PRISCUM

The Newsletter of the *Paleontological Society* Volume 11, Number 2, Fall 2002

On Mentoring In Paleontology

by Patricia Kelley, PS President

Following Stephen Jay Gould's untimely death, various colleagues and friends expressed sympathy to me on the loss of my mentor. Those comments have caused me to reflect on my own experience mentoring and being mentored, and on the importance of mentoring to the future of paleontology.

It has been many years since Steve Gould served as my mentor. I know that in some respects I was challenging for Steve to mentor, because we were so different – I was the wrong gender and the wrong religion (married to a Presbyterian minister-to-be, of all things) and followed the wrong ball team (the Indians, not the Yankees!). But Steve was there at a critical time in my life, and he got me started on the path to a career in paleontology. As a mentor should, he got me excited about new developments the field (in which he played a key role), he guided me in my research, and he taught me how to think. But he also sheltered me from the uncertainties I felt as a female at Harvard, where only one woman up to that time had ever completed her Ph.D. in paleontology (at least that's what I was told). He urged me to TA his general science course, even though my NSF fellowship didn't require me to do so, and I immediately fell in love with teaching (and I still follow Steve's approach to giving exams and grading). He helped me in my job search, and when I graduated, he made sure I would persist in paleontology by warning me that I must not be content with "baking buns for the congregation." Without Steve's mentoring, my life would have been completely different.

I have heard people lament that paleontology is in decline, and that paleontologists retiring from academia are being replaced by faculty in more applied or trendy fields where higher enrollments are guaranteed (e.g., hydrogeology, environmental geology, GIS). Non-academic colleagues in industry, government, or at museums make similar observations. Meetings have been convened on such topics as "The Future of Paleontology" and "Paleontology in the 21st Century," as we try to figure out our role in a changing world and how we can better represent ourselves to others. The PS also keeps careful watch of our membership numbers, and recruitment is a specific task assigned to the "Councilor (Under 40)."

And yet we know how popular paleontology is with the general public. Children are fascinated with fossils; dinosaur movies are blockbusters; writings that make our field accessible to the non-specialist remain popular (Steve Gould comes to mind again

Inside...

Priscum is published twice yearly by the Paleontological Society. Submissions are welcome. Please forward articles, book reviews, announcements, and notes to: Peter Harries, Priscum Editor, Department of Geology, University of South Florida, 4202 E. Fowler Ave., SCA 528, Tampa, FL 33620-5201 or via email at harries@chuma.cas.usf.edu.

here). How can we take advantage of the popular interest in our field that seems almost innate (a colleague's two-year old always wants to visit my office to play with the dinosaur beanie babies I've accumulated over the years)?

I think mentoring is part of the answer. Kids love paleontology, and many go through a "phase" of wanting to become a paleontologist (mine lasted from about age 7 to 10 and then went dormant until, as a freshman at the College of Wooster, I was randomly assigned to paleontologist Richard Osgood for advising; he was my first mentor). Middle school appears to be a critical juncture when kids either are turned off by science, including paleontology, or, less often, maintain interest despite the common approach of memorization of facts/teaching to the test. Perhaps the best sort of mentoring is to involve young people interested in paleontology in authentic research in which they can go into the field, work with real samples, and test actual hypotheses. A number of such research partnerships between paleontologists and K-16 students or the general public have been developed very successfully (see last spring's *Priscum).* The students involved in such ventures may not grow up to be paleontologists, but their appreciation of the field will benefit us nonetheless.

Those of us who are in academia are expected to serve as mentors to our students and to junior colleagues. But you don't have to be in academia or even a professional paleontologist to mentor others in paleontology. My graduate students have enjoyed working with school children, and the kids love working with them. Avocational paleontologists have much to offer in the way of mentoring others; love of the field is the most important qualification, and, after all, the word amateur comes from the Latin for "lover."

It's a wonderful experience to share with others the excitement we feel about our work. Few of us can have the far-reaching influence Steve Gould had, on students, on professional colleagues, and on the lay public. But we can all serve as mentors to others. Being a good mentor takes time and effort, but the rewards are outstanding.

