

April, 1995

Volume 28, Number 2

President's message	1
Missing members!	2
Candidates for Board of Directors	2
AASP and the World Wide Web	4
News of members	4
Letters to the Editor: "Wollemi pine"— <i>Dilwynites granulatus</i> Harris 1965	5
Members in the News: Golden Trilobite awards	5
In Memoriam:	
Warren S. Drugg	6
Francine L. Martin	7
Announcement of meetings	8
Conference report	10
Short course report	11
Palynology in the news: Migratory Pests: Hit 'em with all we've got	12
HF burns	13
News from the UK	14
British Geological Survey	15
British Micropalaeontological Society Silver Jubilee Meeting	16
News from the Nordic countries	16
Geological Survey of Canada budget cuts	16
Thesis synopsis	17
Book reviews	19
Palynology on the World Wide Web	22
Species 2000: Indexing the World's known species	22
Dinosys? Dinosys! —an update	23
Editorial	23
1995 AASP Annual Meeting, Ottawa	24



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AASP MEMBERSHIP APPLICATION AND DUES NOTICE

Dues may be paid up to three years in advance. Overseas AASP Members (Individual or Institutional) who would like to receive their AASP Newsletter and Palynology by air mail, rather than book rate surface mail, need to include the applicable postage surcharge (noted below). Credit card users must pay a \$1.00 U.S. surcharge per transaction.

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Dr. David T. Pocknall, AASP Secretary-Treasurer
Amoco Production Company
P.O. Box 3092
Houston, Texas 77253 U.S.A.

Be sure your name is on your check or international money order. Your cancelled check is your receipt. If you need a written receipt, advise the Secretary-Treasurer when you pay your dues. **All drafts must be payable through a U.S. based bank.**

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E-mail: _____

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

Send, along with your remittance, to Dr David T. Pocknall at the above address.



A.A.S.P. NEWSLETTER

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Martin J. Head, Editor

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The AASP NEWSLETTER is published four times annually. Members are ENCOURAGED to submit articles, "letters to the Editor," technical notes, meeting reports, 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.

The deadline for the next NEWSLETTER, the third of 1995, is **June 15**. All information should be sent on computer disk (MS Word for the Mac is best, but anything will do) or by e-mail, if possible, or if not—send hard copy. Always include a duplicate typescript of all electronic copy sent so I can check formatting, diacriticals, etc. If possible, please illustrate your contribution with art, line drawings, eye-catching logos, black & white photos, color photos, etc. We look forward to contributions from our membership.



PRESIDENT'S MESSAGE

ONE of the things that has always interested me as a teacher has been the general apathy by most students towards the importance of science and how it directly impacts on them as individuals and as members of our society. Two recent articles got me thinking again about this topic and its implications for the future.

As you are aware, the Republican's Contract with America calls for eliminating the U.S. Geological Survey and U.S. Bureau of Mines which would result in estimated savings of \$4.1 billion over a five year period (\$3.3 billion for the USGS alone). According to some proponents of this bill, some of the functions of the USGS could be transferred to other government organizations or performed by the private sector. Of course, transferring the functions to other government organizations would not save any money, and would cost money in the long run as people are transferred, new organization charts are drawn up, not to mention the lost productivity resulting from the upheaval. If some of the functions of the USGS were taken over by the private sector, it would still cost money to access the data and information generated, and it probably wouldn't be in the public domain, where it now is and is readily available to the public.

What I find distressing is that the only rationale seems to be to save money. There is little, if any discussion of the importance of the USGS in gathering and disseminating scientific information that is used to address and solve many of our environmental and even societal problems. How many people know that among its many functions, the USGS monitors earthquake activity, water quality, maps the nation, and provides estimates of oil, natural gas, and coal reserves. All of these activities affect us all, yet the benefits of research in these areas is rarely

mentioned or discussed. Why is this?

I suspect that some of the answer lies in the fact that a large portion of the population is not scientifically literate. A 1985 study by John Miller, director of the Public Opinion Laboratory at Northern Illinois University, estimated that only 5% of the U.S. public was scientifically literate. According to Dr. Miller, a scientifically literate person is one who understands the scientific method, knows the common vocabulary of science, and has an appreciation of the role and impact that science and scientific advances have on society. If Dr. Miller's figures are to be believed, then it's easy to understand that for many people, being able to save \$3.3 billion over five years is probably far more important than the nonmonetary, yet very important, benefits the USGS provides.

If most people can't see the connection between what the USGS does, and how that impacts our society, I wonder what they would think of the article by Warren D. Allmon and Paul J. Morris in the latest issue of *Geotimes* (March, 1995, p. 4) titled "Mass Extinction: So What? An agenda for paleontology into the next century." The essence of this article is that paleontology, with its perspective of deep time, has an important role to play in the growing awareness of human influence on present extinctions, such as those caused by the destruction of the rain forests. The authors suggest that not only is paleontology "uniquely qualified to offer crucial insights into current and impending biodiversity changes, but also that paleontologists can only discover these insights through diligent and ongoing research program focused on three broad areas of inquiry: 1) What is the pattern by which ecosystem collapse leads to mass extinction? 2) What controls the 'selectivity' of mass extinction? 3) What factors control recovery from mass extinction?" The authors conclude that by studying the fossil record, paleontologists can help in formulating sound environmental policies for the 21st century and that "society needs our insights to understand the meaning and magnitude of biological change and to develop policies to protect Earth's ecological systems."

Several things struck me about this article. The first was the contribution that palynology can, and has made in biodiversity and mass extinction studies. Secondly, by being involved in such studies and projects, we can help educate the public and scientific community to the importance of palynology. The third thing was the connection between this article and the plan to abolish the USGS. While we, as scientists, value research and the benefits derived from it, it is becoming increasingly clear that these values are not shared by the general population. Without a basic understanding of science and its implications for society, can we expect many people to understand the shortsightedness of doing away with the USGS, or how research into past extinctions and recoveries may help us to understand, and perhaps alter, what we are doing to the global ecosystem?

In terms of AASP news, we will soon be electing new officers and I urge you to carefully read over the vitas of the candidates in this newsletter and vote when you receive your ballot. By the time you receive this newsletter, the midyear meeting (Saturday, April 8, 1995) will have already occurred. A summary of the items discussed and action taken at that meeting will be in the next newsletter. As you can see elsewhere in this newsletter, Susan and David Jarzen have an excellent meeting planned for Ottawa this year and I urge everyone who can, to attend. The last item to mention is the upcoming IPC 9, scheduled for June 22-29, 1996 in Houston. Vaughn Bryant, Bob Clarke, Doug Nichols, and John Wrenn have been working overtime organizing this meeting. If any of you can help, please contact one of them and volunteer your efforts. It is a Herculean task to put this meeting together and any help they can get would be greatly appreciated.

Reed Wicander, President

E-mail: 3YJWEXP@cmuvvm.csv.cmich.edu

MISSING MEMBERS!

The following have had their mail returned: Carolyn Anstey, Dale Beeson, Ronald Besems, John Daniel, Eric Grimm, Robert Loeb, Urve Miller, Williams Parkins. Anyone knowing these people please ask them to notify AASP Secretary-Treasurer David Pocknall (dtpocknall@aol.com) with their new address.

CANDIDATES FOR BOARD OF DIRECTORS

For PRESIDENT-ELECT



STEPHEN A. HALL is an Associate Professor in the Department of Geography, University of Texas at Austin (since 1985) and Research Scientist, Institute for Geophysics (since 1993), and Director of University of Texas Palynology Laboratory (since 1985). He has been a member of AASP since 1968.

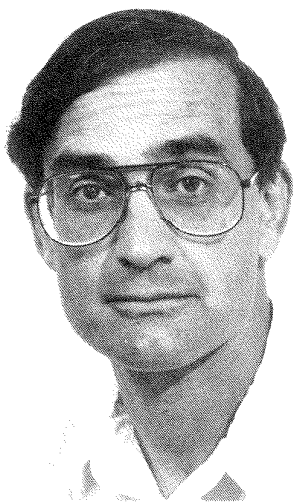
Stephen received a B.S. in geology in 1967 from the University of Oklahoma, studying under L.R. Wilson; an M.S. in geology in 1971 from the University of Iowa, studying under R.G. Baker; and a Ph.D. in geology in 1975 from the University of Michigan, studying under W.S. Benninghoff. He was an Assistant Professor at North Texas State University from 1977 to 1985.

Stephen served AASP as a Director-at-Large, 1988-1989, and as a member of the Student Award Committee (1979); Nominating Committee (1980-81; 1993-94); Chair-in-Palynology Committee (1988-90); and INQUA representative (1989-94).

Offices held in other scientific societies include: International Association for Aerobiology: Secretary-General (1982-1986), Vice President (1986-1990); International Union of Biological Sciences, Commission on Aerobiology, Secretary (1982-86), Chairman (1986-90); Gordon Research Conference on Aerobiology, Chairman (1987); Friends of the Pleistocene, south-central cell, co-leader and co-organizer (1987, 1989, 1994); Society of the Sigma Xi, NTSU Club, vice president (1982-85).

Stephen's research interests are Quaternary palynology and geology, specializing in the southern U.S. Great Plains and Southwest; over 100 publications; listed in *American Men and Women of Science* and *Who's Who in the World*; teaches undergraduate courses in "Biogeography," and "Environmental Hazards" and graduate courses in "Quaternary Pollen Analysis," "Palynology Laboratory Techniques," and "Quaternary Geology."

GORDON D. WOOD is a Paleontological Associate with AMOCO and joined AASP in 1976. He received a B.S. in Marine Biology and Geology from the University of Miami (Florida), an M.S. in Geology from the University of Michigan, and a Ph.D. in Geology from Michigan State University.



Gordon has served AASP as Secretary-Treasurer from 1985 to 1993, as member of the Nominating Committee (twice), as Convener of the Paleozoic Palynology Session for three AASP Meetings (1981, 1987, 1994), and as Technical Editor of *Palynology*. He has also served as Regional Treasurer of CIMP.

Gordon was recipient of the AASP Best Poster Award in 1993, AASP Distinguished Service Award in 1993, and UNOCAL Best Applications Paper Award in 1994. He has published about 70 publications from 1974 to 1994 and his research interests are in Paleozoic and Lower Mesozoic palynology with emphasis on integrated studies for basin modeling.

For SECRETARY-TREASURER
(currently and unopposed for re-election)



DAVID T. POCKNALL joined AASP in 1984. He was a palynologist with the New Zealand Geological Survey for 13 years, and has been a palynologist with Amoco for the past three and a half years. Present assignments are in Latin America, Trinidad, and Egypt.

David was editor of the Newsletter for the Geological Society of New Zealand from 1990 to 1991. He was Chairman of the AASP Nominating Committee for 1992, and currently serves AASP as Secretary-Treasurer.

For MANAGING EDITOR
(currently and unopposed for re-election)

DAVID K. GOODMAN has been a member of AASP since 1975. He received his B.S. and M.S. degrees at Virginia Polytechnic Institute and State University; and his Ph.D. from Stanford University. He was a biostratigrapher at Exxon Production Research Company from 1978 to 1983. He then joined Arco and was at the Arco Research Lab in TX from 1983 to 1991; and at Western District Headquarters in Midland, TX, from 1991 to 1992. At present, Dave is Staff Paleontologist at Arco Alaska Inc., in Anchorage.

Dave has served AASP as Director-at-Large from 1986 to 1987 and as Managing Editor from 1987 to present. He is also on the Editorial Board for *Marine Micropaleontology*; and served as Chairman of the Fourth International Conference on Fossil and Living Dinoflagellates (Woods Hole MA, 1989). Scientific interests include fossil dinoflagellates and regional stratigraphy.

For DIRECTOR-AT-LARGE



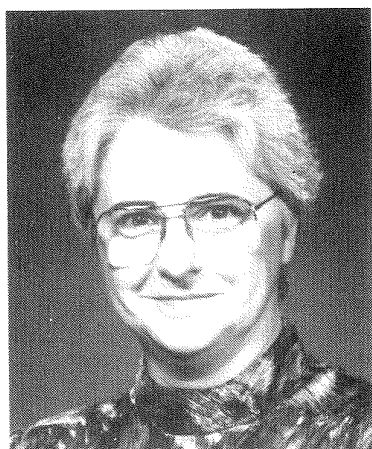
DON ENGELHARDT joined AASP in 1968. He is presently a Research Professor with the Earth Sciences and Resources Institute at the University of South Carolina, and took early retirement from Amoco Production Company in 1992 after 31 years of service to accept this position. He received a B.A. from Wabash College in 1957, an M.A. in 1961 from Indiana University, and a Ph.D. in 1962 from Indiana University.

While with Amoco Don was a palynologist/geologist responsible for planning, developing, and conducting palynologic research for biostratigraphic zonations in operational areas of interest to Amoco. There was little or no published data for many of these areas (e.g. Myanmar [Burma], Kenya, and the former Yugoslavia). Don has concentrated mainly on Mesozoic and Tertiary pollen and spores, and currently is researching the Mesozoic and Tertiary of northern South America, various areas of the former Soviet Union, and South Carolina.

Don has served AASP as Vice-President (1970–1971), President (1972–1973), Councilor (1973–1974), and has served on the following committees: Technical Program Chairman (1971, Tucson; 1978, Houston), Nominating Committees (two times), Ballot Committee (two times), Awards Committee, and judging of student papers and posters (two times). He was Chairman both of Nominating and Ballot committees once, and served on the AASP Consortium Committee.

Don has been working with a couple of students, helping them with

their thesis projects. This is an attempt to pass on some of the knowledge he has acquired over the past 33 years in the field of applied palynology.



JOCELYNE A. LEGAULT is an Associate Professor in the Department of Earth Sciences at the University of Waterloo, and is Advisor to the V.P. Academic on Interdisciplinary Programs. She joined AASP in 1972.

Jocelyne has served AASP as: Councillor (1978–1979) and Director (1982–1984); as member of the Nominations Committee (1976–1977; 1984–1985; 1987–1988), Annual Meetings Guidelines Committee (1984–1985), and Awards Committee (1985–1986); and as Poster Session Judge (1990).



FRANCISCA E. OBOH is an Assistant Professor of Geology, University of Missouri–Rolla, and joined AASP in 1991. She gained a B.S. in Geology in 1983 from the Obafemi Awolowo University, Ile-Ife, Nigeria, an M.S. in Applied Geology from the same university in 1987, and a Ph.D. in Geology in 1991 from the University of Cambridge, England. She is Chairperson of Geology and Geophysics Section, Missouri, Academy of Science, Chairperson of the O. R. Grame Award, Association of Missouri Geologists, and has served as a sedimentologist on Ocean Drilling Program Leg 159. Francisca is involved in palynological and sedimentological research in the Niger Delta, the US Gulf Coast and the Book Cliffs, Utah. She was awarded Best Poster Award at the 1994 AASP Meeting.

