

October, 1991
Volume 24, Number 4

PresidentsMessage.....	1
Louisiana State University Center.....	5
Universities in the news.....	6
DinosaurPalynology.....	8
Members in the News.....	10
Book Reviews.....	13
Members Forum.....	15
Computer News.....	16
AASP Scholarships available.....	18
Positions Available.....	18
The last word.....	19

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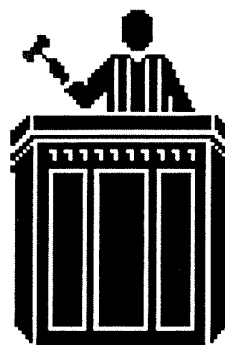
Volume 24, Number 4
J.K. Lentin, Editor

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AASP Presidential Address



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The AASP NEWSLETTER is published 4 times annually. Members are free to submit articles, "letters to the editor", scientific 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 first in 1992, is January 15. Please send all information on computer disk in ASCII or Word Perfect format, if possible, if not - send a typed manuscript. 1992 is our Silver Jubilee celebrating our 25th anniversary as an organization. We look forward to contributions from our membership.

AASP Annual meeting, October, 1991

Palynology in the World of the Business Unit During the past 5 to 10 years there has been an increasingly vocal demand in American business for higher profits, higher quality and lower costs. The latter is often pursued in the simplest way possible, by cutting staff. We have seen this and continue to see this in the oil industry. However, only so many people can be laid off before down-sizing seriously handicaps corporate operations.

In an effort to achieve higher profits, higher quality and lower costs, many companies, in diverse industries, are reorganizing into business units or cost centers. Typically, each unit is autonomous, responsible for making a profit and made to operate within a budget of real dollars, rather than the funny money budgets of the past. One of the most important characteristics of business units, and the one most likely to make these goals attainable, is that important decision making power is being pushed down to the first line managers, and to the

workers. The workers, that is the people who know best what jobs need to be done and how to do them, are being given the power to make decisions that effect those tasks.

They will be holding the purse strings, and seeking the most return on each dollar they spend. With a strict, hard cash budget they will closely assess every expense, whether it is \$100 or \$10,000. It will be almost as if they are spending their own money. The workers will bear the responsibility for the financial results of the decisions that are made, as they always have. But now they will have a say in what is decided.

But what has this to do with palynology?

I see in these sweeping changes in the American oil industry, great opportunities and benefits for we palynologists, our employers, and the profession of palynology. The comments I have to make involve palynology in the oil industry, but they contain food for thought that can nourish other branches of palynology.

During the past fourteen months I have been working in one of Amoco's newly created exploration business units. I was doing 90% palynology and 10 % exploration during the first four months. Since January of this year, I have been doing exploration 90% of the time. Coordinating, assessing and interpreting paleontologic studies for our exploration group has occupied the remaining ten percent of my efforts.

My experiences as an explorationist and as a palynologist in a business unit, has given me insights that I feel are important to all stratigraphic palynologists. If you have had some or all of these insights long ago, please forgive my tardy arrival at these conclusions. More importantly, help me implement the program I am suggesting to deal with the needs identified as a result of these insights.

First, we should note that palynology is a service science. It is well that we recognize this consciously, and keep it in the front of our mind.

We provide information, data and interpretations for clients or customers. It makes no difference whether that customer is an

explorationist, an archaeologist, or some research funding organization. We give them answers, and they give us money. Call it what you will: a salary, a research grant, or a consulting fee. In this sense, then, we palynologists are businessmen and businesswomen, as well as scientists.

My second observation results from the first. Since we are business people, we must begin to think like business people, not just as scientists. To most effectively provide service to our customers, we need a clear idea of the product we have to sell. Only then will we be able to convey clearly to customers what we can do for them. We must always have a clear understanding of our customer's needs. If we give them what they don't want or don't need, then we have failed. And it is likely that that client won't be back.

We also must be concerned with what it costs us to do our job, and what it costs our customers for our services. We need to continually strive to reduce not only our costs, but those of our customers.

Third, since we are business people, we must market our services. We have to identify and apply marketing techniques applicable to our particular case. We can't market our services the way McDonald's markets it's hamburgers, or can we. This is something we will have to find out. The more difficult part of learning to market our services may well be changing our own attitudes. Some may consider marketing palynology to be below their dignity as scientists. There is no justification for this posture in today's reality, if there ever was.

Don't we all publish research results, organize meetings and give talks? Universities demand that their teachers "publish or perish". This is not merely because they like to see their names in print. But because departments become known as centers of this or that field of knowledge, based to significant degree on the publications of faculty members. Reputations built largely on these publications bring in research grants, consulting fees, gifts, scholarships and so on. That is, publications bring in money. Clearly, publishing and professional activities are, among other things, marketing tools. With

them, we market our ideas, our institutions, our profession, and ourselves. So marketing is nothing new in palynology, and it clearly isn't a dirty word.

If you still object to "hawking" palynology, then think of yourself as an ambassador-at-large for palynology. The nomenclature of the task is not important. What is critical is that we inform every current and potential client of what palynology can and cannot do for them. It is as important for our clients to know our weaknesses, as it is for them to know our strengths. If they don't, they may harbor unreasonable expectations that we cannot meet.

For too long we have sat at our microscopes waiting for someone to tell us that we were no longer needed. It is long past time to go on the offensive and market our services. What is needed is a coordinated effort, that cuts across company and university lines, to market palynology.

With that goal in mind, I am establishing an AASP Marketing Committee. Their charge will be to:

- 1) assess what is being done now to market palynology in companies, universities and so on;
- 2) garner ideas from the membership on how we can market our services;
- 3) assess classical marketing techniques to determine which ones are applicable to our needs; and
- 4) write a report on their findings for distribution to the membership. This report will contain ideas and suggestions on marketing palynology for all to try.

I am looking for people to serve on this committee. If you are interested please contact me. This committee will need your help, your thoughts, your ideas and your experiences. Ultimately, each of us, our clients and the profession can benefit from this endeavor. But each of us can start our own marketing efforts by following Don Benson's admonition delivered in his Presidential address at the AASP meeting in I fax. As you may remember, Don told us to go down the hall and talk to our geophysicist.

That's a good start. But we will have to do much more than that in the near future. Not only must we do more, we will be able to do more, because there will be greater opportunities to do so in business units.

There will be more opportunities because decisions will be made, as noted earlier, by first line managers and explorationists. The most significant thing about this is that these decision makers are easily accessible to each of us. We need to find out where they are/or will be exploring, and get involved early in their planning. Show an interest in their work. Show how palynology can help them find oil in their specific basin. Create a demand for palynology by building a network that ties your microscope to their offices.

In addition, new opportunities are opening up because the major oil companies are concentrating their exploration efforts overseas, in frontier and poorly known areas. Often, there is little data available with which to assess the exploration potential of those areas. Consequently, field work and laboratory studies are required to gather the necessary data. There is no reason why palynologists should not be involved in gathering field, as well as laboratory, data.

We need to tell the explorationist why we should be involved in the field work from the beginning. We need to emphasize the unique perspective a palynologist can bring to the field, the special requirements we have for samples and sampling, and the benefits derived from the palynologist seeing the field relationships of the samples to be analyzed. We cannot expect the explorationists to intuitively share our perspective or to collect samples as we would--they do not have the specialized training that we do.

If it is impossible to go to the field with the explorationists, at least discuss, in detail, palynologic samples and proper sampling, before hand. If they are not aware of palynologic sampling needs, the only samples you may get for analysis are cuts of the clean, permeable sandstones that they gathered for their study of potential reservoir rocks.

