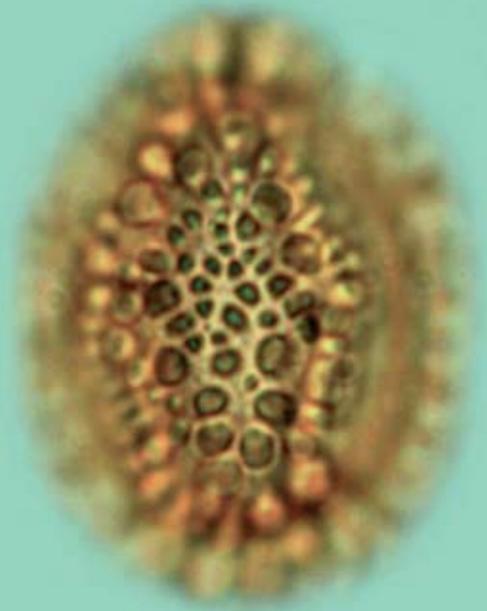
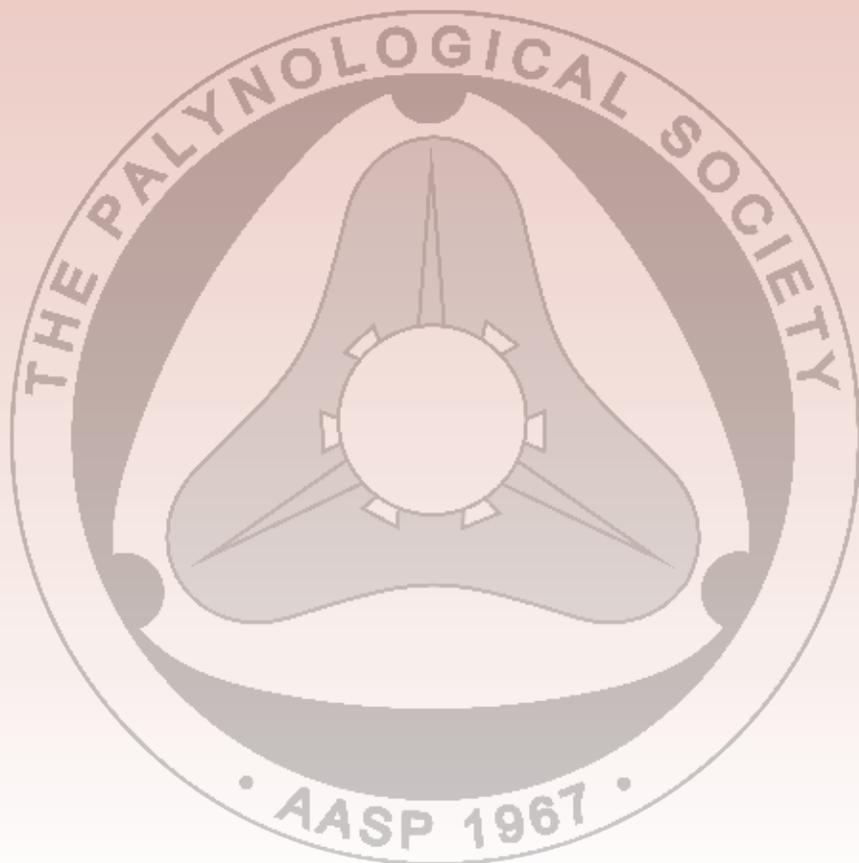


AASP- THE PALYNOLOGICAL SOCIETY



Ilex arnhemensis
by David Jarzen, FLMNH



NEWSLETTER



March 2010
Volume 43, Number 1



A.A.S.P. NEWSLETTER

Published Quarterly by the AASP - The Palynological Society

March 2010
Volume 43, Number 1

President's Page	-5-
Managing Editor's report	-6-
Obituary - Loretta Satchell	-6-
AASP Student Award	-7-
Obituary - Doug Nichols	-8-
42nd AASP Annual Meeting	-10-
Book Reviews	-12-
Palynological news from around the world	-18-
Palynology of shell middens	-22-
Student support	-25-
Workshops and meetings	-26-
43d AASP Annual Meeting	-32-



A.A.S.P.

The Palynological Society

The American Association of Stratigraphic Palynologists, Inc. - AASP-The Palynological Society - was established in 1967 by a group of 31 founding members to promote the science of palynology. Today AASP has a world-wide membership of about 800 and is run by an executive comprising an elected Board of Directors and subsidiary boards and committees. AASP welcomes new members.

The AASP Foundation publishes the journal *Palynology* (annually), the *AASP Newsletter* (quarterly), and the *AASP Contributions Series* (mostly monographs, issued irregularly), as well as several books and miscellaneous items. AASP organises an Annual Meeting which usually includes a field trip, a business luncheon, social events, and technical sessions where research results are presented on all aspects of palynology.

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Professor William R. Evitt (awarded 1982)
Professor William G. Chaloner (awarded 1984)
Dr. Lewis E. Stover (awarded 1988)
Dr. Graham Lee Williams (awarded 1996)
Dr. Hans Gocht (awarded 1996)
Professor Svein B. Manum (awarded 2002)
Professor Barrie Dale (awarded 2004)
Dr. David Wall (awarded 2004)
Dr. Robin Helby (awarded 2005)
Dr. Satish K. Srivastava (awarded 2006)

AASP Honorary Members

Professor Dr. Alfred Eisenack (elected 1975)
Dr. William S. Hoffmeister (elected 1975)
Professor Leonard R. Wilson (elected 1975)
Professor Knut Faegri (elected 1977)
Professor Charles Downie (elected 1982)
Professor William R. Evitt (elected 1989)
Professor Lucy M. Cranwell (elected 1989)
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Professor Aural T. Cross (elected 1991)
Dr. Robert T. Clarke (awarded 2002)
Professor Vaughn Bryant (awarded 2005)
Professor Alfred Traverse (awarded 2005)

AASP Board of Directors Award recipient

Dr. Robert T. Clarke (awarded 1994)

Teaching medal recipients

Professor Aural T. Cross (awarded 1999)
Professor Alfred Traverse (awarded 2001)
Professor Bill Evitt (awarded 2006)

AASP Distinguished Service Award recipients

Dr. Robert T. Clarke (awarded 1978)
Dr. Norman J. Norton (awarded 1978)
Dr. Jack D. Burgess (awarded 1982)
Dr. Richard W. Hedlund (awarded 1982)
Dr. John A. Clendening (awarded 1987)
Dr. Kenneth M. Piel (awarded 1990)
Dr. Gordon D. Wood (awarded 1993)
Dr. Jan Jansonius (awarded 1995)
Dr. D. Colin McGregor (awarded 1995)
Professor John H. Wrenn (awarded 1998)
Professor Vaughn M. Bryant (awarded 1999)
Dr. Donald W. Engelhardt (awarded 2000)
Dr. David T. Pocknall (awarded 2005)
Dr. David K. Goodman (awarded 2005)
Professor Owen K. Davis (awarded 2005)
Dr. Thomas Demchuk (awarded 2009)



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Sophie Warny, 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, meetings reports, information about "members in the news", new websites and information about job openings in the industry. Every effort will be made to publish all information received from our membership. Contributions which include photographs should be submitted two weeks before the deadline. Deadline for next issues of the newsletter is **May 15**. All information should be sent by email. If possible, please illustrate your contribution with art, line drawings, eye-catching logos, black & white photos, colour photos, etc. **We DO look forward to contributions from our membership.**

The Meaning of Life!

By Joyce Lucas-Clark

Recently I was conversing with a friend and we waxed philosophical. She said she had been thinking about the meaning of life. She told me she had decided it was "reproduction." I thought that odd, because she had no children and no intention of every having any, but as she waxed on, I began to think, "There's more than one way to reproduce."

Take teaching for instance. There they go at graduation, young minds filled with information that you put there. They are replicates (hopefully not clones) of you in the form of your ideas and enthusiasm if you have succeeded in your teaching. Then there is writing, where your mind is duplicated on paper. It contains you, yet it lives after you, like your child or grandchild. Posters, abstracts and talks are more short-lived, but still have something of an impact on those who see them, and the thought of you and your ideas gets carried to another person's world...reproduction? Maybe.

Certainly naming new taxa has that feeling of parenthood. I think of the dinos that I have named as my "babies." And, my real human children and grandchildren don't seem to mind.

*So I guess my message today is: "Be fruitful and multiply, ye Palynologists!"
'Tis the meaning of life!*

MANAGING EDITOR'S REPORT

All paid-up members should have by now received their copies of Parts 1 and 2 of Volume 33 of *Palynology*. The official publication date was 28th December 2009 for both parts. Part 1 is the regular issue and comprises 12 articles. Part 2 is special issue commemorating the life and work of John H. Wrenn. I would like to thank Martin Head and Francine McCarthy, who were guest editors of this special part. We hope that you all enjoy reading these two parts of our largest ever volume! As ever, Bob Clarke did a fantastic job as Production Editor.

The next issue will be Part 1 of Volume 34 and will be issued in June 2010 by Taylor and Francis. Several manuscripts are now in the production phase, and we have easily enough material to make the first part of the new regime with Taylor and Francis a very good one. Manuscript submission rates continue to be extremely healthy.

I have been liaising with Taylor and Francis recently about building the online submission

system that all authors will have to use in the near future. Taylor and Francis customise each of their online portals and also ensure that the editor is fully trained in its use. This is all happening now, and I would anticipate it 'going live' during the Spring. I will keep the membership fully updated on the progress.

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Obituary Announcement

Loretta Satchell passed away after a long bout with lung cancer January 18 in Houston. A service was held Jan 23 at the Rothko Chapel in Houston. Loretta served on the AASP Board of Directors in 1988 and 1989. (contact Pip Satchell, pfsatchell@gmail.com).

If you care to, please make a donation to the American Red Cross in lieu of flowers.

<http://american.redcross.org/>

The Center for Excellence in Palynology (CENEX) at LSU is forever grateful to Loretta Satchell for the donation of her reprint collection. Her collection is being used on a weekly basis by palynology students.



AASP Student Scholarships



AASP Student Scholarships are awarded annually to support studies in palynology. These comprise two scholarships for US\$1500 each. Ordinarily, the scholarships will be offered to beginning graduate students, but advanced undergraduates may also apply. The qualification of the student, the originality and imagination evident in the proposed project, and the likelihood of significant contribution to the science of palynology are factors that will be weighed in the selection of award winners. Previous winners of this award are eligible only if they are pursuing a different degree than the one they were pursuing when they received the previous award.

AASP Scholarships are available to all students of palynology in all countries and these students need not be members of AASP.

Application forms can be downloaded from our website at <http://www.palynology.org/content/scholar.html>

Application materials should be sent by email to the Chair of the AASP Awards Committee:

Martin Farley
mbfarley@sigmaxi.net
Geology, Old Main 213
University of North Carolina at Pembroke

Scholarship applications must be arrive by email no later than March 31.

Advice on preparing an effective application for an AASP Student Scholarship

The single most valuable piece of advice is “know and write to your audience.”

You have only a very limited space to describe your project, so use the words wisely. Writing briefly is more difficult than writing at length, but is worth the effort. Literature review should be at a minimum. Keep in mind that the Awards Committee does not know all the context for your project, and may not even have a closely related specialty in palynology. Thus it is important to write for this broader audience. It can be a good idea to show your text to someone who is not a palynologist or involved in the project to see if they understand your description well.

It is fine to have a project that integrates palynology with other data, but be sure to make clear what palynological work you will be performing. If there is prior palynological work, explain how your approach is new or different.

IN MEMORIAM

Douglas James Nichols
February 19, 1942 – January 21, 2010

**by R. Farley Fleming, Bob Cushman,
and David Pocknall**



Douglas James Nichols died unexpectedly on January 21, 2010, at the age of 67 due to complications following surgery for a broken leg. He was an internationally recognized and leading authority on the palynology and palynostratigraphy of the Rocky Mountain and Great Plains region, the Cordilleran thrust belt, and Mesozoic-Cenozoic nonmarine strata of the Western Interior of the United States.

