when he deservedly became President. Over the years, he was a continuing contributor to the Foundation Century Club, one of many examples of his commitment to the Association.

What have we who are left behind lost? The world of palynology has lost a mentor; those studying dinoflagellates have lost the most knowledgeable and talented biostratigrapher in the field; I have lost my best friend; and Him, Barbara and Virginia have lost a father. But the greatest loss is Nan's.

by G.L. Williams

LEW STOVER'S AUSTRALIAN CONNECTION

Lewis E. Stover made a major contribution to stratigraphic palynology and particularly to Australian palynology.

Lew became directly involved in Australian palynology, to the best of my knowledge, in 1965 with the drilling of Esso Gippsland Shelf No. 1, which was the first offshore well in Australia and also the discovery well for the giant Barracouta gas field in the Gippsland Basin in south-eastern Australia. As Lew told the story, the problem was the usual communications breakdown between the operations people at Esso Australia Ltd. in Sydney, Australia and his managers at EPRCo in Houston with the palynologist caught in the middle. The company was eligible for a generous government subsidy provided the well penetrated Cretaceous age sediments which were mapped, based on seismic and extrapolation from the adjacent onshore, only a short distance below the top of an Early Tertiary coal measures sequence. But as was typical of many early wells on the continental shelves around the world a much thicker coal measures sequence was found than had been anticipated. Because the sequence was non-marine samples were rushed to EPRCo in Houston for age dating by Lew and colleague Dan Jones. At that time the difference between the spore-pollen assemblages for the Late Cretaceous and Early Tertiary in Australia had not been fully documented so Lew and Dan relied largely on the palynological succession documented in New Zealand (R.A. Couper, 1960: *Geol. Surv. N.Z. Paleo. Bull. No. 32, 1-88)*. The top of the Cretaceous was correctly picked on *Tricolpites lilliei* Couper within the coal measures, but then came the squeeze. Lew's management at the time wanted a Tertiary age because faulty communication led them to believe that age was what was required. Lew stuck to his guns, the age was duly telexed to Sydney, and the well stopped. The original age dating stands today. As the trainee palynologist to whom this story was imparted a few years later the lesson was driven home - make sure your identifications are correct and be prepared to defend your position.

Lew followed this auspicious start by doing the palynology, often in collaboration with colleagues at EPRCo, of subsequent wells and discoveries in the Gippsland Basin. But it was soon obvious that the escalating drilling program being undertaken by Esso in Australia was too difficult to service from Houston. Thus Lew first came to visit Australia in 1966 to meet the local palynology community and recruit a palynologist for the local affiliate. P.R. (Dick) Evans was fired and a palynological laboratory was established for Esso Australia Ltd. at the University of NSW in 1968. Lew often recounted an anecdote of his first meeting with Robin Helby. Lew asked to see some "southern beeches" the common name for *Nothofagus*, the trees whose pollen are so ubiquitous and abundant in the Tertiary of south-eastern Australia. Robin, who was a member of a surf life-saving club at a northern Sydney beach kindly conducted an increasingly puzzled Lew on a tour of Sydney's famous "surfing beaches".

Lew came out to Australia on assignment to Esso Australia Ltd. between 1969 to 1972 specifically to work up dinoflagellate taxonomy and develop a Tertiary zonation as this group of palynomorphs was becoming increasingly important to the drilling program in the Bass Strait Basins. This exercise exposed Lew to a wide range of material including the types of many of the dinoflagellates described by Isabel Cookson and her co-workers. In fact, it was a key turning point in his career with dinoflagellates dominating his palynological research over the next two decades. Whilst in Australia Lew also did routine service work on exploration wells and was the driving force behind the publication of the most widely used Late Cretaceous to Tertiary spore-pollen zonation in Australia (Stover & Partridge, 1973: *Proc. R. Soc. Vict.* 85, 237-286).

It also should be appreciated that not all of Lew's contribution to palynology can be evaluated from his published papers. He produced many superb company reports which were particularly strong in the area of taxonomic description and illustration. That much of this work remains unpublished is not entirely due to the proprietary and competitive pressures within the oil industry. One case in point, is the photographic catalogue of Isabel Cookson's Tertiary dinoflagellate types which Lew prepared in 1971. Because of superior microscope equipment Lew obtain much better illustrations of Cookson's specimens. But ever the gentleman he refused to publish this work because of the possibility that it might detract from the significance of Cookson's contribution to palynology.

Lew's research on dinoflagellates during the 1970's culminated in 1978 with the publication in collaboration with W.R. (Bill) Evitt of a comprehensive review of all pre-Pleistocene organic-walled dinoflagellates (*Stanford University Publications, Geological Sciences Vol. 15, 1978.* During the several years of gestation of this work Lew kept in touch with his Australian colleagues with a constant stream of requests for information on those Australian dinoflagellate type he had not examined during his assignment to Australia.

Lew returned to Australia in 197 to give the first dinoflagellate course four palynologists in Australia, run under the auspices of the Earth Resource Foundation at the University of Sydney. The Australian materials prepared for this course were subsequently recycled by Lew into his many other short courses and presentations given in the northern hemisphere. During this visit plans for major publications northern hemisphere. During this visit plans for major publications synthesising the Mesozoic and Cenozoic palynological succession in Australia were outlined. For Lew this meant several more trips to Australia and further collaboration with Australian colleagues. Ultimately this work culminated in 1987 (after some delays caused by the rapid growth then downsizing of

the oil industry in the early 1980s) with the publication of Memoir 4 of the Association of Australasian Palaeontologists titled "*Studies in Australian Mesozoic Palynology*". In this volume Lew contributed to six dinoflagellate papers. The plan for a companion volume on Australian Cenozoic palynology was abandoned although some work that Lew was to have contributed to this has been published elsewhere or is still in progress.

Looking back over nearly two and a half decades of collaboration I can truly say that Lew was mentor, friend and an exceptional palynologist.

ALAN D. PARTRIDGE

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NOTICE

9th IPC MEETING (JUNE, 1996)

AASP will be the host society for the 9th International Palynological Congress. Meeting Committee Co-chairs, Vaughn M. Bryant and John Wrenn, have already arranged to hold the meeting at the Marriott Hotel located next to the Galleria Center in Houston, Texas. Meeting dates have been selected (June 22-29, 1996), and 1996 hotel room rates have been confirmed. They will be at no higher than $100 for either a single or double accommodation. We will also have triple and quadruple rooms available for the meeting.

The air-conditioned Marriott Hotel and Galleria Mall Complex will provide ideal places for the 9th IPC. The Galleria is one of the largest shopping mall complexes in the United States. It contains 6 1/2 miles of enclosed, air-conditioned corridors that provide access to more than 300 shops, four cinemas, 32 restaurants and an Olympic-size ice skating rink that remains open to the public all year long. The hotel has three racket-ball courts, tennis courts, and a complete fitness and workout complex containing a weight room, sauna, Jacuzzi, and large swimming pool.

Nearby cultural attractions include the: National Aeronautical Space Administration faculty and museum, Houston Zoo, Museum of Natural History, Museum of Fine Arts, Burke Baker Planetarium, Houston Symphony, Houston Grand Opera, and Houston Ballet. Recreational facilities include more than 20 nearby 18-hole golf courses and amusement-type facilities such as Water World, Astro World, and the new 70 million dollar Space City Houston complex, which includes simulated rides in space ships through our solar system and galaxy.

Symposia topics and field trips for the 9th IPC are in the planning phase, but none have been organized as yet. We are planning to hold up to seven concurrent sessions during each of the five days of meetings. This will provide for a maximum of 700 oral presentations. We have also arranged spaces for 250-300 posters, for those who wish to exhibit them at the meeting.

Our First 9th PIC Circular will be sent to individuals in June, 1994. Until then, we invite members to write either of the co-chairs if they want to volunteer to help, if they wish more information, or if they have suggestions for the meetings.