ROBERT S. VAN PELT joined AASP in 1984. He is a geologist with Westinghouse Savannah River Company, South Carolina, and Adjunct Professor at the University of South Carolina (Aiken campus), working on Cretaceous through Tertiary palynology as part of the Environmen-

tal Restoration Program. Bob received a B.S. in Geology in 1983 from the University of South Carolina, where he was introduced to palynology through a class with Dr Arthur Cohen. He continued graduate work in palynology at the City University of New York and received a Ph.D. in Earth and Environmental Sciences in 1990. His dissertation research, guided by Dr. Daniel Habib, established the dinoflagellate stratigraphic and organic facies of the Middle Jurassic Twin Creek Limestone Formation in the Idaho–Wyoming–Utah Overthrust Belt.



Bob's research interests are mainly in organic facies and biostratigraphy of Jurassic through Tertiary dinoflagellates. Presently, he is primarily engaged in the application of palynology to hydrogeology and environmental restoration activities at the Savannah River Site, South Carolina. Bob helped organize the 1986 AASP Meeting in New York.



AASP AND THE WORLD WIDE WEB

by Martin J. Head

An AASP WWW home page is under construction and should be online soon after you read this announcement. It will feature a text-only version of the current AASP Newsletter, an e-mail directory of AASP members, news of upcoming meetings, other information of interest to palynologists, and the usual cross links to other Web sites of interest. The AASP Web page is supported materially by the Department of Geology at the University of Toronto, and the URL is:

<http://www.geology.utoronto.ca/AASP>

It can be accessed by any web browser, including Netscape and Mosaic. Please contact AASP Webmaster (head@quartz.geology.utoronto.ca) with any suggestions for improvement of the AASP Home Page. For announcements about other Web sites, see under "Canadian Association of Palynologists WWW Page" and "Plant fossil Record database—online (WWW)" in this newsletter.

NEWS OF MEMBERS

REX HARLAND is now a palynological consultant working from home as well as continuing to hold an Honorary Lectureship at the University of Sheffield, where he contributes to their M.Sc. course in

Palynology. Rex says these dual roles keep him busy and out of trouble! He remains active in dinoflagellate biostratigraphy of the Quaternary, particularly the Holocene, and has a detailed dinoflagellate record from the Quaternary of DSDP Hole 610A (eastern North Atlantic) which he hopes to soon publish. Rex can be reached at:

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LETTERS TO THE EDITOR

Dear Martin.—Regarding your Editorial in the January issue of the AASP Newsletter, just to hand, I would like to submit the following letter for the next issue...

"WOLLEMI PINE" — *DILWYNITES GRANULATUS* HARRIS 1965

The "Coelacanth-like" opportunity offered by the recent discovery of a new genus of Araucariaceae virtually on the outskirts of Sydney did not escape the attention of the few remaining Tertiary specialists in Australia.

Thanks to male cone material supplied to the Australian National University by Ken Hill, Royal Botanic Gardens, Sydney, consensus has been reached that pollen of the "Wollemi Pine" falls within the concept of *Dilwynites granulatus*, a species described in 1965 by Wayne Harris from the Late Paleocene–Early Eocene Princetown Section, Otway Basin, in southwestern Victoria.

Minor differences exist between "Wollemi Pine" pollen and *Dilwynites granulatus*, notably in the size and density of the grana forming the granulate/gemmate ornamentation. Nevertheless the type is distinct from pollen of the two living genera (*Agathis*, *Araucaria*)—based on modern pollen of the three Australian and a range of New Guinean, New Caledonian, Fijian, New Zealand, and South American species held in the very extensive herbarium at the Australian National University (See AASP Newsletter 28, 15–16, 1995).

This being so, we are in the unusual position of having a "ready-to-go," reliable fossil pollen history for this new genus of araucarians, based on the time distribution of *Dilwynites* in petroleum exploration wells across Australia:

D. granulatus first appears in both southern and northern margin basins in the Turonian ca. 91 Ma. A possible older member of the same clade is *Osmundacites dubius* Burger 1980. This species is characterized by evenly granulate ornamentation but lacks a well defined aperture. As implied by the name, its pteridophyte affinity is open to doubt (Alan Partridge, Geology Dept., Latrobe University). Either way, a reasonable supposition is that the clade was part of the inherited Gondwanan flora but may have evolved outside of Australia. For example, we note Araucariaceae macrofossils of Jurassic age have been recorded from the Northern Hemisphere.

During the Tertiary, *Dilwynites granulatus* was a rare to abundant element of palynofloras preserved in sites as diverse as the Tasmanian Highlands (>800m elevation) and a coastal meteor impact crater north of Perth, Western Australia. The youngest pollen records are from Pliocene marine carbonates in the Gippsland Basin.

During this period, as elsewhere, regional climates underwent marked warming, then cooling whilst the Australian continent drifted northwards from adjacent to Antarctica to its modern position against

South East Asia. How then did "Wollemi Pine" survive in apparently just one of the many gorges on the Eastern Highlands of New South Wales? All that can be stated with some confidence is that long-term protection from fire and drought due to topography and relative freedom from plant competition due to infertile soils would have been helpful.

Perhaps surprisingly, the fact that *Dilwynites* has just been shown to have a gymnosperm source does not significantly alter the current pollen-based reconstructions of the Tertiary flora and vegetation in Australia—We have long assumed an araucarian rather than a lauracean affinity [see Hill, R.S. (ed.) 1994 *History of the Australian Vegetation: Cretaceous to Recent*, Cambridge University Press].

Other regions? Rosemary Askin has recorded *Dilwynites granulatus* (listed under Lauraceae) in Danian sediments from Seymour Island, Antarctica. As noted by Mike Pole (*New Scientist* 24/31 December 1994) foliage of the "Wollemi Pine" is similar to *Araucariodites*, found in Paleogene deposits in Tasmania and New Zealand. Strengthening the latter link is the suggestion, again from Alan Partridge, that *Dilwynites granulatus* is in fact a junior synonym of the New Zealand pollen *Monosulcites granulatus* Couper 1960.

Further work, including SEM and TEM analysis at the Australian Geological Survey Organization, is underway...

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MEMBERS IN THE NEWS



Golden Trilobite awards

The third round of the Paleontological Society's Golden Trilobite Awards, which recognize excellence in paleontological publishing, have been announced. In the systematic monograph category, the winner is the encyclopedic *A classification of Living and Fossil Dinoflagellates* by R.A. Fensome, F.J.R. Taylor, G. Norris, W.A.S. Sarjeant, D.I. Wharton, and G.L. Williams, published as *Micropaleontology Special Publication No. 7*, by the American Museum of Natural History, New York.

In the special publication category, the award goes to the U.S. Geological Survey for its pair of related paleontological publications—the poster *Fossils Through Time* and the pamphlet *Fossils, Rocks, and Time*, which elaborates on the poster. Both were prepared by John Pojeta and Lucy Edwards of the Survey.

Reprinted from *American Paleontologist*, 3(1): 7 (February, 1995).

IN MEMORIAM

WARREN S. DRUGG

1929–1994

It is with a great deal of sadness that I record the passing of Warren S. Drugg in La Habra, California, on December 1, 1994, after a battle with a cancer that had only been diagnosed nine months earlier. His untimely death was a blow to his family and to all his friends in the palynological and geological community. Warren will be greatly missed by all those who had the privilege of knowing him.

He was born in Sitka, Alaska on January 29, 1929 to Nels E. Drugg, a commercial fisherman, and Edith Newhall. The family moved to Vermont in 1942 and then to Seattle, Washington in 1947, where Warren graduated from Ballard High School. In 1952 he received a BA in Geology from the University of Washington.

He then served as a First Lieutenant in the US Air Force in the Photo Radar Interpretation section of the Strategic Air Command in various locations (Topeka, KA, Japan, Guam, and North Africa) and did much interpretative work in the Indo-China area in the early stages of the Vietnam war for which he received the Army Commendation Medal. He returned to the United States in 1956 and then obtained an MA in Geology in 1959 from his alma mater.

At this time he married Marlene Boivin, whom he had first met in 1944 through his friendship with her brother. The couple moved to San Francisco in 1958 where he worked as a palynologist for the California Exploration Company with the late Benjamin H. Burma until 1957. It was during this time that I first met Warren.

In 1960 he and Marlene moved to La Habra, California where he had been transferred to the California Research Corporation as an Associate Research Geologist. He was assigned to the Paleontology Group to plan and conduct research and development on the applications of palynology to problem solving in hydrocarbon exploration.

The laboratory was headed by the late Dr. A.R. Loeblich who had been hired recently. He induced Warren to continue his education in the field of Paleobotany which was at that time considered to be a key to the relatively new science of applied Palynology, a subject in which many oil companies were interested for its potential for solving geological problems. Warren received his Ph.D. in 1965 from the Claremont Graduate School. He studied Russian as a minor and enjoyed using his facility in the language to sprinkle a few words in ordinary conversation "for effect."

Warren spent his entire thirty-two year career at CRC as a working palynologist making age and environmental determinations on samples from all over the world. I had occasion to consult with him many times and it was through these meetings as well as many inter-company Paleontological Meetings and Seminars and the American Association of Stratigraphic Palynologists Annual Meetings that I had the good fortune to get to know Warren. We always immediately gravitated toward each other and because we had so many common interests and opinions we could immediately pick up where we had left off a year earlier.

I first really got to know Warren in 1962 when we drove from La Habra to Tucson to attend the first International Conference on Palynology. He navigated; I drove. His confidence (misplaced) in his unerring sense of direction led us to leave El Centro, basically located on a single east/west major highway, in the direction of Mexico (south). A similar incident occurred at the Dallas AASP meeting, where I, the driver was informed that Fort Worth, over in the blackness was our real destination (Warren said he was "familiar with the area" because he had been stationed at Love Field). Marlene mentioned that once when trying to



Warren S. Drugg, 1929–1994

leave La Habra for Seattle, on vacation, it took him five hours to get out of town.

Warren's problem with directions did not prevent him from making substantial contributions to palynology including his published studies on the Moreno Formation of California, Some Jurassic Dinoflagellate Cysts from England, France and Germany, Some Eocene and Oligocene Phytoplankton from the Gulf Coast, USA and Some New Genera, Species and Combinations of Phytoplankton from Lower Tertiary of USA. There were also many useful unpublished company reports. I have one separate on *Glyphanodinium* which reads "To my field assistant, H.V. Kaska, with condescension, Warren", another "To my good friend, from 'Ammobroma' Drugg". Warren could always inject some of his mischievous sense of humor into almost any situation, no matter how unfunny.

By the time he retired on January 1, 1991, he had been advanced to Senior Research Associate in the Geology Division and had, in recent years mostly worked on Saudi Arabian palynology for Aramco.

Because of his Norwegian heritage he liked to compare himself favorably with the Vikings and he particularly admired their success in "looting and sacking" endeavors. He was also interested in the Northwest Indians and collected their paintings and carvings as well as having an impressive collection of his own carvings of masks and totems.

I was in Southern California last year for Thanksgiving Day. I called Warren the day after and wanted to drive to La Habra to visit, but he said he was too weak to see me. I knew that he had been suffering terribly from the effects of chemotherapy, but I was not prepared for the news from Marlene three days later that he was gone.

He wrote me a letter in 1992 after I had a heart attack which said "I am sorry that you have been struck down much as Sir Bors was unseated in a tournament, only to rise again and go on to greater triumphs" and then went on to wish for my speedy recovery. He then later, in vintage Warren style, informed me that he expected me to do the decent thing and die first. Thus I did not expect to be writing his Memorial, which has stirred many other pleasant memories of our times together, so soon

and sadly. If it contains much of Warren the person, rather than an abstract of his work, it is because of the way I knew him, as a friend.

Warren leaves behind, besides his wife, three children: Martin, Gordon and Karen, all in Southern California, three grandchildren and his sister Virginia of Seattle, Washington.

We are all going to miss him.

I would like to thank Marlene, Floyd Sabins, Betty Froman and Bert van Helden for assistance in the preparation of this Memorial.

Harold V. Kaska
Clayton, CA
February 2, 1995

FRANCINE LAURE MARTIN

1937–1994

Francine Martin graduated in 1958 from the Free University of Brussels (ULB) with a degree in zoological science, and also obtained her teaching diploma (B.Ed.). The following year she earned the Certificat d'Ethnologie from the Sorbonne, Paris.

From September, 1959 to August, 1964, she taught high school biology, first at the Lycée of Ixelles, and later at the Athénée Adolphe Max of Brussels. This experience was very gratifying for Francine, who always recalled with pleasure the positive relationship she had with her pupils.

In 1965, she returned to research at the Institut Royal des Sciences Naturelles de Belgique, Brussels. Having begun her palynologic research as early as 1966, Francine can rightly be considered a pioneer in this field. She defended her Doctoral thesis, "Les Acritarches de l'Ordovicien et du Silurien belges. Détermination et valeur stratigraphique," in 1968 at the Free University of Brussels (ULB). From that point on, she dedicated her life to the study of Cambrian to Devonian acritarchs, and to a lesser extent, chitinozoans.



Francine Martin

b. Woluwe St. Lambert 11/26/37, d. Bruxelles 12/16/94

From the beginning of her scientific career, she showed a particularly modern viewpoint, especially in regards to the biostratigraphic potential of acritarchs, with an awareness, already expressed in the conclusions of her Ph.D. thesis, that "la biozonation des Acritarches pourra un jour doubler celle des Graptolithes." Her papers, brilliant and often unconventional, always included accurate geological documentation, thus testifying to Francine's generosity and constant concern that scientific data and knowledge should be freely shared.

As a consequence of her scientific approach, taxonomic observation of the acritarchs was never a purely morphological enquiry of Dr. Martin. Her interest was focused more on the identification and the precise circumscription of the acritarchs as biostratigraphic markers, on the variability of their shape as a reflection of their state of preservation, on their stratigraphic and geographic distribution, and on the detection of possible reworking.

From 1966 to 1974, Francine principally studied Ordovician and Silurian acritarchs from Belgium. Her papers on the Lower Ordovician acritarchs of the Montagne Noire, France (Martin, 1974) and on the Lower Silurian of Deerlijk, Belgium (Martin, 1973) are very representative of this period. They also reveal another of her areas of interest concerning acritarchs, namely, their paleoecologic value. In addition to her acritarch studies during this time, Francine also contributed to the study of chitinozoans with papers published in 1969 and 1975.

Francine investigated Silurian and Ordovician (and later also Devonian) palynomorphs from Belgium until 1985, but as early as 1975, began to broaden her geographic interests to regions outside the French–Belgian area, thus studying, for instance, Ordovician chitinozoans from Canada (Martin, 1975).

An important turning point in Dr. Martin's research occurred in 1978, when she decided to verify her belief in the biostratigraphic potential of acritarchs by using sedimentary successions independently dated by macrofossils and conodonts. She thus embarked on a series of important studies of the Lower Palaeozoic of Newfoundland (often in close collaboration with W.T. Dean for the trilobite-based stratigraphy) which allowed her first to define the characteristic acritarch assemblages of this stratigraphic interval, and then to propose the first informal biozonation extending from the Middle and Upper Cambrian up to the base of the Tremadoc (Martin, 1982). In 1988, this informal biozonation became a refined acritarch biochronological zonation (Martin and Dean, 1988). Given the low provincial differentiation of Cambrian acritarchs, Francine's highly original scheme also proved very fruitful, as demonstrated by the essential confirmation of its validity and its application around the world. These important results led to her election in 1984 as a corresponding member of the IUGS Subcommission on Cambrian Stratigraphy. In 1994, she applied the same acritarch zonation to the Cambrian of Wales (Young et al., 1994).