Have fun mentoring! You could change someone's life.

Remembering Stephen J. Gould: A Paleontological Society Special Event

October 28, 2002

Members of the paleontological community were saddened to learn of the death of Stephen Jay Gould on May 20, 2002. Steve Gould's contributions to our field were enormous, changing the way we look at the fossil record, the history of life, and the evolutionary process. Steve was unmatched in terms of communicating the excitement of our field to other geoscientists and to the public.

The Paleontological Society will host a retrospective on the life and work of Stephen Jay Gould at the Geological Society of America meeting in Denver, on October 28, 2002. This event will follow the PS Business Meeting, at which Gould will receive posthumously the Paleontological Society's highest honor, the PS Medal. The Paleontological Society Council learned of Steve's illness a few days before our spring meeting, enabling us to honor him with this award and to let him know that his colleagues wished to honor him in this way. Gould's widow, Rhonda Roland Shearer, will be present to accept the award and colleague Niles Eldredge will be the citationist.

Following the Business Meeting, including the awarding of the Medal, we will reconvene for the Special Event, "Remembering Stephen Jay Gould." Students and colleagues of Gould will share their perspectives on his life and work. Participants in the program include Roger Thomas, Elisabeth Vrba, Richard Bambach, David Jablonski, Charles Marshall, and Linda Ivany. Warren Allmon has prepared a PowerPoint review of the life of Stephen Jay Gould.

The schedule for the day's events is as follows (times are approximate):

11:30 a.m.	Reception (cash bar available)
12:00 noon	Luncheon opens for seating
12:30 p.m.	Luncheon served
1:00 p.m.	Business Meeting including Awards
3:00 p.m.	Remembering Stephen Jay Gould: A PS Special Event
4:00 p.m.	Continued informal discussion (a.k.a. beer)

Paleontological Programs at the Annual Meeting of the Geological Society of America (October 26-30, 2002), Denver, CO

compiled by Lisa Park and Rowan Lockwood

On behalf of the Joint Technical Program Committee, here is a list of the Technical Sessions and other PS sponsored events for GSA-Denver 2002 with their times, locations and URLs to the GSA website where the entire session schedule and access the abstracts. This year, we had 354 abstracts that will comprise 18 oral and 2 poster sessions! Please note that due to the schedule change for the meeting this year, the short course will be on **Saturday** and the luncheon on **Monday**.

Listed here are only those events either sponsored or somehow otherwise related to the Paleontological Society. Please note that there are many other paleo-related sessions sponsored by other Divisions and affiliated Societies that might be of interest to you. We hope this list helps you to schedule what looks to be a great meeting! See you in Denver!

Saturday, October 26

8:15 AM-5:30 PM *Paleontological Society Short Course: Marriott: Colorado E*
The Fossil Record of Predation

Michal Kowalewski and Patricia H. Kelley, Presiding
http://www.geosociety.org/meetings/2002/crs-other.htm>http://www.geosociety.org/meetings/2002/crs-other.htm

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Sunday, October 27, 2002

8:00 AM-11:30 AM, Colorado Convention Center: A108/110
Paleontology/Paleobotany I: Quantifying Morphology and Morphological Trends
Glenn S. Jaecks and Gene Hunt, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_3318.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_3318.htm

8:00 AM-12:00 PM, Colorado Convention Center: A112
Paleontology/Paleobotany II: Paleoecology and Preservational Bias
Mark A. Wilson and Thomas D. Olszewski, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_3288.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_3288.htm

8:00 AM-12:00 PM, Colorado Convention Center: A105/107
Three Billion Years of Reef Evolution I
George D. Stanley and Paul Copper, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_2700.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_2700.htm

1:00 PM-3:45 PM, Colorado Convention Center: A108/110
Paleontology/Paleobotany III: Early Life
David R. Schwimmer and Margaret L. Fraiser, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_3289.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_3289.htm

1:00 PM-3:45 PM, Colorado Convention Center: A102/104/106
Advances in the Fossil Record of Insects and Terrestrial Arthropods
Robert E. Nelson and Cary R. Easterday, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_2853.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_2853.htm