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THE BRITISH MICROPALAEONTOLOGICAL SOCIETY

Micropalaeontology of the Former Soviet Union

Southampton University, Sept. 3-4, 1993.

Sponsored by BP Exploration, Shell, Unocal, GeoStrat, Halliburton RDS, Millennia, StrataData, Palaeo Services, SSI

The British Micropalaeontological Society is pleased to announce a special meeting devoted to the "Micropalaeontology of the Former Soviet Union", to be held at Southampton University between September 3-4, 1993.

The purpose of the meeting is to learn more about micropalaeontological studies being carried out in the Former Soviet Union and to form links with scientists from FSU. To this end a number of micropalaeontologists from the FSU will be invited to present their latest research. It

is hoped that specialists in all branches of micropalaeontology and all parts of the stratigraphic column will be represented. There will also be presentations by western micropalaeontologists who are working in the FSU. All presentations will be in English.

The meeting will be over two days:

3 September - Lectures at Southampton University
4 September - Field Trip to the Dorset Coast

The field trip will be an opportunity to discuss micropalaeontological issues in a more informal manner with the delegates from the FSU.

Logistics

Accommodation (B&B) and dinner are available at a modest cost at Southampton University. Please indicate on the registration form your requirements. Lunch arrangements are left to individuals (pubs, cafes, etc. are available).

To help with the costs of this meeting a registration fee of £20 is being charged (reduced to £10 for students).

If you wish to attend this meeting please complete the registration form before March 31st 1993. A final program will be dispatched to those who complete the form.

For further information please contact:

Dr. Mike Simmons, BP Exploration, Stockley Park, Uxbridge, UB11 1BP, United Kingdom. Tel: 081 750 0934. Fax: 081 750 0276
or
Dr. Ronald Austin, Department of Geology, University of Southampton, Highfield, Southampton, S09 5NH, United Kingdom. Tel: 0703 592010. Fax: 0703 593052

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CRIME LABORATORY MANAGER

The New York City Police Department is seeking a qualified individual to fill a managerial position in the Police Crime Laboratory section. This position will assist the Director in managing and administering the technical and scientific operations and day-to-day activities of the Lab. Minimum Requirements: A Doctorate in Chemistry, Physics, Biology, Forensic Science, or a related scientific field, plus three years of full-time professional laboratory experience in one of the fields listed above, including 18 months in an administrative or supervisory capacity; or a Master's degree in the above listed areas, plus four years of professional laboratory experience in those fields listed above including 18 months in an administrative supervisory capacity. City residency required within 90 days. Send resume and salary history to:

NYC Police Department
Employment Section, Room 1014
Attn: Daris Gonzalez
One Police Plaza
New York, NY 10038

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HELP WANTED

IKU Petroleum Research is a Norwegian research company specializing if offshore petroleum-related R&D in the areas of exploration, production and environmental technology. The company has 170 employees and is a member of the SINTEF Group in Trondheim, a research organization with more than 2400 employees.

Our Exploration Geology Department is seeking a

Stratigraphic Palynologist

Qualifications
Applicants should have a strong background in Cenozoic and Cretaceous dinoflagellates. However, qualified candidates with major experience in the Jurassic will be considered. Knowledge of sequence stratigraphy, quantitative biostratigraphy, computer data management and kerogen/ palynofacies is desirable. Experience in project management would be an advantage.

Responsibilities
The successful candidate will undertake integrated regional studies, sequence stratigraphy, age and depositional environment analysis, and organic facies analysis. Participating in exploration research teams is essential.

Scientific milieu
The Exploration Geology Department employs 40 people, chiefly performing research projects for the oil industry focusing on the Norwegian continental shelf. Close cooperation with the company's Reservoir and Well Technology Departments enables a multidisciplinary approach in the project work.

Conditions
- competitive salary
- pension
- corporate medical service
- insurance
- housing allowance
- flexible working hours

For more information please contact

Morten Smelror,
Manager of Exploration Geology Department,
or **Joar Saettem,**
Manager of Regional Geology Section,
phone +47-7-591100.

Please send application no later than 28 May 1993 to:
IKU Petroleum Research
N-7034 Trondheim
Norway
ATT: Margrete Mevik, Personnel officer

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XIII INTERNATIONALCONGRESS ON CARBONIFEROUS-PERMIAN

The permanent Committee and the Polish Organizing Committee extend to you a cordial invitation to attend the XIII International Congress on Carboniferous - Permian which will be held in Kraków, Poland, from August 28 to September 2, 1995. For more information please write:

Prof. Sonia Dybova-Jachowicz
Panstwowy Instytut Geologiczeny
Oddzail Gornoslaski
1 Krolowej Jadwigi
41-200 Sosnowiec, POLAND

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PALYNOLOGISTS IN THE NEWS

1993 NEVADA MEDAL TO MARGARET DAVIS

An ecologist who pioneered new techniques for revealing the earth's past environments, and understanding present and future ecological change, has been selected to receive the Desert Research Institute's 1993 Nevada Medal, Governor Bob Miller announced.

Miller said Dr. Margaret Bryan Davis, Regents' Professor in the University of Minnesota's Department of Ecology, Evolution and Behaviour, will be honoured at the Nevada Medal Awards Dinner in Reno April 30. She will present the Sixth Annual Nevada Medal Lecture at the University of Nevada, Las Vegas on April 29 and at the University of Nevada, Reno on April 30.

The Nevada Medal Award is sponsored by the shareholders of Nevada Bell, a Pacific Telesis Company, and includes a $5,000 prize. Past recipients have included James Van Allen, discoverer of the Van Allen Radiation Belt; Benoit Mandelbrot, who introduced fractal geometry; and Carl Djerassi, who developed the first oral contraceptive.

Davis' research has challenged prevailing scientific assumptions that plant and animal communities are generally stable, moving intact from one latitude to another as the climate changes. She showed instead that ecological systems are involved in a continuous process of change. Her research proved that many of the plant and animal communities of today's forests have not existed as long as scientists once believed and that combinations of plant and animal species not found together in nature today did unexpectedly coexist at times in the past.

Davis' contributions center around new techniques for defining the composition of plant communities through the analysis of the pollen they produce. By examining the make-up of pollen from ancient plants, it became possible to chart the change in past ecosystems in response to climate and other environmental influences.

"More than just explaining how the present environment developed, these methods allow us a new approach to some long-standing environmental questions," Davis said. "We can begin to distinguish between the impacts of humans and the natural process of change that has always occurred. For example, we can examine the way ecosystems become acidic naturally over many thousands of years compared to the rapid changes caused by "acid rain" from human sources.

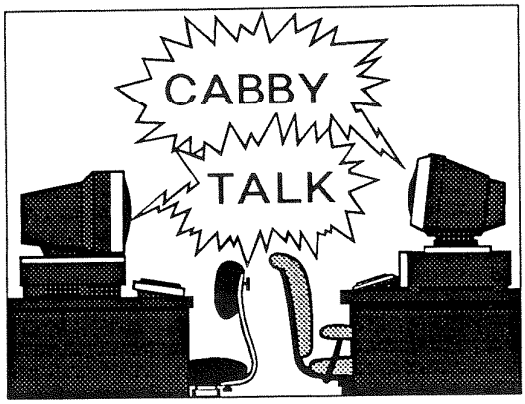
"It's very interesting that evidence of early human impacts on local ecologies shows up more readily than scientists may have expected. In some cases humans may have only hastened a process that was already occurring; in others, humans may have initiated the process.

"This directs us to look closely at issues such as the effect of clear-cutting forests in reducing forest productivity and the diversity of forest species, and the effect of agriculture in artificially limiting the expansion of species and other similar ecological influences. Ecological change will always occur, but we must understand what part we play in it."

Davis served as president of the American Quaternary Association in 1978-80, and her peers elected her to the National Academy of Sciences in 1982. In 1987-88 she was president of the Ecological Society of America.

The field of palynology- the study of pollen-was only a few decades old in North America when Dr. Davis began her studies as an undergraduate at Radcliffe College in the 1950's. She continued her studies as a Fulbright Scholar in Scandinavia, where pollen analysis first developed, and received her Ph.D. in biology at Harvard in 1957.