In addition to field sampling techniques, it is critical to discuss palynologic sample

preparation with the explorationist. Why? Because the explorationist may decide to send the samples out to a consultant, rather than have them analyzed in-house. As long as that possibility exists, it is imperative that the explorationist have an understanding of the importance of palynologic sample processing. Sample processing is the key to palynology. Let me say that again. Sample processing is the key to palynology. Our success is, in large part, determined by the knowledge and skill of the processing technician. The need for high quality sample processing cannot be over-emphasized. Sound, analytical results cannot be derived from poorly processed samples.

A case in point. This year Amoco conducted a test of three consulting companies, from three different countries. Amoco and the three consulting companies ran cuts from the same 27 outcrop samples. All three consulting companies exhibited very poor processing capabilities, compared to our in-house laboratory.

And, as a direct result of the poor processing, their age determinations were, for the most part, wrong. Some more than others. A few were off by a couple of epochs. In addition, their age determinations differed from each other, and from those of Amoco. Their palynologists did the best they could with what they had to work with. But they were destined to failure by poor sample preparations.

Palynologic sample processing cannot be taken for granted. It can be the Achilles heel of our profession. Palynology is too expensive to do without vigorous quality control on sample processing. Quality control is necessary to assure that maximum value is obtained for the money spent. It is my belief that millions of dollars are wasted, world-wide, every year, on palynologic studies based on poorly prepared samples.

If there is one way palynologists can save money for their company right now, it is by providing the much needed quality control on sample processing, internally as well as externally.

Consultants wishing to increase their share of the palynologic consulting market, might consider putting as much emphasis on processing as on analysis and interpretation.

Do not misconstrue my comments as

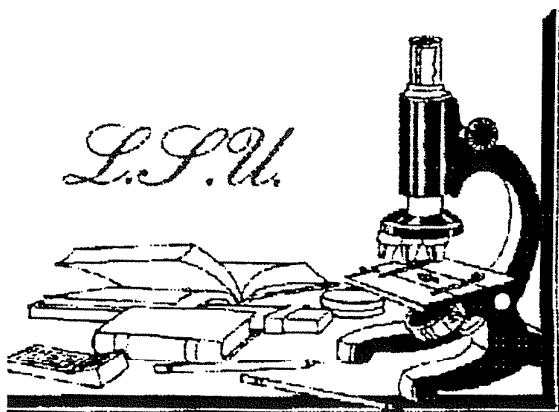
"consultant-bashing". That is not my intent. Quite to the contrary. Today, no oil company can, or wishes, to maintain a paleontologic staff large enough to provide all its needs in world-wide exploration and development. Economic forces are propelling a growing need for high quality palynologic consultants to provide services that were once provided largely within the oil companies.

Reducing the size of an in-house paleontologic staff, results in significant savings in salaries, benefits and overhead costs. And this is what oil companies have been doing. But the savings realized by staff reductions, can be quickly wiped out by poor consulting results. Consequently, there will continue to be an important need for in-house palynologic expertise in oil companies. They can provide quality control of sample processing, and conduct confidential studies. They are accessible for timely, confidential discussions and feed back to the explorationists, and will provide credible guidance to them on the profitable application of palynology. And they are also accountable to in-house management. This is part of the message oil company palynologists must convey to all of their customers, explorationists as well as managers.

I see a need for both company palynologists and consulting palynologists. Working together, they can be an efficient biostratigraphic team, and provide the high quality service that is needed by the explorationists.

My final observation is that we are all tied together--company palynologists, consultants, college professors and sample processors. The ecology of our profession links us one to the other. What is good or bad for one, is good or bad for all. We can only succeed if we work together to provide higher quality for our customers, lower costs for our employers and higher profits for both.

John H. Wrenn
AASP President



PROGRESS REPORT ON ESTABLISHMENT OF THE CENTER FOR EXCELLENCE IN PALYNOLOGY

A decade-long ambition of AASP--the creation of an endowed professorship in palynology--should become a reality in 1992, with the hiring of the Director of the AASP CENTER for EXCELLENCE in PALYNOLOGY at Louisiana State University. The ultimate goal is the establishment of two endowed professorships at LSU. The CENTER is intended to be an integral part of the Geology and Geophysics Department at LSU, where it will: 1.) promote excellence in the teaching of applications-oriented paleo-palynology, with particular reference to the contributions which paleopalynology can make toward chronostratigraphy and paleoecology, and toward solving geological problems in the collateral disciplines of stratigraphy, sedimentology, sequence stratigraphy, geochemistry and kerogen studies; 2.) train, advise and direct graduate students studies to graduate degrees so that they become able professional practitioners of applications-oriented paleopalynology and broadly capable geologists; and 3.) promote scholarly research and publication in paleopalynology. We expect the faculty of the

CENTER to recruit and train the brightest young minds to pursue palynological careers in academia, geological surveys and industry.

Over the last year we have attempted to blend the goals of AASP with those of LSU. The process produced what, in retrospect, were surely a normal quotient of problems, surprises and highlights. Both AASP and LSU, energized with the awarding of the CENTER, began the fund raising program and initiated the search for the Director in 1990. In retrospect, we may have established an overly optimistic timetable for launching the CENTER. Discussion, negotiation and mid-course adjustments during the past year have produced a set of mutually agreeable goals and procedures, and have deepened the resolve of both parties to conclude the process successfully.

The initial Search Committee progressed to the point of identifying a "short list" of three candidates. At that time, serious concerns of the LSU Geology and Geophysics Faculty surfaced regarding the impact of the CENTER on existing plans to fill four faculty positions, and whether the qualifications of the candidates for the endowed chair equalled those of eminent scholars in endowed chairs in other University departments. These concerns arose because of inadequate communication between all parties before the search process began.

The newly-appointed Dean of Basic Sciences, Dr. Peter Rabideau, convened meetings in September, 1991, between representatives of AASP (Professors Aureal Cross and Vaughn Bryant, Harry Leffingwell and Ken Piel) and the LSU Geology and Geophysics Faculty and Administration. As a result of those meetings, the faculty fully endorsed the CENTER upon assurances that: 1.) it would be a fully integrated part of the Department; 2.) its goal was to be a fully integrated program of teaching and research; and 3.) it essentially would be financially self-supporting.

It was also agreed that the search for candidates to fill the Directorship would begin anew, and be broadened. Dean Rabideau appointed a new Search/Selection Committee, chaired by Dr. Barun Sen Gupta, a micropaleontologist in the Department. Two

AASP representatives (Vaughn Bryant and Harry Leffingwell) are members of the Committee. At the Dean's request, they were selected by him from a list of potential representatives submitted by the AASP President. AASP representatives will participate as equals throughout the interview process, but the faculty alone have the final vote to select the Director.

The profile of the Director was broadened to include the rank of Full or Associate Professor. In addition, the granting of tenure will not be automatic, but will follow University guidelines for appointments of experienced professionals to such faculty positions. Academic, industrial and state and federal survey candidates will receive equal consideration.

The applications of all previous candidates will be included in the current search. Those candidates should update their applications, if appropriate.

Our goal is to identify suitable candidates for the position of Director by mid-March, 1992. Attainment of that goal should permit conclusion of the interview process and selection of the Director before the end of Spring semester, and see the Director's arrival on campus in August. If suitable candidates are not secured by mid-March, the search process will continue until successful.

Details of the fund raising are contained elsewhere in the Newsletter, but I wish to emphasize here that the endowment principal will be raised by soliciting industrial corporations, individuals in industry, U.S. members of AASP, philanthropic entities, etc. No funds will be taken from the accounts of either AASP Inc. or the AASP Foundation to contribute to the endowment principals. Interest on the endowment, and the monies from successful grants proposals, will provide the operating funds for the CENTER.