Doug was born in Jamaica, Long Island, New York, on February 19, 1942, to Kenneth C. and Beatrice O. Nichols. He was raised in Long Island, New York, and New Jersey. Doug attended New York University where he received his B.A. in Geology (1963) and his M.S. in Geology (1966). While at New York University, he met Jan Weisbrodt and they married on October 10, 1964. After receiving his M.S., he moved to State College, Pennsylvania, and studied with Dr. Al Traverse at Pennsylvania State University (Penn State), and received his Ph.D. in Geology in 1970.

Following graduation from Penn State, Doug held teaching positions at Arizona State University and SUNY Geneseo. During this early phase of his career, he applied his geological expertise to a project that was somewhat removed from his paleontological research. He worked with a team that was analyzing lunar features in an attempt to establish a relative time framework for the moon. This research, supported by NASA, resulted in the publication of a series of papers on lunar stratigraphy. He was proud of this research and believed that the experience helped hone his skills as a stratigrapher.

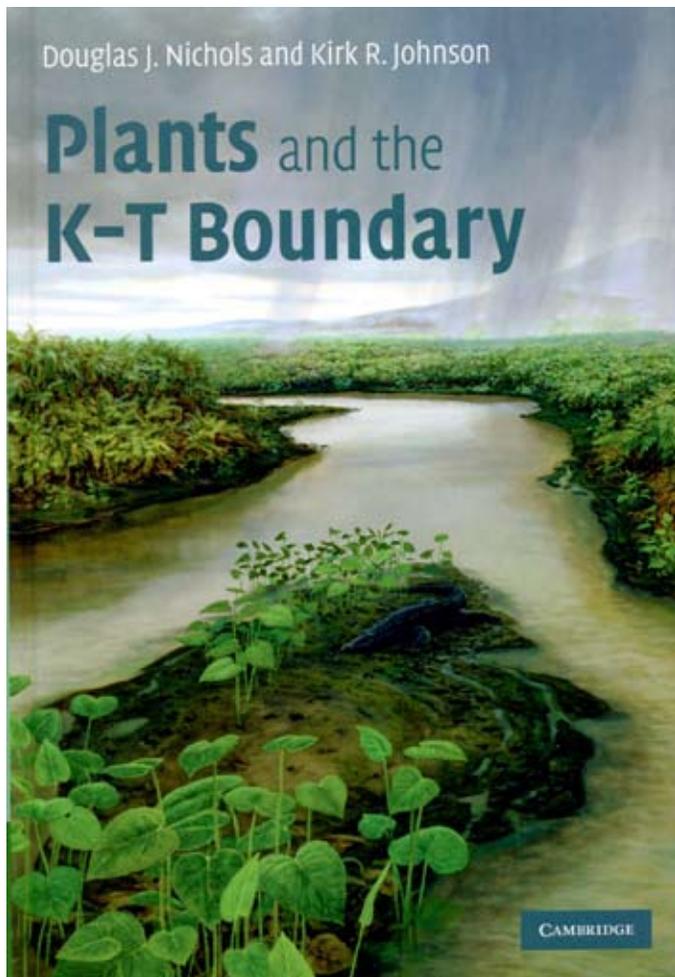
In the early 1970s, he moved to Denver, worked for Chevron Oil Company for several years, and eventually accepted a position as Research Geologist with the U.S. Geological Survey in 1978. He worked at the USGS from 1978 until he retired in 2006. Since retiring, he served as scientist emeritus with the USGS, was a research associate at the Denver Museum of Nature and Science, and served as Editor-in-Chief for *Cre-*

taceous Research.

Doug's palynological career was built on a solid foundation of excellence in palynological systematics, taxonomy, and classification. This foundation was established during his time with Dr. Al Traverse at Penn State and Doug expanded his critical expertise over the years. He applied his extensive knowledge of fossil pollen and spores to many other realms, including stratigraphy of Mesozoic-Cenozoic rocks in Western North America, paleoecology of ancient coal-forming environments, detailed studies of the Cretaceous-Tertiary boundary, and the evolutionary history of plants. His work has been used as the basis for numerous geological endeavors, including the search for oil and gas, analysis of complex geological structures in the Cordilleran thrust belt in Western North America, assessment of coal resources in the Northern Rocky Mountains and Gulf Coast regions, and determination of the age of rocks in support of basic geological research and mapping. In total, Doug was author or co-author of more than 140 articles in scientific journals.

The foundation of his palynostratigraphic work on Paleogene rocks was established in his 1973 paper revising the taxonomy and nomenclature of the *Momipites-Caryapollenites* lineage. This paper presented a critical analysis of fossil juglandaceous pollen from Western North America and the Gulf Coast regions and revised the nomenclature of these species. Building on this work, Doug published a seminal paper in 1978 based on collaborative research done with Hank Ott, a palynologist and colleague of Doug's at Chevron Oil. They established a zonation for Paleocene rocks of Western North America based on the *Momipites-Caryapollenites* lineage. This palynostratigraphic zonation has stood the test of time and has proven to be a valuable tool for correlating Paleocene rocks throughout Western North America. In addition to establishing the zonation, Doug and Hank proposed evolutionary relationships among the fossil species within the *Momipites-Caryapollenites* lineage.

For much of his career, Doug was interested in the work of Roger P. Wodehouse on fossil pollen of the Green River Formation. Doug's first



publication on Wodehouse's taxonomy was published with Al Traverse and Tate Ames in 1973. Doug continued working with Tate Ames on the Wodehouse material until Ames' death in 1992, at which time it was set aside. After his retirement from the USGS, Doug resumed work on the Wodehouse material utilizing the original microtome sections and thin sections in the USGS archives. He was able to complete a major revision of Wodehouse's taxonomy utilizing Wodehouse's original holotype material that includes never before published photographs of Wodehouse's holotypes. Doug submitted this paper to the AASP shortly before his death and it has been accepted for publication in the Contributions Series.

Much of Doug's career focused on developing and refining palynostratigraphic zonation for Upper Cretaceous and Paleogene rocks of the Rocky Mountain and Gulf Coast regions. He published a series of papers that, like his original work with the *Momipites-Caryapollenites* lineage, were built on his detailed taxonomic analysis of palynological assemblages recovered from tightly-controlled measured sections. In addition, he integrated his detailed research with existing published work to construct a robust palynostratigraphic framework. His Upper Cretaceous and Paleogene palynostratigraphic zonation

have been successfully applied by numerous palynologists, geologists, and stratigraphers throughout North America.

One of the highlights of Doug's career was his work on the palynology of the Cretaceous-Tertiary boundary. Initially he carried out this research in collaboration with the late Robert H. Tschudy, who was also a palynologist with the USGS in Denver. Doug documented Cretaceous-Tertiary boundary sections throughout Western North America and his research provided new data and insights on the geology of the K-T boundary. Recently he published a book (see cover to the left) with Kirk Johnson of the Denver Museum of Nature and Science that summarizes what is known about the fossil plant record at the K-T boundary. The book is comprehensive and uses palynological and paleobotanical data from more than 100 localities around the world as the basis for presenting a comprehensive account of the plant record across the K-T boundary.

Throughout his career, he was a very active member of the American Association of Stratigraphic Palynologists (now, AASP—The Palynological Society). He served as President-elect (1981-1982), President (1982-1983), and Managing Editor (1983-1987). In 1977, his proposed design for the AASP logo, which is based on a chorate dinoflagellate cyst, a trilete spore, and a triporate pollen grain, was selected as the AASP logo. As part of his career-long interest in taxonomy, he was an active member of the International Association for Plant Taxonomy and had been a Member of the Committee for Fossil Plants since 1987. He was on the organizing committee of the International Palynological Congress (IPC) in Houston in 1996 and co-led a successful fieldtrip to the great state of Wyoming. Doug gave excellent oral presentations of his research results and did so at numerous international and local meetings, including AASP, GSA, and IPC meetings.

In addition to being an internationally recognized palynostratigrapher, Doug was a warm, generous, and compassionate man. He maintained his interest in education and served as advisor and mentor for numerous graduate students around the world, and for all his friends and colleagues he was always willing to listen and provide counsel on any topic. The beauty of the natural world inspired him and he integrated this appreciation into his life work. As an inspiration to his family, friends, colleagues, and students, he will be missed by all.

Doug is survived by his wife of 45 years, Jan, son Ken and daughter-in-law Jeruesha, of Bethoud, Colorado; daughter Joyce and granddaughter Samantha of Arvada, Colorado; daughter Amber and son-in-law Bruce of Firestone, Colorado; and sister Faith and brother-in-law Pete of West Milford, New Jersey.



42nd AASP ANNUAL MEETING

The 42nd Annual Meeting was held in Kingsport, Tennessee, September 26 – September 30, 2009. The meeting



experienced a reduction in the number of attendees in these tough economic times which was consistent with many other organizations.

The organizers tried a few new activities. Saturday, September

26 we sponsored a full day workshop “*Understanding Pollen and its Applications*” organized by Jen O’Keefe, Sarah de la Rue, Fred Rich and Michael Zavada. We had 19 participants which included professionals, graduate students, undergraduate students and local K-12 school teachers.

The workshop focused on methods and content that can be incorporated into the secondary school classroom and undergraduate curricula. This I believe is a first attempt in educational outreach associated with our annual meeting and the response has been good. Sunday, September 27 was registration and our traditional icebreaker was held at the ETSU and General Shale Brick Natural History Museum at the Gray Fossil Site late afternoon and evening. The Gray Fossil Site adjacent to the Museum is a rich Miocene Site that has produced plant fossils and pollen, and a diverse mega-fauna. The icebreaker was preceded by a tour of the site and facilities, and the music at the icebreaker was provided by *The Bearded*, giving the evening a real southern Ap-

palachian flavor. Despite the reduced number of attendees Africa, Europe, South and Central America and North America were represented. Technical sessions began on Monday morning. Monday afternoon a number of registrants opted for a workshop being conducted at ETSU on Palynodata by James White and Chris Jessop. ETSU had purchased 10 licenses for our computer lab to allow participants to get first hand experience with the software prior to purchasing the program for their personal computer. The workshops was well presented and from my own experience has already been useful in investigating the evolution and distribution of the Asteraceae. Other registrants opted for the afternoon field trip to Roane Mountain State Park, a good representation of the most diverse region in the Southern Appalachians Mountains. The trip was led by Dr. Fred Alsop (vertebrate biology and ornithology) and Dr. Tom Laughlin (herpetology). Late afternoon we will all met at the Museum of Natural History for a public lecture by David

Jarzen, *Palynology and the Artist: One way to make reconstructions of past environments* which was open to the public. The



Tuesday technical sessions including a symposium organized by Lanny Fisk in honor Ronald Kapp. This symposium included a variety of papers and subdisciplines of palynology that have been influenced

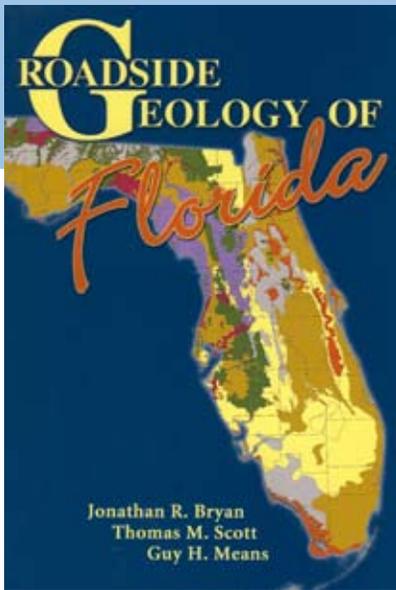


by Ronald Kapp's work. At the end of the day we met at the Museum of Natural History for our second public lecture by Lucy Edwards, *Buried Surprises – A Paleontologist Tells Tales of the Largest Impact Crater in the U.S.*, also open to the public. This is also the first time that the Society has offered general lectures open to the public to show case the importance of our discipline. Tuesday evening the banquet was held at Meadowview for those attending the meeting. Technical session continued on Wednesday morning followed by the business luncheon and the close of the meeting. Following the meeting some stayed for the International Storytelling Festival in Jonesborough, TN (the oldest settlement in Tennessee), a festival celebrating the rich oral traditions of the Appalachian region. Aside from the usual benefits of professional interaction, the success of the pre-meeting workshop, especially its attention to education, and the offering of general public lectures was a good way of introducing the public and teachers to the importance of our science. I think this type of outreach is going to

be increasing important to the maintaining the health and survival of our science. If you would like to peruse the program, that was adorned with artistic photos of our favorite palynmorphs, and contrived and candid photos of the meeting (such as the photo of Pr. Barrie Dale above) go to: <http://www.etsu.edu/cas/biology/news.aspx> and click on *schedule* and *pictures* (it may take a few minutes to download). Also don't forget your 3-D glasses to view a spectacular 3-D hystrichoshere (it is really cool if you project the slide onto a huge screen and view in 3-D, you just can't look away). If you have any questions or comments contact me at zavadam@etsu.edu.