By the 1980's, her contributions became recognized in the scientific community as effective new tools for understanding the response of entire ecosystems to environmental and climate change and for assessing the role past history has played in determining the patterns we see in modern landscapes.



COMPUTERS IN PALYNOLOGY

Dr. Warren Kovach has been a member of the AASP Computer Applications in Biostratigraphy (CAB) Committee since its inception. Unfortunately, his name was not mentioned in the first announcement of the Committee.

We urge the AASP membership to submit news and articles on computer application in biostratigraphy to our Newsletter. We are still interested in compiling a database on biostratigraphic software. Please contact any of the Committee members (Michael Farabee, Massoud Jameosanaie, Warren Kovach, Judith Lentin, or Pierre Zippi) if you like to share such information with your colleagues. We are looking forward to hearing from you!

GeoLogic

Palaeontology Software Module.

by

Dr. Jim Cole and Dr. Christopher Harlow

INTRODUCTION:

GeoLogic is a multi-disciplinary geological databasing and chart production software package (see illustration on the following page). The add-on Palaeontology Module provides comprehensive fully functional relational databasing facilities for biostratigraphers.

GeoLogic has been designed to run on IBM PC AT or compatible computers (80286, 80386, or 80486), making the system accessible to geologists and Biostratigraphers with either a limited computing background or a more in depth understanding of computer systems. The PC was chosen as the medium to run GeoLogic, as it is now widely available to and understood by individual geologists. Thus GeoLogic is applicable to small independent Biostratigraphers or to large companies who need multiple copies.

GeoLogic has been created and written by Chris Harlow who was instrumental in the design of the Halliburton STRATS system.

GeoLogic allows the user to import curve data, e.g. wireline log data, mudlogging data, MWD data, etc., and to display this alongside the palaeontological data set. Other depth related information may also be displayed e.g. geochemical data, sedimentology data, etc.

CAPABILITIES:

Some of the main features of the GeoLogic Palaeontology Module are:

Data input is via either a touch-sensitive Concept Keyboard or directly via the keyboard. Overlays may be constructed easily by the user and used in conjunction with the Concept Keyboard as a means of providing a particularly rapid and accurate method for the input and editing of data. A library of overlays may be constructed, each applicable to a particular geological scenario.

Nomenclature control is via multiple species dictionaries, which may also be used to database free format text, e.f. descriptions and diagnoses and to tag PCX format graphical images to species names as an aid in identification. The latter may be viewed on screen during data input.

A five level, user definable species grouping system for comprehensive filtering and sorting of the databases.

Sample identification and storage is by sample type, sample depth and sample label.

Retrieval of descriptions, diagnoses and even graphical images from species dictionaries may be made while sample logging is taking place.

Comprehensive text editing facilities allowing entry of free format comments both about samples and about species occurring in samples.

Display of palaeontological data via the GeoLogic Chart generation program may be in both conventional species distribution format or calculated, curve/histogram format.

Abundance symbol selection is from a library of 94 different symbols available in 16 colours.

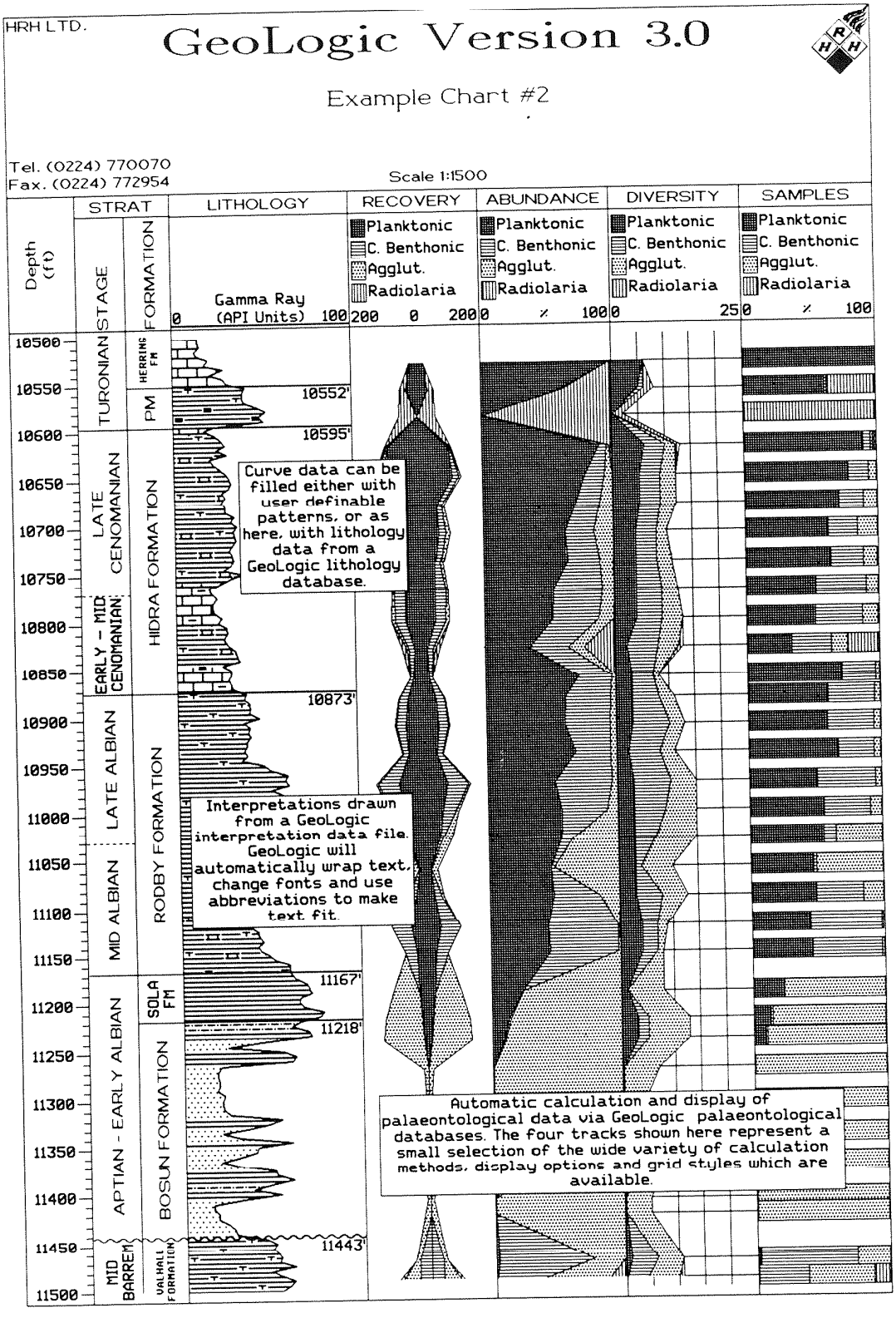
Data is stored in industry standard dBase III file format with the ability to download data as ASCII format data files.

Output can integrate any wireline and lithological data with the palaeontological data on any scale, giving the ability for summary charts or full log formats.

The system comes with context sensitive Help menus and full documentation.

Technical data:

GeoLogic requires 4Mb free space on the hard disc and supports a wide range of printers including dot-matrix, inkjet and bubble jet, HP Laserjet II compatible laser printers and HP Paintjet colour printers. Planned upgrades


HRH LTD.
GeoLogic Version 3.0
Example Chart #2
Tel. (0224) 770070
Fax. (0224) 772954
Scale 1:500
Depth (ft)
STRAT
STAGE
FORMATION
LITHOLOGY
RECOVERY
ABUNDANCE
DIVERSITY
SAMPLES
Planktonic
C. Benthonic
Agglut.
Radiolaria
Gamma Ray (API Units)
0
100
200
0
200
%
25
TURONIAN
HERRING FM
PM
LATE CENOMANIAN
HIDRA FORMATION
EARLY - MID CENOMANIAN
LATE ALBIAN
RODBY FORMATION
MID ALBIAN
APTIAN - EARLY ALBIAN
SOLA FM
BOSUN FORMATION
MID BARREM
VALHALL FORMATION
10552'
10595'
10873'
11167'
11218'
11443'
Curve data can be filled either with user definable patterns, or as here, with lithology data from a GeoLogic lithology database.
Interpretations drawn from a GeoLogic interpretation data file. GeoLogic will automatically wrap text, change fonts and use abbreviations to make text fit.
Automatic calculation and display of palaeontological data via GeoLogic palaeontological databases. The four tracks shown here represent a small selection of the wide variety of calculation methods, display options and grid styles which are available.

include Versatec support, HPGL support and a Windows version.