As the CENTER initiative moves forward during the next year, I would plead with you not to engage in either the discussion or the dispersal of uninformed rumors. To some extent this reflects curiosity and interest in the CENTER, but in the end this activity can only harm the initiative. If you have questions concerning the CENTER, please address them to a member of

the Board of Directors or me to obtain informed answers.

I sincerely hope that establishment of the CENTER will become a source of deep pride for the entire palynological community, and particularly for U.S. palynologists who are contributing financially. The CENTER will benefit all of us--let's handle it thoughtfully and with integrity!

Kenneth M. Piel, Chairman
AASP CENEX Committee

UNIVERSITIES

Last year an open invitation was given to all universities to send information about their palynology programs, so that we might pass this news along in our NEWSLETTER. The following report was provided as an ASCII file on a 3.5" computer disk. I urge all palynologists working in universities around the world to send us news about all aspects of your research, and I will print it.

PALYNOLOGY RESEARCH CENTRE

Institute of Earth Studies
University College of Wales -- Aberystwyth

In the wake of the recent review of teaching and research in Earth Sciences at British universities, the Institute of Earth Studies was established at The University College of Wales, Aberystwyth. Within the Institute is the Palynological Research Centre (PRC), set up in 1990 and staffed by Drs. David J. Batten, Warren L. Kovach, Henry F. Lamb, Bruce A. Tocher and Mrs. Lorraine Morrison in order to create, along with the existing micropalaeontology group, a centre of excellence in the study of plant and animal

microfossils of all ages.

M.SC. COURSE

A new M.Sc. course in Palynology has been instituted to complement the existing but separate M.Sc. in Micropalaeontology. We planned the course to give students a broad-ranging and interdisciplinary knowledge of palynology while covering the main topics in depth. It covers a variety of topics including applications of the study of organic matter to petroleum exploration and coal research, the morphology and systematics of miospores and dinoflagellates, the evolution of land plants from their first appearance up to the present day as indicated by the spore, pollen and megafossil record, palynological evidence of climatic and phytogeographic change through the Quaternary, the application of studies of dispersed sedimentary organic matter to environmental monitoring, the use of palynology in determining the provenance of foodstuffs such as honey as well as in other forensic applications, and computer-assisted multivariate and graphical methods of analysing palaeoenvironmental and biostratigraphic data. The students are also trained in various laboratory and field techniques, and they obtain practical experience through both a two-week industrial placement scheme and independent research on their dissertations.

We have recently finished the first year of the course in which five students participated. Three were enrolled for M.Sc. degrees and two are Ph.D. students. Funding has come from a variety of sources, including both the British and Greek governments and The Geochem Group, Chester, England. In addition, there are currently three external Ph.D. students who are being supervised by UCW palynologists, and two other Ph.D. students within the Institute are incorporating palynological studies into their projects. In the 1991-92 academic year we will have four M.Sc. and three more Ph.D. students.

RESEARCH

The research activities of the palynologists are diverse and cover the whole of the Phanerozoic

Era. David's main interests are in Mesozoic palynology and palaeoenvironments, floral provinces and climate, palynofacies, organic maturation and petroleum source rocks. Warren studies the palaeoecology and systematics of Mesozoic plant megaspores as well as the application of numerical methods to palaeoenvironmental and biostratigraphic research and the use of computers in palaeontology. Henry works on Quaternary vegetation and climatic history, with recent studies focusing on lacustrine palaeoenvironments and the environmental history of the Arctic and North Africa. Bruce is investigating Mesozoic and Cainozoic dinoflagellate biostratigraphy and ecology, and is also concerned with palaeoenvironmental interpretations and palaeoceanographic modelling.

In addition, Dr. Catherine Duigan, a research fellow, is working on the palaeolimnology of lakes in the High Atlas Mountains of Morocco, as well as on the taxonomy and palaeoecology of diatoms and Cladocera and elemental analysis of ostracod shells. Two new postdoctoral researchers, Dr. John Keating and Dr. Shandor van der Kaars are joining us shortly to work on Jurassic palynology of the Central Graben of the North Sea and Quaternary palynology of the Middle Atlas Mountains of Morocco respectively.

FACILITIES

The PRC is housed in a purpose-built suite of offices and laboratories. These include two large palynological preparation labs, supervised by Mrs. Lorraine Morrison, and a teaching/research lab for the students. Each student is provided with a Carl-Zeiss Jena or Nikon research microscopes, and they have access to our extensive slide collection of recent and fossil palynomorphs and a large Palynology and Micropalaeontology Library.

There are a number of IBM-PC compatible computers in the centre with a full range of software. These are linked by Ethernet to the University's DEC 5830 mainframe computers,

providing electronic mail facilities and central data storage. We have recently installed hardware and software (provided by Halliburton Geodata in Aberdeen, Scotland) to turn some of these computers into stratigraphic workstations, where palynological data can be entered into a database through a 256 key touch pad, the resulting diagrams being automatically drawn on a large format plotter.

The staff and students also have access to the facilities of the Institute and the University, including Cambridge Instruments and Jeol scanning and transmission electron microscopes, an inductively coupled plasma mass spectrometer (ICP-MS) run by our environmental geochemistry group, a Sedigraph 5100, thermoluminescence and amino-acid dating laboratories, satellite image processing unit, and map library.

FUNDING

Since the inception of the Palynological Research Centre we have been awarded funding for research from a number of sources. We have recently received a grant from a consortium of oil companies under the leadership of the American Association of Stratigraphic Palynologists for an interdisciplinary study of the Cenomanian-Turonian Oceanic Anoxic Event in central Europe and the Western Interior of North America. Funds from Elf, U.K. are supporting a palynological study of the Jurassic of the Central Graben in the North Sea. This is in collaboration with sedimentologists and geochemists in the universities of Liverpool and Glasgow.

We have also received grants from the Leverhulme Trust and the National Geographic Society for Quaternary palaeoecological research into climate change and desertification in lakes of the High Atlas Mountains of Morocco. This work is being carried out in conjunction with the Swiss Federal Institute of Technology, Zürich, Switzerland, Institut Agronomique et Vétérinaire Hassan II, Rabat, Morocco, and Université de Cadi Ayyad, Marrakech, Morocco. In addition, we have received support from the Natural

Environment Research Council under the Palaeoclimate Special Topic for a fine resolution study of Quaternary hydro-climatic events in North Africa, in collaboration with Loughborough University.

Enquiries about graduate, postdoctoral, and collaborative research opportunities are welcomed.

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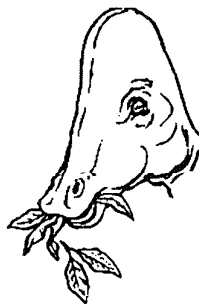
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DINOSAUR PALYNOLOGY

Did you know that the pollen grain was responsible for discoveries of great magnitude during the 20th century: the first definitive evidence for the existence of atoms, estimates of the physical constant known as Avogadro's number, a mathematics for describing

randomness in quantum mechanics and a metaphor for small fluctuations in economics. It is the truth!

In 1827 Robert Brown was observing pollen grains through a microscope. He had a problem with the chaotic movement of these small particles in the water droplet on the slide. Brown studied the movements in detail and later his name was given to the phenomenon - Brownian motion. Einstein found the source of Brownian motion - inadvertently in 1905 - while seeking proof that atoms were real physical entities, but that's another story. Robert Brown's curiosity about pollen was the lead into some of the fundamental discoveries of the century.