Dr. Martin was also aware that the time was not yet right for a serious attempt at an acritarch-based biozonation for the Ordovician, owing to an often confused taxonomy, and scanty and frequently contradictory data on the stratigraphic and paleogeographic distribution of its many species. This was particularly true because this group is characterized by a strong provincialism for this chronological interval. All her work on the Ordovician (acritarchs and sometimes also chitinozoans) between 1978 and 1994 had the same goal: recognition and precise definition of possible Ordovician biostratigraphic markers in the North American Province (Canada; 1980–1984), Australia (1982), northern China (1988), and in the area that Francine herself (1982) defined as the Perigondwana Province, an area which incorporates and places in a more modern paleogeographic picture, the "Mediterranean Province" of previous authors. In this way, Dr. Martin came to study the Perigondwanian acritarch assemblages of Newfoundland, Argentina, and Turkey. In 1990, she became a corresponding member of the IUGS Subcommission on Ordovician Stratigraphy.

In addition to her biostratigraphic acritarch studies, Francine was also particularly interested in the problem of palynologically defining the Cambrian–Ordovician boundary. This interest is evident in the work carried out in Alberta, Canada (Dean and Martin 1982, Martin 1992) and in northern China (1984) during her active participation in the Dayangcha International Conference on the Cambrian–Ordovician Boundary.

Throughout her scientific life, Francine Martin also studied the acritarchs of the Silurian, publishing papers from 1966 to 1990. Most of her Silurian studies were centered in Belgium, but they also included Argentina, Austria, Norway, Canada, and England. She followed much the same approach that she used in her Ordovician studies, namely determining the characteristics of the various palynological assemblages, the identification of the most important taxa in the assemblages, and their stratigraphic and geographic distribution. The result was the recognition in 1989 of six informal acritarch “groups” between the Rhuddanian and Pridoli, which correlated approximately to the corresponding graptolite biozones (Martin 1989). Her election as a titular member of the IUGS Subcommittee on Silurian Stratigraphy from 1974 to 1992, as Secretary of the same subcommittee from 1974 to 1984, and as a corresponding member since 1994, all testify to the importance of these studies.

Dr. Martin had a lifelong interest in the problem of the Ordovician–Silurian boundary, as reflected in the fact that she was a corresponding member of the IUGS Ordovician–Silurian Boundary Working Group from 1979 to 1985. The experience she gained in this field is very clearly expressed in her 1988 10-page paper on Late Ordovician and Early Silurian acritarchs (Martin 1988).

During the years 1981 to 1985, Francine conducted research on the Devonian of Belgium. The results of her work focused mainly on the Frasnian–Famennian boundary interval and are summarized in her 1994 paper “Acritarchs: a review.”

The wide ranging and multifaceted scientific experience of Francine Martin is well illustrated by one of her last works, “Acritarchs: a review” (Martin 1994). In that paper, while also addressing non-specialists, she summarizes for specialists, through appropriate examples (Precambrian, Precambrian–Cambrian boundary, Cambrian–Ordovician boundary, Frasnian–Famennian boundary), the role of acritarchs as a biostratigraphic tool. This was one of Francine’s favorite works, and one that all of her friends cherish, because it reflects two characteristic traits of her personal style: scientific precision and readability.

Marco Tongiorgi and Anna Di Milia
Pisa, Italy

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ANNOUNCEMENT OF MEETINGS

Quaternary Palynology in Canada

Special Session on Quaternary Palynology at the 28th AASP
Meeting in Ottawa, October 10–14, 1995

Notice and Call for Papers

Convener: Pierre J.H. Richard

As you probably know by now, the American Association of Stratigraphic Palynologists (AASP) will hold its 28th Annual Meeting. Ottawa next Fall. The local organization is in very good hands with Suzan and David Jarzen of the Canadian Museum of Nature. It will certainly be a “CAPital experience”. This meeting will be a great occasion for palynologists to attend and participate in discussions on the status of our vast discipline.

I was asked to convene a special session on Quaternary Palynology and have accepted enthusiastically. I see this session as an opportunity for Quaternary palynologists to illustrate the role of pollen analysis in environmental reconstructions of the “recent” past. It is also a good occasion to further examine the contribution of paleopalynology as an independent sub-discipline for reconstructions at the plant population and community levels on one hand, and for reconstructions not only of climate, but also of many other aspects of the “milieu” on the other hand.

Quaternary Palynology in Canada is very dynamic, and this is illustrated by the present composition of the Canadian Association of Palynologist’s board, with Glen MacDonald, a Quaternary palynologist, as president. We should take advantage of the present venue of the AASP Meeting to contribute the Special Session on Quaternary Palynology with new results and views from all over Canada.

A call for papers

The Special Session on Quaternary Palynology will include two half-days, on Wednesday, October 11 and on Friday, October 13, 1995. It will consist of 20 min. lectures (15 min. + 5 min. discussion), and a summary.

Please contact Pierre J.H. Richard with your title as soon as possible. Other instructions, deadlines for abstract, etc. will be given later to the

participants. Send an e-mail message, a fax, or a letter to:

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The Society for Organic Petrology

12th Annual Meeting
August 27–30, 1995
Houston, Texas

The meeting will be held at The Woodlands Conference Center and Resort, in The Woodlands, north of Houston in a lovely wooded setting with many resort amenities.

Program

August 27. Pre-Meeting workshop held at DGSi, three miles from the Conference Center. Organized in cooperation with the TSOP Research Committee, the workshop will feature hands-on examination of samples of topical interest, such as solid hydrocarbons, vitrinite suppression, recognition of kerogen at all stages of maturity, and environmental applications.

August 28 and 29. Oral and Poster Presentations. Theme session: "Integration of organic petrology and geochemistry" in honor of Pieter Van Gijzel, who died in 1994, and who strongly advocated this approach. Contributions welcome.

August 30. One day field trip to examine lignites in the vicinity of College Station. The trip will be lead by Peter Warwick (USGS, Reston) and will emphasize the geochemistry and petrography of the lignites in two working strip mines.

Submit tentative titles for presentation before April 30, 1995 to John R. Castaño (address below), indicating your preference for oral or poster presentation; we will send you instructions on preparation of extended abstracts. Deadline for submission of abstracts is **June 30, 1995**. Authors will be invited to submit papers for publication in a special issue of the International Journal of Coal Geology.

In addition to the Theme session, other topics to consider include: organic petrology of rocks and coals, palynology, thermal maturity, fluorescence, geochemistry, environmental applications, depositional environment of organic-rich rocks, and optical and electron microscopy. Talks on related topics are also welcome. For additional information, contact:

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8701 New Trails Drive
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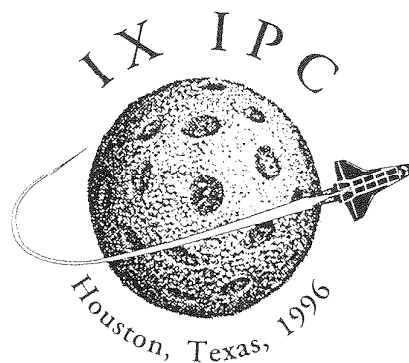
Aeroallergen Identification Course

Multidata held its first Aeroallergen Identification Course in Minneapolis, MN, over the weekend. Twenty-six people attended from 15 states and Canada to learn the basics of how to identify pollen and spores commonly recovered in air samples. The principal instructors for the course were Drs. Ed Cushing and Jim Groth, both of the University of Minnesota.

We plan to offer this course again in October or November and at least once per year thereafter. Although the course's curriculum is designed for people working in the field of clinical allergy, perhaps other folks working with airborne pollen and spores would benefit from attending.

I would be happy to furnish details to anyone who is interested in this opportunity.

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Ninth International Palynological Congress

Houston, Texas, 1996

You are cordially invited to attend and participate in the Ninth International Palynological Congress (IX IPC). The congress will be held in Houston, Texas, USA, 23–28 June 1996. IX IPC is sponsored by the International Federation of Palynological Societies (IFPS) and hosted by the American Association of Stratigraphic Palynologists (AASP).

Opening ceremonies will be held on Sunday evening, 23 June 1996. Symposia and technical sessions will be held over five days, Monday through Friday, 24–28 June. All sessions will be held at the JW Marriott Hotel located on Westheimer Street by the Galleria Center in Houston. The official language for all presentations is English.

Following is a list of highlights of IX IPC. Details and the Call for Papers are included in the Second Circular, which is being distributed. Updates of information about IX IPC will be available in the AASP Newsletter, in Palynos, and on the Internet (POLPAL and PALEONET).

Symposia

Aerobiology (M.K. O'Rourke, E. Levetin, & M. Hjelmroos)
Antarctic Palynology (A. McMinn & J.H. Wrenn)
Archeological Palynology (O. Davis, J. Gish, & K. Edwards)

Aspects of Palynology of ODP (B. Tocher, S. Damassa, & J. Firth)
 Biased Pollen Assemblages (M. Evron)
 CIMP Symposium on Paleozoic Palynology (R. Wicander)
 Cryptospores and Origins of the Terrestrial Flora (P. Strother)
 Entomopalynology (G. Jones & V. Bryant)
 Forensic Palynology (D. Mildenhall)
 Intertropical Last Glacial–Holocene Climatic Change (H. Hooghiemstra)
 Last Interglacial/Glacial Transition: Patterns and Causes of Change (C. Whitlock)
 Melissopalynology (G. Jones)
 Modern Dinocysts: Distribution, Ecology and Taxonomy (J. Wrenn)
 Neogene–Quaternary Dinocysts (M.J. Head & J.H. Wrenn)
 Neogene Vegetation (R. Taggart)
 New Frontiers and Applications in Palynology (B. Boyd)
 Paleozoic Palynology (A. Cross)
 Palynology of Recent & Ancient Delta Systems (D. Pocknall & E. Williams)
 Palynology of Grasslands (S. Hall)
 Palynology of Key Boundary Sections (D. Nichols & D. Pocknall)
 Palynomorph Distribution Patterns and Their Interpretation (G. Williams, M. Boulter, & R. Fensome)
 Phytoliths and Pollen (J. G. Jones & D. Piperno)
 Quaternary Palynostratigraphy of the Himalayas (C. Sharma & M. S. Chauhan)
 Role of Palynology in Hydrogeological and Environmental Studies (R. Van Pelt & J. Lucas-Clark)
 Survivorship Following Migration and Extinction Events (N. Frederiksen)

Field Trips

- A1. Cretaceous–Tertiary Boundary in the Raton Basin (F. Fleming)
- A2. Geology and Palynology of Wyoming (D. Nichols, D. Pocknall, & R. Flores)
- A3. Palynology of Wetland Environments of the Southern U.S. (F. Rich, G. Chmura, & R. Gastaldo)
- B1. Brazos River, Southeast Texas (J. Anderson, D. Pocknall)
- B2. Eocene Fossils of Whiskey Bridge (C. Cunningham)
- B3. K–T Boundary and Eocene Localities in Central Texas (J. Stein, J. Gennett, & A. Raymond)
- B4. Palynology of the American Southwest (O. Davis)

Short Courses and Workshops

- Fourth Workshop on Neogene and Quaternary Dinoflagellates (M.J. Head & J.H. Wrenn)
- Short Course on Fungal Palynomorphs (W.C. Elsik)
- Workshop on Identification of Unknown Airborne Pollen and Spores (M.K. O'Rourke)

Doug Nichols
 Co-Secretary, IX IPC
 FAX 303-236-5690, E-MAIL dnichols@greenwood.cr.usgs.gov

Palynomorph Distributions Through Time

Graham Williams, Mike Boulter and I are planning a symposium for the IPC in Houston in 1996 on "Palynomorph Distributions Through Time". The idea is to bring together presentations involving large-scale patterns of distribution of palynomorphs and the evolutionary or paleoecological interpretations of these patterns. For example, dinoflagellate diversity through time and its evolutionary implications; spore diversity through the Carboniferous and the implications for land plant distributions; palynofacies distributions and its interpretation in terms of sequence stratigraphy. If you think you can stretch your imagination

(not to mention data) and come up with a contribution for this symposium, we would like to hear from you. I can be contacted at Geological Survey of Canada (Atlantic), Box 1006, Dartmouth, Nova Scotia, Canada B2Y 4A2; phone 902-426-2732; fax 902-426-4465; e-mail: fensome@agc.bio.ns.ca (not as cited in the recent AASP Directory)

Submitted by Rob Fensome

CONFERENCE REPORT

Fourth European Palaeobotanical and Palynological Conference

Heerlen/Kerkrade 19–23 September 1994

by Waldemar Herngreen

General

The fourth European meeting of paleobotanists and palynologists was held in Heerlen/Kerkrade, the Netherlands, September 19–23, 1994, in memory of Professor Dr W.J. Jongmans (1878–1957). Earlier conferences took place in Montpellier (France), Madrid (Spain), and Vienna (Austria).

The congress sessions and all participants were housed in the wonderful Rolduc Conference Centre, originally a medieval convent, which offered a superb venue.

About 150 participants, mainly from Europe, but also from Algeria, Argentina, Australia, Canada, Madagascar, the United States, and South Africa attended the conference (19–21 September) and most of them took part in one of the excursions (22–23 September). For the first time a good number of delegates from the eastern European countries were able to participate thanks to generous donations by Dutch industries and the International Science Foundation (New York). These countries included Poland (9), Romania (1), Russia (3), Czechia (3), and the Ukraine (2).

On Wednesday 21st, almost all participants visited the seat of the provincial government (Treaty of Maastricht!). In this quite remarkable building a reception was offered. Afterwards the conference dinner took place at Fort St. Pieter, followed by a guided evening tour in the old medieval parts of Maastricht.

Contributions

Sixty-five oral contributions, mainly in two parallel sessions, and about thirty posters were presented. Major categories of talks include:

Topics:	Palaeobot.	Palynol.	Various	Total
Key-note lectures			3	3
Climatology/new methods	3	2		5
Paleozoic	14			14
Mesozoic	14	8	1	23
Tertiary/Quaternary	11	9		20
	42	19	4	65

Three invited speakers contributed: Dr W. Kouwe, Geological Survey of the Netherlands (sequence stratigraphy), Prof. T.N. Taylor, Old State University (biology, paleoclimatology, and paleoecology) and Prof. B. Spicer, formerly Oxford, now Open University (paleobotany

Prof. B. Spicer, formerly Oxford, now Open University (paleobotany and global change: adaptation and opportunism in a stressful regime).

Jongmans Medal

The Dutch Geology and Paleontology Foundation, the members of which organized the conference, has established an award for outstanding people working in the field of geology and stratigraphy, with particular emphasis on paleobotany in the widest sense. The first recipient of the W.J. Jongmans Medal is Prof. Dr W. Remy, Department of Palaeobotany, Geological and Paleontological Institute, University of Münster, Germany. Winfried Remy, born March 21, 1924 in Breslau, Silesia, studied geology at the Humboldt University, Berlin. After a short intermezzo in Tübingen where he obtained his doctorate in 1952, he earned his "Habilitation" degree in Berlin. After construction of the Berlin wall, he moved to Münster where he was appointed professor in 1965 and head of the paleobotany section in 1968. Although he officially retired in 1989, Dr Remy is still very active.