AVAILABILITY:

GeoLogic Version 3.2 is now released and is used world-wide by many Oil and Service Companies. For further information and chart examples please contact:

Dr. Jim Cole or Dr. Chris Harlow,
HRH Limited,
Unit 21 Kirkhill Place,
Dyce,
Aberdeen AB2 0ES,
Scotland.
Tel: 44-224-770070
Fax: 44-224-772954

TECHNICAL NOTES

POLLEN PLAYS A PART IN CRIME-BUSTING

Forensic palynology is the scientific application of the study of modern and fossil pollen and spores (palynomorphs) to help solve legal problems.

The technique has been known for years but used rarely, accordingly to Dr. Dallas Mildenhall, Forensic Palynologist.

Surveys of major law enforcement agencies in the United States have shown little has been known of this area of forensic science.

Only law enforcement agencies in New Zealand among the major nations, routinely collect and use forensic pollen studies in civil and criminal cases.

Spores and pollen recovered from dirt, clothing, hair, rope baskets and materials used as packing can reveal geographical origin or can link an individual or item with the scene of a crime.

Likewise, pollen and spores found in illegal drugs like opium, marijuana and cocaine, can link those drugs with their source area and can show which shipments of drugs originated from the same or different sources. (see NEWSLETTER Vol 26, no.1)

Palynological evidence by its very nature can rarely be used as definite proof in a criminal case.

Its usefulness lies in associating a suspect with the scene of crime and, by implication, demonstrating that a particular person may have committed the crime.

Although each pollen assemblage is in its own way unique, it is difficult to demonstrate without complex mathematical calculations, time-consuming and costly counting of pollen grains and spores, and the use of numerous control samples.

Laboratory procedures can take from two hours to two days and differ according to the exhibits.

Clothing, for example, is examined for dirt which is scraped off with a scalpel, soaked off in strong detergents, or lifted by adhesive tape.

Whole items may be immersed and well agitated in warm water with detergent. The liquid is then centrifuged down.

The spores and pollen are floated off and washed in acid (using several strong acids which destroy the cell contents leaving the characteristic outer cell walls intact).

They are then filtered to eradicate unwanted plant material and mounted in glycerine jelly on a glass slide.

Soils and rock samples are subject to strong acid treatment to clear them of any minerals so that only organic material remains.

The organic remains are further tested with concentrated nitric acid to release the spores and pollen which are then washed in potassiumhydroxide, mounted in glycerine jelly and examined.

the recovery of more than 37kg of prize deer velvet from a freezer in a private garage in Wairoa 12 years ago led to a High Court trial which was to establish palynology as a tool with potential in New Zealand forensic science.

Colin Gary Christoffersen, 35, self-employed, denied the theft, claiming that the velvet had been collected by him over two seasons and was in storage until the price of velvet rose.

The velvet (antlers in a soft state) was later identified as having been stolen three months earlier from Ohinepaka Station, Wairoa.

Station employees had herded deer into pens ready for the velvet to be removed next day. When they turned up at the pens the following day, the velvet had already been cut and had vanished. A scene check indicated the precious commodity had been packed into woolbale sacks stacked in a nearby woolshed and carried away.

Pollen samples were collected from the mud in the stock pens, mud stuck inside and outside one of the recovered woolbale sacks and from a woolbale sack left at the scene. Mud clinging to the base of the deer antlers found in the suspect's freezer, one of which was contaminated with blood, was also collected for analysis.

Forensic palynologist, Dr. Dallas Mildenhall, concluded that the mixture of blood and mud at the base of the antlers could only have occurred immediately after the antlers were cut off.

The suspect maintained he had cut the antlers off free-ranging wild deer in native scrub where small clearings occurred. However, the high quality of the antlers and the nature of the mud on them made this assertion highly improbable, Dallas said.

Palynological analysis found that the peculiar pollen assemblage on the antlers could only have derived from cultivated grassland near a walnut tree (which grew close to the Ohinepaka stockyards), acacia (which grew some distance away), willow and a large number of introduced herbaceous plants.

No sample contained any evidence of having derived from a native forest or scrubland environment. All samples contained spores typical of a continuously wet and muddy environment.

All samples were found to have come from the same source. The Court accepted that source was the stock pens.

Summing up, the Auckland High Court judge placed great weight on the palynological evidence and sentenced Christoffersen to non-residential periodic detention.

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THESIS ABSTRACTS

ABSTRACT

Palynological and foraminiferal studies in the subsurface Cretaceous of the northern Western Desert, Egypt

Ph.D. Dissertation, 1992

Mohamed Ismail A. Ibrahim

**Geology Department, Faculty of Science,
Alexandria University, Alexandria, Egypt.**

The thesis provides an insight into the much needed link between microflora and microfauna for accurate delineation of stratigraphic boundaries. The palynomorphs and foraminifera are useful tools not only in the definition of stratigraphic tops, but also as palaeoenvironmental and palaeogeographical indicators.

Throughout the present study, 228 samples from the Lower-Upper Cretaceous succession encountered in two wells namely Kahraman-1 and Abu Gharadig-18 Wells were studied for palynological and foraminiferal analyses.

The detailed palynological analysis of the Cretaceous succession of both wells yielded a rich, well preserved and diversified pollen, spores and dinoflagellates. These microfloras which are recovered from the Aptian-Maastrichtian strata of the studied wells, contain 75 genera and 128 species of pollen grains and spores, one genus and two species of megaspores, and 58 genera and 119 species of microplanktons. *Afropollis* n. sp. and *Stephanocolpites* n. sp. are two new angiosperm species described, photographed and recorded from the Cenomanian of the present study. Based on the encountered marker species of pollen and spores, eight successive miospore zones ranging from Aptian to Maastrichtian equivalent to eight dinoflagellate zones and two subzones were established.

The foraminiferal analysis of the studied samples led to the recognition of 108 planktonic foraminiferal species belonging to 30 genera from the Cenomanian-Maastrichtian successions of Kahraman-1 and Abu Gharadig-18 Wells. On the other hand, 10 index benthonic species of the genera *Thomasinells, Discorbis,* and *Bolivinoides* were also recognized. The Aptian-Albian sediments are barren of any foraminiferal contents. The Cenomanian-Maastrichtian successions of KRM-1 and AG-18 Wells are subdivided into eleven globotruncanid zones of cosmoplitan significance, equivalent to six local heterohelicid zones. Four benthonic foraminiferal zones are also established and well correlated with the other zones.

The study of the palynomorphs and the planktonic foraminifera prove and demonstrate the existence of the regional hiatus between Santonian-Campanian in northern Egypt and the Western Desert as a result of missing upper Santonian deposits. They also detect the local unconformity at AG-18 Well between Santonian-Maastrichtian due to the absence of upper Santonian-Campanian strata.

The present study throws light on climatic and geographic conditions prevailed during the Aptian-Maastrichtian time. During Aptian time, Egypt was located with the pre-Albian West African-South American Province (WASA). During the Albian-Cenomanian, Egypt and the Middle East were parts of the mid-Cretaceous African-South American Province i.e. ASA (= Northern Gondwana Province = Northern Gondwanan Realm). This province comprises most of Africa and northern South America.