Long before Robert Brown graced our planet, pollen may have had an influence on the life and death struggle of the dinosaurs. It is not difficult to show that the slow decline of the dinosaurs and ultimately their extinction at the end of the Cretaceous, corresponds to the rise and proliferation of the angiosperms. It is silly to say the dinosaurs died of hay fever. However, considering the very real response of the human organism to angiosperm pollen, in spite of our evolution during the time of the angiosperms, it is easy to contemplate the incapacity of *T. rex* with constant sneezes, drippy nose, swollen eyes and perhaps even unconsciousness due to angiosperm pollen. These are the human responses to angiosperm pollen, who is to say that physical harm these same microscopic particles may have had on the primitive respiratory systems of the dinosaurs. This may not have the appeal of extraterrestrial influence but it is certainly backed by, at least, as much real evidence as the impact theory.

Having stuck my neck out this far, let us consider other wonders of the angiosperm world which could have influenced the evolution and extinction patterns of herbivores and those animals which preyed on them, as well as human history. In the May 1991 issue of *The Atlantic* (vol.267, no.5, p.44-50) there is a fascinating article titled "Infectious Terrorism" by R.S. Root-Bernstein. The early part of the article tells of a battle in 67 B.C. in which the Roman general Pompey set out to conquer King Mithridates of Pontus. King Mithridates' force was hopelessly

outnumbered - but the peculiarities of an angiosperm saved them.

Mithridates and his men retreated to an area near Trabzon on the Black Sea coast of Turkey. The king, who spoke 22 languages and had an insatiable curiosity, had a chief advisor known as Kateuas who is known as the first herbalist of record. During Kateuas' extensive study of plants he had learned of another battle which occurred at Trabzon, 300 years earlier in 401 B.C. Kateuas noted that the hills were covered with beautiful rhododendrons and the woods harbored rich beehives and recognized the significant strategic opportunity of the hills of Trabzon. Although Kateuas did not know why, he did know that if Pompey's troops ate the abundant honeycombs that were found in the woods, the results would be most unpleasant for Pompey. Indeed, Pompey's troops indulged in honey-feasting, went into drunken convulsions and were massacred by the waiting army of Mithridates.

The honey of Trabzon is known as "mad honey". We now know that the poison in the honey from Trabzon is a grayanotoxin. Grayanotoxins are produced by various species of rhododendrons and laurels and are present in the nectar of these plants. The bees use this nectar for making honey which is highly toxic. The symptoms of grayanotoxin poisoning includes excessive salivation, vomiting, loss of coordination, tingling and burning sensations in the mouth and extremities, low blood pressure, decreased heart rate, muscular weakness and sometimes convulsions. Although few attacks are fatal, even a small amount of "mad honey" can result in total incapacitation, which lasts for about 24 hours.

There are many toxins and other chemicals in flowering plants, we humans have learned to use these to our benefit and sometimes our own destruction. However, it is quite possible that these toxins found in the flowering plants and their pollen could have had a major role in the extinction of the dinosaurs whose decline parallels the diversification of the angiosperms.

ecological thoughts

RECIPE FOR A COW

Ingredients

1-80 pound calf
170 pounds nitrogen
8 acres grazing land
45 pounds phosphorus
1.5 acres farmland
90 pounds potassium
12,000 pounds forage
pesticides
2,500 pounds grain
herbicides
350 pounds soybeans
hormones & antibiotics
125 gallons gasoline
other petroleum products
1.2 million gallons water

After two years of tending the grain crops and feeding the cow, it is time to turn the cow into a piece of meat. Squeeze the cow into a feedlot with about 200,000 other cattle. Give the cow some MGA to kill its sex drive, which can distract the cow from eating. Feed the cow all the remaining stuffing of grain and soy, mixed with some roughage.

After four months in the feedlot your cow weighs about 1,000 pounds and is ready for slaughter. Cut away all the inedible parts, and you will have about 440 pounds of meat - a thousand 7-ounce servings. Unfortunately, only 16 pounds will be T-bone steak. The rest will be pot roast, chuck, stew meat, and other less cherished cuts, but enough for a good meal for a thousand people.

If you are in the mood for something simpler, you could just bake the 2,500 pounds of grain and the 350 pounds of soybeans into bread and casseroles (add a few vegetables). With this recipe, you can feed 18,000 people each a one-cup serving.

(adapted from *The Cousteau Almanac, An Inventory of Life on our Water Planet*, 1981)

MEMBERS IN THE NEWS

PRINCES OF SANDASTRE



BOYHOOD DAYDREAMS BLOOM INTO MULTI-VOLUME FANTASY

By Naomi Frankel, Saskatoon

Geologist W.A.S. (Bill) Sarjeant specializes in micropaleontology and geological history; he's also a writer with a fast-growing bibliography and an elaborate fantasy world that's been nearly 50 years in the making. Among his "collected works" are a seven-volume history of geology; a book entitled *Ms. Holmes of Baker Street*, which sets forth the theory that Sherlock Holmes was a woman; articles about detective fiction, folk music, and local architectural history; and hundreds of scientific articles.

I've come to Sarjeant's home in Saskatoon's gracious academic enclave to discuss not science but "science fantasy," the term he uses to describe *Princes of Sandastre*, the first book of a multi-volume work he's written under the pen-name Antony Swithin. First sold by the Lucinda Vardey Agency in 1989 in Collins U.K., Book one of the "Perilous Quest for Lyonesse" series sold more than 8,000 copies in Britain in the first month. In Canada, HarperCollins has contracted to publish the first four volumes; it

brought out *Princes of Sandastre* in September and will release the second volume in the series, *The Lords of the Stoney Mountains*, this spring.

Princes of Sandastre opens in the year 1403 in England, where the family of protagonist Simon Branthwaite has been caught on the wrong side of a failed rebellion. His father and elder brother have fled across the Atlantic Ocean to a land called Lyonesse on the island of Rockall. Young Simon sets sail to find them, and here, as the jacket blurb says, "begin adventures stranger than the wildest of Simon's imaginings."

The island of Rockall, surprisingly, is not pure fiction. A real Rockall exists somewhere in the North Atlantic. "It's just a large rock about the size of a city block, sticking up out of the ocean," Sarjeant explains in a voice that still retains its mild North Country accent. But this rock bears no resemblance to the island of his books, which is of a size somewhere "between Iceland and Australia." It is this latter Rockall in which Sarjeant's imagination has held citizenship for most of his life.

Sarjeant was born in Sheffield, England, in 1935. Five years later, during the Second World War, a serious mishap had long-lasting repercussions for him. He was undergoing a tonsillectomy when an air raid led to his removal in mid-surgery to a bomb shelter. The resulting medical complications kept him out of school for more than two years. An only child whose mother was working outside the home and whose father was away in the RAF, Sarjeant spent most of his day alone. One of his favourite pastimes was poring over the family's atlas, and it was there that he discovered Rockall.

"It was at the height of the colonial empires," he explains, "and all the island groups around the world had got "British", "Spanish," or whatever after their names except this one island. It was just labelled "Rockall" and nobody owned it, and this fascinated me".

So fascinated was he that when he could learn no more about the island from the books available at home, he began to supply the information himself. He started by drawing his own maps of the island. Over the next few years

he went on to create Rockallese postage stamps, gazetteers, heraldry and emblems for its ruling

families, and even a cricket team that, in his imaginary games, played against a team of the great British cricketers of the time. A boy cut off from playmates, school, and physical vitality anchored himself to an island of his own creation.

Throughout his grammar school years Sarjeant continued writing the history of his island and its people. "I had got to the ninth century, and it was getting quite elaborate," he recalls. But he misplaced these jottings somewhere and never found them. Still, the basic plot of his Rockall novel crystallized in his mind during these years.

After grammar school Sarjeant obtained his geological degrees at Sheffield University, and at this time his preoccupations changed out of necessity. First, he was too busy with his school work to spend time inventing Rockall; afterward, his energies were entirely taken up by trying to make ends meet and feed his family. Nevertheless, Rockall was always there, he tells me, "and the ideas were still developing."