Winfried Remy, often in collaboration with his wife Renate, published numerous contributions on Carboniferous and Permian plants. His three volumes on the floras of Paleozoic paralic and limnic basins are generally considered standard references. Apart from a fundamental botanical approach, his work is characterized by an open mind for applied earth sciences. In addition to stratigraphical interpretations, paleogeographical and paleoecological aspects are dealt with. In collaboration with others, Remy has greatly expanded our understanding of the Lower Devonian Rhynie (Scotland) chert plants. This has led to the discovery of an alternation of generations in the oldest known anatomically preserved land plants.

Excursions

Three optional field trips were organized:

1. Two days to the Devonian of Belgium and the famous Carboniferous Piesberg quarry near Osnabrück (Germany).
2. One day to the Upper Cretaceous from Aachen in the east to the Maastrichtian stratotype section in the west.
3. Two days in the Mio-Plio/Pleistocene of the Dutch/German border area in the Lower Rhine Embayment, with visits to an open-cast brown-coal mine and the type locations of the Reuverian and Tiglian.

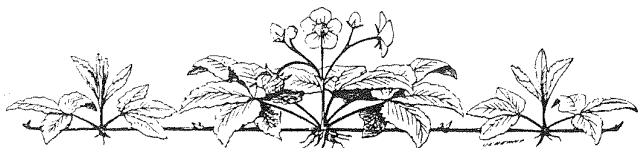
Proceedings

The proceedings will appear in a special volume of the "Mededelingen Rijks Geologische Dienst" (Geological Survey of the Netherlands).

Next, 5th, conference

Prof. L. Stuchlik, director of the W. Szafer Botanical Institute, has kindly offered to organize the next conference in Krakow, Poland, 1998.

G.F.W. Herngreen, Secretary-General 4th EPPC
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SHORT COURSE REPORT

Short Course in Paleogene Dinoflagellate Cysts

Laboratory of Palaeobotany and Palynology, University of Utrecht, Netherlands, June 6th–10th 1994

by Ian Harding

The late and much missed Lew Stover was the initial driving force behind the idea of devising a Short Course on Paleogene dinocysts, and I think I can speak for all participants in the Utrecht event by saying that this event was a most fitting tribute to his memory.

Despite previous cancellations, the LPP hosted the first incarnation of this Short Course in royal fashion (the participants got a flavor of things to come at the 'ice-breaker' event, a group feasting at a local Indonesian restaurant generously provided by the LPP Foundation). The four day course was delivered in the main by Sarah Damassa, Graham Williams, Henk Brinkhuis and Jon Bujak, and what a team they made! Unfortunately, Jamie Powell, listed as a co-convenor was unable to attend the event. The presentations were of an impressively high standard throughout, including much new research. The course was attended by some 25 people from some 13 countries (OK, 14 if we include Wales, Bruce!).

To the uninitiated (this author), the first part of the course was invaluable, providing an overview of and an introduction to the most important species of Paleogene dinocyst. This part of the course comprised the majority of the massive and 400 page manual, a very polished tome. The course convenors managed to compile a stunning set of transparencies, many from Graham's collection, to illustrate a total of almost 180 species. The slide show drew regular gasps of appreciation from their audience, many of whom are eagerly awaiting the distribution of copies of the slides regardless of cost (would that all dino publications were illustrated to such a high quality)! This session and the following one which dealt with published stratigraphical ranges of the same taxa, generated such interest and discussion that they filled a much longer time slot than was originally envisaged. However, it was deemed by many that to have participated in the workshop-style discussion had been a very worthwhile exercise. Such was the input that Graham went away saying that the range charts would have to be revised almost as soon as they had been prepared!

The course then went on to describe regional Paleogene dinocyst zonations. Henk described recently published work on Mediterranean Tethyan sequences, followed by Jon elucidating a new perspective on North Sea Paleogene biostratigraphy. Given many years experience in both the North Sea and other exploration areas, Jon showed how many of the problems associated with palynological biostratigraphy of the North Sea Paleogene can now be resolved. These problems were explained by reference to regional changes in paleogeography and paleoceanographic conditions, and Jon showed how dinocysts can be used as interpretative tools in this type of reconstruction. The results of several years of investigating DSDP/ODP material from the North Atlantic were then presented by Sarah, including interesting data on fluctuations in dinocyst diversity by latitude through Priabonian, Lutetian and Chattian stages. To bring a more global perspective to proceedings (and to show the audience that New Zealand hadn't fallen off the Earth as indicated by some of the world maps used by others!), the meeting welcomed Graeme Wilson who presented a review of his work on the Antipodean Paleogene.

Despite Jamie's absence a short session on sequence stratigraphy was presented by Henk supplemented by a case study of recently completed work on the type Thanet Beds by Henk, Jamie and Jon which showed that dinocysts have a huge potential in sequence stratigraphic interpretation. Rob Fensome then took the stage to show how the



Paleogene dinoflagellate short course, Utrecht, Netherlands. Left to right. Front row: Dominique Pourtoy, Claire Boutet, Graham Williams, Henk Brinkhuis, Sarah Damassa, Jonathan Bujak. Second row: Waldemar Herengreen, Rob Fensome, Henrik Nohr-Hansen, Sophie Warny, Graeme Wilson, Shaaban Aly. Third row: Christine Höll, Helmut Willems, Eric Monteil, Beate Kerntopf, Richard Levy, Dirk Munsterman. Fourth row: Ian Harding, Elisabeth Sunding, Suzan Kerstholt, Barbara Slodkowska, John Firth. Fifth row: Gun Mangerud, Bruce Tocher, Frank Peeters. Sixth row: Martin Wilpshaar. (Photo: Albertine Dijkema; supplied with caption by Rob Fensome)

Palynodata database had been used to calculate dinocyst diversities through geological time, with results that may correlate with fluctuations in the global sea-level curve (and therefore changes in circulation patterns, shelf areas, development and closure of transient seas). Proceedings were drawn to a very Dutch conclusion with Henk's description of a multidisciplinary study of a new K/T boundary section recently discovered in a labyrinth of caves near Maastricht. The last presentation, although not Paleogene in nature, was a most significant paper by Gerard Versteegh, who showed that fluctuations in palynomorph populations are very powerful tools to interpret Pliocene cyclic and non-cyclic environmental changes when combined with sedimentological information and subjected to frequency analysis.

However, no meeting is complete without its social programme: we'll remember the evening meal in the canal-side cellar where the assembled delegates stood up one-by-one to give an impersonation of their favorite dinoflagellate for a long time. Who will forget the verbal and physical pummelling Graham gave Henk throughout the meeting (ever thought of becoming a comedy duo?). Our thanks must go to all at the LPP for their soon-to-be-legendary hospitality, and to the LPP Foundation for their generosity, and especially to our gallant lecturers Henk, Graham, Sarah and Jon, whose knowledge and good humor made the course a highly educational and entertaining event!

To end with a perhaps overblown and verbose comment the latter presentations given at this Short Course ideally illustrated that we are now seeing the dawning of a new era in dinoflagellate studies. The next great phase of research is being ushered in by innovative and forward-looking projects which draw interpretative strength from their integrated nature: it is high time we got out there and started shouting about our work to make the wider geological community aware of what we're now capable of doing!

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PALYNOLOGY IN THE NEWS

Migratory Pests: Hit 'em with all we've got

by Sandy Miller Hays

Even as Entomologists Shaver and Beerwinkle struggle to find just the right scent to tempt tomorrow's moth to a deadly treat, Gretchen Jones, Vaughn Bryant, and Jesus Esquivel are trying to pinpoint where the moths fed yesterday by studying pollen on the pests' bodies—a science called palynology.

"These insects are nectar feeders. So if they get pollen from a plant on their bodies as they feed, identifying the pollen should be an easy way to find their food sources," explains Jones. "The problem is: There are a lot of flowering plants, and each species makes its own distinctive-looking pollen grain."

In fact, pollen identification is anything but simple. For starters, "Some of these moths are pretty big, and they might have only two or three pollen grains on them," says Bryant, director of Texas A&M's Palynology Laboratory. "And we're using scanning electron microscopy (SEM), which is time-consuming and expensive. It can take almost an hour to effectively look at just one moth's head."

Identification is further complicated because certain pollen grains' most striking characteristic may appear only at one spot on the grain: the grain lands "facedown" on the insect, that characteristic is hidden.

"Probably 40 percent of the grains you find can't be identified

because their key characteristic isn't in view, but there's no effective way to pull the microscopic pollen off the insect and study it," says Bryant.

Another problem is that most pictorial guides to pollen were done with a compound light microscope with limited depth of field, so each view usually depicts only a thin slice of the grain, showing parts of its exterior and interior structures. SEM's, however, show the pollen grain's whole exterior in a single view.

"It's like looking at a kiwi fruit, slice by slice, compared to looking at the whole fruit," Jones says. "Trying to identify these pollen grains with the existing guides was a nightmare."

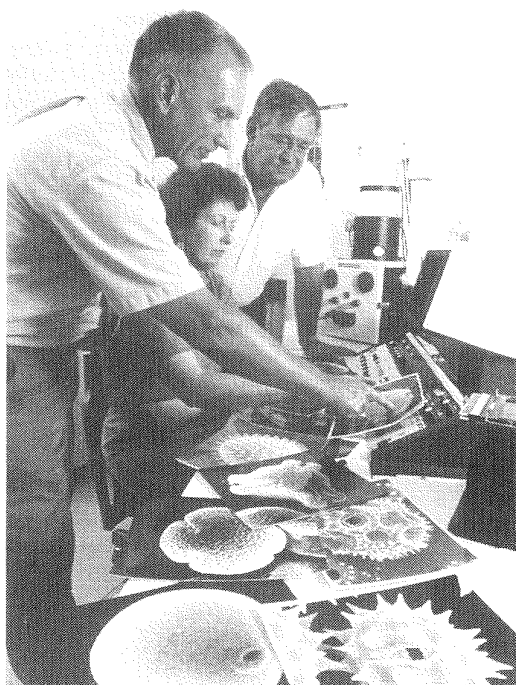
Since the materials at hand weren't much help, Bryant, Jones, and Lingren have been compiling their own picture atlas of pollen SEM's over the past 4 years. "It identifies the pollen types of 440 species of plants that grow in the southern United States and shows them as SEM's," Bryant says.

"That's helpful for this project. But if this atlas is to be used by other researchers in other studies, 440 species out of the 300,000-plus types is just a drop in the bucket."

While the scientists are understandably proud of their continually expanding pollen atlas, it is only a sidelight to the original aim of the corn earworm migration work with Lingren.

"In the spring, these moths travel by the millions to other corn-growing areas," Jones explains. "The question is, where are they coming from? By tracking pollen types, we can determine that they've been feeding on specific plants in specific area. The pollen tells us that they came from a location with a particular type of plant, and we can put that together with weather information to determine where they might have migrated from."

At the center of all this activity is Pete Lingren, a man with a simple idea: Find what the adults like to eat, then offer a deadly artificial substitute before they begin to spread.

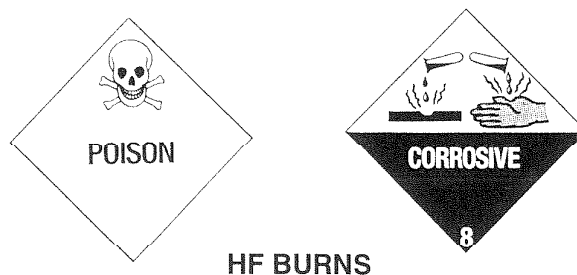


Scanning electron microscopy analyses provide helpful insights into insect mobility. Here, entomologist Pete Lingren (right), biologist/palynologist Gretchen Jones, and Texas A&M professor Vaughn Bryant discuss high-magnification photos of pollen grains found on corn earworm moths. (Photo: Jack Dykinga, *Agricultural Research*, December 1994, p. 8).

"We want to develop an areawide management strategy so that when the moths come out in the spring, they never make it to the next climatic zone," Lingren concludes. "It's a matter of stopping the problem at its source. If you kill one female adult, you've eliminated the potential for 1,000 progeny."

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[Excerpted from "Migratory Pests: Hit 'em with all we've got" by Sandy Miller Hays. The full article appeared in *Agricultural Research*, December 1994, p. 4-8. Submitted by Vaughn Bryant.]



As a laboratory safety specialist by trade and an avocational archaeologist interested in the applications of palynology and micropaleo in general to archaeological contexts, climatic change studies, etc., I am currently in the midst of preparing a long posting for the users of HF at Cornell, mostly of whom are semiconductor types. Our recommendation for minor HF burn treatment is: 1) extensive flushing of the burned area with water, 2) the topical application of 2.5% calcium gluconate gel. Topical application of the calcium gluconate gel will tie up the fluoride ion at the exposure site before it has a chance to become a systemic poison. Also, subcutaneous injection of 10% calcium gluconate solution in and around the exposure site can prevent systemic effects. This needs to be done by a competent physician experienced in HF burn treatment. **Always** seek immediate medical treatment. Some of the worst HF burns are from minor (tiny drops even) splashes that may go undetected at first. The acid has poor warning properties and easily penetrates the skin where it disrupts various enzyme systems, destroys blood calcium levels and becomes a systemic poison.

Calcium gluconate gel can be purchased from:

Pharmascience Inc.
1-800-363-8805, ext. 3038
fax: 514 342 7764
contact: Jim Putnam

Six tubes are \$27.55 US each plus 5% shipping and handling.
12 or more tubes are \$22.05 US each plus 5% shipping and handling.

This Canadian company is the exclusive distributor of this product in the US, which is made by a US firm. The product has a two year shelf life, although some reports state that fresher material works better.

A homemade formulation for this product, quoted from the SAFETY mailing list is: "Calcium gluconate gel may be prepared by mixing 2.5 grams of calcium gluconate USP in 100ml of surgical water soluble lubricant (e.g. KY Jelly, Johnson & Johnson Products, Inc., New Brunswick, NJ 08903) or by mixing one 10cc ampule of 10% calcium gluconate solution per 1.5 oz of KY Jelly."

HF is a genuinely really nasty material and it should be used with as much advanced PPE as possible and only in a well working chemical fume hood. One recent death was a worker in geological sciences!

I have not previously heard of the use of benzalkonium chloride compounds for the treatment of HF burns. I have heard of the use of magnesium sulfate (Epsom salts) and glycerine before. $MgSO_4$ must act to neutralize the fluoride ion in a manner similar to that of calcium gluconate. I do know that the calcium gluconate treatments do work. It has been recommended if you are working with HF that the local medical center or hospital be contacted and that you let them know you are working with HF. You should find out if they have a burn specialist knowledgeable in HF burn treatment and make contact with that person so that in the unlikely event of a HF burn the medical center would be prepared for immediate response. Time is extremely critical in HF burn treatment, as you can imagine!