Pollen assemblages recorded from the present materials, and characteristic to this phytogeographic province are elaterat pollen (*Elaterosporites, Elaterocolpites, Elateroplicites, Galeacornea* and *Sofrepites*), *Classopollis* spp., *Tropollis* spp., ephedralean pollen, *Reyrea* spp., *Cycadopites* spp. and Araucariacean pollen. No bisaccate pollen occur in the Albian-Cenomanian sediments of the present wells as also criterion to this province. The climate of the Northern Gondwanan Province is interpreted on the basis of the sporomorphs as tropical but semi-arid.

The presence of *Dichastopollenites* cf. *dunveganensis* in the late Cenomanian of the Kahraman-1 and the Abu Gharadig-18 wells supports the opinion that Egypt was at the boundary between the Northern Gondwanan and the Southern Laurasian Realms in the late Cenomanian time.

The northern Western Desert palynoflora shows that during the Late Cretaceous (Turonian-Maastrichtian) time, North Africa was at the boundary between the Palmae and the European Normapolles Provinces. This could be proved through the present study by the presence of Normapolles pollen-type like *Trudopollis* sp. (1%) together with bisaccate pollen, e.g. *Podocarpidites* cf. *multesimus* (1%). It could be also support the conclusion of Méon (1990) that at least in the late Senonian, North Africa was nearer to southern Europe and thus the influence of the European flora was strongly there. The climate during the Turonian-Maastrichtian time could be deduced as warm but more humid than it was in the Albian-Cenomanian. The low frequency of the ephedralean pollen in the Late Cretaceous supports this climatic inferences.

The qualitative and quantitative analyses of the microfloras and microfaunas, encountered in the present study led to establish a depositional and palaeoenvironmental model for the Aptian-Maastrichtian successions of the northern Western Desert as summarized in the following:

1) The Aptian biotype in the study area is dominated by land-plant microfloras and contains relatively few dinoflagellate cysts. As a result, deposition in near-shore marine environment (inner shelf) is suggested for most of the Aptian succession. The numerous tetrads of *Classopollis*, indicates that their parent plants were important components of the coastal marshes. The presence of the dinocysts *Oligosphaeridium* and *Cribroperidinium* denotes a transgressive phase, whereas the occurrence of *Pseudoceratium retusum* within the dinocyst elements could conceivably reflects some boreal influence on the great Tethyan basin during the Aptian period.

2) The diversity of Albian dinocysts beside the slight increase in number of gonyaulacoid cysts relative to peridinioid and ceratiacean cysts implies deposition in a relatively more marine environment rather than in Aptian time. Therefore, a coastal to inner shelf environment prevailed during the deposition of the Dahab and the Kharita Formations (Albian) of the northern Western Desert of Egypt.

3) The deposition of the Cenomanian succession in the northern Western Desert of Egypt most probably took place in shallow marine water of inner to middle shelf depth (0-50m), as a result of progressive phase of marine transgression. The depositional environment might be shallower in the Matruh Basin than in the Abu Gharadig Basin as indicated by the low P/B ratios and low species diversity, in addition to the high frequency of the simple agglutinated foraminifera in KRM-1 Well.

4) The dramatic change in the palynomorph assemblage towards high percentages of chlorococcalean green algae (*Pediastrum, Scenedismus, Botryococcus,* and *Tetrastrum*) reflects a brackish to fresh water incursion resulting from fluvial influence during the late Cenomanian-early Turonian time (basal part of Abu Roash Formation).

5) The Turonian sediments (middle part of Abu Roash Formation) of the studied wells may have been deposited in shallow-water of middle shelf depth (50-100m) with good connection to the open sea. It can be concluded that the site of the KRM-1 Well (Matruh Basin) was probably shallower rather than the site of the AG-18 Well (Abu Gharadig Basin) during the Turonian time.

6) The upper part of the Abu Roash Formation (Coniacian-Santonian) in the northern Western Desert was deposited under open marine conditions, most probably in the outer-shelf (palaeodepth 100-200m). The high P/B ratios, the increase in planktonic species diversification, the higher rate of origination of planktonic foraminifera, and the high percent of open marine gonyaulacoid dinoflagellate cysts (33-60%) support this palaeobathymetric conclusion. It is also noteworthy that the Matruh Basin began to become deeper more or less than the Abu Gharadig Basin.

7) The Campanian-Maastrichtian Khoman Formation of the northern Western Desert of Egypt was deposited under deep and/or warm marine water, most probably in a water depth corresponding to the upper slope (200-600m). While during the early and middle Maastrichtian (*Globotruncana falsostuarti & Gansserina gansseri* Zones) the palaeodepth may reached the upper slope > 600m. During Campanian-Maastrichtian, the Tethys probably reached its greatest depth at about the

time of the maximum southward transgression. The very high P/B ratios (1.109.0), high species diversity (20-40), abundance of deeper water planktonic globotruncanids, abundance of dinocysts, and the poverty of sporomorphs (1-2%) support this interpretation. The Matruh Basin was deeper than the Abu Gharadig Basin at this time interval.

Supervisors: Prof. Dr. M.R. Abdel-Kireem, Prof. Dr. S.E. Saad, Dr. E. Schrank, Prof. Dr. E. Klitzsch and Dr. A. Samir

Examinators: Prof. Dr. S.E.M. Ansary and Prof. Dr. M.E.A. Bassiouni

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PALYNOSTRATIGRAPHY OF THE OLINI GROUP (CONIACIAN-CAMPANIAN), UPPER MAGDALENA VALLEY, COLOMBIA

Carlos Jaramillo
Universidad Nacional de Colombia

ABSTRACT

In an attempt to establish the chronostratigraphic subdivision of the Olini group, we analyzed 40 outcrop samples of a stratigraphic section in Ortega-Coyaima region, Tolima department, Colombia for palynological purposes.

The Olini group is overlying the "Villeta" group and underling the "Nivel de Lutitas y Arenas" Formation.

Based on the identification of 43 dinoflagellate species and 5 sporomorph species it was possible to date the whole sedimentary section as upper Coniacian through middle to upper Campanian.

A local boundary Coniacian-Santonian was adopted on the basis of the first occurrence of *Alisogymnium euclaense, Dinogymnium acuminatum* and *Dinogymnium undulosum*; and a local boundary Santonian-Campanian on the basis of the first occurrence of *Areoligera senonensis* and the last occurrence of *Odontochitina porifera.*

Four informal palynological concurrent assemblages could be established;

Assemblage A (upper Coniacian): *Hystrichodinium difficle, Dinogymnium sp.* A and *Odontochitina operculata,* poor recovery of palynomorphs.

Assemblage B (Santonian): first occurrence of *Alisogymnium euclaense, Dinogymnium undulosum, D. acuminatum, D. digitus, D. longicornis* and *D.* ____ nov. sp. Peak abundance of *Odontochitina costata, Odontochitina porifera, Xenascus ceratioides* and *Oligosphaeridium complex.*

Assemblage C (upper Santonian through lower Campanian): first occurrence of *Hystrichodinium pulchrum, Areoligera senonensis,* and last occurrence of *Odontochitina porifera, Oligosphaeridium complex, Dinogymnium undulosum,* and *D.* ____ *nov. sp.* Peak abundance of *D.* ____ nov. sp., *Palaeohystrichophora infusoriodes, O. complex,* and *O. costata.*

Assemblage D. (middle to upper Campanian): first occurrence of *Senegalinium laevigatum, Spinidinium sp. C., Andalusiella polymorpha and Cerodinium leptodermum.* Peak abundance of *C. leptodermum, A. polymorpha* and *S. laevigatum.*

The high diversity of Gymnonidial Order (12 species were found) increases its biostratigraphic potential.

A new species of the genus *Dinogymnium* is proposed, and antapical horn and CI:59.7 are its diagnosis key.

High degraded, fine, amorphous organic matter dominates the stratigraphic section, specially in "Lidita Inferior" and "Lidita Superior". The "Nivel de Lutitas" shows an increasing of humic, herbaceous and woody material; the level of degradation is lower than Liditas and there are a bigger size of palynodebris. A possible peak of regression is indicated in this interval, 150 meters over the top of "Lidita Inferior".