In 1972 Sarjeant, his wife Peggy, and their two daughters aged 5 and 3 emigrated to Canada, where he took up a position as a professor of geology at the University of Saskatchewan. The financial pressures at last eased, and once again (despite the birth of a third daughter in 1973) he had a bit of leisure time, some of which he spent drawing more elaborate maps of Rockall. The first one he did was of "modern Rockall" - he called it a "communications" map. But he wasn't able to fit in landmarks such as roads and mountains without making it too cluttered, so he next drew a topographical one. These were followed by a geological map, a natural vegetation map, political and electoral maps and, finally, an ethnological map.

"By this time I had a complete atlas to work from and my wife said to me, "Isn't it time you stopped drawing maps! You're 45 now. Are you ever going to start writing?" So he did.

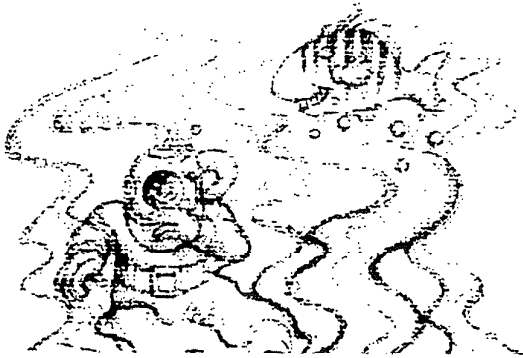
That was about nine years ago. Now, six volumes are completed - they cover about five years in the Rockall saga - and Sarjeant figures he's "a little more than halfway through the story." And when this sequence of stories is done, he's got another Rockall plot he'll immediately be developing as well as "at least

three other plots in my mind in various parts of Rockall."

"And when you've finished your Rockall stories," I ask, "What then?"

"It won't end," he replies in a tone that reveals surprise at my thinking it would. "I've got another 30 years with a bit of luck to write about Rockall.

(from *Quill & Quire* 1991, vol.57, no.1, p.33.)



HOT STUFF

As a storm brews over the ocean a tiny phytoplankton in the water below can only bob with the waves and quietly go about its business of converting nutrients and sunlight into food. Alone, this plant is a mere fleck of green at the mercy of the weather. But with its countless neighbors, it may also affect the weather, including the amount of wind and rain received inland.

Shubha Sathyendranath long suspected the microscopic plants had a macroscopic influence. As an oceanographer, she knew that the tiny plants absorb sunlight at the ocean surface, heating up the surrounding water. But, she wondered, do they heat up the water enough to warm the air above it, triggering weather changes?

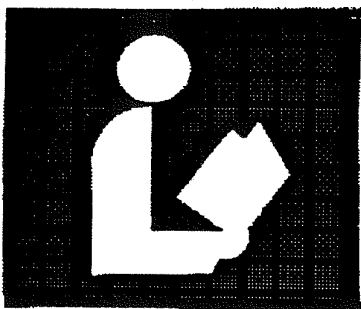
To find out, Sathyendranath and others at the Bedford Institute of Oceanography in Nova Scotia studied the Arabian Sea, west of India,

where phytoplankton populations vary from season to season. The researchers gauged population density by analyzing satellite photos of the area, which showed variations of ocean color from blue to green, based on the abundance of the plants' green chlorophyll pigments.

Next Sathyendranath determined the amount of heat the plants had contributed to sea-surface temperatures recorded monthly throughout the year. To do this, she used a computer model that included all the variables affecting sea temperature, such as sunlight and wind. Then she ran the program twice, for an ocean with and without phytoplankton, and noted the temperature difference. As she suspected, the heat phytoplankton contributed varied with the seasons. It was negligible in January, when phytoplankton were sparse. But in September, when they covered large parts of the Arabian Sea, they absorbed a huge quantity of sunlight and added as much as seven degrees to the sea's heat budget.

"That, of course, doesn't mean you actually see a seven-degree rise in sea-surface temperature," Sathyendranath points out, "because you have to factor in the heat loss through evaporation and other variables." But what's clear is that the surface heat produced by phytoplankton contributes to rising air and moisture - the precursors of wind and rain. Sathyendranath hopes that climate modelers, who are mainly physicists, will now consider the collective influence of the ocean's little green guys on the world's weather patterns.

Animal-rights activists in California have hired a lawyer to represent Timmy, a gorilla at the Cleveland Zoo. Officials want to send him to New York to mate with four females at the Bronx Zoo. Activists claim Timmy has found a steady relationship with a local, infertile gorilla and the move could make him an emotional "basket case".



BOOK REVIEWS

SHORT REVIEWS OF BOOKS RECENTLY RECEIVED

by Reed Wicander

Department of Geology, Central Michigan University,

Mt. Pleasant, Michigan 48859

Studies of Sonoran Geology. 1991, edited by Leon Perez-Segura and Cesar Jacques-Ayala. Geological Society of America Special Paper 254. \$32.50. 130 pages.

The volume brings together eight papers on a variety of topics concerning the geology of Sonora and northwestern Mexico. The contributions represent work done in the past ten years to furthering our geological knowledge about this region. The Introduction provides an overview of the history of geological studies done in this region beginning in the 18th century as well as a summary of the geological history of the region as it is presently known. This is especially helpful to people not familiar with the region. The eight papers that follow represent diverse topics on the geology, paleontology, biostratigraphy, and coal of the region. This is a very useful volume for anyone interested in this area, especially considering that, as the editors point out, much of the research being done at present is not published.

Paleozoic and early Mesozoic paleogeographic relations; Sierra Nevada, Klamath Mountains, and related terranes. 1990, edited by David S. Harwood and M. Meghan Miller. Geological Society of America Special Paper 255. \$62.00 422 pages.

This volume is an outgrowth of a 1988 Penrose Conference and 1989 theme session at the combined annual meetings of the Cordilleran and Rocky Mountain Sections of the GSA concerning the paleogeographic relations between the Klamath Mountains, Sierra Nevada, and western North America. The volume is divided into five sections and 25 papers. The first section concerns the Early and Middle Paleozoic magmatic arc, basinal and ophiolitic terranes of the aforementioned areas and contains seven papers dealing with stratigraphy, biogeography, geochronology and tectonostratigraphy of these areas. Section two deals with the Middle and Late Paleozoic marginal basin systems, while the third section has three papers that discuss the Carboniferous and Permian paleogeography of island-arc terranes. Section four devotes five papers to the topic of Permian and Triassic arc sequences and accretionary complexes, with the final section consisting of seven papers on Early Mesozoic convergent-margin paleogeography.

As stated in the preface, the tectonic evolution of the volcanic-arc sequences in the Klamath Mountains and northern Sierra Nevada has been debated since before plate tectonic theory was widely accepted. As the concept of accreted terranes has gained greater acceptance, the controversy over the origin of these volcanic-arc sequences and their relationship to North America has intensified. This volume brings together many viewpoints as well as much information concerning these arc sequences. My only complaint is that there wasn't an introductory paper giving some historical perspective to the problem to serve as background material for the papers.

Stratigraphy, depositional environments, and sedimentary tectonics of the western margin, Cretaceous Western Interior Seaway. 1991, edited by J. Dale Nations and Jeffrey G. Eaton. Geological Society of America Special Paper 260, \$42.50. 221 pages.