I am preparing a longer document on the use of HF, first aid treatment of HF burns and related topics for HF users at Cornell. If you would like to have a copy of this document when it is finished (in a few days to a week), please let me know by e-mail and I would be happy to forward a copy to you. If you have any additional questions, please feel free to contact me.

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NEWS FROM THE UK

by James B. Riding, UK correspondent

The UK-based Palaeontological Association held one of its Review Seminars at the British Geological Survey's De La Beche Conference Centre at the Keyworth (Nottingham) office on Wednesday 18th January 1995. These meetings are specifically aimed at students (undergraduate and postgraduate) and are designed to give authoritative overviews on focused palaeontological topics. This one was entitled "Micropalaeontological studies: a review of recent advances" and four of the seven invited contributions were based on palynology. Stuart Molyneux (BGS) gave a paper on developments in acritarch biostratigraphy during the past decade. Stuart noted that, since a major review of Palaeozoic acritarch biostratigraphy by Charles Downie in 1984, much basic documentation has been undertaken. This has led to acritarch zonations being proposed for much of the Cambrian to Devonian interval. Some gaps, however, still remain and key intervals urgently require further detailed work; it is clear that much exciting research has yet to be done. Stuart then described a recent attempt at the integration of acritarch data with similar studies of other fossil groups etc. which has led to promising leads as to why acritarch abundance and diversity fluctuated so markedly throughout Palaeozoic time. Rex Harland

(Sheffield University) gave a presentation on recent advances in the use of dinoflagellate cysts as indicators of oceanographic change. Rex explained how dinoflagellate cysts are becoming ever more important in the elucidation of climate change in the Quaternary marine realm. Quantitative work can offer great insights into both short-term and long-term climatic shifts in both the Neogene and Quaternary.

Examples were presented of key ODP sites around the UK continental shelf. John Richardson of the Natural History Museum spoke on "cryptospores and plant evolution." This lecture explored aspects of the early evolution of land plants in the lower Palaeozoic. John described the form and functional morphology of these early microspores and speculated on the many possibilities of evolutionary pathways. Jamie Powell (Millennia) wound up the meeting with a review of the biozone in industrial palynology. Jamie explained the basics of the various biozone types and their application by industry. More sophisticated techniques, such as the graphic correlation method, were reviewed in a highly polished performance. The other (non-palynological) speakers were David Siveter, Paul Pearson and Dick Aldridge, who also presented the closing remarks. This meeting represented an excellent one-off opportunity for students to learn about current micropalaeontological advances, however the attendance was disappointingly low. Nevertheless, it is good to see that the Palaeontological Association is interested in microfossils and I hope the review seminar series is continued despite these low turnouts.

Another recent micropalaeontological meeting in the English midlands was a British Micropalaeontological Society (BMS) Demonstration Meeting at Leicester University on Wednesday, 8th March 1995. Over 50 delegates attended, who perused an excellent array of posters. There is to be a BMS Palynology Group meeting at the Centre for Palynological Studies, Sheffield University on Thursday, 27th April 1995 starting at 2.00 pm; the local secretary is Duncan McLean. I do not have the details of the programme for this event at this stage. Needless to say, any AASP members are most welcome to attend. Duncan will supply further details; his phone number is 0114 282 5117.

The sale of volumes 1 to 12 of the BMS journal is going very well, so well that Volume 3, part 2 (the Charles Downie volume) is completely sold out. However, all the other twenty parts are currently available at £1 each. I have recently found that surface mail charges are relatively low so that a complete set delivered to the US can be as little as \$56. Contact me for details.

Dr Nick Turner of the British Geological Survey and Mr Huaicheng Zhu of the Nanjing Institute of Geology and Palaeontology, currently resident at the Centre for Palynological Studies, Sheffield, are undertaking a collaborative research programme. A pilot project has been scheduled for the next twelve months, the aim of which is to publish further palynological details of important Carboniferous Stages and Chronozones in the UK. It is planned to expand the geographical scope of the study over the following two years to include key sections in China and other appropriate regions.

Finally may I say how sorry we on this side of the Atlantic were, to hear of the recent passing of Warren Drugg (see p. 6). Warren was well known to many UK palynologists and was universally liked and respected. He was a true gentleman, in every sense of the word, as well as being an excellent scientist. He will be badly missed.

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BRITISH GEOLOGICAL SURVEY

by Bernard Owens

One hundred and fifty years ago, on 4th November 1844, Edward Forbes was appointed by the Board of the Ordnance Survey to become the first paleontologist of the British Geological Survey. From that time to the present day, the Palaeontology Department, now the Biostratigraphy and Sedimentology Group, has remained in existence and may therefore qualify as the oldest such organization in the world.

Today the majority of the Group is located in custom-built accommodation at the BGS headquarters site at Keyworth, Nottingham and comprises six macropaleontologists, three micropaleontologists, and six palynologists with the capability to deal with most major fossil groups from the Cambrian to Quaternary. Not only has the size of the Group grown significantly, particularly over the past 25 years, so too has its area of activity. The original remit to assist the officers of the Geological Survey in their interpretation of British stratigraphy has now been radically expanded to include a wide range of stratigraphical support services to the exploration industry both at home and overseas. The Group is currently working in the UK and ten countries overseas providing advice to exploration companies and government bodies. The Group continues to manage the vast palaeontological components of the Survey collections which include more than 3 million specimens and 150,000 palynological and micropaleontological slides, the latter containing in excess of 15,000 type and figured specimens. Staff from the Group continue to play a major role in the activities of British learned societies and currently provide the Secretary and Treasurer of the British Micropalaeontological Society. On the international level they are represented on a least five IUGS Commissions and Sub-commissions. The following account provides details of some of the recent palynological activities of the Group.

Stuart Molyneux's principal research activities continue to be concerned with Lower Palaeozoic acritarch and chitinozoan biostratigraphy, paleobiology and paleoecology, in particular those aspects relating to Ordovician stratigraphy and the early Palaeozoic framework of the Anglo-Brabant Massif. His recent work in the Lake District resulted in the publication of results proving the existence of an unconformity at the base of the Eycott Volcanic Group (Millward and Molyneux, 1992). In addition to preparing biostratigraphic contributions to the BGS Snowdon and Cader Idris memoirs he has published the following papers: Molyneux (1992) and McCaffrey et al. (1992). He is currently engaged as the leader of a project to improve methods for recording and disseminating stratigraphical information and increasing stratigraphical resolution. In addition, he is supervising the palynological aspects of work by two University of Leicester post-graduates, Ruth Elliott and Angela Fielding. He continues to act as Secretary for the Acritarch Commission of CIMP.

Nick Turner is engaged in Carboniferous palynological studies in both mainland Europe and the UK. He continues to develop his Viséan–Westphalian studies in central and northern England and has recently published the following papers: Turner (1993); Turner and Owens (1993); Turner and Spinner (1993) and Turner et al. (1994).

Aideen McNestry has undertaken both Devonian and Carboniferous investigations in southern and central England. In the Plymouth

region she has investigated palynomorph residues from Devonian and Early Carboniferous low grade metamorphic sediments integrating the data recovered with all other available biostratigraphic evidence. In the Stoke region, work has concentrated on the Late Carboniferous and in particular the Eturia Group. The results from both of these studies are currently being prepared for publication in the relevant BGS memoirs.

Geoff Warrington is engaged on a number of projects involving Permian to Early Jurassic palynostratigraphic studies. He has recently completed litho- and biostratigraphical contributions to a major multidisciplinary study of the Cheshire Basin involving a regional analysis of the basin's development, infill dating and depositional processes. He is completing palynological and biostratigraphical studies of Permo–Triassic and Early Jurassic sediments in the Birmingham, Loughborough, Nottingham, Cirencester, Minchhead, and Exeter areas as support for the Survey's mapping program. Work on a major review of the Permo–Triassic deposits in Northern Ireland was initiated earlier this year. In addition to providing biostratigraphic contributions to the Thirsk, Kingston upon Hull and Brigg, Harrogate, Doncaster and Goole, and Bristol memoirs, he has recently published the following papers: Warrington and Ivimey-Cook (1992) and Warrington et al. (1994).

Jim Riding, the BGS Secretary, is undertaking a wide range of Mesozoic–Cenozoic palynological studies. In addition to providing palynological support to Mesozoic aspects of the Survey's mapping program, he continues to develop his interest in Antarctic palynology in close association with colleagues from the British Antarctic Survey. Later this year he will commence a major review of Russian Mesozoic dinoflagellate palynostratigraphy with counterparts in St. Petersburg under auspices of an EC funded INTAS Project. The study will attempt to equate in detail the successions of the Russian Platform and Siberia with those of Western Europe. Jim has recently completed two chapters to the forthcoming AASP Jubilee volumes on Palynology.

Bernard Owens, in addition to managing all activities of the Group, continues with his work on Devonian–Carboniferous palynostratigraphy. He has recently coordinated the first phase of a major Palaeozoic study in the Kingdom of Saudi Arabia in collaboration with colleagues in Saudi Aramco and CIMP. These results will be submitted to the Review of Palaeobotany and Palynology in the near future.

All the biostratigraphers in the Group have contributed major reviews to the recently completed BGS review of lithostratigraphy of the North Sea Basin sponsored by the UK Offshore Operators' Association. Five volumes are already published with two further Southern North Sea volumes scheduled to appear in 1994.

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Further information concerning the biostratigraphical activities of the BGS may be obtained from Bernard Owens at the address below or on Tel : 0602-363100, Fax : 0602-63200.

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[This is an abridged version of an article appearing in *The British Micropalaeontologist*, 51: 34–36; and submitted by James B. Riding.]

BRITISH MICROPALAEONTOLOGICAL SOCIETY

SILVER JUBILEE MEETING

Saturday 18th November 1995

University College London

First Circular

The British Micropalaeontological Society was founded in 1970 and thus is twenty-five years old in 1995. The committee have decided to hold a special meeting to celebrate the Silver Jubilee. The venue is University College London and the meeting will commence mid-late morning. Six keynote reviews will be given by experts in the fields of calcareous nanofossils, conodonts, foraminifers, ostracodes, palynomorphs, and radiolarians. The program has not been finalized at this stage; however William R. Riedel (Scripps Oceanographic Institution, La Jolla, CA) has already agreed to lecture on radiolarians and information technology. We are currently in negotiation with several other overseas specialists.

There will be a dinner at University College London in the evening: Dr Bernard Owens, a former chair of the Society, will give an after-dinner speech.

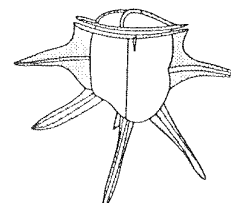
In order to help finance the travel costs of speakers it is necessary to levy a registration fee of £5 to BMS members and £10 for non-members. There will be no registration fee for students (members or non-members).

This meeting will, hopefully, be both scientifically worthwhile and a convivial occasion and we hope that as many members as possible will attend. In order to help planning and our ability to bring the overseas micropaleontologists to London, may we invite you to register interest now. The program will give undergraduate and graduate students an excellent overview of all the major micropaleontological groups.

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NEWS FROM THE NORDIC COUNTRIES

by Niels Poulsen, AASP Newsletter Correspondent



Biological Institute, University of Copenhagen

Some of the biologists at the Biological Institute of the University of Copenhagen are working with living or extant dinoflagellates. Marianne Ellegaard has contributed a short review of their work which is primarily directed towards food absorption, distribution and role in the food chain, ultrastructures, and taxonomy.

Antonio Calado is undertaking a Ph.D. study on food absorption in fresh-water dinoflagellates (mixotrophy, nourishment by a mixture of photosynthesis and absorption of other C-sources).

Marianne Ellegaard is carrying out a Ph.D. on the biogeographic distribution of recent dinoflagellate cysts and correlation between salinity and dinoflagellate cyst assemblages in the past 5000 years. Her current research now also involves Quaternary dinoflagellate studies from ODP Leg 151.

Gert Hansen is now in a post-doctoral position working with ultrastructures in the motile stage of dinoflagellates, especially within the *Gonyaulax* group. Gert's post doctoral fellowship includes a study period in the United States.

Per Juel Hansen is an adjunct (assistant professor) at the Marine-biological Laboratory at the University of Copenhagen. Per is working on the role of dinoflagellates in the marine microbiological food-chain studying growth, mixotrophy, grazing, and food assimilation. Two M.S. students, Hans Henrik Jacobsen and Alf Skovgaard, are associated with this work.

Jacob Larsen (project employed) is undertaking a taxonomic study of living athecate (unarmored) dinoflagellates and of toxic dinoflagellates. Jacob is hoping to join the recently initiated Center for Toxic Algae. Two M.S. students are associated, Lias Schmidt, working with benthic, mobile dinoflagellates, and Jan Bonne, who is studying fresh-water dinoflagellates.

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GEOLOGICAL SURVEY OF CANADA

budget cuts

Below are (very selective) highlights of the damage report on the GSC in the wake of the deficit-fighting Federal budget brought down Feb. 2

OVERALL RESOURCES.—For the GSC as a whole, there will be a

drop of 32% from \$110M per year in 1994/95 to \$75M per year in 1997/98. The estimated reduction in number of personnel will be approximately 24%—from 980 to 740.

ORGANIZATIONAL CHANGES.—In Ottawa, the Geophysics Division will cease to exist as a separate unit. Its aeromagnetic, gravity and applications programs will be moved into the Continental Geoscience Division.

On the West Coast, the current two Divisions will be relocated into one principal facility near Victoria with an information link remaining in Vancouver. The new GSC (Victoria) will be the headquarters for the national seismic, geodynamic and geomagnetic programs formerly based in Ottawa.

The small downtown office in Yellowknife will be closed and staff relocated to Calgary or Ottawa.

The names of the principal GSC regional offices will be changed as follows: West Coast—"GSC (Victoria)"; Calgary—"GSC (Calgary)"; Quebec—"GSC (Quebec)"; Dartmouth—"GSC (Atlantic)".

The internal Branch framework will be changed to accommodate the new Divisional structure.

OPERATIONAL CHANGES.—Wherever possible, cost-sharing with industry, universities, other government departments and provincial agencies will be sought for all GSC activities. The Polar Continental Shelf Program will phase in cost recovery for all clients over the next two years.

MAJOR PROGRAM CHANGES

Geoscience Surveys.—Energy related surveys concentrated in the Western Canada Sedimentary Basin in collaboration with industry and the provinces; energy related mapping north of 60 maintained at a reduced level. Marine mapping reduced in remote northern and deep water areas.

Energy.—Reduction in basin analysis studies, particularly in the frontiers; oil, gas and coal resource assessments continued at a slower pace.

Environment.—Focus on coastal marine environmental programs in partnerships with provinces and industry.

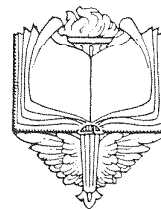
HIGHLIGHTS OF DIVISIONAL CHANGES.—GSC (Calgary) will manage the national energy program. Energy related geoscience surveys north of 60 reduced. Focus on national programs in paleontology, basin processes, organic geochemistry, petroleum systems science, hydrocarbon resource assessment.