Mike Zavada



BOOK REVIEWS

By Reed Wicander

Roadside Geology of Florida by Jonathan R. Bryan, Thomas M. Scott, and Guy H. Means. ©2008. Mountain Press Publishing Company, P. O. Box 2399, 1301 South Third Street West, Missoula, Montana 59806. ISBN 978-0-87842-542-6. 376 pages, 112 color photographs, 95 black-and-white photographs, and 172 figures and illustrations. \$26.00 (paperback)

Here are a few interesting facts I learned about the geology of Florida from just reading the Preface. Except for volcanic Hawaii, Florida is the land most recently emerged from the sea. Furthermore, Florida has the lowest highest point of all fifty states at 345 feet above sea level. How's that for a trivia question! Furthermore, Florida has more than 700 springs with relatively cool, azure waters from one of the most productive limestone aquifers in the world. For the paleontologist, Florida's record of invertebrates, especially for the past 40 million years, is nearly unmatched anywhere in the world, and it has one of the best mammal records of the last 25 million years in North America.

The Introduction covers the usual material found in all of the *Roadside Geology* books, i.e., a little about the state, its common minerals, rocks, and fossils, structural and geomorphic regions, etc., and includes some beautiful color photographs of these features.

This is followed by an extensive review of the state's geologic and paleontologic history, with a review of plate tectonics and geologic time for the uninitiated, another hallmark of the *Roadside Geology* series. Included in this chapter is a section on the first Floridians, with an overview of its rich archaeological record dating back to the late Pleistocene. At this point I would like to remind our readers of the excellent book *First Floridians and Last Mastodons: The Page-Ladson Site in the Aucilla River*, S. David Webb (ed.), ©2006, Springer, The Netherlands. ISBN 10-1-4020-4325-2, reviewed in the 2008 AASP Newsletter (vol. 41, no. 3) by David M. Jarzen.

The third chapter, titled "Sculpting A Land From The Sea," discusses the origin of its current surface topography in terms of the processes related to sea level changes, coastal dynamics, and the forces of weathering and erosion.

The rest of the book divides Florida into five regions. Each region features various road logs, which are geological narratives emphasizing the geological history, the paleontologic record, and the processes sculpting the present-day landscape. These road logs typically follow the major highways of the region. There are additional logs for side roads leading to points of interest.

Actually, each region's chapter is divided into three parts. The first part covers the major highways connecting the larger cities. Then there are Side Trips, which are set off by thick blue borders. The third feature is what I would call "Interesting Vignettes" which are set off from the other two parts by blue font. There are many of these and cover a whole host of interesting topics such as "A Lonely Trilobite in Florida," "It Came from the Bog – Carnivorous Plants of the Panhandle," and "Florida Land Developer – The Coral Animal," to name just three of these vignettes.

The first region covered is the Panhandle – The Other Florida. Much of the Panhandle consists of quartz-rich sediments of Miocene and Pliocene age that were deposited in rivers and deltas that currently slope gently to the south. In addition, there are karst terrains, and the surface topography of the Panhandle has been deeply incised by erosion, producing some impressive relief that is not common elsewhere in Florida. The road logs in this chapter cover the major highways, US 29, 90, 98, Interstate

10, and Florida 20 with several side trips, and many interesting vignettes.

Northern Peninsula – Upon the Suwannee River, with the requisite information about the Suwannee River of Stephen Foster fame is the next region. The major road logs cover US 27, 98, 19, 441, as well as Interstate 10 and 75. Most of this chapter is taken up with interesting vignettes, particularly the fossils of the region, both marine invertebrates and terrestrial vertebrates.

The third region is Central Peninsula – We Dig Phosphate. This region has a variety of geological features, including the most important economic mineral resource of the state – phosphate. Since its discovery in the 1880s, Florida has led the nation in phosphate production, and supplies 75% of the United States needs, as well as 25% of the worlds needs. The central peninsula is also famous for its “paleontological bounty,” boasting extensive Eocene, Oligocene, and Pleistocene marine invertebrates, as well as exquisite vertebrate faunas of Miocene and Pliocene age east of Tampa, in the Central Florida Phosphate District.

Southern Peninsula – A River of Grass Flows Over It is the fourth region covered. All of the surface rocks of the southern peninsula formed during the Pliocene and Pleistocene, during which the region was repeatedly submerged below sea level. This region is teeming with fossils, many of which are beautifully illustrated in both black-and-white and color photographs. Paleontology aside, most people associate this area with its most famous features, Big Cypress Swamp and the Everglades, two areas that are extensively discussed.

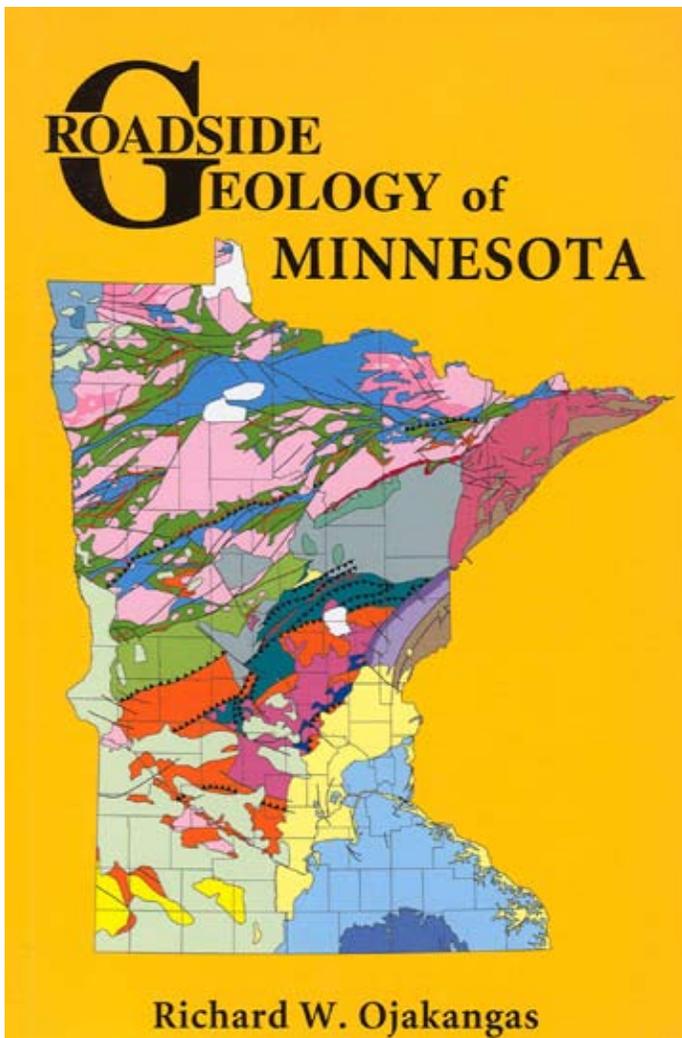
The fifth and last region covered is the Florida Keys – Pleistocene Republic. As would be expected, this section contains many beautiful photographs of reefs and their inhabitants, as well as extensive discussion of their formation and denizens.

Roadside Geology of Florida ends with a Glossary, Appendices of the Rocks of Florida, Museums, Geological, Paleontological, Oceanographic, and Archaeological Organizations, References and Suggested Readings, and an Index.

As with all of the *Roadside Geology* books, I enjoyed learning about the geology and paleontology of Florida, many things of which I was unaware of, and can use in my various geology and paleontology classes. However, my main criticism of this volume is that the only maps were the small-scale geology/highway maps at the beginning of each chapter. There was only one of these maps for each region covered. I would have liked to have seen more maps for the various road logs in each chapter. That criticism aside, I look forward to using this book on my trip to Florida. And, none of the pages contained any hanging chads!



Pensacola, Florida (Photo credit: S. Warny)



Roadside Geology of Minnesota by Richard W. Ojakangas. ©2009. Mountain Press Publishing Company, P. O. Box 2399, 1301 South Third Street West, Missoula, Montana 59806. ISBN 978-0-87842-562-4. 355 pages, 180 color photographs, 110 two-color maps and illustrations. \$26.00 (paperback)

This *Roadside Geology* volume follows the style of *Roadside Geology of Connecticut and Road Island* in that it divides the state into regions followed by Road Guides for each region. This is a format that I like and find easy to follow.

Most people think of Minnesota as the land of 10,000 lakes or the state of the mythical Lake Wobegone, but it harbors a fascinating geologic history beneath its glacial cover. As stated in the

Preface, “Minnesota’s landscape is geologically young, the result of the last few tens of thousands of years of glacial advances and erosion during the 10,000 or so years since the glacials melted. However, Minnesota has a much longer legacy, with rocks dating back to 3.5 billion years.”

Just as with the other *Roadside Geology* books, this one starts out with an Introduction in which some basic geology is covered, such as plate tectonic theory, then an overview of Minnesota geology in which the story is divided into Archean Time (4.5 to 2.5 billion years), Early Proterozoic Time (2.5 to 1.6 billion years) with some discussion of the iron formations, Middle to Late Proterozoic Time (1.6 billion to 542 million years), including the formation of the Midcontinent Rift System, Paleozoic Time (542 to 251 million years), Mesozoic Time (251 to 65 million years), Tertiary (Paleogene-Neogene) Time (65 to 1.8 million years), Pleistocene Time (1.8 million to 10,000 years), and Holocene Time (10,000 years to present). This Introduction gives the reader an excellent perspective on the geologic history of Minnesota as well as gaining some general geologic knowledge. The whole Introduction is amply illustrated with very nice maps, diagrams, and color photos.

One of the interesting facts I learned in the Introduction is that the actual number of lakes greater than 10 acres in size is 12,034, and Minnesota’s lakes, along with her rivers, give the state more shoreline than Hawaii, California, and Florida combined – 90,000 miles! I should also mention that there is a nice pollen diagram in the section on Vegetation Changes.

As I previously mentioned, the rest of the book divides the state into four main regions, with each region followed by a Road Guide. Thus, the first region, Northeastern Minnesota –The Arrowhead of Exposed Bedrock begins with a history of its Glacial Geology followed by a discussion of its Bedrock Geology. This eight-page geological overview sets the stage for the extensive Road Guide section that follows. Each stretch of highway covered contains excellent diagrams, maps, and beautiful color photos. The

Road Guides for Northeastern Minnesota alone are 142 pages! Some of my favorite sections include the iron ores and the information about the mining of these ores. The photos throughout this section are outstanding and cover many of the features I talk about in my Historical Geology class, Banded Iron Formations, graded bedding, pillow lavas, glacial polish, and the list goes on. In addition, there is a short discussion of the role played by the Gunflint Iron Formation in terms of its place in the historical context of Precambrian paleobiology.