The 11 papers contained in this volume concentrate on sedimentologic and biostratigraphic studies of near-shore marine, sandy shoreline, and fluvial facies that developed along the western margin of the Late Cretaceous seaway. These studies provide new information concerning the geological history of the Sevier thrust belt and the development of its foreland basin. Such information provides a more complete history of the Cretaceous Western Interior Seaway because these studies can be tied in with the numerous studies done on the offshore marine facies. Of particular interest to palynologists are the papers by Jeffrey G. Eaton on the "Biostratigraphic framework for the Upper Cretaceous rocks of the Kaiparowits Plateau, southern Utah" in which palynology is used in establishing ages and correlations, and "Depositional environments, palynology, and age of the Dakota Formation, south-central Utah" in which palynology is used to age date the formation and interpret the paleoecology.

The Highlands Controversy. 1990, by David R. Oldroyd. The University of Chicago Press, Chicago, Illinois 60637. \$29.95 (paper), \$65.00 (hardcover). 528 pages.

This book is part of the University of Chicago Press series "Science and Its Conceptual Foundation." In it, David Oldroyd treats the last of the three major geological controversies of Sir Roderick Murchison's career (his first two concerned the Devonian and the Cambrian-Silurian). This final battle was with the Scottish geologist James Nicol over the interpretation of the geology of the Scottish Highlands. David Oldroyd's goal in this book is to analyze how scientific knowledge is formulated within a competitive scientific community. To achieve this

goal he examines closely the Murchison-Nicol debate concerning the interpretation of the geologic structure of the Northwest Highlands of Scotland and how, through detailed mapping and measuring of sections, the complex geology of this region was finally deciphered. Also involved in this controversy were both professional geologists and scholar-amateurs, such as Archibald Geikie and Charles Lapworth.

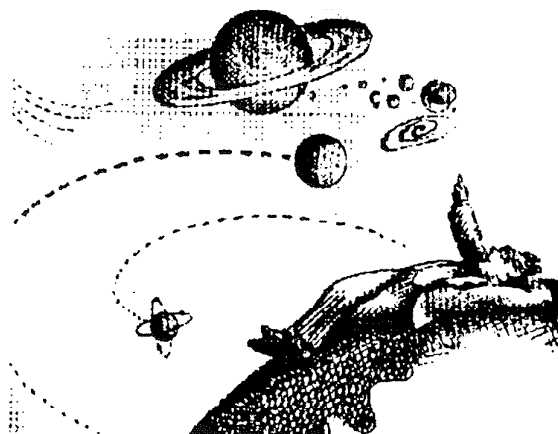
This is a well written and easy to read book with many historical photographs and line-drawings, as well as a gallery of pertinent color maps. For anyone interested in nineteenth century British geology and a look at the major and minor geologic figures of this time, this is an excellent addition to the history of this period.

Biogeochemistry of Major World Rivers. 1991. Edited by E.T. Degens, S. Kempe, and J. Richey. John Wiley & Sons, Inc., 605 Third Avenue, New York, New York, 10158-0012. 356 pages.

This very technical book is divided into fifteen chapters and covers the various aspects of the biogeochemistry of the world's major rivers. Among the topics covered are the remote sensing of water substances in rivers, estuarine and coastal waters, the biogeochemistry of the Amazon, Parana, and Orinoco rivers of South America, the carbon and mineral transport in major North American, Russian, Arctic, African, and Himalayan Rivers, minerals in rivers, dissolved organic carbon in rivers, particulate matter processes in estuaries, and modelling terrestrial sources of nitrogen, phosphorus, sulphur, and organic carbon to rivers, as well as a summary chapter. There is a wealth of data in this book covering the various aspects of river biogeochemistry as well as a very current bibliography at the end of each chapter.

The L.A. Times is the fattest U.S. Newspaper, averaging 2.3 lbs. The AASP NEWSLETTER is not quite that fat!...but we have fewer adverts.

MEMBERS FORUM



It has been suggested that a space be provided in each newsletter to include information provided by members, regardless of the topic. The following article was sent by Arun Kumar from India. No editing will be done on articles which are included in the "Members Forum".

THE FIRST SCIENTIST AND HIS EXPERIMENTS

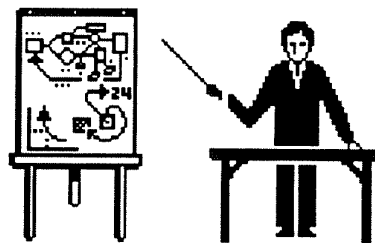
The Times of India published an article entitled, "Uddalaka Aruni: The world's first scientist" by P.C. Catterjee on 17th August. This article is a commentary on the two volumes on History and Science in ancient India by Prof. D.P. Chattopadhyay. This article informs us about the first scientist in the world and his experiments.

Thales of Miletus (c 560 BC) has been traditionally credited to be the first man of science in the world. He is said to have predicted an earthquake. He was also a star gazer, who fell in a well, because while walking, instead of looking at the ground, his head was up looking towards the sky.

Prof. D.P. Chattopadhyay in his book claims that the first scientist in the world is Uddalaka Aruni, who preceded Thales by two centuries. He is a real historical figure and is referred to in several Upanishads and Brahmanas. The Upanishads report how Uddalaka Aruni observed facts and used empirical methods to verify his conclusions. For example, there is a story about his son who had been trained in Vedic lore and whom the father questions about such empirical facts as, other things being constant, does the intake of food affect consciousness? His son states that he learnt nothing of this form from his priestly preceptors. Uddalaka then asks his son to go without food for a fortnight but to take water. After the fasting, the father questions the son, who replies that his awareness of things is hazy. He is asked to go back for a fortnight, eat well and come back and this time he reports that he has fully recovered his senses. But far from arguing only from cause to effect and in the reverse direction, Uddalaka also had a conception of the laws of nature.

Arun Kumar
Dy. S. Palynologist
KDMIPE, ONGC, Dehradun, India.

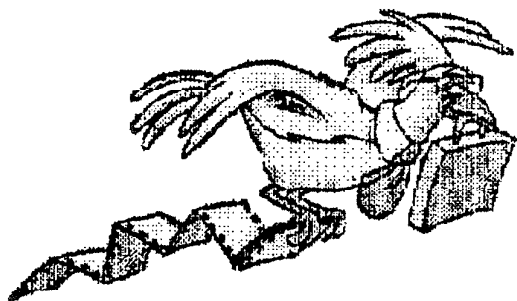
SHORT COURSE PRELIMINARY ANNOUNCEMENT



Bill Elsik will offer a short course on fungal palynomorphs 26-28 February 1992 in Houston. The short course will run three days, and will

follow South-Central GSA (which meets in Houston 24-25 February). The course will consist of lectures and exercises. Participants will receive a course manual and 35mm slides of important taxa. The cost of the short course will be about \$300 per person with a limit of 30. A possible field trip on the 29 February is still under investigation. Precise location and cost will be covered in the final announcement to be released shortly. For further information, contact Martin B. Farley, Exxon Production Research Co., P.O. Box 2189, Houston, Texas 77252, (713) 964-4033.

COMPUTER NEWS



context-sensitive help, and provides a large number of user-defined settings that can be saved for future use.

A review by Kent Colbath of the older version of MVSP appeared in the October 1987 issue of the AASP Newsletter.

The shareware version of the program can analyse matrices up to 100x100 and comes with an abbreviated manual on disk. It is available from the author for US\$10 or UK£5, to cover costs of distribution. An enhanced version, MVSP Plus, is available for a US\$75 or UK£40; this version can analyse matrices up to 750x750 (if enough memory and hard disk space are available), supports the 80x87 math coprocessor, and comes with a complete printed manual.

Requires an IBM-PC or compatible, 2 floppy disk drives (hard drive recommended), and 512k RAM. Graphics adaptor suggested (CGA, EGA, VGA, Hercules).

Dr. Warren L. Kovach
Palynological Research Centre
Institute of Earth Studies
University College of Wales
Aberystwyth, Wales SY23 3DB U.K.