GSC (Quebec) will focus on: bedrock geology and minerals of Eastern Canada; Quaternary and environmental geology. Emphasis will be on contributing to socio-economic and environmental priorities in collaboration with provinces and other partners.

GSC (Atlantic) will manage the national marine program. Reduction in marine activities in remote northern and deep water areas. Focus marine coastal/environmental programs on partnership activities in high priority areas. Frontier basin work reduced but core expertise maintained.

[The above is substantially abbreviated from a report circulated on the internet by Lionel E. Jackson Jr., Research Scientist, Geological Survey of Canada, Vancouver, E-mail (work) ljackson@gsc.emr.ca (home) ljackson@helix.net —Ed.]

THESIS SYNOPSIS



Palaeoenvironmental changes in the Mediterranean and North Atlantic in relation to the onset of northern hemisphere glaciations (2.5 Ma B.P.)—a palynological approach*

Ph.D. thesis by Gerard J.M. Versteegh

The Earth's climates are the outcome of processes resulting from many different internal and external forcing and feedback mechanisms that influence climate on a range of time scales. Some of these processes proceed in a lifetime and can be studied as they appear. In contrast any understanding of the long term processes that govern climate variability in time can only be achieved by taking the past as a key to the future (which is a logic assumption in deterministic systems). The study of past climate change thus relies on our ability to reconstruct past environmental conditions using physical, chemical and biological information extracted from the sedimentary record.

On a time scale of several hundred thousands of years, the Earth's climate oscillated between cooler (glacial) and warmer (interglacial) periods. This kind of climate variability has not always been present. It appears that an important step towards the "present day" glacial/interglacial variability, the onset of northern hemisphere ice ages, occurred only 2.52 Ma ago (e.g. Raymo, 1994).

A considerable amount of the climatic variation associated to the glacial/interglacial oscillation is attributed to the so called Milankovitch cycles; variations in solar insolation on Earth due to cyclic changes in the Earth's orbital parameters of eccentricity, obliquity and climatic precession. The eccentricity or ovalness of the Earth orbit has main periods of 100,000 and 400,000 years. The obliquity or tilt equals the angle between the equator and the Earth orbit, its main period is 41,000 years (41 ka). The climatic precession with main periods of 19 ka and 23 ka results from a combination of rotation of the length axis of the Earth orbit around the sun and a process in which both the northern and southern half of the Earth's rotation axis circumscribe a cone in such a way that the tip of each cone is located at the centre of the Earth. Amplitudes and phases of the Milankovitch cycles during the past 3 million years can be accurately calculated. The phase shift between the calculated and real cycles, for example, is claimed to be only a few thousand years throughout this period (Hilgen and Lourens, 1994).

Since Milankovitch cycles influence climate, and in turn climate influences the sediment composition, it is not surprising that sedimentary cyclicities can be related to the Milankovitch cycles. Provided one knows which sedimentary cycle corresponds to which Milankovitch cycle, an accurate age assessment of sediments deposited over the last millions of years is possible. Such an "astronomical calibration" enables evaluation of timing and persistence of a wide variety of physical, chemical and biological signals as far back as the onset of northern hemisphere ice ages, 2.52 Ma ago.

The present study aims at a better understanding of marine biosphere responses to this first glaciation as well as the subsequent climate regime characterized by alternating glacial and interglacial intervals. The role of Milankovitch cycles is investigated by means of reconstruc-

tion of Mediterranean and central North Atlantic palaeoenvironments for the interval between 2.8–2.2 Ma.

As a basis for the environmental reconstructions the relation between abundance and composition of organic microfossil associations and past environments is investigated by using palynological techniques. Two principle categories of palynomorphs can be obtained from marine sediments: palynomorphs from land plants (pollen grains and spores), and palynomorphs representing marine phytoplankton (mainly organic dinoflagellate cysts, or shortly, dinocysts). These latter are formed during the life cycle of dinoflagellates and represent the cell wall of their resting stage. By studying marine sediments, in which continental and marine palynomorphs occur together in the same samples, the relative timing of changes in marine and terrestrial environments can be assessed.

The palynological results are combined with a second tool for palaeoenvironmental reconstructions, the ratio of stable oxygen isotopes $^{18}\text{O}/^{16}\text{O}$. Due to the phenomenon that with decreasing temperature H_2^{16}O molecules evaporate easier than H_2^{18}O molecules, (all precipitation, ice and fresh water is therefore relatively enriched in H_2^{16}O), this ratio depends on ice volume, temperature and salinity.

At the start of the project, only a few sections consisting of marine sediments and including the interval of interest had been astronomically calibrated (Hilgen, 1991). For these sections, located in southern Italy, astronomical calibration was achieved by correlating periodically occurring sets of organic rich layers (sapropelic layers) to sets of extreme minima in climatic precession which occur every 100 ka or 400 ka.

In Chapter 1 this astronomical calibration is refined. It appeared to be possible to characterize the astronomically calibrated organic rich layers palynologically. Changes in the ratio between continental and marine palynomorphs closely matched the calculated amplitude variation in 65°N summer insolation. Not only the insolation extremes but even each maximum and minimum in insolation could be related to a resulting maximum or minimum in the continental/marine palynomorph ratio.

The oxygen-isotope record (Lourens et al., 1992) and palynomorph composition demonstrate that, at times of insolation maxima, not only continental influence was increased but also marine primary productivity and the input of shallow marine palynomorphs, whereas salinity was lower. This combination of changes is attributed to a positive correlation between precipitation and insolation for this area. As a result of this increased precipitation river discharge increases, introducing more, relatively nutrient-rich fresh water further offshore. This in turn results in decreased salinity and increased productivity, continental and coastal influence in the samples.

These precipitation changes which are mainly a function of precession (21 ka cycles) have the most dominant effect on the palaeoenvironment. On a 41 ka scale temperature interferes with precipitation. Warm–wet and cool–dry periods alternate although precipitation cycles precede temperature cycles by 9 ka. On a scale of 100 ka changes in sea level are the most important variable.

Finally, two cold events, each associated with a reduced sea-level, occurred. The strongest event coincides with the onset of northern hemisphere glaciations, 2.52 Ma B.P (oxygen isotope stage 100). Prior to this event a cooling at 2.72 Ma (oxygen isotope stage 110) can be demonstrated. Both events interfere with the Milankovitch cycles in such a way that during these intervals minima in sea-level and temperature are forced to Milankovitch frequencies. The amplitude of the variations can not be explained on the basis of orbital forcing alone.

The environmental reconstructions are based on species which still occur today. Some extinct species can be traced up to 2.5 Ma. In Chapter 2, a multivariate approach is used to determine the environmental preferences of such extinct species and extant species that are

environmentally less well constrained. The techniques used (DCA and CCA) assume a unimodal species response to environment. This assumes that species can only occur on a limited section of a given environmental gradient. From one end of this section to the other, a species increases in abundance, reaches its optimum and decreases again. The species optimum in relation to the main environmental gradients in the Mediterranean dataset (temperature and onshore–offshore gradients) is assessed by using environmental information derived from oxygen isotopes, planktic foraminifera, pollen, spores and extant dinoflagellate cyst species.

After unravelling the main (Milankovitch scale) environmental variables in the Mediterranean area, the question raises to which extent these findings can be transferred to other areas. In Chapter 3 therefore, the study concentrates on a completely different environment, the nutrient poor open North Atlantic Ocean where the same interval (2.2–2.8 Ma) is studied from a core derived from the west flank of the Mid Atlantic Ridge. In this environment a 41 ka cyclicity dominates the sediment composition. This cyclicity correlates with temperature and ice volume changes according to the oxygen-isotope record. In contrast to the Mediterranean, the 23 ka precipitation and 100 ka sea-level cycles can be hardly observed. This could well be due to the near absence of any land derived signal in the North Atlantic record. The palynomorph assemblage indicates an oligotrophic environment throughout the investigated interval. Its low diversity does not allow for productivity estimates on the basis of the species composition.

However, the 41 ka cyclicity in the concentration of relatively autochthonous dinoflagellate cysts does reflect changes in productivity since changes in sedimentation rate, carbonate dissolution, preservation and transport can not account for the observed variability. In contrast to the situation in the Mediterranean, the higher productivity occurs in the cooler intervals. Not only productivity but also the concentrations of pollen, spores and allochthonous dinoflagellate cysts lead the oxygen isotope record. A phase difference between palynological records and the oxygen isotope record is also seen in the Mediterranean. For both areas, therefore, a more direct atmospheric response to insolation is held responsible for the observed productivity increase. In contrast to the Mediterranean area, the atmospheric response in the North Atlantic is not considered to be transferred to the marine environment by increased river discharge but by changes in ocean current patterns due to a different wind stress on the ocean surface. Comparison of the reconstructed palaeoenvironments of 2.5 Ma ago with those for the last glacial cycle shows that also in the more recent past cool–dry and warm–wet conditions alternate in the Mediterranean, whereas in the open North Atlantic Ocean marine productivity increased during the last glacial period. These similarities suggest that the response to Milankovitch cycles in these areas remained uniform for at least the last 2.5 Ma.

The Mediterranean cooling events at 2.72 and 2.52 Ma are also recognised in the North Atlantic. In the latter area, however, an additional third cooling is recognised in between at 2.6 Ma (oxygen isotope stage 104). These events represent the last steps towards the onset of the first northern hemisphere glacial period as well as the onset itself.

In Chapter 4 the possible impact of these steps on the open ocean and coastal environments is studied by assessing their effect on the distribution of dinoflagellate cysts in the investigated Atlantic and Mediterranean environments. For both regions a stepwise reduction in diversity is associated with the successive cooling events. The biostratigraphic implications of this reduction are discussed.

Finally, in Chapter 5 some of the dinoflagellate cyst taxa which have stratigraphical and/or environmental importance in either the studied interval or in other Pliocene intervals are formally described.

All chapters are, or will also be published in international scientific journals.

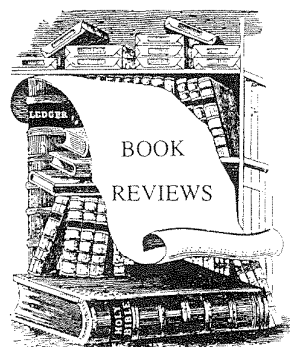
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*Ph.D. Thesis, Laboratory of Palaeobotany and Palynology, University of Utrecht, Utrecht, The Netherlands. Published: Jan. 20, 1995 (300 ex. ISBN 90 393-0896-9); Defended: Feb. 13, 1995. Promotor: Prof. H. Visscher. Copromotor: Dr. H. Brinkhuis.

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Aspects of Archaeological Palynology: Methodology and Applications, edited by Owen K. Davis, American Association of Stratigraphic Palynologists Contribution Series 29 (1994). AASP Foundation, Dallas Texas. 221 pages, \$15.00 (order copies from: Palynology Laboratory, Texas A&M University, College Station Texas 77843-4352).

This publication is an important contribution to the growing field of Archaeological Palynology, an as such is a necessary addition to the library of students and professionals interested in this exciting area of Palynology. As Davis notes in his introduction, the field of Archaeological Palynology is growing rapidly with over 100 papers per year from the American Southwest alone. This volume represents an attempt to provide a compilation of papers dealing with important fundamental issues within this field.

The publication contains 17 articles covering a wide range of topics including vegetational reconstruction, disturbance and taphonomy, processing and extraction techniques, diet, artifact sourcing, dispersal and deposition, and preservation. These 17 articles also cover a wide range of geographic areas and time periods within the Quaternary. Most papers cross-cut several of these topics.

The paper by Oeggl and Wahlmüller described the vegetational

reconstruction of a Mesolithic hunting camp from the early Holocene and indicated minimal human impact on the vegetation. Papers by Carrón and Dupré; Medianik; and Cattani, Garcia-Anton, and Renault-Miskovsky base their climatic reconstructions on material from the archaeological sites. Carrón and Dupré demonstrated that the vegetation changes during the last glacial period from Southeastern Spain were related to geographic location and correlated with the marine isotope scale. Medianik relates the vegetation and climate changes of the Late Paleolithic site in Moldavia to the patterns of site formation.

Medianik relates human disturbances during the Paleolithic of Moldavia to observed increases in herb and percentages. In an insightful comparison between sites from southern California and Almería Spain, Davis and Mariscal note the presence of disturbance indicators reflecting human activity.

Several papers focused on specialized techniques for concentrating pollen of specific target taxa (i.e. cultigens). Gish has described a technique for large fraction screening. While admitting that this procedure alters the archaeological pollen assemblage, the problem of alteration of an artifactual assemblage is not addressed. Clarke examined differential recovery rates among groups of palynomorphs and showed that there were major differences.

Two papers dealt with reconstruction of prehistoric diet remains by pollen analysis. Bottema and Woldring suggest that the pollen samples recovered from tin mines in Turkey were from coprolites of refugees from the Byzantine period. They also note changes in diet between the Bronze age samples and the Byzantine samples. Grieg presents a thorough analysis of pollen samples from medieval through 18th century Britain. His analysis reveals changes in diet and increasing diversity of plant materials from these coprolites. This study provides the reader with a look at historic British diets and provides many possibilities of the potential sources for latrine pollen and how they may be best interpreted.

The article by Dirot shows how pollen and spores trapped in moss used to caulk a sunken 17th century French river boat were interpreted to determine where the boat was manufactured, possible trading routes followed, and where the boat was repaired. This is an excellent study in forensics as applied to archaeology. Davis and Buchmann also presented an excellent study of how pollen, initially carried underground by burrowing insects, can become incorporated into the archaeological sediments. These deposits can be confused with archaeological derived pollen assemblages. This source of contamination becomes critical in the interpretation of archaeological assemblages.

Hunt has presented an excellent article of the interpretation of pollen assemblages from fluvial sediments. This topic is of the utmost importance to archaeological palynologists who must routinely deal with this topic.

Several of the authors have separated fossil grass pollen into cerealia-type or non-cerealia-type and this separation has been based on size. I question the utility or accuracy of this separation since several investigations (Mack, 1971; Bragg, 1969) have demonstrated the large size variability present within taxa.

This book is highly recommended for both students and professional palynologists. The price alone is a bargain especially in comparison with many textbooks. This volume contains much information about the ways in which pollen data can be used and interpreted from archaeological sites. This is a necessary addition to the bookshelf of botanists, archaeologists, palynologists, or anyone interested in this field. I highly recommend purchase of this book.

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Geology Underfoot in Southern California by Robert P. Sharp & Allen F. Glazner, 1993. Mountain Press Publishing Company, P.O. Box 2399, 2016 Strand Avenue, Missoula, Montana 59806. ISBN 0-87842-289-7. 206 pages. \$12.00.

Considering all of the geologic upheavals that occur in southern California, this is an excellent book for anyone interested in the geology of the area. Written in an easy-to-understand conversational style, and generously illustrated with numerous black-and-white photographs and maps, this book is clearly intended for the mass market. I hope the book is very successful because it engages the attention of the reader by continually asking questions about the area being examined, while also relating the geology to the history of the area or pointing the importance of geology in such practical concerns as the siting of nuclear power plants.