The second region, Northwestern and Central Minnesota – Glacial Moraines and Lakes, has a short five-page introduction covering both the Glacial Geology and Bedrock Geology. It is in this region that most of Minnesota's 10,000-plus lakes are located. Fittingly, most of the Road Guides discuss the glacial topography. Itasca State Park is located in this region, and it is Lake Itasca which is the source of the Mississippi River. In fact, "if you want to canoe the entire Mississippi River from its source to the Gulf of Mexico, you may want to begin downstream of where the river passes under MN200 in a culvert, less than one-quarter mile from Lake Itasca."

Southwestern Minnesota – Quartzites and Old Rocks is the third region covered in this volume. It is here where one can find exposures of 3.5 billion-year-old Archean gneisses (Morton Gneiss) along a portion of the Minnesota River Valley between Morton and Jackson on US 71. Also, along this stretch of highway is the Jeffers Petroglyphs, operated by the Minnesota Historical Society. Carved by the Native Americans, these petroglyphs (approximately 2,000), the oldest estimated to be 7,000 years, were carved into the 1.7 billion-year-old Sioux Quartzite. This region also boasts the title of "Original Wind Power Capital of the Midwest." More than 400 wind turbines have been built on Buffalo Ridge (part of the Bemis end moraine of the Des Moines lobe) near Lake Benton.

The fourth and last region covered in this book is Southeastern Minnesota – Marine Rocks and Fossils. "Southeastern Minnesota is the

happy home of marine sedimentary rocks, lots of which are exposed because there is little glacial cover at the eastern edge of the region." It is in this region that we can find lots of Paleozoic sedimentary rocks and fossils, such as the St. Peter Sandstone, a blanket-sandstone deposited at the beginning of the Tippecanoe sequence, as well as the Galena Group, Maquoketa Formation, and Cedar Valley Group. One site, in particular, caught my eye, and that was Pillsbury Hall, University of Minnesota. It is on the National Registry of Historic Buildings and the second oldest building on campus. What is interesting about it is that two different colored Upper Proterozoic rocks quarried in northern Minnesota were used in its construction. The dark red sandstone came from the Fond du Lac Formation at the west end of Duluth, whereas the buff-colored Hinckley Sandstone was quarried near Sandstone, Minnesota. Both of these rocks are the two youngest Precambrian rocks in Minnesota, dated at somewhere between one billion and 500 million years old. Another reason to visit Pillsbury Hall is the 5.5-foot-diameter core of Archean-age pillowed greenstone standing tall in front of the building. The core is from a mine shaft in Ely.

As with all the other books in the *Roadside Geology* series, this one concludes with a Glossary, Additional Readings, References Cited, and Index section.

As you can probably tell, I am a big fan of the *Roadside Geology* series. My students are always borrowing them when they go on trips, and I find them a great source of interesting facts that I use in class. The series has improved over the years with better maps and more color photographs. I particularly like the format of the *Roadside Geology of Connecticut and Rhode Island* and *Roadside Geology of Minnesota*, i.e., an extended Introduction and geologic history, then a short summary of each region followed by detailed Road Guides for each region. Oh, and did I mention that at \$26.00 each, these are bargains for anyone with an interest in geology and the state they live in or will be traveling through.

Roadside Geology of Connecticut and Rhode Island by James W. Skehan. ©2008. Mountain Press Publishing Company, P. O. Box 2399, 1301 South Third Street West, Missoula, Montana 59806. ISBN 978-0-87842-547-1. 288 pages, 135 color photographs, 103 two-color maps and illustrations. \$26.00 (paperback)

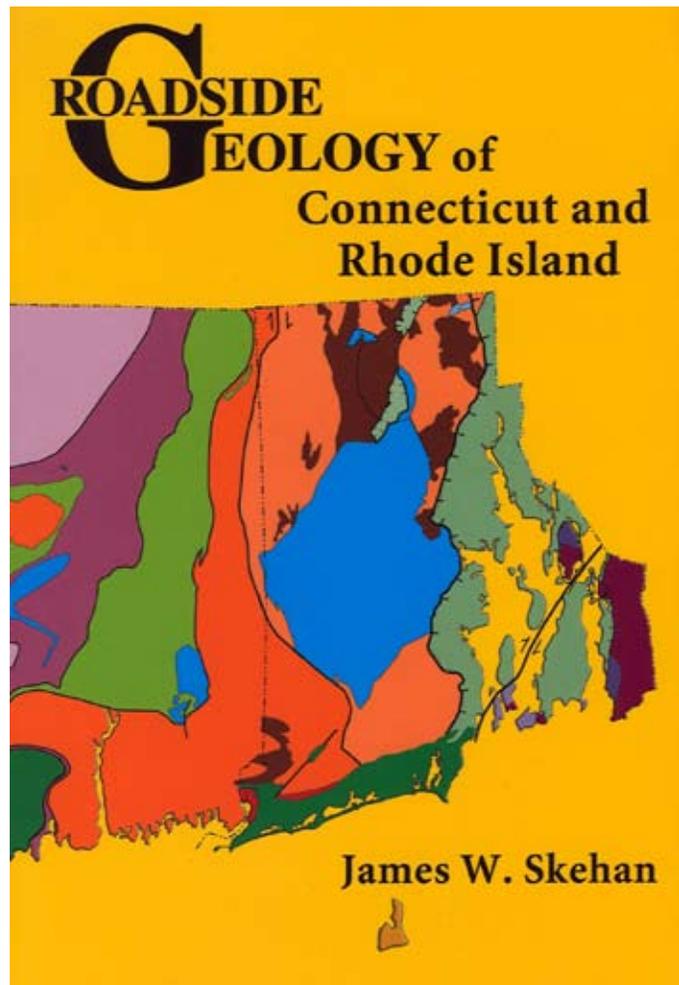
During the past 25 years, I have had the pleasure of reviewing many of the *Roadside Geology* books published by Mountain Press Publishing Company. In fact, the *Roadside* series volumes are the most widely borrowed by my students and friends. Written for those with a curiosity about the geology and geologic history of our nation's 50 states, I've found all of the *Roadside Guides* to be well written, nicely illustrated, and full of interesting information about the state covered. These three newest editions are no exception, and are an upgrade in terms of the artwork and photographs, but yet still very reasonably priced.

As stated in the press release for this book, "Connecticut and Rhode Island may be small, but they contain some of the most interesting geology on Earth – 1.2-billion-year-old rocks, parts of at least six former continents, volcanic island chains, and the footprints of dinosaurs."

As with the other books in this series, *Roadside Geology of Connecticut and Rhode Island* begins with a very comprehensive 31 page Introduction. The usual overview of plate tectonic theory, the rock cycle, the three major groups of rocks, and geologic time are succinctly covered to lay the groundwork for how these concepts and types of rocks are related to the geology of Connecticut and Rhode Island. This section is followed by a very nice discussion with some excellent illustrations of the bedrock history of Connecticut and Rhode Island, complete with an overview of the paleogeography and the two state's place in this global geologic history. A glacial history of these states follows, with definitions and illustrations of the various glacial landforms and deposits. An interesting feature of this section is a look at some of the pioneers of North American glacial geology, including the Reverend Edward Hitchcock and Ernst Valdemar

Antevs. A postglacial history and the effects of sea level changes on the coasts of these two states, followed by the impact of human activity in the region brings the Introduction to a close.

The rest of the book is divided into three major regions, Rhode Island and Eastern Connecticut, the Hartford Basin of Connecticut, and Western Connecticut. Each of these regions is followed by a Road Guide section(s).



Rhode Island and Eastern Connecticut are combined into a single region because their geologic stories must be told together. Both consist of terranes that have been added to the eastern margin of North America. The large Avalon Terrane, a former microcontinent, underlies all of Rhode Island and extreme eastern and southern Connecticut, in addition to the numerous terranes comprising Eastern Connecticut. The history and geology of these terranes and their role in the

geology of eastern North America is covered in this section, in addition to the post accretionary history of the Narragansett Basin and its rock formations. An overview of glaciation in this region concludes this major region.

Two Road Guides, one for Rhode Island, and one for Connecticut follow the geologic history of these regions. Both Road Guides include nicely illustrated maps, excellent commentary, and beautiful color photos of the geology along the major highways in these regions. Included in these two guides are such interesting stops as Purgatory Chasm in Middletown, Rhode Island, which is one of the finest localities in the world for the study of “stretched” pebbles. These elongated boulders of the Pennsylvania-aged Purgatory Conglomerate have been stretched as a result of the Alleghanian orogeny. Another interesting locality discussed, and illustrated with several color photographs, is the cumberlandite outcrop, a 1.5-mile-long ellipsoidal body at the intersection of West Wrentham and Meeting House Roads, in northern Rhode Island. Cumberlandite is the state rock of Rhode Island!

Two localities in the Connecticut Road Guide caught my eye. The first had to do with bog iron that was mined in eastern Connecticut during the colonial period. Stafford Hollow, at the intersection of CT 319 and CT 19 is the site of an iron furnace built in 1737. This furnace gave way to the Lafayette Furnace, named in gratitude to the French general of the Revolutionary War. The first stoves manufactured in Connecticut were made here from the superior quality bog iron ore beds, and continued to be built until the ore beds of Stafford were exhausted. The second locality, in Eagleville, on CT 32 at its intersection with CT 275 features St. Joseph’s Catholic Church, whose exterior contains multicolored, garnet-studded, iron-stained slabs of the locally quarried Clugh Quartzite.

The second region covered is the Hartford Basin of Connecticut, which is one of several basins that formed as a result of the breakup of Pangaea beginning in the Triassic Period. Following an explanation of the rifting of Pangaea, James Skehan then discusses the formation of

the fault block valleys and rocks of the Hartford Basin. The section on Jurassic Life and the study of dinosaur footprints preserved in the sedimentary rocks of the Hartford Basin was, for me, the most interesting section of this region’s coverage. The glacial lakes Middletown and Hitchcock concluded this section.

A single Road Guide follows, highlighting the best locations to observe the geology, rocks, and dinosaur footprints of the Hartford Basin. My only complaint about this section is that there weren’t any photographs of the dinosaur footprints from Dinosaur State Park.

The final region covered is Western Connecticut. As stated in the introductory paragraph, “Western Connecticut is a maze of folds, faults, and tiny slivers of different rock types. The geology is very complex, and many aspects have not been clearly resolved.” Nonetheless, James Skehan does a nice job in explaining the complex history of the region, which includes the Taconic orogeny, Acadian orogeny, the Mount Prospect and Hodges Complexes of the Paleozoic Era, followed by Jurassic rifting associated with the splitting apart of Pangaea, and glaciation during the Pleistocene.

The Road Guide contains excellent maps, descriptions, and color photographs of the region’s geology.

A Glossary, a very extensive and up-to-date Bibliography, and an Index, close out this *Roadside Geology* volume.

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Palynological news from around the world



4th Argentine Meeting of Aerobiology

On 8 and 9 December 2009, the Fourth Argentine Meeting of Aerobiology was held in Mar del Plata city, Argentina, for the first time under the XIV Argentine Symposium on Palaeobotany and Palynology. The presentations of the aerobiological scientific papers were preceded by the conference by Dr. Jordina Belmonte Soler from the Universitat Autònoma de Barcelona, Spain, who was specially invited for this event.

The topic addressed at the conference was the role that Aerobiology plays in Science and Society.

Afterwards eleven aerobiological works were presented. The topics discussed were: the study of problematic taxa from an aerobiological perspective, a comparison of airborne pollen spectra from different cities, the relationship with meteorological factors, the allergenic pollen types, and long-distance pollen transport.

The following researchers attended the Aerobiology Meeting: Viviana S. BALZARETTI MAGGI, Flavia J. BARREIRO, Jordina BELMONTE SOLER, M. Martha BIANCHI, Valeria CARAMUTI, M. Elena GARCÍA, M. Cristina GARDELLA SAMBETH, Fabiana LATORRE, Andrea C. MALLO, M Gabriela MURRAY, Daniela S. NITIU, Ruth OTERO, Claudio F. PÉREZ, and Sandra M. VERGAMINI, representing Argentina, Brazil, Spain and the United States.