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Monday, October 28, 2002 AM

8:00 AM-12:00 PM, Colorado Convention Center: A105/107
Three Billion Years of Reef Evolution II:Onshore-Offshore Paleoenvironmental Reconstructions
George D. Stanley and Paul Copper, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_3391.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_3391.htm

8:00 AM-12:00 PM, Colorado Convention Center: A102/104/106
Developing Perspectives on the Ecological Context of Biological Evolution Across the Neoproterozoic-Cambrian Transition
Loren E. Babcock, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_2637.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_2637.htm

1:30 PM-5:30 PM, Colorado Convention Center: A101/103
Wetlands Paleoecology Through Time
Stephen F. Greb and William A. DiMichele, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_2773.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_2773.htm

11:30 PM-5:30 PM: Marriott Hotel
PALEONTOLOGICAL SOCIETY LUNCHEON AND BUSINESS MEETING
Note: New Day!

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Tuesday, October 29, 2002

8:00 AM-12:00 PM, Colorado Convention Center: A207
Paleontology/Paleobotany IV: Phylogeny and Ontogeny
Peter J. Wagner and David K. Jacobs, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_3290.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_3290.htm

8:00 AM-12:00 PM, Colorado Convention Center: A102/104/106
Paleobiogeography: Integrating Plate Tectonics and Evolution
Bruce S. Lieberman, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_2196.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_2196.htm

1:30 PM-5:30 PM, Colorado Convention Center: Exhibit Hall
Paleontology/Paleobotany (Posters) I
<http://gsa.confex.com/gsa/2002AM/finalprogram/session_3203.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_3203.htm

1:30 PM-5:30 PM, Colorado Convention Center: C105/107
Paleontology/Paleobotany V: Diversity Dynamics and Extinctions
Margaret M. Yacobucci and Rowan Lockwood, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_3291.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_3291.htm

1:30 PM-5:30 PM, Colorado Convention Center: A108/110
Phenotypic Variation: Discriminating Between Evolution and Environment
Steven J. Hageman and Peter Kaplan, Presiding
<http://gsa.confex.com/gsa/2002AM/finalprogram/session_2776.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_2776.htm

1:30 PM-5:30 PM, Colorado Convention Center: A207
Reconstructing the Cambrian World: Temporal and Spatial Changes in Physical and Biotic Environments

Ed Landing and Gerd Geyer, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_3076.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_3076.htm

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Wednesday, October 30, 2002

8:00 AM-12:00 PM, Colorado Convention Center: Exhibit Hall
Paleontology/Paleobotany (Posters) II
http://gsa.confex.com/gsa/2002AM/finalprogram/session_3287.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_3287.htm

8:00 AM-12:00 PM, Colorado Convention Center: A105/107
Paleontology/Paleobotany VI: Terrestrial Paleoenvironments and Biostratigraphy
Bonnie F. Jacobs and Patricia A. Holroyd, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_3292.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_3292.htm

8:00 AM-12:00 PM, Colorado Convention Center: A102/104/106
Seafood Through Time-The Ecologic Context of the History of Life I: In Honor of Richard K. Bambach
Andrew M. Bush and Roderic Brame, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_2715.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_2715.htm

Wednesday, October 30, 2002 PM (1:30-5:30pm)
1:30 PM-5:00 PM, Colorado Convention Center: A101/103
P**aleontology in National Parks: Sharing the Fossil Record with Managers and the Public**
H. Gregory McDonald and Ted Fremd, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_2648.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_2648.htm

1:30 PM-5:15 PM, Colorado Convention Center: A111/109
Evolutionary Paleobiology and Paleoecology of the Bivalvia
Peter D. Roopnarine and Carol M. Tang, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_2982.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_2982.htm

1:30 PM-5:30 PM, Colorado Convention Center: A102/104/106
Seafood Through Time-The Ecologic Context of the History of Life II: In Honor of Richard K. Bambach
Andrew M. Bush and Roderic Brame, Presiding
http://gsa.confex.com/gsa/2002AM/finalprogram/session_3259.htm>http://gsa.confex.com/gsa/2002AM/finalprogram/session_3259.htm

Call for the Paleontological Society Medal and Schuchert Award Nominations

The PS Medal and Schuchert Award recognize excellence in the pursuit and the study of paleontology. Recipients of the PS Medal must have achieved eminence based on advancement of knowledge in paleontology, whereas the Schuchert Award is given to paleontologists whose work early in their careers reflects excellence and quality. There are no restrictions placed on nominees for the PS Medal; recipients of the Schuchert Award, however, are ordinarily under the age of forty when presented.