The book is divided into 20 vignettes, which the authors describe as “stories, like snapshots, focused on some particular scene, relationship, or feature selected from the rich mixture of southern California’s geological phenomena. Like snapshots, they do not cover everything, only items in focus and within the field of view.” Robert Sharp and Allen Glazner use this technique very well. For example, in vignette 1 on the San Onofre nuclear reactors and the Cristianitos fault, they discuss the concern citizens have that the fault might move and cause damage to the power plant. They immediately ask the question “Is the Cristianitos fault active?” They then examine the geologic evidence, taking the reader through a discussion of the geology of the area, explaining how the area formed, and asking questions, which they answer by showing different geologic features. They point out that there is no evidence of movement along the fault in the last 125,000 years, then in the next sentence ask how reliable is the 125,000-year age, and on what is it based, which they then discuss.

By using this conversational question and answer method, the authors are able to explain a lot of geology in a manner that is easy to understand and comprehend. I particularly like their final paragraph in this vignette, because it points out some of the things I was discussing in my Presidential Message about the public’s lack of understanding about science works and its impact on society. “What is the lesson of San Onofre Bluff? Good exposure of simple geological relationships can provide information of real value to society.”

As the authors state in the Preface, this book is written for the non-professional reader, and as such technical jargon is kept to a minimum. In order to acquaint the reader with some of the basic principals of geology, and an overview of the geology of southern California, the authors provide an opening chapter titled “The Big Picture.” A glossary of important terms is provided, as well a bibliography of additional references.

Some of the other vignettes covered include: Perils of Tampering with Nature—The Harbor at Santa Barbara; An Ice Age Sand Lobe—Nipomo Dunes; The San Andreas Fault and Cajon Creek Cooperate—Cajon Pass; Red Rock Canyon—A Geologic Library; A Great Natural Geological Laboratory—Rainbow Basin; Young Volcanoes in the Mojave Desert—Walking About at Amboy and Pisgah Craters; Flamingos in the Desert—Pluvial Lake Manix; Eighty Seconds of Catastrophe—The Blackhawk Slide; and An Intimate Contact with Volcanic Phenomena—Hot Creek.

I thoroughly enjoyed this book and highly recommend it for anyone

who is visiting southern California and wants to add some geology to their trip. It is very well written, easy to read, and provides good directions to the various sites of interest. I learned many new things about the geology of southern California, even areas that I have visited many times. I plan to take the book with me this summer when we visit our families in southern California and take a few of the trips. For \$12, you can’t go wrong with this book.

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Messel—An insight into the history of life and of the Earth by Stephan Schaal & Willi Ziegler (eds.), 1993. Oxford University Press, 200 Madison Avenue, New York, NY 10016. ISBN 0-19-854654-8. 322 pages. \$75.00.

The Messel oil shales near Frankfurt, Germany contain a remarkable collection of exquisitely preserved plants, insects, and animals of Middle Eocene age. During the past 120 years, a tremendous number of fossils have been recovered from the Messel site including ferns, conifers, palms, insects, fish, amphibians, turtles, tortoises, lizards, crocodiles, marsupials, insectivores, anteaters, rodents, ungulates, bats, birds, and primates. Not only are the hard parts preserved, but in many cases the soft tissue and stomach contents are also preserved. So complete is the fauna and flora, that it represents essentially a complete ecosystem that existed some 50 million years ago.

This beautifully illustrated book describes the fossils recovered and discusses their ecology, biogeography, and evolutionary significance. Divided into 27 chapters, each chapter opens with a short discussion of the group in question, and proceeds with a discussion of the members of that group that have been recovered from the Messel pits. Each chapter contains numerous beautiful color photos of the fossils, and many reconstructions of what the organisms looked like and their phylogenetic relationships.

The first chapter is a curriculum vitae of the Messel pit, providing the reader with a chronology of its history from the chance finds of limonite which led to its opening as an open-cast mine in 1859, the first fossil find in 1875, the first methodical excavations for fossils in the pit in 1966, its planned use as a refuse repository in 1971, a planning decision in favor of it being used as a central refuse deposition site, and finally the decision in 1990 by the Ministers for the Environment and for Science finally announcing that this world-famous fossil site would not be used for waste disposal.

Following this, chapter 2 discusses the paleogeography of Europe during the Eocene, while chapter 3 presents the genesis of the Messel oil shale in which the fossils are found. Chapter 4 provides an overview of the fossil plants, and chapters 5 through 22 discuss the individual groups of insects and animals recovered. The final chapters include a discussion of the taphonomy of the organisms, how the fossils were excavated and prepared for display, an analysis and interpretation of the fossilized gut contents preserved in some of the mammals, and the biogeography of the Messel fauna and flora.

This is a superbly illustrated volume, and one that I spent many hours just looking at the pictures of the exquisitely preserved fossils. While not a vertebrate expert, the discussions were easy to follow and interesting. While the price (\$75) is probably a bit high for many personal libraries, considering the quality and numbers of the photos (most of them in color), I don’t consider the book to be excessively priced. This book provides an excellent snapshot of what Messel looked like some 50 million years ago, and I recommend it to everyone with an

interest in fossils and taphonomy.

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Pollen Grains of Canadian Honey Plants, by Clifford W. Crompton and Walter A. Wojtas, 1993. Research Branch, Agriculture Canada, Ottawa, Canada, 228 pages of text and plates

Publication Number: 1892/E 1993. Price: \$51.95 US (no shipping charged for US orders) or \$39.95 Canadian (Canadians add shipping). Catalogue Number: A53-1892/1993E. ISBN Number: 0-660-14818-8. Available from: Canada Communication Group Publishing, Ottawa, Canada K1A 0S9, phone: (810) 956-4800, FAX: (819) 944-1498. Credit Cards: Visa and MasterCard accepted.

Pollen Grains of Canadian Honey Plants provides a guide by which nectar sources of Canadian honey can be identified by pollen grain analyses. As indicated in the title, this book focuses on pollen types from taxa important as nectar and pollen sources for Canadian honeybees. Pollen types from 188 taxa in 52 plant families are illustrated in 282 scanning electron and 556 light microscope micrographs. Of the 188 taxa, 36 are in the Fabaceae, 21 in the Asteraceae, and 15 in the Rosaceae. Many of the taxa illustrated also occur in the United States. Measurement bars on the micrographs allow for size computation and comparison between pollen grains.

The text is divided into eight chapters including introduction, techniques, pollen grain descriptions, keys, a glossary, and references. The importance of pollen grains for insects, benefits of pollination systems, and the need for pollen analyses of honey are briefly discussed. Topics dealing with the microscopic analyses of honey (under-presentation, frequency classes, contaminants, etc.).

Descriptions of the pollen types, the index, the glossary, and the references are the major selling points for this book. The description of each pollen type includes its size (including polar area index, length, and width), aperture, and ornamentation. Family names are in bold capital letters and scientific names are in bold. The common names of each taxon in French and English, distribution data, flowering periods, and ecological notes are also included. The index is well organized and is arranged alphabetically. Key words (such as acetolysis), family and scientific names, and French and English common names are included in the index. The glossary and the reference section give anyone a good start in learning the terminology and the literature concerning the study of pollen in honey. Although not an extensive list, many of the more renowned researchers in melissopalynology are listed (e.g. O.M. Barth, E. Crane, M.-J. Feller-Demalsy, M.H. Lieux, J. Louveaux, M. Maurizio, E. Oertel, and G. Vorwohl).

There are a few blemishes in this quality atlas. The technique section is relatively brief and the three techniques suggested do not provide an accurate representation of the pollen contents of honey samples. The keys are difficult to use with the couplets varying from dichotomous to multiple. The micrographs could be larger and the

quality of some could be improved.

Although Canadian beekeepers, honey packers, and brokers are the intended primary users, this book will be of benefit to any one working with honey, analyzing honey by its pollen types, or trying to identify unknown pollen grains. This book is also useful for any palynologist working with unknown pollen types. The cost of this atlas makes it even more attractive when compared to other pollen atlases. This atlas should find its way onto the book shelf of every North American Palynologist.

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A Stratigraphic Index of Dinoflagellate Cysts by A.J. Powell (ed.), 1992. British Micropalaeontological Society Publication Series, Chapman & Hall, 2-6 Boundary Row, London. xii + 290 pages. £65.

A Stratigraphic Index of Dinoflagellate Cysts is one volume in a series aimed at providing a synthesis of current knowledge of various microfossil groups. It has pictures. It has range charts. It has zonations. It has clearly written and well researched text describing and elaborating on the pictures, charts, and zones. It belongs on the desk of every one who works with dinocyst biostratigraphy.

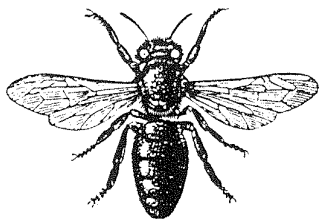
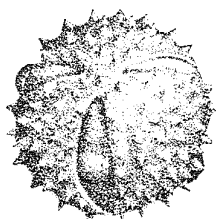
The British Micropalaeontological Society Publication Series clearly focuses on the stratigraphic distribution of dinoflagellate cysts in British sediments. The Preface clearly states "this volume... does not purport to represent stratigraphic coverage of areas outside the territories of the British Isles." The range charts included throughout the book do not give worldwide ranges—but the text often includes information to help the reader deal with wider ranges reported elsewhere. The book consists of five chapters: one each on the Triassic, Jurassic, Cretaceous, Tertiary, and Quaternary Systems.

Editor Powell has done a good job of balancing his desire for overall consistency with the individualities of authors and fossils. Headings are consistent among chapters, subheads are allowed to vary. Stratigraphic explanations and discussions of stratigraphic principles are good. Biozones are interval zones; that is, they represent the interval between specific, clearly stated first and/or last appearance datums (FADs and LADs). For convenience, each Biozone is given a three-letter mnemonic.

The Triassic chapter, authored by A. James Powell is the shortest. It contains no pictures (either range charts or plates) and gives a single Biozone. The stratigraphic discussion in the text would have benefited from a summary graphic. The stratigraphic data in this chapter are clearly credited to Geoff Warrington in acknowledgements.

The Jurassic chapter, written by James B. Riding and Joanna E. Thomas details 15 Biozones, 11 of which are further divided into 33 subzones (34 if one includes one subzone in the basal Cretaceous). The dinoflagellate zonation is tied to Ammonite zones and the chapter includes a nice explanation of the somewhat strange rules of extending the base or top of a range to the base or top of the Ammonite zone. In this chapter Biozone definitions rely on multiple criteria and make for tricky reading; the authors' use of commas and articles is all that distinguishes the criteria for the base and the top of each zone. The chapter is well illustrated by 20 plates.

The Cretaceous chapter is authored by Lucy I. Costa and Roger J. Davey and includes unpublished work on well sections in both the Chalk and Shetland groups. In contrast to other chapters, no zonation is offered. Instead index taxa are listed for each stage. The range charts are tied to stages and Ammonite zones, but here, dinoflagellate taxon



range limits can and do occur within a zone. Eleven plates illustrate Cretaceous taxa.

The Tertiary chapter, by A. James Powell, is the longest. It introduces 36 Biozones. Eleven plates illustrate some, but by no means all, of the important taxa. The zones produce a very fine subdivision; unfortunately some zones may not be recognizable outside their type areas.

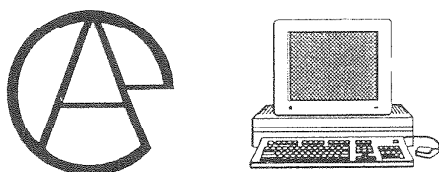
The Quaternary chapter, by Rex Harland, establishes no Biozones. It includes a range chart and three plates.

The book contains convenience features that were really appreciated: species list, index, nice running headings, range information in the figure captions, separate bibliographies for each chapter—to name a few. The plates are of high quality. Typographical errors are minor. Page numbers were omitted from many full page illustrations; the reader will want to put them in by hand.

This book is a wealth of information. The range charts and figure captions provide convenient summary information. I certainly hope readers will use these summaries to lead them to the appropriate discussions in the text that provide the true strength of the book.

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PALYNOLOGY ON THE WORLD WIDE WEB



Canadian Association of Palynologists WWW Page

by Alwynne Beaudoin

It's an age of acronyms and I'd like to introduce you to yet another: WWW. This stands for World Wide Web, the latest and fastest-growing method of electronic communication and information transfer. WWW documents are usually read with a browser, such as Mosaic or Netscape, and can incorporate text, images, and even sounds. Web documents can include "links" to information that resides at other sites, thus allowing information to be combined and presented in many different ways. It is an extremely powerful and versatile means of presentation. Each Web document is referenced by its URL or "Uniform Resource Locator", such as the one given below for the CAP WWW page. If you have not already had a chance to explore the Web, I urge you to do so. "Mosaic Quick Tour for Windows: Accessing and Navigating the Internet's Word Wide Web" (Gareth Branwyn, Ventana Press, 1994) is a good introduction to the concepts and operation of the Web.

CAP, of course, is the Canadian Association of Palynologists/ Association Canadienne des Palynologues. CAP is the first national palynological organization to have its own Web page. The CAP WWW page was launched on March 8 1995 and in its first day of operation received 34 visitors. The CAP home page has been accessed from visitors at sites world-wide, including, for example, USA, UK, Sweden, Japan, and Germany.

The CAP WWW page consists of a "home page" which contains a directory of information and links to various other components or

subsidiary pages. These pages contain information on the Association, announcements of upcoming conferences, a directory of palynologists, a list of recent papers in palynology, an article on palynology, a guide to internet resources, news of Departments with palynology programmes and information on laboratory equipment and supplies. The pages are being continually updated and I expect more material to appear soon. The CAP WWW page may be found at:

<http://gpu.srv.ualberta.ca/~abeaudioi/cap/cap.html>

The CAP WWW page is a good starting point for an exploration of the Web because it contains links to many other earth science and botanical sites. I welcome your comments on this presentation.

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[For information on the AASP WWW page, see "AASP and the World Wide Web" on page 4—Ed.]

Plant fossil Record database—online (WWW)

According to M.C. Boulter (M.C.Boulter@uel.ac.uk) on the internet, the International Organisation of Palaeobotany's Plant Fossil Record (PFR) database project announces a new version, PFR2.2. It is the first to contain taxonomic details of some fossil species of modern genera. You can still create global maps of the occurrence records that you select, and the same search commands can link to gophers at the Smithsonian Institution, Yale and Berkeley. The url is:

<http://www.uel.ac.uk/palaeo/>

The description on its WWW home page states that: "This Version 2.2 of the Plant Fossil Record (PFR2.2) database includes descriptions and occurrences of many thousands of extinct plants. For the first time modern genera with fossil species are included in the description database. Names, places and ages can be searched and the occurrences are instantly plotted on a global map. Patterns of migration and evolution through geological time can be clearly examined to help better understand the history of climatic and environmental change." There is a caveat—"the records have not been checked as 'correct' identifications, locations or age determinations, and are as they were published. You, the user, must take responsibility to justify their reliability".