Other works presented in the Actuopalynology and 4th Argentine Meeting of Aerobiology, centered on issues of Melissopalynology and Pollen Morphology. The session was dedicated to the memory of Professor Martha A. Caccavari.

Apart from works presentation, and as every year since 2006, a discussion meeting on several Aerobiology concerns was conducted.

The main issues discussed were: a) experiences and

news update, b) ways of involving the Argentine Group of Aerobiology in the 9th International Congress on Aerobiology, Buenos Aires 2010, c) possibilities of organizing an Argentine aerobiological network, d) financial support: subsidies, other forms of financing, ideas, and consensus, e) website, and f) assembly.

It is worth noting the addition of new colleagues, continuing the commitment to promote and prioritize our research in the country and in South America.

Symposium website: <http://www.xivsapp.com.ar>

Argentine Group of Aerobiology Website: <http://www.aerobiologia.com.ar> (Argentina)

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News from India.
**A Report on the Conclave-Evolution:
Life's Continuum
(held on 15/11/2009)**

In the Bicentennial Birth Anniversary year of Sir Charles Darwin and Sesquicentennial year of the publication of his famous book on the *Origin of Species*, a conclave entitled **Evolution-Life's Continuum** was organized by the Birbal Sahni Institute of Palaeobotany on **15/11/2009**. Ten eminent research workers on evolution delivered theme oriented lectures. Scientific staff members of the institute, research scholars, leading researchers and academic staff members from Botany, Geology, Zoology, and Anthropology departments of the University of Lucknow participated in the conclave. These lectures prompted the scientific fraternity of the Lucknow to think over the contributions of Sir Charles Darwin in the field of plant, animal and human evolution.

A summary of the conclave is given below:

Prof. Vidyanand Nanjundiah, Centre for Ecological Sciences & MRDG, Indian Institute of Science, Bangalore 560 012, delivered a talk on **150 Years after *The Origin of Species***. This book is considered a watershed in the history of science. It established that living forms were products of organic evolution, a process of transformation that involved modification by descent and diversification. It also propounded the means of Natural Selection by which evolution could take place. The natural selection can be seen as the first step in our recognition of life as a property of matter and of biology as the science of living matter. In fact, the essence of natural selection was summarized in terms of three features: 'random variation', 'heritability' and 'differential fitness'.

Prof. J W. Schopf, Department of Earth and Space Sciences, University of California, Los Angeles, 595 Charles Young Drive East, Box 951567, Los Angeles, CA 90095-1567 USA, spoke on the topic **Fluorescence (CLSM) and molecular-structural (Raman) imagery: New methods to investigate the Precambrian history of life**. In his lecture, he

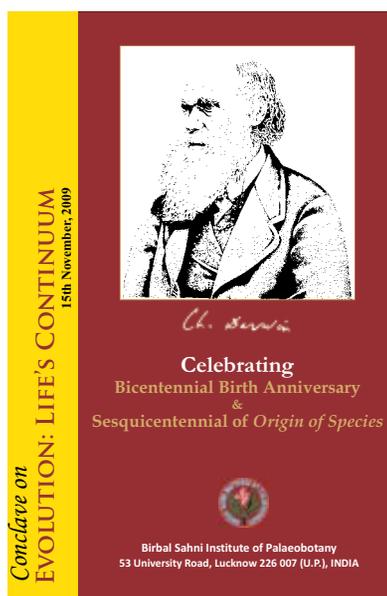
demonstrated that how the problems of the study of the permineralized fossils can be addressed by the use of two techniques recently introduced to palaeobiology: confocal laser scanning microscopy (CLSM) and Raman imagery. These techniques, both of which are non-intrusive and non-destructive, can provide data by which to characterize, *in situ* and at submicron resolution, the cellular and organismal morphology of thin section-embedded organic-walled fossils. The techniques are complementary: CLSM detects laser-induced fluorescence emanating from the carbonaceous kerogen of which such fossils are composed, whereas Raman provides direct analyses of the molecular-structural composition of such kerogen and its embedding mineral matrix as well as providing a means to assess quantitatively the geochemical maturity of the preserved organics. It was also shown that these are successfully applied on permineralized

Precambrian microorganisms as well as on younger sediments.

Dr. Syed Abbas Jafar, 5-B Whispering Meadows, Haralur Road, Bangalore-560034 delivered a talk on **What Darwin missed: relative Magnitude dictates survival-extinction**. Descent of Life forms as understood under the hypothesis of modern Neo-Darwinian paradigm incorporates a vast world of microscopic and submicroscopic nature in the backdrop of advances made in molecular biology, Genetics, Genome and biochemistry. He suggested that nothing is big or of small magnitude except by comparison; there is no absolute size in universe,

it is boundless towards both big and small. It was shown that this observation can be applied on the life forms preserved in the geological records. The relative Magnitude model finds application in Social, Economic and biologic fields.

Prof. Dianne Edwards, Cardiff University, Main Building, Park Place, Cardiff, CF10 3YE, United Kingdom delivered a lecture on **The colonisation of the land: the struggle for survival**. She showed in that it provides evidence for the origination, diversification and extinction of groups of organisms through geological time, the fossil record is indispensable to evolutionary theory. This was appreciated by Darwin although he showed little interest in palaeobotany.



However he did discover a petrified forest of *Araucarioxylon* in Argentina and collected 25 specimens comprising permineralised, mainly conifer, wood in S. America and Australia as well as some *Nothofagus* leaves during the voyage of the Beagle. Indeed one of his most quoted phrases was palaeobotanical. His frustration at the lack of evidence to explain away the sudden appearance of angiosperms similar to modern forms led to his “abominable mystery”. Prof. Edwards traced the history of early land plants studies. The colonization of the land was a gradual process in which plants of ever increasing size and complexity involving finely tuned adaptations replaced each other over very long periods of time in true Darwinian fashion. The pioneering vegetation had a major impact on the atmosphere in the Devonian, drawing down CO₂ in photosynthesis and chemical rock weathering, and so transformed the greenhouse world of the Ordovician into the icehouse conditions of the Carboniferous with a global climate very similar to that of today. It also created organic rich soils which were perfect habitats for pioneering land animals, but sadly, as far as we are aware and returning to Darwin, no earthworms.

Prof. Ashok Sahni, Centre of Advanced Study in Geology, Panjab University, Chandigarh, delivered a lecture on **Indian Amber: Evolving Insects and Microbiota on the Drifting Plate**. In his lecture, he showed that the present day biodiversity is overwhelmingly dominated by insect, arthropod and plant species in comparison to other groups of organisms. The fossil record of insects though not poor, is still far short of being representative of the great diversification that exists today. The find of amber in Palaeocene-Lower Eocene western margin lignite deposits in the last five years has opened a new window not only for the chemistry and stratigraphic implications of the amber, but also in classical terms, the taxonomy, relationships and evolutionary history of embedded insect inclusions in the light of geodynamic framework of the Indian Plate. In addition, amber inclusions shed light on modern day insect diversity of India which is largely composed of endemic forms. Exceptional preservation allows for palaeo-histological studies of dissolved and removed body fossils using electron microscopy. The Indian Eocene amber, therefore, provides a fine-scale evolutionary record of embedded inclusions in a manner that imprint or carbonized remains do not allow.

Prof. Manju Banerjee, Department of Botany, University of Calcutta, Kolkata, delivered a talk **Diversity and inter-relationship in the glossopterid group in understanding evolution of plants**. She showed that fossil plant studies have shown each group of the late Palaeozoic gymnosperm including glossopterids has adopted special features in their course of evolution. Gymnosperm is the immediate ancestor of the angiosperms. As such, attention has been given to each and every group of gymnosperms to trace the possible ancestry of angiosperms. However, the glossopterids have acquired an important position in the consideration of evolution of angiosperms both in the morphological and cladistic analyses. In the present context, the recent knowledge on the habit and habitat, diversity pattern, inter-relationship and evolutionary significance of the glossopterids have been taken into consideration.

Prof. Jane Shen-Miller, Department of Organismic Biology, Ecology & Evolution, University of California, Los Angeles, California 90095-1567, USA spoke on the topic **Exceptional longevity of fossil seeds of sacred lotus, *Nelumbo nucifera* – Survival of the fittest**. She established that seeds of sacred lotus, *Nelumbo nucifera*, are among the longest viability known in plants, 1300 years, ranking them as prime examples of Darwinian evolution’s “survival of the fittest.” As Darwin’s interest expressed in the *Vitality of Seeds* (1843), she discussed, the remarkable long-term viability of *Nelumbo* seeds, now documented for many radiocarbon-dated specimens of hundreds of years in age, is attributable to their thick sturdy pericarp impervious to water; to the presence at germination of a chlorophyll-bearing embryo axis primed for photosynthesis; the emergence of shoots before roots, characters that promote selection of suitable environment and rapid growth of developing seedlings; and of abundant heat-stable (to 100°C) proteins that function in intracellular protection and damage repair.

Dr. Rajiv Nigam, National Institute of Oceanography, Dona Paula, Goa- 403004 presented the recent work of his group on **Climatically controlled changes in reproductive behaviour of benthic foraminifera: A precursor to evolution**. He demonstrated many morphological features associated with evolution in foraminifera like septations, arrangements of chambers (biserial, triserial and multiserial), different coiling arrangements (planispiral to trochospiral

and dextral to sinistral), nature of wall structures etc. They evolved by adaptation, which allow them to cope with changing environment regimes, exploit new environments, diversify, and function efficiently. One of the most prominent methods of adaptation in foraminifera involves reproduction.

Dr. Lalji Singh, CSIR Bhatnagar Fellow 2009, Centre for Cellular & Molecular biology Uppal Road, Hyderabad 500007 presented the results of recent studies on **Mystery of our origins**. In his talk he posed many questions. His recent study that is published in the Journal *Nature* answered them were presented. Since the dawn of civilization Man has been asking this question who are we? Where have we come from? Until 1858 it was universal belief that man is special creation of God. In 1858 based on phenotypic transition of various organisms including plant and animal species Charles Darwin proposed the theory of evolution and wrote a book on 'Origin of Species'. Eight years later, Darwin in 1871 wrote a book on 'The Descent of Man'. He declared that the chimpanzee and gorilla are our closest living relatives based on anatomical similarities and predicted that the earliest ancestors of humans would turn up in Africa, where our ape kin live today. Today it is widely accepted view that modern human diverged from a common ancestor of chimpanzee and human nearly 6-7 million years ago. Based on fossil records found in Africa it is now believed that modern human originated from a single mother about 160,000 years ago in East Africa. Due to East-African mega-droughts between 135 and 75 thousand years ago, when the water volume of the lake Malawi was reduced by at least 95% could have caused their migration out of Africa. Which route did they take? Our study of the tribes of Andaman and Nicobar Islands using complete mitochondrial DNA sequences and its comparison with the mitochondrial DNA sequences of the world populations available in the database led