Janet/Internet: WLK @ ABER.AC.UK
Compuserve: 100016,2265

MVSP - A MultiVariate Statistical Package

A new version of MVSP, a multivariate statistical program for IBM-PC and compatible computers, is now available. MVSP performs a number of numerical analyses useful in many fields, including palynology. It calculates three basic types of eigenanalysis ordinations: principal components (PCA), principal coordinates (PCO), and correspondence analyses (CA). It can also perform cluster analysis, with eighteen different distance and similarity measures and seven clustering strategies. Three different diversity indices may be calculated for ecological data. Scatterplots and dendrograms of the results of these analyses can be plotted in graphics mode. The program also has a built-in data editor and a variety of options for data manipulation and transformation. It is menu driven, with



During the 24th Annual Business Meeting in San Diego, I invited everyone to next year's meeting in France. I'd like to repeat that

invitation here in the Newsletter. Next year is the **SILVER ANNIVERSARY** of AASP. In recognition of the event, we are publishing a special Silver Jubilee volume, edited by Jan Janssonius, and the Board has selected a very special setting for the annual business meeting. The 25th annual meeting of AASP will co-convene with the 8th International Pollen Congress, September 6-12, 1992, in Aix-en-Provence, France. This venue is particularly appropriate given our status as an international scientific society - about ½ of AASP members live outside the U.S.A.

Papers and poster sessions will be presented as part of the general sessions and symposia of IPC 8. Our business meeting will be at the Roi Renee Hotel in Aix. Payment for the business luncheon is listed on the registration form for IPC 8. All AASP members should have received the second circular for the IPC meeting, including the registration form, which is due before March 1, 1992.

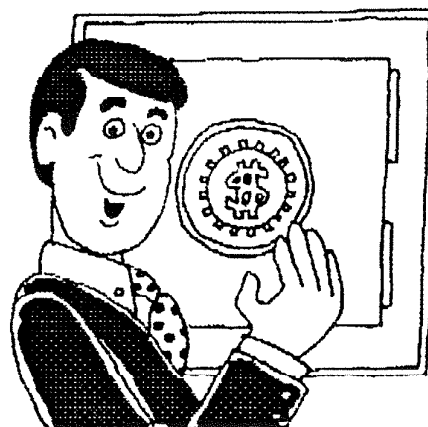
The French organizing committee for IPC 8 has worked hard to keep costs low for the meeting. The plane fares to Marseille are relatively low, and bus lines leave from the airport directly to downtown Aix. Reduced rates have been negotiated with the city's hotels, and student accommodations are available at the university. Aix was founded as the Roman capital for this picturesque region of southern France. It was home for Cezanne, Van Gogh, and Picasso. It is famous for both wine and candy, its safe streets, and for Mt. Saint-Victoire where Picasso is buried.

Excellent to exotic field trips are planned before and after the meetings, and those who are interested in computer applications can contact Lou Maher, University of Wisconsin, to register for a 4-day short course on computer applications in Quaternary Palynology.

Dr. O.K. Davis

\$\$\$\$\$\$\$\$\$\$\$\$\$\$

If you think \$300 is not enough for an AASP Scholarship ---PLEASE make a \$10 - \$20 (or more) donation when you pay your dues this year!



AASP CENTER for EXCELLENCE in PALYNOLOGY

Finance Report

Fund raising has taken substantial strides since the last report in the Newsletter. Corporate pledges in the amount of \$100,000 from both Unocal and Exxon, along with the earlier pledge of \$100,000 from Amoco, bring the total in that category to \$300,000.

Individual contributions include \$6,549.99 in direct contributions, \$4,300 in corporate matching contributions (received), \$3,050 in corporate matching (outstanding), and pledges in the amount of \$350, for a total of \$14,249.95.

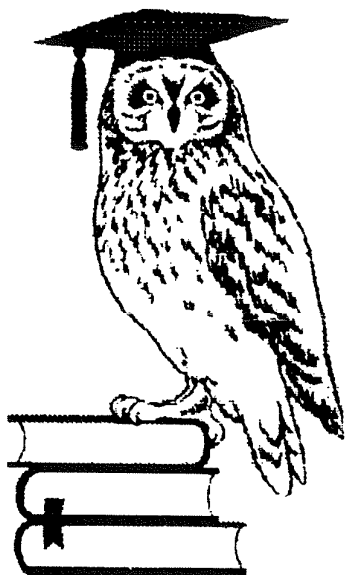
The campaign will continue solicitations within industry (both corporate and individual) and within U.S. members of AASP, to whom the following is addressed. Strong, broadly-based support from these sources is critical to success of the CENTER, and a pivotal element in any approaches to organizations or individuals outside our discipline and the oil industry. If you have considered making a contribution toward the endowment principal, please give it serious consideration as soon as possible. Corporate matching programs provide industrial palynologists with the opportunity to double or triple their contributions.

The crisis we face in palynology should

provide sufficient motivation for us to step forward and meet the challenge. We may not have another opportunity such as this to restore and energize our discipline, so please join with our prior contributors in effecting a solution. Together we can get the job done!

I again solicit information from anyone regarding additional potential donors--either corporate or individual. Names and any information concerning previous donations or causes supported would be appreciated.

Kenneth M. Piel, Chairman
AASP CENEX Finance Committee



AASP STUDENT SCHOLARSHIPS AVAILABLE

The application form for the American Association of Stratigraphic Palynology, Inc. Student Scholarships is included at the back of this newsletter. Up to two scholarships of \$300 (US) each may be awarded. Applications must be received by March 2, 1992. Awards will be announced by March 31, 1992. Previous winners of this award are eligible only if they are pursuing a different degree than the one they were pursuing for the previous award.



POSITIONS AVAILABLE

SOUTH AFRICAN MUSEUM, CAPE TOWN

Permanent research position for palynologist to develop programs and projects on Mesozoic-Recent land plants of southern Africa and the Southern Hemisphere. Preferably with Ph.D. Salary scale S.A.R. 39,210 - 59,566 P.A. Initial contract for one year, renewable. CV and enquireies to: R.V. Dingle, Micropalaeontology Research Unit, SA Museum, Box 61, GT 8000, South Africa, FAX 27-21-246716.

ENDOWED CHAIR IN PALYNOLOGY LOUISIANA STATE UNIVERSITY

The Department of Geology and Geophysics at LSU invites applications and nominations for an anticipated endowed chair in palynology, with duties to begin in August 1992. We are particularly interested in finding a

scientist with academic and/or industrial experience in pre-Quaternary stratigraphic palynology who can establish, and serve as Director of, an integrated Center for Excellence in Palynology, dedicated to both research and teaching. Applicants should have a Ph.D., an enthusiasm for teaching, a record of excellence in scientific research, and appropriate administrative skills. This tenure-track appointment will be at the Full Professor or Associate Professor level.

The American Association of Stratigraphic Palynologists has selected LSU as the location for this Center for Excellence in Palynology and will play a key role in its establishment. The Center will complement the wide range of existing programs in the Department of Geology and Geophysics and the Quaternary palynology program in the Department of Geography and Anthropology. A fully equipped stratigraphic palynology laboratory is planned for the future. Present supporting facilities and resources include light and electron microscopes, palynological research collections, and a first-rate library and computer facilities

Applicants should submit a letter with a description of their research and teaching interests, a curriculum vitae, and the names of at least three references to:

Barun K. Sen Gupta, Chair
Palynology Search Committee
Department of Geology and Geophysics
Louisiana State University
Baton Rouge, LA 70803-4101

The initial deadline for applications is March 15, 1992; the search will continue until the position is filled. All application materials will be held in strict confidence. Louisiana State University is an equal opportunity/affirmative action employer.