The nominations should include: 1) nominee's full name, address, phone number (and email if available); 2) letter of nomination; 3) letters of support for the candidate; 4) CV; 5) information about the candidate's research accomplishments and their impact; 6)
professional outreach; 7) contributions other than research; 8) special honors received. Nominations for the Schuchert Award should also include the nominee's date of birth.

Please submit nominations by February 1, 2003, to Patricia H. Kelley, Past-President of the Paleontological Society (Department of Earth Sciences, University of North Carolina at Wilmington, Wilmington, NC 28403-5944). If you have questions, please contact Patricia Kelley (910-962-7406; FX: 910-962-7077; or kelleyp@uncw.edu).

Call for Strimple Award Nominations

Do you know an amateur who has furthered the field of paleontology? Please recognize that person by nominating him or her for the Paleontological Society Strimple Award.

The Strimple Award recognizes outstanding achievement in paleontology by amateurs (someone who does not make a living full-time from paleontology). Contributions may be an outstanding record of research and publication, making outstanding collections, safeguarding unique paleontological materials through public service, teaching activities in the area of paleontology, and collaborations with others working in paleontology.

Anyone, including other amateurs, may make a nomination. Nominators do not have to be members of the Paleontological Society. The nominations should include: 1) nominee's full name, address, phone number (and email if available); 2) contact information for nominator; 3) certification by the nominator of the amateur status of the nominee; 4) description of the nominee's achievements in paleontology (not to exceed three pages); 5) three to five supporting letters and other documentation, which will be bound and presented to the awardee.

Please submit nominations by February 1, 2003, to William I. Ausich, Chair of the Strimple Award Committee (Dept. of Geological Sciences, 125 South Oval Mall, The Ohio State University, Columbus, Ohio 43210.

If you have questions, please contact William Ausich at the above address, call 614-292-3353, or email ausich.1@osu.edu.

Paleontological Society International Research Program - *Sepkoski Grants* For 2003

by Ron Parsley

The Paleontological Society is pleased to announce continuation of its small grants program for paleontologists living in Eastern Europe and republics of the former Soviet Union. For 2003, thirty grants of US $500 will be awarded. These grants will be made directly to individuals and not to institutions. Grantees will be selected by a committee of the Paleontological Society based on the quality and feasibility of the proposed research and quality of past achievement. Consideration will be given to paleontologists of all ages. Awards are now called **PalSIRP Sepkoski Grants** in honor of Dr. J. John Sepkoski, Jr., founder of the program. Dr. Sepkoski died at age 50 in 1999.

Applications for a *PalSIRP Sepkoski Grant* must include the following three items, all typed in English:

1. The cover sheet (downloaded from the Sepkoski Grant announcement on the internet) completely filled out and sent with the rest of the application.
2. Cover letter, stating the applicant's full name as it appears on the passport, passport number, date of birth, institutional affiliation, address, telephone number, FAX number, and *especially the e-mail address.* The letter should also provide names and addresses (including e-mail) of North American/European Community (exclusive of former Warsaw Pact countries) paleontologists familiar with the applicant's research; these persons will be used as references and contacted by the *Sepkoki Grants* Committee.
3. Research proposal, no longer than two pages, single-sided, providing a project title, a brief description of proposed research, its significance, and the general uses of the *PalSIRP Sepkoski Grant* funds. The subject matter covered by grant proposals may be in any field under the discipline of paleontology. Applicants should look over the *Journal of Paleontology* as a guide to acceptable topics. Appropriate ancillary uses of *Sepkoski Grant* funds include (but are not limited to) salary support, domestic and foreign travel, and equipment purchase. Requests for field expenses, publication costs, attendance at scientific meetings, and related aspects to any of these areas are acceptable. No detailed budget or accounting is required for the $500 grant.
4. Curriculum vitae (C.V.) listing birth date, education, current professional position, and all published papers, articles, and books. Additional information, such as employment history, awards, participation in international conferences and projects, etc., may be included.