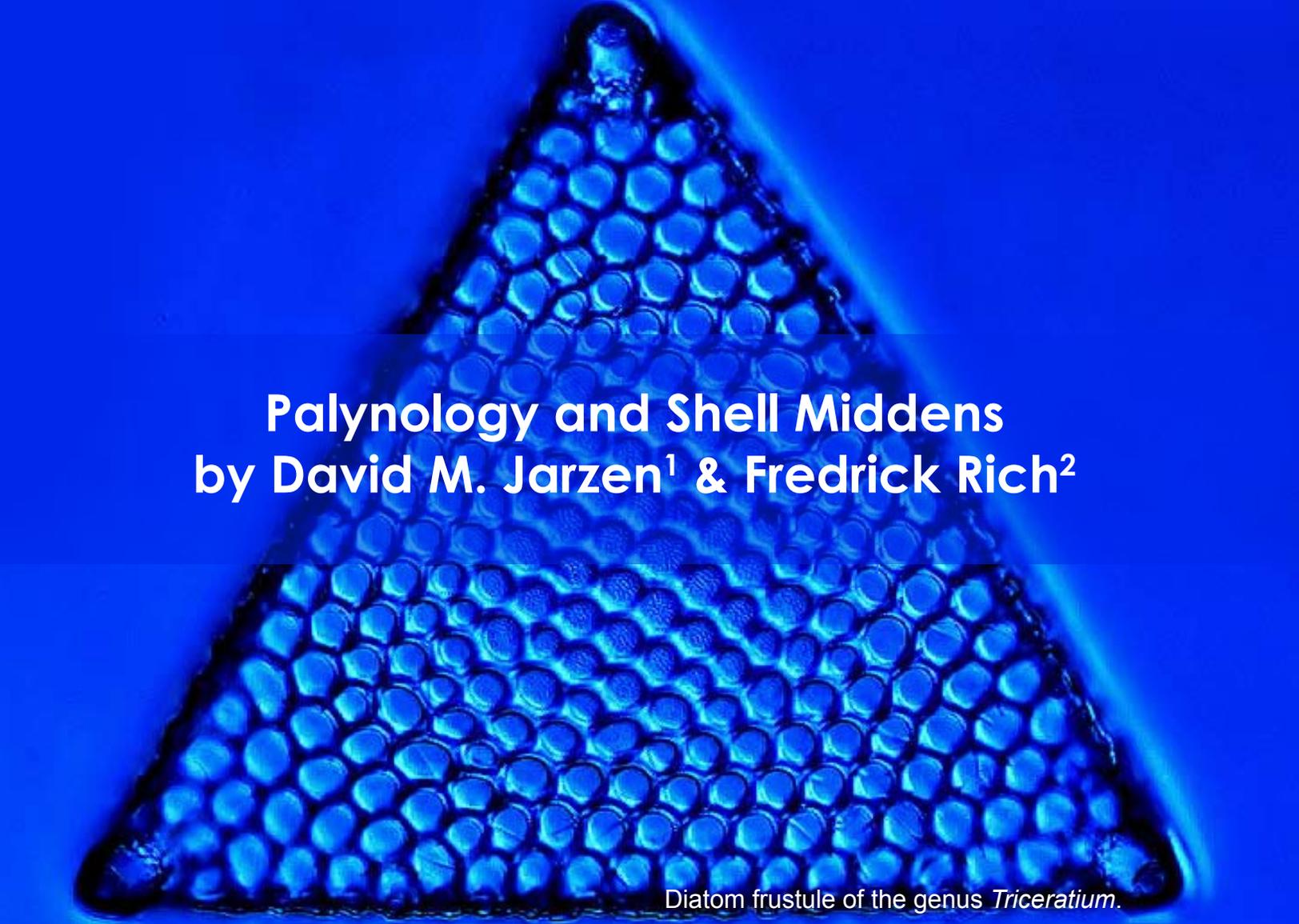


to the theory of southern coastal route of migration through India, against the prevailing view of northern route of migration via Middle East, Europe, south-east Asia, Australia and then to India. Our earlier study revealed that Negrito tribes of Andaman and Nicobar Islands, such as Onge, Jarawa, Great Andamanese and Sentinelese, are probably the descendants of the first man who moved out of Africa.

Prof. David L. Dilcher, Affiliate Professor of Botany, Florida Museum of Natural History, 205 Dickinson Hall, University of Florida, Gainesville, FL 32611-7800, USA delivered a talk on **The Ever Changing Continuum of Life in the Evolution of Land Plants**. He spoke on the evolution of land plants that are full of changes both vegetative and reproductive.

He stressed that in order to understand basic concepts of the major groups of land plants we must study their reproductive biology. Of particular interest are the major steps that lead to the evolution of the angiosperms. This major group of plants in the world today comes from a seed plant ancestry with the male and female reproductive organs borne on separate plants or separate leaves of one plant. The angiosperms developed syndromes to promote pollination events using insects of the Mesozoic to accomplish this. They brought both male and female organs together, but this had the potential to allow self pollination. The closing of the carpel promoted out crossing and also was accompanied by the development of self incompatibility. The closed carpel should define the angiosperms. Later sterile organs evolved which resulted in the evolution of the flower.

The conclave generated a great interest among the participants. People interacted with experts. In the evening the Conclave concluded with a valedictory function where experts and participants expressed their views about the meeting and lessons they learnt and questions that are yet to be addressed.



Palynology and Shell Middens by David M. Jarzen¹ & Fredrick Rich²

Diatom frustule of the genus *Triceratium*.

Archaeologists are often able to describe in great detail the nature and community organization of ancient cultures. They use human artifacts and waste products to reconstruct the habits and lifestyles of early human populations. Often the plant life associated with an archaeological site may provide not only climatic information, but also data as to the nature of the people, their habits, and their habitats. One way to study the plant life associated with an archaeological site is through pollen and other microfossil analysis – Palynology!

This is exactly what Morgan R. Crook (University of West Georgia) intended when he contacted us to look at the palynological assemblages associated with one of two Native American, Late Archaic (3000 B.C. to 1000 B.C.) and early Woodland (1000 B.C.

to A.D. 900) shell mounds at the mouth of the Savannah River (Crook, 2009). The site we looked at is the Delta Site (38JA23) an early Woodland period shell mound. These shell mounds or middens are the result of the accumulation of shell debris and other organic material being deposited generation upon generation in one or more specific areas. In essence a shell midden is a garbage dump. In the case of the Delta site, we independently received core samples from two cores drilled at Test Pit #1. Rich received samples from Core A, while Jarzen received a sample from Core C (see Figure 29 in Crook, 2009).

We both employed standard palynological preparation techniques, but Jarzen did not use HF (hydrofluoric acid) in the process, in order to recover the delicate,

siliceous tests of diatoms that may be present. Diatoms are filtered into the gut system of shellfish, including hard clams (*Mercenaria* spp.), Atlantic Ribbed Mussel (*Geukensia demissa* Dillwyn, 1817) and the Eastern oyster (*Crassostrea virginica* Gmelin, 1791) and perhaps others. It was thought that perhaps the diatoms associated with the shellfish, if preserved, may provide clues as to what season, and from what source (brackish or marine) the shellfish were being collected. It was a shot in the dark, but the processing without HF might allow for more information than may otherwise be possible. The removal of the calcareous component of the samples took a fair bit of time. In fact, some of the samples contained entire shells of oyster and clam, and required several days in 10% to 25% HCl (hydrochloric acid), with violent reaction, to disaggregate and remove the CaCO₃ (calcium carbonate). The complete shells could not simply be removed from the remainder of the sediment by hand, before processing, as the shells themselves often contain a diatom flora unique to that species. A total diatom flora would provide more information.

Most palynologists are aware that soil samples, especially soil samples with a relatively high pH factor, may play havoc with the contained palynomorphs (Dimpleby, 1985). In fact, most archaeological sites are located on base-rich soils as these are more productive than areas of more acidic soils. Thus searching for pollen and spores in higher alkaline soil samples is often a very time-consuming task. But diatoms may be preserved when other microfossils are destroyed. Some diatoms and some pollen were recovered from the samples, but always in low numbers and frequently in a degraded condition. The diatoms also suffer from dissolution depending on time of deposition, temperature and pH of the soils or sediments, as the biogenic silica is often rapidly degraded and dissolved (Reed,

1998). Wet-dry climatic cycles also play a significant role in the mechanical degrading of pollen (Campbell, 1991). The importance of pH to the preservation of pollen, spores, diatoms and perhaps other microfossils is worthy of note, and we urge those collecting samples for palynological analysis to sample not only the shell midden site, but to sample the surrounding area as well, where the pH may be lower and not as harmful to the preservation of the palynomorphs. Bryant and Hall (1993) have discussed in depth the techniques and problems associated with archaeological palynology.

But all is not lost. We recovered a reasonable number of identifiable palynomorphs, including spores, pollen and fungal elements. A few identifiable diatoms were recovered in the sample processed by Jarzen. Common in many of the samples were pollen grains of Chenopodiaceae, *Quercus*, *Pinus* and *Ambrosia*. Spores of the fern *Osmunda* and the moss *Sphagnum* were also fairly common. In the sample prepared without the use of HF, other palynomorphs of interest included several examples of fungal spores and fructifications, algal cysts, insect egg cases, and diatoms identified as *Coscinodiscus* and *Triceratium* (see illustration). For a complete list of our findings and the interpretation of some of these finds see Crook (2009).

Using this knowledge we are both currently working on projects involving the early cultural heritage of St. Catherines Island off the coast of Georgia. We are looking at cored material and surface and shell midden samples from several sites on the island. Hopefully, using what we have learned from our experience with the Delta site samples, we will be able to collect and process our samples using techniques (yet to be established) that will provide better recovery and preservation. Perhaps we need to look at the sediment enclosed in “unopened” shell-



Surface of a shell midden at Saint Catherines Island, Georgia. This is typical of shell middens, with an abundance of Oyster shells (*Crassostrea virginica*). Photo: DMJ

fish, as was done in the work of Rich and Pirkle (1998) with steinkerns. There is a lot of information to be derived not only from the pollen and spores associated with early human occupied sites, but also from the associated diatom assemblage (Vos and Wolf, 1993).

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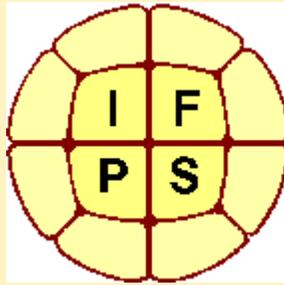
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1. Florida Museum of Natural History, University of Florida, Gainesville, FL 32611-7800
2. Department of Geology and Geography, Georgia Southern University, Statesboro, GA 30460-8149



<http://geo.arizona.edu/palynology/ifps.html>

Dear IFPS councillor,

The IFPS has agreed to support student participation at the upcoming Third International Palaeontological Congress (IPC3) to be held in London 28th June-3rd July 2010 (details on the following website: <http://www.ipc3.org/>). Could you please bring this announcement to the attention of all members of your IFPS affiliated society.

£3000 has been set aside from IFPS funds to be awarded to students presenting palynological results (talk or poster). Sums allocated will be between £100 and £500. Thus we intend to sponsor between 6 and 30 students.

Students wishing to apply should e-mail a covering letter (no more than one page of A4) along with their talk/poster abstract to Charles Wellman (IFPS Secretary-Treasurer). The covering letter should briefly explain how much funding is being sought and why it is required. Please note that abstract deadline for IPC3 is 28th February 2010. Applications for IFPS support should arrive before 1st April 2010.

Yours sincerely,

Dr Charles Wellman [c.wellman@sheffield.ac.uk]
(Secretary-Treasurer IFPS)
Dept. of Animal & Plant Sciences
University of Sheffield
Alfred Denny Building
Western Bank
Sheffield S10 2TN
UK

On behalf of the IFPS Committee and Council:-
Dr Thomas Servais (President)
Dr Charles Wellman (Secretary-Treasurer)
Dr Jean Nicolas Haas (*PALYNOS* editor)
Prof Thomal Litt (Past President)

9th February 2010

ECOLMAS course/workshop

Invitation to the ECOLMAS course/workshop: (Palaeo-)ecology of cyst forming dinoflagellates to be held in Bremen from 17.05.2010 - 21.05.2010.

In the morning hours a course on graduate level (for PhD students upward) is organized. The course part will consist of lectures and practical exercises on selected aspects of the ecology of modern cyst forming dinoflagellate by several dinoflagellate specialists such as Barrie Dale, Fabienne Marret, Kenneth Mertens, André Rochon, Gerard Versteegh. Emphasis lies hereby on the use of dinoflagellate cyst as palaeoenvironmental indicators. Following the tradition of the excellent "modern dinoflagellate cyst

workshops" held in previous years, participants are invited to present their recent work (or that of their group) in the form of poster or oral presentations in an informal atmosphere during the afternoons.