Middle neritic conditions prevailed during the accumulation of the sediments of "Lidita Inferior" and "Lidita Superior". Inner to middle neritic conditions characterize the sediments of "Nivel de Lutitas".

Good oil source rocks were found in the "Lidita Inferior" and "Lidita Superior", the "Nivel de Lutitas" shows some oil with minor gas prone. The whole stratigraphic section seems to be into a early mature to mature stage of thermal maturation.

EDITOR'S NOTE: A number of fine line drawings and plates arrived with the thesis abstract by Carlos Jaramillo, unfortunately it is impossible to publish these illustrations in the NEWSLETTER. Also, the name of the new species which is to be published elsewhere was deleted for nomenclatural reasons.

A note from Faith Duncan whose thesis abstract appeared in the last NEWSLETTER indicated a typographical error in the title of her thesis. I had failed to place a little curly line over the second "n" in the word Encueñtro. The following is the corrected version of the information regarding her thesis

Botanical Reflections of the Encueñtro and the Contact Period in Southern Marian County, California. by Faith L. Duncan of the Department of Anthropology and Geosciences, University of Arizona, Tucson, Arizona. December 1992, the thesis was supervised by Dr. Paul Martin.

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Recent graduates of either M.Sc. or Ph.D. programs are urged to submit their abstracts for publication in the AASP NEWSLETTER. Professors are urged to urge their students to submit abstracts for publication in the AASP NEWSLETTER.

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INFORMATION REQUESTED

POLLEN KEYS AND ATLASES OF THE WESTERN HEMISPHERE

I am trying to find references to all of the pollen keys and atlases that have been published only on modern pollen and spores (Quaternary age) found in areas of the Western Hemisphere. Listed below are the references that I have been able to locate to date, and a brief description of what each contains.

If you know of other atlases or keys which meet the criteria listed above, please let me know. I am compiling this information for a chapter in a book and would like the chapter to be as complete as possible. Please send your comments to:

Vaughn M. Bryant, Jr.
Palynology Laboratory
Texas A&M University
College Station, Texas 78743-4352

1. Pollen and Spores of Borro Colorado Island, by David W. Roubik and Jorge Enrique Moreno P. (1991 Missouri Botanical Gardens, St. Louis, Missouri). This pollen key and atlas is a comprehensive study of pollen and spores produced by plants that are commonly found in the tropical regions of Central America. The book includes a variety of keys: 1) listed by family, 2) by genus, and 3) by aperturation. In total the key covers 131 plant families and shows photographs of the pollen or spores of 1,269 different plant taxa.

2. An Atlas of Selected Pollen Important to Honey Bees in the Eastern United States, by Stephen B. Bambara and Nancy A. Leidy (1991 North Carolina State Beekeepers Association, 1403 Varsity Drive, Raleigh, North Carolina, 27606). All of pollen in this atlas are taken at the scanning electron microscope level. One of the major drawbacks of this atlas is that it contains only 57 photographs of 37 different pollen taxa.

3. Sampling and Identifying Allergenic Pollens and Molds: An Illustrated Identification Manual for Air Samplers, by Grant Smith (1990 Blewstone Press, P.O. Box 8571 Wainwright Station, San Antonio, Texas 78208). This pollen atlas covers 408 pollen taxa and 192 fungal types found in North America. All of the photographs are in color and are of unacetolyzed pollen and spores. Although useful for aerobiologists, the atlas is less useful for those who might want to investigate the details of a specific pollen type that only the resolution of an acetolyzed pollen grain photo might offer.

4. Palinologia de los Tuxtlas: Part I, Especies Arboreas, by Maria del Socorro Lozano-Garcia and Enrique M. Hernandez (1990 Special Publication 3, Institute of Biology, Universidad Nacional Autonoma de Mexico, Mexico, D.F.). This light microscope pollen atlas is written in Spanish and covers 101 arboreal pollen types found in 42 plant families growing in the Los Tuxtlas region in southeastern Veracruz, Mexico. The book is arranged alphabetically by plant families and contains fairly detailed descriptions of each pollen type. However, it does not contain a key to these pollen types.

5. O Polem no Mel Brasileiro, by Ortrud M. Barth Schatzmayr (1989 Conselho Nacional de Desenvolvimento Cientifico e Tecnologico, Instituto Oswaldo Cruz, Caiza Postal 926, 20.001 Rio de Janeiro, Brazil). This atlas contains pollen photographs of 86 different plant taxa which are known to be important sources of pollen and nectar used by Brazilian bees in the production of honey. All of the illustrations are of fresh pollen as they would appear in unacetolyzed honey samples.

6. Airborne and Allergenic Pollen of North America, by Walter H. Lewis, Prathibha Vinay, and Vincent E. Zenger (1983 John Hopkins University Press, Baltimore). The airborne and allergenic is an excellent reference to important pollen types that are known to cause allergic reactions in people. The text provides photographs of pollen in three different preparations: unacetolyzed, acetolyzed, and as they appear when viewed using a scanning electron microscope. Pollen from 67 angiospermae families and a few gymnospermae and cryptogram taxa form the illustrations in this text.

7. An Atlas of Airborne Pollen Grains and Common Fungus Spores of Canada, by I. John Gassett, Clifford W. Crompton, and John A. Parmelee (1978 Canada Department of Agriculture Monograph No. 18, Ottawa, Canada). This text

was designed to illustrate the pollen types of nearly 150 floral types and the spores of more than 50 fungi that occur in Canada. The book contains photographs of pollen types and spores as they appear in unacetolyzed and acetolyzed preparations and when viewed with a scanning electron microscope. Although not stated in the title, this atlas focuses mainly on the allergy-producing pollen and spores of Canada.

8. An Atlas of Pollen of the Trees and Shrubs of Eastern Canada and the Adjacent United States (Part I:Gymnospermae to Fagaceae [1972]; Part II: Ulmaceae to Rosaceae [1974]; Part III: Leguminosae to Cornaceae [1974]; Part IV: Clethraceae to Caprifoliaceae [1979], by R. J. Adams and J. K. Morton (Department of Biology, University of Waterloo, Waterloo, Ontario). Each of these three books contain a collection of scanning electron micrographs of pollen types. The number of taxa represented by each text ranges from a low of 75 to a high of over 125. In the four texts combined, more than 400 taxa are illustrated.

9. Key to the Quaternary Pollen and Spores of the Great Lakes Region, by John H. McAndrews, Albert A. Berti, and Geoffrey Norris (1973 Royal Ontario Museum Life Sciences Miscellaneous Publication, 100 Queen's Park, Toronto, Canada. This book is a key to fossil pollen types one might find in sediments of the Great Lakes region of the United States and Canada. The book contains 144 taxa of which 46 are ones commonly found in fossil deposits, and the other 76 represent ones which represent less than 1% of the types generally found in fossil deposits of that region. All of the light microscope illustrations are of fossil pollen. An accompanying pollen key and glossary of terms is included.

10. Pollen and Spores of Chile, by Calvin J. Heusser (1971 University of Arizona Press, Tucson, Arizona). This book covers selected taxa in the pteridophyta, gymnospermae, and angiospermae. It contains a fairly detailed description of each of the palynomorphs listed in the key and pictured in the plates. Of special importance are the 687 taxa covered in black-and-white photographs shown in the 60 plates. For a few taxa there is only one photograph, but for most others there are from 2-4 pictures of each specific palynomorph taken from different views.

11. Pollen Flora of Argentina, by Vera Markgraf and Hector L. D'Antoni (1971 University of Arizona Press, Tucson, Arizona). Like the similar book by C. Heusser on the pollen flora of Chile, this book covers selected taxa of the pteridophyta, gymnospermae, and angiospermae that grow in Argentina. The book contains black-and-white photographs of 374 different pollen/spore taxa which are illustrated in 43 plates. There are also individual descriptions of each palynomorph taxon and an accompanying key to the pollen and spore types covered in the text.