AASP Scholarships are available to all students of palynology in all countries. Send a Scholarship donation when you pay your dues!



THE LAST WORD...

Thus ends another newsletter. Please remember that the AASP NEWSLETTER is meant to provide news for the palynological community. The NEWSLETTER is sent to nearly 1000 individuals, 4 times each year. Please feel free to send information or articles for publication. I would prefer that you send your information on a computer disk in ASCII or Word Perfect format. However, if this is not possible, I am always happy to exercise my fingers and type your contribution. Information for the next NEWSLETTER should arrive in my office before January 15, 1992. I look forward to hearing from you. Please Note on page 1 of this newsletter that my address has changed...

PALYNOLOGY editor has a new address and telephone number:

Dr. David K. Goodman
Editor, PALYNOLOGY
Arco Oil and Gas
600 North Marienfeld
Midland, Texas 79701-4372
Tele: (915) 688-5267
Fax: (915) 688-5657

NEW AASP FOUNDATION PUBLICATION

Contributions Series Number 27

Miospores of the Kekiktuk Formation (Lower Carboniferous), Endicott Field Area, Alaska North Slope

by:

Robert L. Ravn

Abstract:

The Kekiktuk Formation of the Alaska North Slope is a non-marine unit of Early Carboniferous age that crops out in the Brooks Range and is present in the subsurface over a large area. In the vicinity of Endicott Field near Prudhoe Bay, where it forms a major hydrocarbon reservoir, it is divided into three informal units: A lower member consists mainly of shales and coals, with minor sandstones; a middle member is dominated by thick sandstones and conglomerates recording deposition mainly by braided stream systems, with minor intervals of shale and coal; an upper unit, consists of a complex of coals, shales and sandstones representing a variety of lower-energy fluvial deposits, developed in the early stages of a long transgressional episode that resulted in the deposition of strata of marine origin above the Kekiktuk Formation.

In the Endicott Field area, the Kekiktuk Formation yields a prolific and diverse miospore flora containing forms characteristic of the boreal *Monilospora* Suite, or Region, widely described and discussed as evidence of marked provincialism among Early Carboniferous miofloras. It ranges in age from ?latest Tournaisian/early Viséan to early late Viséan, equivalent to the Pu-VF miospore biozones of northwestern Europe. The localities presently nearest to northern Alaska from which miospores of similar age have been described are in the Northwest Territories of Canada. The Kekiktuk mioflora closely resembles those from northwestern Canada, but it also bears a strong resemblance to miospore assemblages reported from Spitsbergen. This latter similarity supports a paleogeographic reconstruction placing the northern Alaska shelf near Spitsbergen during Viséan time.

Two new miospore genera are described, *Granomurospora* Ravn n. gen., and *Teratodaspora* Williams & Ravn n. gen., along with the following new species: *Anapiculatisporites kekiktukensis*, *Apiculiretusispora microseta*, *Cingulizonates flammulus*, *Colatisporites? papillatus*, *Converrucosisporites owensii*, *Convolutispora? occulta*, *Corrugatisporites borealis*, *Densosporites steinii*, *Densosporites undulatus*, *Foveosporites gracilifoveatus*, *Foveosporites? wigginsii*, *Grandispora melvinii*, *Granomurospora bensonii*, *Heterotriletes ternensis*, *Knoxisporites platyradiatus*, *Lophozonotriletes undulimarginatus*, *Murospora complicata*, *Murospora tumida*, *Neoraistrickia coronata*, *Neoraistrickia williamsii*, *Pilosporites xiphoformis*, *Reticulatisporites labiatus*, *Reticulatisporites walweekii*, *Spelaeotriletes asperatus* and *Verrucosisporites endicottensis*. A number of other taxa are reassigned or emended.

173 pages, 29 photographic plates, 11 text-figures, stratigraphic distribution chart.

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Palynology Laboratory, Texas A&M University, College Station, Texas 77843-4352

(Nov. 1991)

AASP Foundation Century Club

WHAT ?

The Century Club of the American Association of Stratigraphic Palynologists Foundation is an organization founded by the Trustees of the Foundation in order to provide persons with the opportunity to support the publishing activities of the AASP Foundation.

WHY ?

1. To develop an established level of giving that will continue to provide a solid financial base for the Foundation.
2. To provide unrestricted funds to support the various publishing activities of the Foundation.
3. To provide a meaningful organization and method of recognition of dedicated "friends" of the AASP Foundation.

HOW ?

Your tax deductible contribution of \$100 or more to the AASP Foundation entitles you to belong to the Century Club. The 1992 "membership" drive is on now. Your contribution may be made by personal check or by a pledge which is payable *before* December 1992.

JOIN !

To join the Century Club just complete the attached Contribution/Pledge Form and mail to the address listed below.

The AASP Foundation is a 501 (c)(3) not-for-profit, public organization. That means that contributions to the AASP Foundation are fully tax deductible from your U.S. Federal income tax return. Also, many employers have a matching gift program whereby they match your personal gift to not-for-profit organizations. It is well worth the effort to explore this possibility concerning your gift to the AASP Foundation.

1992 AASP Foundation Century Club Contribution Form

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P. O. Box 819047
Dallas, Texas 75381-9047

Mail to: _____

Contribution enclosed: \$ _____
I wish to pledge: \$ _____

American Association of Stratigraphic Palynologists Student Scholarship

The American Association of Stratigraphic Palynologists is pleased to announce its program of Student Scholarships to support studies in palynology. Currently, two such scholarship for \$300 (US) each may be awarded annually. Ordinarily the scholarships will be awarded to graduate students, but advanced undergraduate students may also apply.

Basis of Awards - The qualification of the student, the originality and imagination evident in the proposed project, and the likelihood of significant contribution to the science of palynology are factors that will be weighed in selection of award winners.

To Apply - Part A of this form is to be filled out by the student and Part B by the student's faculty supervisor. The faculty supervisor will send both forms together to the address given at the end of Part B. Scholarship applications must be received no later than March 1, and awards will be announced by March 30.

PART A - Application for A.A.S.P. Student Scholarship

Student's name:

Address:

Universities or other institutions attended (earliest listed first). Include the institution that you will be attending during tenure of the scholarship, the degree you will be seeking, and the anticipated completion date:

Institution	Degree	Beginning Date	Completion Date
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What is your background in palynology?

Professional experience:

Previous awards or honors:

Summary of institutional or other support for your project (specify whether granted or applied for):

Title of proposed investigation:

Project supervisor:

Summary of the investigation (250 words or less, on an attached sheet); include objectives, why you selected this problem and its significance, and how you plan to approach and carry out the investigation.

I agree that the recommendation I am requesting from my faculty supervisor will be held in confidence by officials of my institution, and I hereby waive any rights I may have to examine it.

yes _____ no _____

Date: _____ Applicant's signature: _____

Part B - Endorsement by Faculty Supervisor

1. Ranking of the applicant versus other students you have known who are pursuing the same degree:

lower 50% _____ upper 50% _____ upper 25% _____ upper 10% _____ upper 5% _____

2. Did the idea for the project originate from student? yes _____ no _____

3. Can you verify the student's statements as to other awards, honors, or financial aid received or applied for? yes _____ no _____ Comment: _____

4. Please provide a brief summary (100 words or less, on an attached sheet) or your assessment of the applicant's project and his or her potential to attain the objectives. Among other traits, please comment on the student's native intellectual ability, ability to express her(him)self, perseverance, imagination and the probable creativity, and the value of the project.

Faculty supervisor's name: _____

Signature: _____ Date: _____

Position: _____ Institution _____

Address: _____

Please return Parts A and B to:

Dr. Lucy E. Edwards
U.S. Geological Survey
970 National Center
Reston, Virginia
U.S.A. 22092