Deadline for submission of abstracts: 16 April to Karin Zonneveld,
zonnev@uni-bremen.de
FB-5 Geowissenschaften, Postfach 330440, D-28334
Bremen, Germany



2010 AASP-CAP-CPC joint meeting, Halifax Nova Scotia September 29-October 1st, 2010

Please mark you calendars and plan to attend the joint AASP-CAP-CPC meeting in Halifax, Nova Scotia, September 29-October 1st. The meeting will be held at the Harbourview Holiday Inn, just minutes from the ferry terminal and with spectacular views of the Halifax Harbour.

Rob Fensome, Peta Mudie and Graham Williams are the Local Organizing Committee.

We are planning exciting field trips, including one to Joggins World Heritage site where you can see some of the most spectacular fossil tree trunks and the world's earliest reptiles. Other field trips will possibly include locations such as the Paleoindian site in Debert, the Cobequid-Chedabucto fault, the North Mountain Basalt, Arisaig, and the unique Windsor gypsum cliffs at St Croix. Impressive drumlin fields and glacial deposits are found throughout Nova Scotia, especially around Old Town Lunenburg, a UNESCO World Heritage Site.

And let's not forget that the Bay of Fundy has the largest tides in the world!



Photos : Pablo Etchevers

SYMPOSIUM ON THE PALEOGENE OF SOUTH, CENTRAL AMERICA AND THE CARIBBEAN La Plata, Argentina, 20-24th September, 2010

A symposium on the Paleogene of South and Central America will be held at the X Argentinean Congress of Paleontology and Biostratigraphy and VII Latin American Congress of Paleontology (La Plata, Argentina, 20-24th September, 2010).

The aim of the symposium is to have an overview of research related to the Paleogene of South and Central America, facilitating the exchange of information and integration of results from different disciplines and regions.

Participants are invited to submit abstracts on all aspects of the Paleogene of South and Central America/Caribbean, particularly on stratigraphy, biostratigraphy, paleogeography, paleontology, paleoecology, and paleoclimates. Contributions on global aspects of the Paleogene and from other regions of the world are also welcome.

Details and deadlines for submission of abstracts will be at the Congress's web page. (<http://www.congresospaleo2010.fcnym.unlp.edu.ar>). For details on the symposium, please contact Carlos Jaramillo (jaramilloc@si.edu) or Carolina Nañez (carolina.nanez@yahoo.com).



The Society of Ethnobiology

The Society of Ethnobiology invites papers for our 2010 conference "The Meeting Place: Integrating Ethnobiological Knowledge", to be held 6-10 May, 2010, in Victoria, British Columbia. This year's conference theme celebrates the potential of ethnobiology to bridge disciplines, ideas, and communities, and to foster an understanding of the connections between the biological and cultural worlds. Please visit the Society of Ethnobiology website for details: <http://www.ethnobiology.org/node/249>.



Pollen, Spore Master Class

August 16-20, 2010 Utrecht, The Netherlands

Course Outline:

General Pollen/Spore Morphology and Taxonomy
Concepts and Applications

Paleozoic Spore Chronostratigraphy and Paleoecology
(with special focus on Middle East plays)

Mesozoic Spore/Pollen Chronostratigraphy and Paleoecology
(Australia, N.W. Europe, North America)

Cenozoic Pollen Chronostratigraphy and Paleoecology
(North and South America)

Special Focus on Neogene Pollen Chronostratigraphy and Paleoecology
(West Africa, Southeast Asia)

Quaternary/Holocene Palynostratigraphy and Paleoecology
Fieldtrip: Type-Maastricht

Confirmed Instructors include:

Guy Harrington, Carlos Jaramillo, Andy Lotter, Robert Morley, Henry Hooghiemstra,
Michael Stephenson, Thomas Demchuk, James Eldrett and Jim Riding

TNO Personnel: Oscar Abbink, Timme Donders, Dick Munsterman, Roel Verreusel.

Additional instructors will be announced in future advertisements



The Aims and Deliverables of the Class will be:

- * Provide instruction on basic pollen/spore/algal taxonomy as an aid in identifying and classifying varied terrestrially-derived palynoflora
- * Provide a general background into terrestrial palynomorph morphology, taxonomy, chronostratigraphy, paleoecology and paleoclimate through the Phanerozoic
- * Provide case studies of standard and innovative Industrial applications of terrestrially-derived pollen/spore/algae to subsurface problem solving, including calibration to sequence stratigraphic modeling (system tracts):
Middle East - Paleozoic; Southeast Asia - Cenozoic; Offshore Nigeria - Neogene
- * Each of the age-specific topics and lectures will be accompanied by Type-Maastricht in the Southern Netherlands, an opening evening Icebreaker, and mid-week Dinner
- * Maximum enrollment will be 35-40 participants.
- * Course fees are anticipated to be: 500 Euros (Students), 750 Euros (Academic/Consultant), 1100 Euro (Industry)

For additional information regarding this course, please contact either:

Thomas D. Demchuk (Thomas.D.Demchuk@conocophillips.com)
or James Eldrett (James.Eldrett@Shell.com)

Please visit the AASP website (www.palynology.org) and read future issues of the AASP Newsletter for additional information

The Society for Organic Petrology
27th Annual Meeting

Theme: Advances in Organic Petrology

September 12-16, 2010 - Denver, Colorado, USA



TSOP



TSOP is an international society for scientists and engineers involved with coal petrology, kerogen petrology, organic chemistry and related disciplines

ANNUAL MEETING ANNOUNCEMENT AND CALL FOR PAPERS

Denver, Colorado, USA
Sheraton Denver West Hotel

September 12-16, 2010

Conference Theme:

Advances in Organic Petrology

Field trip to western Colorado, Piceance Basin, to see the Green River Oil Shale

TECHNICAL PROGRAM AND ABSTRACTS, GENERAL INQUIRIES AND REGISTRATION
Mark Pawlewicz or Paul C. Hackley
E-mail: pawlewicz@usgs.gov phackley@usgs.gov

ABSTRACT SUBMISSION DEADLINE: APRIL 19, 2010

Meeting and abstract submission details:

<http://www.tsop.org/2010Denver/>

TSOP: www.tsop.org

TSOP student research grant
(deadline May 15, 2010)

Meeting organized by the U.S. Geological Survey

<http://www.usgs.gov>



2010 GRADUATE STUDENT GRANT PROGRAM, THE SPACKMAN AWARD

The Society for Organic Petrology (TSOP) invites applications for graduate student research grants, the Spackman Award. The purpose of the grants is to foster research in organic petrology (which includes coal petrology, kerogen petrology, organic geochemistry and related disciplines) by providing support to graduate students from around the world, who demonstrate the application of organic petrology concepts to research problems.

Size of the Spackman Award:

Monetary awards up to a maximum of \$1,000.00 US will be granted. TSOP will also provide Merit Awards, in the form of certificates redeemable for TSOP publications, to top-ranking applicants not receiving grants. The program awards a maximum of two grants each year. All applicants are invited to apply for a year's free Student Membership in TSOP.

Use of the Spackman Award:

Grants are to be applied to expenses directly related to the student's thesis program, such as fieldwork, laboratory analyses, etc. A portion (not to exceed 25%) of the funds may be used to attend TSOP Annual Meetings. Funds should not be used to purchase capital equipment, to pay salaries, tuition, room, or board during the academic year. Funds must be spent by the end of the calendar year following granting of the award, and an account of expenditure with copies of receipts should be provided by the end of that year (December 31, 2011 for awards granted in 2010).

Review and Ranking of Applications:

A committee of at least three TSOP members (and/or external experts when needed) will review the pool of applications. The reviewers will be drawn from people having no association with the host institution of any applicant. Each reviewer will independently rank each proposal according to established merit criteria, using the Application Evaluation Form included in the application packet. The cumulative score from all of the reviewers will be used to determine the final ranking of the applications. Winners will be notified prior to the 2010 Annual Meeting, and all applicants will be informed by e-mail of the final status of their applications.

Application Deadline:

TSOP Spackman Award application deadline is May 15, 2010. Grants will be awarded in September, 2010.

Detailed information and an application form are on the TSOP web site: www.tsop.org/grants.htm or applications may be obtained from:

Prof Colin Ward
Chair, TSOP Research Committee
School of Biological, Earth and Environmental Sciences
University of New South Wales
Sydney, NSW, 2052
Australia

**CIMP 2010 General Meeting in Poland
Warsaw-Kielce, September 13-16, 2010**



INVITATION

PAPERS & ABSTRACTS

REGISTRATION & DEADLINES

FIELDTRIP

ORGANIZING COMMITTEE



Invitation to CIMP 2010 General Meeting in Poland

Dear Palynologists,

We kindly invite you to the **General Conference of Commission Internationale de Microflore du Paléozoïque (C.I.M.P). Palynology and its possibilities: a record of climate and environmental changes, Warsaw-Kielce, September 13-16, 2010.**

The Institute of Geological Sciences of Polish Academy of Sciences with Polish Geological Institute National Research Institute and the Institute of Geological Sciences of Wrocław University are pleased to host this meeting and to showcase long (since the XIX century) and ongoing tradition of the Polish palynological research.

We propose the capital city of Poland - Warsaw as location of the Meeting. We plan 3 days of presentations (lectures and posters) and 3-day field trip in the Holy Cross Mountains where we can visit many outcrops of the Palaeozoic deposits. We also consider one day workshop before field trip, comparative studies of the palynological slides collections of the CIMP 2010 participants. Conference language is English.

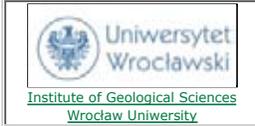
The CIMP 2010 General Meeting offers the opportunity to meet nearly all Polish palynologists and foreign guests working on Palaeozoic strata, to discuss problems and solutions in this field, to identify new issues, and to shape directions and joint projects for future research.



Institute of Geological Sciences
P.A.S.



Polish Geological Institute



Institute of Geological Sciences
Wrocław University

[Reply Form >>](#)

Home page

www.ing.pan.pl/CIMP-2010/index_cimp.htm

Correspondence and Secretariat



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Polish Academy of Sciences

CIMP 2010
Institute of Geological Sciences
Polish Academy of Sciences
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Dr Monika Masiak IGS PAS - mmasiak@twarda.pan.pl
Dr Marzena Oliwkiewicz-Miklasinska IGS PAS - ndmiklas@cyf-kr.edu.pl
Dr Marzena Stempień-Sałek IGS PAS - mstempie@twarda.pan.pl

KEY DEADLINES:

- Return Reply Form: **December 31, 2009**
e-mail address: cimp2010@ing.pan.pl ,
- Registration fee: **March 31, 2010**
For details see the webpage of conference
- Payment for the post conference excursion: **March 31, 2010,**
- Submission of the abstract: **May 31, 2010,**
- Submission of the paper: **June 30, 2010.**



Nova Scotia 2010

Wednesday 29th September to Saturday 2nd October 2010
Harbourview Holiday Inn, Dartmouth, Nova Scotia

**Joint Meeting of [AASP-The Palynological Society](#),
the Geological Association of Canada Paleontology Division, and
CAP- Canadian Association of Palynologists**

Local Organizing Committee. Rob Fensome, Nelly Koziel, Peta Mudie and Graham Williams,
Geological Survey of Canada, Bedford Institute of Oceanography, Dartmouth, Nova Scotia

Society Representatives.

For AASP-TPS — Francine McCarthy, Brock University, St. Catharines, Ontario;
For GACPD — Mike Melchin, St. Francis Xavier University, Antigonish, Nova Scotia; For CAP —
Elisabeth Levac, Bishops University, Sherbrooke, Quebec.

Location. The meeting will be held at the Harbourview Holiday Inn in Dartmouth, Nova Scotia, with a modern conference centre overlooking the Halifax skyline across Halifax Harbour. The Inn is minutes away from buses and ferries that take visitors directly to historic downtown and waterfront Halifax, with its many dining venues to suit all tastes, a variety of traditional pubs (some with their own brews), and opportunities for harbour cruises. The hotel is also across the road from a sports complex, including swimming pool and gym; and close to downtown Dartmouth with its own waterfront attractions, restaurants and pubs. Dartmouth is known as the City of Lakes and is the starting point of the historic Shubenacadie Canal, a Nineteenth Century link between the Atlantic and the Bay of Fundy. Short bus rides or drives take the visitor to the seashore and attractive waterside walks. Autumn foliage should be in its early stages at the time of the meeting, and the weather is usually (but not always) fine and temperate in early fall, so participants should bring layers of clothes to adapt to changing temperatures.