12. How to Know Pollen and Spores, by Ronald O. Kapp (1969 William C. Brown Company, Dubuque, Iowa). Kapp's hand-drawn illustrations of key palynomorphs found in North America was published in 1969 and was used widely for the next decade until it finally went out of print. It was especially useful because it contained sketches of dinoflagellates, foraminifera, algae and algal spores, fungal spores, 32 taxa of mosses and tracheophyta, and 327 different taxa of gymnosperms and angiosperms (both modern and extinct). Although it has been out of print for more than ten years, old copies are still being used. Until a better key is produced, it remains one of the best learning keys for North American pollen types.

13. Pollen Grains, by R. P. Wodehouse (1965 Hafner Publishing Company, New York [1st printing 1935]). The Wodehouse text is the first key published that is devoted to selected types of angiospermae and gymnospermae pollen taxa from the Western Hemisphere. The Wodehouse text contains descriptions of each pollen taxon, 14 plates of hand-drawn pictures of pollen grains, and an index. Although the pollen key is useful, the author states in the preface, "These (keys) are not intended for identification, though it is conceivable that in some cases they may be used for such a purpose."

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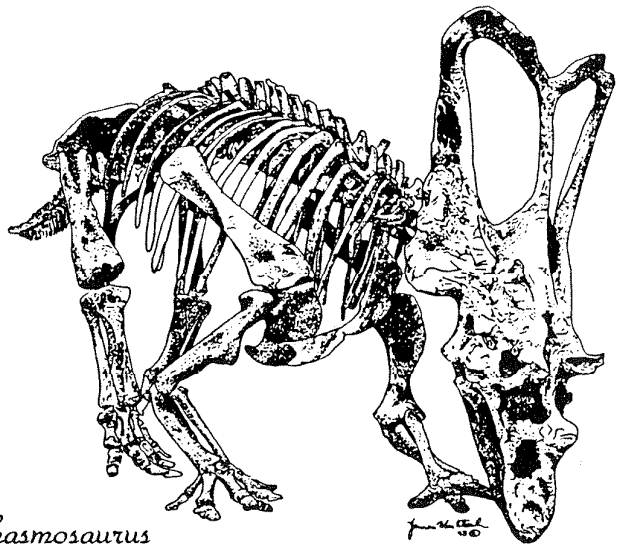
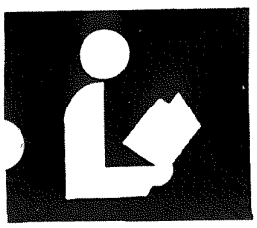


Chasmosaurus



BOOK REVIEWS

Book Review Editor - Reed Wicander
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Pollen and Spores: Patterns of Diversification

(Systematics Association Special Volume 44).

S. Blackmore & S.H. Barnes (eds.). 1991. Clarendon Press, Oxford, 391 p. ISBN 0-19-857746-X. $120.00

This book is an edited volume of papers presented at a symposium with the same title which was held jointly at the Linnean Society of London and the Natural History Museum in March of 1990. The subtitle, "Patterns of Diversification" is perhaps meant in its widest possible meaning, for there is a wide range of topical coverage in this volume and much of it is not specifically devoted to the study of pattern. The coverage varies from excruciatingly narrow focus of digitized counting of microperforation density (ranging from 40 to 80 perforations per μm_2) on 42 pollen grains (from three species) to the latest views on the *phylogenetic* pattern of Angiosperm origins based on the study of pollen grains. Because of the broad coverage of topics, the volume has potential appear to a wide number of researchers in palynology, paleopalynology and paleobotany. The organization follows an approximately evolutionary sequence beginning with three papers on bryophyte grade plants, followed by three fern papers, one on seed origins, and twelve Angiosperm articles.

Brown & Lemmon compare sporogenesis in extant bryophytes and lycophytes. Their discussion is extremely relevant to the following two papers in *situ* spores in rhyniophytoids (Fanning et al.) and dispersed cryptospores (Gray), which emphasize the problematic nature of fossil cryptospore dyads and tetrads. Fanning et al., have now isolated dyads from rhyniophytoid-like sporangia and it would be interesting to find an existing cytological mechanism for dyad-producing sporogenesis. Gray seems so intent upon proving that all cryptospore tetrads are tetrahedral (and, therefore, directly ancestral to the bryophytes) that she has dismissed the range of morphological and configurational variation which has been documented by the systematic work of Vavradová, Richardson and others. But it is this variation in configuration, wall development and surrounding membranes in both dyad and tetrad cryptospores which will eventually lead to an understanding of the relations of diaspores to the parent plants of the early terrestrial floras.

The paper by van Uffelen on surface patterning of polypodiaceous spores during exospore development presents some fascinating arguments about the relation between biologically controlled pattern formation and physiochemical (abiological) pattern development. This is part of the rather difficult interface between the biological and physical sciences, harkening back to D'Arcy Thompson. The following papers on fossil and extant Schizaeaceae spores (van Konijnenburg-van Cittert) and heterosporous lycopods and aquatic ferns (Collinson) are excellent. Particularly impressive are the extensive TEM illustrations of fossil megaspore walls in direct comparison with their modern counterparts. Chaloner and Hemsley complete the heterosporous section of the book with a short discussion on the rôle of exine thickness and megaspore size as a possible argument in favor of the heterosporous origin of the seed. Their article is in part a response to some of the hypotheses proposed recently by Dimichele et al., 1989.

Doyle and Hotton present a synthesis of early angiosperm evolution based on cladistic analysis of characters and comparison with the phylogenetic systematic work of Donoghue & Doyle> Their results are presented in the form of evolutionary trees with fossils (both hypothetical and real) positioned as ancestors. Friss et al., present their work on pollen grains found *in situ* on Cretaceous anthers and stigmatic surfaces. Their work indicates that Cretaceous floral remains are more common than has been previously thought. Comparative morphological works are presented on the Tertiary-Recent Palmae and Sapotaceae (Harley et al.). Studies on pollen wall development are found in papers by Zacada, Gabarayeva, and the Heslop-Harrisons (intine function). Zavada has done an important job of explaining in a clear and unambiguous manner the problem in relating cytologically derived wall terminology (based on staining) and TEM (ultrastructurally) based terminology. The remaining chapters are essentially biological and include two papers on the taetum, one on gamete evolution and a brief report by Co et al., on a computer simulation study of aquatic pollination. These will be of less interest to the paleontologically inclined.

The volume is characterized primarily by its diversity and wide range of topics. Its appeal will vary depending upon one's own particular interest or fossil group, which is why I have tried to describe the contents in a fairly complete manner.

Reviewed by:
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Fossil Prokaryotes and Protists

Edited by Jere H. Lipps
Blackwell Scientific Publications, Inc.,
238 Main St., Cambridge, MA 02142
1993, 342 pages, 286 figures, ISBN 0-86542-073-4;
$49.95US (paperback)

Blackwell has scored yet another impressive victory in the race for the lion's share of the geoscience book market. The publication of **Fossil Prokaryotes and Protists** comes at a time when enrollment in geology programs is increasing again and the need exists for a very readable, informative text in micropaleontology.

I received the book in the mail shortly before Christmas, and over the term break had the choice of reading it, or the **Sword in the Stone**. I opted for Jere Lipps book, and was very pleased with my choice. It isn't that tales of King Arthur are so uninteresting, but that the text of Fossil Prokaryotes is so interesting. Indeed, this is one of the most readable technical books I've encountered; this is all the more remarkable when one considers that it is a joint effort, with 15 authors contributing to 14 chapters. Jere Lipps did an excellent job of orchestrating this project so that there is one writing style and close adherence to a format style. The result is that the book has internal consistency which many jointly authored books lack.