This database includes **dinoflagellates** and **acritarchs** (I believe mostly from Bob Raven's excellent "Taxon" database) as well as spores, pollen, and macrofossils. Individual taxon distributions are hence now available on nicely presented world maps at the click of a mouse.—Ed.

SPECIES 2000: INDEXING THE WORLD'S KNOWN SPECIES

"Species 2000: Indexing the World's known Species" is a new program launched by the International Union of Biological Sciences. It has the objective of enumerating all known species of plants, animals, fungi and microbes on Earth, modern and fossil, as the baseline dataset for studies of global diversity. The objective is to facilitate the creation of global master species databases, by augmenting existing taxonomic databases and where appropriate establishing new systems.

The output will be an important element in the information needed

for the implementation of the Convention on Biological Diversity, providing support for the preparation of surveys and inventory of biodiversity, and a common medium for global communication about biotic resources, their utility and conservation. Implementation of Species 2000 will involve forming a federation of existing taxonomic databases. It seeks as members, holders of such databases.

For further details contact the paleontology representative on the Steering Committee, m.c.boulter@uel.ac.uk

DINOSYS? DINOSYS! —AN UPDATE

Not just a software shell, but solid data & free demo disk

WHY & WHAT.—During the last decades, rapid developments in dinoflagellate palynology have led to a dramatic increase in taxonomic and stratigraphic data. Hundreds of genera and thousands of species have been described up to now. The number of taxa will continue to increase, including taxa from yet uncovered areas. In order to keep up with these developments, LPP has in 1990 started the development of an electronic data- and image-library on dinoflagellate cysts, a relational database for the IBM-compatible PC, the “DinoSys” database project.

DinoSys is a relational database on fossil dinoflagellate cyst. It is not merely a software shell, but documents fossil dinocyst genera and species on the basis of published and specialist information: taxonomy, synonymy, stratigraphy, geography, images and literature. All text is in English.

In order to guarantee its continuity, and to be able to provide future updates and upgrades, DinoSys is offered for sale to the palynological community: exploration companies, consultants, geological surveys, academic institutions and individuals.

DEVELOPMENT.—DinoSys software is developed by LPP. Whenever necessary, software is upgraded (e.g. Windows 95 and ODBC—“Open DataBase Connectivity”, for access to data on e.g. Unix machines) and further developed in order to accommodate new developments and concepts.

Data are compiled by LPP. Images are provided by LPP and palynologists worldwide (Jonathan P. Bujak, Sarah P. Damassa, Rob Fensome, Hans Gocht, Martin J. Head, Judith K. Lentin, Walter Riegel, Bruce Tocher, Laurent de Verteuil, Graham L. Williams, Graeme J. Wilson, and a bunch of people at LPP, and more is in store).

Major sponsors so far have been NORSK HYDRO, STATOIL, AMOCO, SIPM and LPP.

FREE DEMO DISKETTE.—A free demo-diskette has become available now. It includes some genera, species, literature references and images, and offers possibilities to enter and retrieve in-house data, integrated with published (demo) data. Please contact LPP for your free copy (see also requirements).

A demonstration tour will be planned through Europe and America. Serious candidates can contact LPP for a schedule.

IN-HOUSE DATA & CUSTOMIZATION? YES!—Although DinoSys can be purely used as a dinocyst reference system, it offers many possibilities to enter and integrate in-house data, e.g. company wells, in-house ranges, company taxa and images, and in-house reports, basically the same type of data that is already in DinoSys. These personal/company additions do not conflict with future updates.

LPP can also customize the software for data on dinocysts and other

fossil groups, and accommodate them within the database. For quotes, please contact LPP at the address below.

REQUIREMENTS.—IBM compatible from 486 DX(2) up. Windows accelerator (1 MB or up) colour VGA, 8 MB RAM or up. DinoSys now takes nearly 45 MB of your hard disk for program and data, and over 1.5 GB of images are presently available. Eventually these numbers may double. DinoSys now runs under Windows 3.1, and can be used in a network. In the near future it is expected that images can be accessed directly from CD.

More information on subscription fees and specifics can be obtained at the address below. Please state the nature of your (company's) activities, e.g. exploration, consulting, or academic/educational.

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[Part of the above text previously appeared in a modified form in the *AASP Newsletter* 27-4 of November 1994.]

EDITORIAL

THE World Wide Web is revolutionizing information transfer on a global scale: so much so, that the haves/have-nots will in future be decided by those with/without access to the internet. The World Wide Web (WWW) owes its success to Hypertext Markup Language (HTML), a kind of page-layout code that allows documents to be accessed by a wide variety of computers without losing their basic layout (header, subheads, main text, lists, etc.). These basic instructions are interpreted by a web browser (the program you must run to access a particular web site: Mosaic and Netscape are popular examples). Graphics can be incorporated to enhance the presentation. The neat thing about the Web is that it allows all sorts of documents, and even other web sites, to be linked. Each Web presentation begins with a “home page” —an introduction and directory from which one can access other documents by simply clicking a mouse. I can jump from my computer in Toronto to the CAP WWW home page in Alberta (see p. 22), from there go to the Plant Fossil Record database in East London, U.K. (p. 22), and end up in Australia where the ANU has a Web server on pollen studies—all in seconds. The WWW is a huge network with one new home page being launched somewhere every 20 minutes. The AASP Home page is presently under construction and will hopefully be up and running by the time you read this newsletter (see p. 4). The home page will feature, among other things, an AASP e-mail directory compiled by David Pocknall (Dtpocknall@aol.com). If you aren't on this list, and wish to be added, please send him your e-mail address soon.

Web sites don't just float around in cyberspace—they exist as files and documents (formatted in HTML) on a computer, usually located at the institution where the WWW home page was instigated. AASP is fortunate to have support of the computing facilities in the Department of Geology at the University of Toronto, where the embryonic AASP home page resides at no cost to AASP. On behalf of AASP I thank the Department of Geology, particularly our computer manager, Jim Charters, for this support. I also want to thank Niels Poulsen and Jim Riding, correspondents for the Nordic countries and U.K. respectively, for their always timely reports. Note that we do need newsletter correspondents from other countries and areas. If you would like your country's palynological activities to receive wider exposure and are willing to supply material on a semi-regular basis, please contact me.



SCHEDULE AND CALL FOR PAPERS
28th AASP ANNUAL MEETING
October 10–14, 1995
Ottawa, Ontario, Canada



Registration Fees: Professional Can\$105
Student or Retired: Can\$ 80
Additional Late Registration Fee:
(After August 15th) Can\$ 30

Proposed Schedule of Meeting Events
Venue: Chateau Laurier Hotel, Rideau Street

October 10 12:30 p.m. **AASP Golf Tournament**, Pineview Municipal Golf Club, Ottawa
Tuesday
6:00 p.m. **AASP Board of Directors Meeting**, Palladian Room

Drawing Room of the Chateau Laurier (unless otherwise noted)

October 11 8:00 a.m. **Special Session on Quaternary Palynology**
Wednesday
1:00 p.m. **Special Session on Highlights from “Palynology: Principles and Applications” (AASP Silver Jubilee Volumes)**
6:00 p.m. **Ice Breaker**—Salon of the *Canadian Museum of Nature*
Metcalf and McLeod Streets

October 12 8:00 a.m. **Special Session on Dinoflagellates and Acritarchs of**
Thursday **Mesozoic-Cenozoic Oceans and Marginal Seas**
8:00 a.m. **Poster Displays** (all day)
1:00 p.m. **Special Session on Dinoflagellates and Acritarchs (continued)**

October 13 8:00 a.m. **Special Session on Quaternary Palynology (continued)**
Friday
8:00 a.m. **Poster Displays** (all day)
12:00 p.m. **Group Photo**
12:30 p.m. **Business Luncheon**, Banquet Room, Chateau Laurier
14:00 p.m. **General Session**
6:00 p.m. **AASP Board of Directors Meeting**, Palladian Room

October 14 8:00 a.m. **Field Trip to Eardley, Quebec (nodule site) and surroundings**
Saturday **to do a little digging in some Quaternary deposits, led by Dr. Richard Harington of the Canadian Museum of Nature.**

POSTER SESSIONS

October 12 & 13 Posters may be displayed from Thursday morning through Friday afternoon. Area of individual displays will be approximately 3 ft. x 3 ft. cork panel suitable for normal tacks.

SPECIAL SESSIONS Three Special Sessions will be offered at this meeting:

Quaternary Palynology in Canada convened by Dr. Pierre J.H. Richard (University of Montreal, Montreal, Quebec H3C 3J7). An opportunity for Quaternary palynologists to illustrate the role of pollen analysis in environmental reconstructions of the "recent" past, and further examination of the contribution of paleopalynology as an independent sub-discipline for reconstructions at the plant population and community levels, not only climatic reconstructions but of other aspects as well. (Dr. Richard can be reached at FAX 514-343-8008 or E-mail richard@ere.umontreal.ca).

A second Special Session entitled, **Dinoflagellates and Acritarchs of Mesozoic–Cenozoic Oceans and Marginal Seas** will be convened by Drs. Geoffrey Norris and Martin J. Head (Department of Geology, University of Toronto, Toronto, Ontario M5S 3B1). Dinoflagellates have become established as sensitive chronostratigraphic and paleoenvironmental indicators in oceans and epicontinental seas. This symposium will explore the contributions of extinct and extant cysts and associated acritarchs to magnetobiogeochronology, paleoceanography, and paleoecology of neritic through bathyal sedimentary sequences. Integration of data from shallow and deep water environments is anticipated. The convenors would appreciate hearing from intending participants as soon as possible (preferably by FAX at 416-978-3938 or E-mail to norris@mica.geology.utoronto.ca Please preface subject header AASP DINOS).

The third Special Session will be selected papers from the AASP Jubilee Volumes, ***Palynology: Principles and Applications***. The session will be convened by Drs. Graham Williams and Rob Fensome of the GSC, Bedford Institute of Oceanography, Dartmouth, Nova Scotia.

ABSTRACTS

An abstract form is provided with this announcement. **Please note** on the abstract form to which session you will be submitting your paper/poster, **Quaternary Palynology in Canada**, or **Dinoflagellates and Acritarchs of Mesozoic–Cenozoic Oceans and Marginal Seas**, or **General**.

AASP GOLF TOURNAMENT

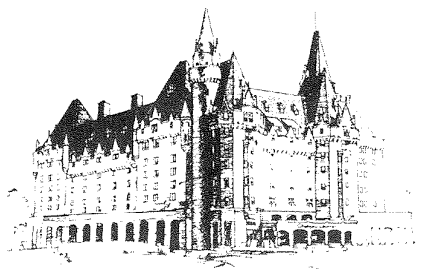
Please contact Vaughn Bryant, Jr. if you are interested in playing in the tournament (telephone 409-845-5242; FAX 409-845-4070, Email vmb7045@tamu2000.tamu.edu). This will be held on Tuesday, October 10, in the afternoon beginning at 12:30 p.m. (Can\$50—includes green fee, cart rental, and a trophy). Pineview Municipal Golf Club, 1471 Blair Road, Ottawa, Ontario.

GROUP PHOTO

We will again have the expert photography and production of the team of Vaughn Bryant, Jr., and Bob Clarke, who did a superb job on the AASP Group Photo at last year's meeting, keeping the cost down to both AASP and the individual.

ACCOMMODATION

Each individual is responsible for the cost of his/her accommodation; it is not included in the registration fee (Reservation envelope will be provided with registration forms).



Single/Double occupancy rate: CAN\$ 125.00/night

Chateau Laurier

Attention: Reservations AASP 28th Annual Meeting
1 Rideau Street
Ottawa, Ontario K1N 8S7

AIRLINES

Ottawa is now easily reached by the addition of new direct flights of USAir from Pittsburgh, New York City or Syracuse. We are pleased to announce that we have contacted USAir to be designated as the official carrier for the attendees of the 28th Annual Meeting. USAir agrees to offer a 5% discount off First Class and any published USAir promotional round trip fare. A 10% discount off unrestricted coach fares will apply with 7-day advance reservations and ticketing required. These convention discounts are valid between **October 7-17, 1995** to allow visitors more time, if needed, before and after the meeting. To obtain your discount, telephone **1-800-334-8644**, refer to **Gold File No. 11270009**.

Also contacted for discounted airfares: Air Canada, which is affiliated with Continental Airlines. Discounts can be obtained by calling **1-800-361-7585** or your travel agent, requesting **Event Number CV950224** to be entered in the Tour Code box of your ticket. Discounts of 15% off regular roundtrip Executive and Hospitality Class within Canada; 15% off Business Class between Canada and USA, and other discounts depending on the class.

NOTE ON REGISTRATION FEES

Please note on the Registration Form that fees are in Canadian Dollars. You may send your fees in U.S. Dollars; however, please use the following exchange rate: "**Canadian dollars multiplied by 0.8 = U.S. dollars**" and then forward the converted rate amount to us. Overseas and International participants may pay by VISA or Mastercard credit cards; U.S. and Canadian participants, please send checks or money orders.

NEW AASP FOUNDATION PUBLICATION

Contributions Series Number 30

POLLEN OF THE SOUTHEASTERN UNITED STATES: WITH EMPHASIS ON MELISSOPALYNOLOGY AND ENTOMOPALYNOLOGY

by:

Gretchen D. Jones, Vaughn M. Bryant, Jr., Meredith Hoag Lieux, Stanley D. Jones, & Pete D. Lindgren

ABBREVIATED TABLE OF CONTENTS

INTRODUCTION	1
POLLEN KEYS AND ATLASES.....	2
POLLEN OF THE SOUTHEASTERN UNITED STATES	5
METHODS AND PROCEDURES.....	5
POLLEN PREPARATION FOR THIS ATLAS	6
COATING OF SEM SAMPLES	7
SEM EXAMINATION.....	8
PHOTOGRAPHY	8
PLATE PRODUCTION.....	8
REFERENCE COLLECTIONS AND VOUCHER SPECIMENS.....	8
INTRODUCTION.....	8
VOUCHER SPECIMENS.....	9
COLLECTION OF VOUCHER PLANTS	9
PREPARATION OF VOUCHER SPECIMENS.....	9
SUMMARY OF PLANT COLLECTION AND PREPARATION PROCESS.....	10
LABEL DATA FOR VOUCHER SPECIMENS.....	10
NOMENCLATURE	11
COLLECTION OF POLLENIFEROUS MATERIAL FROM VOUCHER SPECIMENS.....	11
COLLECTION POLLENIFEROUS MATERIAL FROM HERBARIUM SPECIMENS	12
ACKNOWLEDGMENT OF POLLEN SPECIMENS	12
POLLEN TAXA LISTS AND MICROGRAPHS.....	12
LITERATURE CITED.....	13
POLLEN TAXA LIST SORTED BY FAMILY, GENUS AND SPECIES.....	21
POLLEN TAXA LIST SORTED BY GENUS AND SPECIES	36
POLLEN TAXA LIST SORTED BY APERTURATION	51
POLLEN TAXA LIST SORTED BY ORNAMENTATION.....	62
POLLEN TAXA LIST SORTED BY MICROGRAPH NUMBER	71
MICROGRAPH PLATES.....	78

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(July, 1995)