Costs (all in Canadian Dollars). Pre-registration will be \$190, \$90 for students; on site registration will be \$225 and \$110 respectively. Pre-registration deadline is 27 August 2010, field trip deadline to be announced.

The hotel rate at Harbourview Holiday Inn Hotel will be \$149 plus taxes per person for single or double occupancy, with \$15 for additional beds. The organizing committee will do their best to play “match-maker” for individuals seeking to share rooms. We encourage participants to stay at the Harbourview Holiday Inn --- the more rooms we use, the better will be the price for the meeting rooms.

Door-to-door airport bus transport from Halifax International Airport is about \$21.

Meeting Events. The social program includes an opening night “Meet and Greet” and public lecture. Natalia Rybczynski of the Canadian Museum of Nature has agreed to give the public talk on new Cenozoic mammals from the Arctic, and the Arctic’s role as an evolutionary pump. Natalia is an excellent speaker and has been involved with exciting Arctic finds, including the preserved remains of a beaver dam. A dinner is planned for GAC Paleo Division and business lunches for CAP and AASP, accompanied by traditional Nova Scotian Town Crier, bagpipers and the Order of Good Cheer awards. Dependent on interest and availability, a mid-conference harbour cruise aboard the sternwheeler Harbour Queen will be planned.

Technical Sessions. The planned technical program will accommodate more than 60 talks (with two concurrent sessions), including keynotes. The sessions will include:

1) Paleobotany in all its aspects. Conveners, Graham Williams and John Calder. This session will highlight macro and micropaleobotany (palynology of spores and pollen) and talks on how the two subdisciplines shed new light on ancient plant communities and evolution are especially welcome. The session could include talks on classic localities such as Joggins and other North American Carboniferous localities, as well as those elsewhere. Another focus could be the impact of evolving plant cover on sedimentation. It is hoped to include some contributions relating to the K/T boundary and other work of Doug Nichols (recently deceased).

2) Canadian Paleontology. Conveners, Mike Melchin and Paul Johnston. Some of the world’s most significant paleontological discoveries have been Canadian. Possible topics could include the Mistaken Point fauna, Burgess Shale, Tiktaalik, Miguasha fish, Joggins vertebrates and invertebrates, and Wasson Bluff.

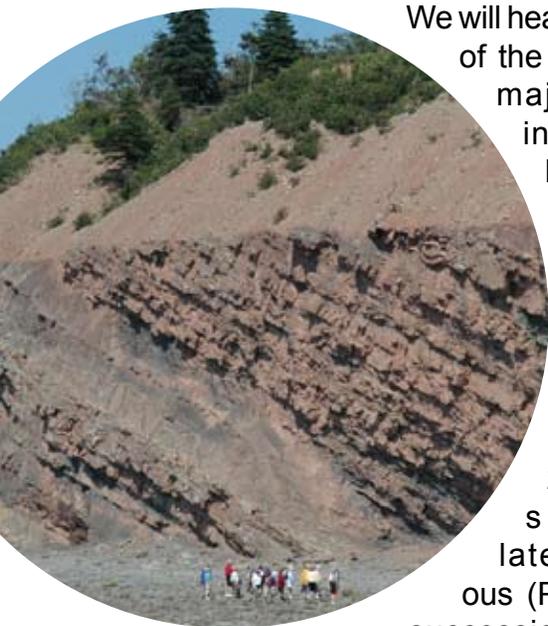
3) The Amazingly Diverse World of Quaternary Palynology: A Session in Celebration of the Career of Jock McAndrews. Convener Francine McCarthy. The versatile palynological career of Jock McAndrews and his students has covered the spectrum from Holocene freshwater dinocysts and other non-pollen palynomorphs, through the archaeopalynology of mammoth skulls and varved lake sediments to volumes on modern pollen morphology and identification. In celebration, a keynote talk will be given by Roger Byrne from the University of California at Berkeley, Jock’s first post-doctoral associate and co-worker at Crawford Lake in 1973. Roger is now studying wildfire records and human impacts of landscapes using varved marine sediments off California and Mexico.

4) New frontiers in paleobiology. Conveners, Rob Fensome and Peta Mudie. One focus of this session will be the integration of molecular and fossil data, and several potential speakers have been approached on this topic — Kazumi Matsuoka will give a keynote talk on DNA and the classification Pleistocene – Recent dinocysts. Another focus could be on the elucidation of the phylogeny of groups such as ferns and angiosperms using both molecular and fossil data.

5) General session. Convener, Elisabeth Levac. Papers addressing industrial uses of paleontology are especially encouraged.

Field Trips. Two field trips are being planned, both on the Saturday 2nd October. At the moment, participant costs are about \$100 Canadian for each trip, inclusive of lunches and museum entrance fees, based on a minimum of 20 and a maximum of 29 people per trip.

Field Trip 1 --- Bay of Fundy: Parrsboro Shore and Joggins Fossil Cliffs



We will head to the shores of the Bay of Fundy, major stops being in the Five Islands-Parrsboro area and Joggins, the latter designated a UNESCO World Heritage site in 2008 for its spectacular late Carboniferous (Pennsylvanian) succession exposed in the famous "Fossil Cliffs". The

trip's coordinators will be Rob Fensome and Graham Williams, with various experts "chipping in" along the way. We will leave the hotel at 8.00 am and head to the north shore of the Minas Basin, where we will explore either the Mesozoic rocks at Five Islands or the mid Carboniferous section at East Bay, Parrsboro, the choice depending on tide constraints. The first underwater turbines for tidal power generation in North America are currently being installed in the Bay of Fundy near Parrsboro. The site has been chosen because offshore is the Minas Channel, through which more water flows during a tide change than the water flowing from all the world's estuaries during equivalent time. We will eat lunch at the Fundy Geological Museum, which highlights Canada's oldest-known

dinosaurs.

In the afternoon, on the way to Joggins, we will stop at the Cobequid Fault, Nova Scotia's ancient answer to the San Andreas Fault (though no longer active). Once at Joggins, we guarantee low tide and the possibility to explore both the exciting new Joggins Fossil Centre and the cliffs. This part of the trip will be coordinated by Melissa Grey, Science and Education Coordinator at the Joggins Fossil Centre. Joggins was the haunt of Victorian geological superstars William Dawson, Charles Lyell, Abraham Gesner (discoverer of kerosene) and William Logan (first director of the GSC). The site was also mentioned in Darwin's Origin of Species, and is associated with coal mining and Canadian confederation. All of this historical interest is in addition to the fact that it is home to the world's earliest known reptiles and land snails, and spectacular fossil tree trunks (if erosion cooperates). There is also a till section for Quaternary enthusiasts.

We will take "tea" at the Joggins Fossil Centre and thence return to Dartmouth via the Trans-Canada Highway and Veterans Memorial Highway. This will be a long day trip and participants should not plan on taking an evening flight.





Field Trip 2 --- Nova Scotia's Atlantic Shore: Quaternary and Environmental Geology

This field trip will explore Nova Scotia's Atlantic Shore, focusing on Quaternary and environmental geology. The coordinator will be Peta Mudie, and leaders at particular sites will include geologists Ralph Stea, Bob Taylor, Mike Parsons, Peter Giles and archaeologist Roger Lewis. This trip will also leave the hotel at 8 am. First stop will be West Lawrencetown, where we will see a wave-eroded section of a drumlin with older Hartlen and younger Lawrencetown tills, and Cambrian bedrock outcrops with glaciated grooves and striations. The drive will then take us along the coastline of embayments to the Chezzetcook drumlin field and salt marsh, via Minesville abandoned gold mine, with its ongoing history of arsenic and mercury pollution from tailings. At Chezzetcook, we will view vegetation zonation and explore the history of the salt marsh.

The trip will then continue to Peggy's Cove, southwest of Halifax, where (weather permitting) we will eat lunch near Peggy's Cove lighthouse perched on glacier-scoured Devonian granite, part of the South Mountain Batholith, the largest granitic body in the Appalachian Orogen. The unique landscape of Peggy's Cove and surrounding areas was produced by the Wisconsinan glaciation. On retreat of the ice, rising sea level filled the scoured areas, forming an endless array of

coves and inlets now hosting an endemic ice-age relic flora and ponds filled with bog moss, sundew and pitcher plants.

On the return trip, we will first examine exposures of Mississippian Windsor Formation shell-bearing carbonates near Glen Margaret, then explore the Quaternary geology and archaeology of eastern St. Margaret's Bay, and visit one of the last remaining Mi'kmaq shell middens on Indian Point where the coast is rapidly changing from erosion and urban development. Roger Lewis, of the Nova Scotia Museum of Natural History, will talk about the history of Mi'kmaq archaeological sites in the region before our return to Dartmouth.

Don't miss all the stimulating and fun events at Nova Scotia 2010 — registration will be available in spring 2010. Contact Rob Fensome (rfensome@nrcan.gc.ca), Peta Mudie (pmudie@nrcan.gc.ca) or Graham Williams (graham.williams@nrcan.gc.ca) for more details and updates.

Page 34 top: Joggins' Fossil Cliffs, Canada's newest UNESCO World Heritage Site.

Page 34 bottom: Tidal flats at Five Islands, on Nova Scotia's Minas Basin, site of the highest tides in the world.

Above: Drumlin at Lawrencetown on Nova Scotia's Eastern Shore.



Nova Scotia 2010

Wednesday 29th September to Saturday 2nd October 2010
Harbourview Holiday Inn, Dartmouth, Nova Scotia

Joint Meeting of AASP-The Palynological Society, the Geological Association of Canada Paleontology Division (as its annual Canadian Paleontology Conference, CPC), and CAP- Canadian Association of Palynologists

Costs (in Canadian dollars). Pre-registration will be \$190, students \$90. On-site registration will be \$225, students \$110. The hotel rate will be \$149 plus taxes per person for single or double occupancy, with \$15 for additional beds. For students only, the organizing committee will provide a "matchmaking" service for those who would like to look for a room mate. Door-to-door airport bus transport from Halifax International Airport is \$21.

Deadlines: for pre-registration 27 August 2010. We plan to have pre-registration available by late spring 2010. Abstracts deadline: 20 August 2010. Deadline for field trips to be announced.

Technical Sessions. The planned technical program will accommodate more than 60 talks (with two concurrent sessions), including keynotes. The sessions will be:

- 1) Paleobotany in all its aspects. Conveners, Graham Williams and John Calder. This session will highlight macro and micropaleobotany and talks on how the two subdisciplines shed new light on ancient plant communities and evolution are especially welcome. The session could include talks on classic localities such as Joggins. Another focus could be the impact of evolving plant cover on sedimentation. It is hoped to include contributions relating to the work of Doug Nichols (recently deceased).
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- 3) The Amazingly Diverse World of Quaternary Palynology: A Session in Celebration of the Career of Jock McAndrews. Convener Francine McCarthy. The versatile palynological career of Jock McAndrews and his students has covered the spectrum from Holocene freshwater dinocysts and other non-pollen palynomorphs, through the archaeopalynology of mammoth skulls and varved lake sediments to volumes on modern pollen morphology and identification. Roger Byrne from the University of California at Berkeley, Jock's first post-doctoral associate and co-worker at Crawford Lake in 1973 will provide the keynote talk.
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Joggins Fossil Cliffs

Field Trip 2 --- Nova Scotia's Atlantic Shore: Quaternary and
Environmental Geology

Don't miss all the stimulating and fun events at Nova Scotia 2010.
For more information, contact Peta Mudie (pmudie@nrcan.gc.ca),
Graham Williams (graham.williams@nrcan.gc.ca) or
Rob Fensome (rfensome@nrcan.gc.ca).