As a Quaternary palynologist I do not feel qualified to comment on the technical accuracy of chapters dealing with things which I am only superficially acquainted with (e.g. radiolaria). I certainly defer to the likes of andrew Knoll in his discussion of Prokaryotes (Chapter 5) and Lucy Edwards in her description of Dinoflagellates (Chapter 7). In a recent discussion with Reed Wicander he told me he believed the chapter on Acritarchs and prasinophytes (Chapter 6, written by Carl Mendelson) was indeed up-to-date and thorough. My belief, then, is that Dr. Lipps took great care in author selection and the technical content of the book is what is should be.

There are some remarks I'd like to make about the construction of the book. Many aspects of the text are unusually good. One thing did bother me often, though, and that was the weight of the cover stock. More and more paperback books are being printed in order to contain prices (at $49.95 US this book is a steal?). However, I noticed that the front cover of the book is remarkably hygroscopic, and just like the awns or certain grass seeds it moves, almost visibly, when the level of humidity in the air changes. In south Georgia this is a problem and the front cover more than once curled up on itself like a wood shaving.

Well, so much for the book's negative qualities. The positive qualities are as follows:

1. There is a nicely annotated bibliography at the end of each chapter.
2. The variety of authors has allowed each group of organisms to be treated by someone who is well acquainted with them.
3. Key words are in bold type, with a corresponding glossary listing in the back.
4. Some of the photographs are remarkable. Figure 1.2 show Didinium nasutum, a ciliate, caught in the act of digesting the cilia off of a hapless, partially ingested Paramecium caudatum. Also, there is a photo of the foram Orbulina universa feeding on a copepod (Figure 12.3), with all the foram's pseudopodia extended. How do the photographers do these things?! Finally, Lucy Edwards included an excellent stereo pair of Nematosphaeropsis pusulosa (Figure 7.5) in her text, and I didn't even need a stereoscope to make it look 3 dimensional. Nice touch!

   Other chapters have similarly superior figures. The SEMs in Chapter 10 show very crisp images of diatoms with excellent resolution of detail, in some cases to far less than 1 micron. The SEMs of tintinnids in Chapter 14 could be sharper and would have benefited from better cropping, but many are reprinted in this text, so that may not have been an option. In any case, Figure 14.9, showing Codonaria oceanica with its agglutinated lorica composed of six different coccolith genera is very impressive.
5. The authors try to clarify the prodigious problems of nomenclature which one encounters in whole Kingdoms of organisms which are not organized about the single-celled level. Lucy Edwards points out the problems one faces with just the dinoflagellates (Chapter 7), while Jere Lipps confronts the issue of Chapter 1. This is a conceptual problem which entry-level students always face, particularly when one considers that we seem to be driven to classify things into neatly separated groups. The fact is that protists and prokayotes don't seem to belong to any familiar classification scheme. Zoologists and botanists claim, respectively, that these creatures are phylogenetically organized within the International Code of Zoological Nomenclature and the International Code of Botanical Nomenclature, depending upon such conditions as whether the cells have chloroplasts or not, or are heterotrophic. Heterotrophic photosynthesizers still need a home, but I'm afraid even Jere Lipps has failed to find them one. Furthermore, Lipps shows how an Order in the protozoological scheme might be handled as a Division or a Phylum in the botanical scheme. Attempts to straighten the classifications out using tables seem to fail, however, as the relationships among taxa between the tables in Chapter 1 may not be terribly clear to a non-protozoologist.

Fossil Prokaryotes and Protists is an excellent product drawn from a number of very capable minds. It is

supposed to be the companion volume to Blackwell's text, **Fossil Invertebrates**, edited by Boardham, Cheetham, and Rowell. The reader will make no mistake in knowing where Jere Lipps and his colleagues place their interest, 'ther, as they scrupulously avoid having anything to do .ith "higher" organisms. Witness the caption for Figure 1.4, which reads "A diagrammatic phylogeny of eukaryotes based on RNA molecular sequencing and similarity of mitochondrial cristae, showing the place of various groups of eukaryotes. *The multicellular kingdoms, animals, plants, and fungi, are a much later and less significant development.*" (italics mine). Providing that your multicellular, eukaryotic ego doesn't take offense at being the product of "a much later and less significant development", I truly believe you will enjoy this fine book. I have recommended it to others, and intend to adopt it for micropaleontology next year, when it will fulfil its expectation of being a suitable companion for **Fossil Invertebrates**

Fredrick J. Rich,
Dept. of Geology and Geography, Georgia Southern University.

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Palinologia de los Tuxtlas: Part I, Especies Arboreas

'Maria del Socorro Lozano-Garcia and Enrique M. ernandez, Special Publication # 3; 1990. Institute of Biology, Universidad Nacional Autonoma de Mexico, P.O. Box 70-233, Mexico City 04510, Mexico. 61 pages, 19 B&W plates. Price not listed.

The recent publication of the Pollen and Spores of Borro Colorado Island by David W. Roubik and Jorge Enrique Moreno P. stands as the most comprehensive single volume yet available on the pollen flora of tropical plants found in Central America. Nevertheless, a recent publication on the pollen taxonomy of selected arboreal flora in the state of Veracruz, Mexico deserves recognition.

This light microscope pollen atlas, by Maria del Socorro Lozano-Garcia and Enrique M. Hernandez of the Universidad Nacional Autonoma de Mexico, covers 101 arboreal pollen types found in 42 plant families growing in the Los Tuxtlas region in southeastern Veracruz, Mexico. The book, written in Spanish, is arranged alphabetically by plant families and contains fairly detailed descriptions of each pollen type. However, it does not contain a key to these pollen types.

The pollen types for this study came from plant specimens that were collected and identified by G. Ibarra anriquez during the early 1980s. The voucher specimens and the pollen collection can be found on deposit at the National Herbarium of the Institute of Biology in Mexico City. In addition to the pollen descriptions, there are 19 black-and-white photographic plates containing 220 individual micrographs of 101 different pollen types. Most of the pollen types are of different genera; for a few genera, however, up to three different species are covered.

Most of the pollen types represented in this book are types that are not generally found in the United States. However, whether or not all of the represented types are of flora native only to Mexico, or other regions of Central and South America, is not clear from the text. Each of the 42 plant families is represented in the text by from one to ten different pollen genera.

Although this is neither a comprehensive nor an extensive study of the arboreal pollen types found in the Los Tuxtlas region, it does, nevertheless, represent an important reference for tropical pollen types. For anyone working in the tropical regions of Mexico, or even other tropical regions of Central America, this publication should become an essential reference. This text should also become part of the reference books used by palynologists who intend to conduct forensic pollen studies of materials from the Western Hemisphere, who intend to examine the pollen found in Mexican honey, or who may at some time need to know the pollen morphology of selected arboreal flora found in the state of Veracruz, Mexico. Whether or not additional volumes covering other pollen types found in the flora of the Los Tuxtlas will become available in the future is unclear.

Review by Vaughn Bryant Jr.

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THE LAST WORD

EDITORS NOTE: Unless I start a new page, there is no room for editorial in this edition. I have a poem by Bill Elsik, which I put some place safe, which will appear in the next issue. I hope to have a report on the Dino-5 meeting as well. I already have some good photos. Don't forget to vote for the AASP officers of your choice.

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ABSTRACT

The Index alphabetically lists all dinoflagellate cyst taxa at and below the generic rank, and known to the authors as of 31 December 1992: it includes 555 genera, 3489 species, 326 subspecies and 8 varietates. Also listed are generic, specific and infraspecific names not considered legitimate, not considered validly published, and those which are treated as taxonomic junior synonyms. One hundred and sixteen new combinations are proposed, as well as 9 new names for junior homonyms, 10 changes of rank, and 8 validation of names. Each citation for a validly published species name includes the holotype information.

No. Copies	Publication Name Vol. or No.	$/Vol.	Total $
_____	Contributions 28 - Fossil Dinoflagellates: Index to Genera & Species 1993 edition, J. K. Lentin & G. L. Williams, 864 pages, 3-ring notebook, April, 1993. (Book Rate postage paid)	$37.00	_____
		TOTAL	$_____

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