These three items should be **sent by e-mail** (in Microsoft Word ***as a single attachment*** or plain-text) to the following address:

e-mail: parsley@tulane.edu

Proposals received prior to **31 March 2003** will be considered for 2003 funding. Proposals received after that date will not be considered. Proposals not written in English will be returned without consideration. Paleontologists living in the following countries are currently eligible for *PalSIRP Sepkoski Grants*: all republics of the former Soviet Union, including the Baltic States, Mongolia, and nations in Eastern Europe (other than East Germany), including Poland, the Czech Republic, Slovakia, Hungary, Romania, Bulgaria, Albania, and the countries of the former Yugoslavia. There is no limit to the number of times a paleontologist may apply for a PalSIRP *Sepkoski Grant* but only one application, per year, will be considered. **Applicants for the 2003 grant program are strongly encouraged to contact their North American/European Community referees by e-mail to determine their willingness to act as recomenders. It is also suggested that applicants send along a copy of their proposal to their referees for informational purposes.** The Paleontological Society asks all readers for their assistance in advertising *PalSIRP Sepkoski Grants.* Please send grant application information to your colleagues in Eastern Europe and the former Soviet Union.

Dr. Ronald L. Parsley
PalSIRP Sepkoski Grants
Department of Geology
Tulane University
New Orleans, LA 70118 USA

PalSIRP Recipients for 2002

Vitaliy Anistratenko: *Mollusca of Upper Miocene of Paraththyes* • National Academy of Sciences of Ukraine, Kiev, Ukraine

Olga Anistratenko: *Sarmatian archaeogastro-pods of the Ukraine* • National Academy of Sciences of Ukraine, Kiev, Ukraine

Alexandre Bannikov: *Middle Eocene fishes in the North Caucasus* • Paleontological Institute, RAS, Moscow, Russia

Jirí Bek,: *Carboniferous spore populations in the Czech Republic* • Geological Institute, AS CR, Prague, Czech Republic

Zdenka Brabcova: *Revision of the subclass Conularia based on Barrandian material* • Museum of West Bohemia, Pilzen, Czech Republic

Maria Bitner: *Pliocene brachiopods from the North Atlantic Province of Europe* • Institute of Paleobiology, PAS, Warsaw, Poland

Petr Budil: *A revision of the Lower Devonian dalmanitid trilobites of the Prague Basin* • Czech Geological Survey, Prague, Czech Republic

Doren-Soren Baciu: Natural Science Museum, *Upper Eocene-Oligocene fishes in East Carpathians, Tarcau Nappe • Romania,* Piatra Neamt, Romania

Natalia Goreva: *Conodont Succession at the Moscovian-Kasimovian Transition in East European Platform and Urals* • Geological Institute, RAS, Moscow, Russia

Sándor Gulyás: *Taxonomy, evolution, and paleoecology of Lake Pannon Planorbidae* • University of Szeged, Szeged, Hungary

Alexander Ivanov: *Dentition of Late Devonian-Early Carboniferous Elasmobranchs* • St. Petersburg University, Russia

Olga Kossovaia: *Upper Carboniferous and Permian non-dissepimental Rugose of the western Urals and Volga Urals region* • All-Russian Research Geological Institute, St. Petersburg, Russia

Martin Kundrát: *Studies on lambeosaurid hadrosaurs* • Charles University, Prague, Czech Republic

Elga Kurik: *Middle Devonian placoderm arthrodires* • Tallinn Technical Univer-sity,Tallinn, Estonia

Alexey Lopatin: *Middle Eocene insectivores from Mongolia* • Paleontological Institute, RAS, Moscow, Russia

Marcin Machalski: *The Gryphaea show goes on- new data from Kimmeridgian of Poland* • Institute of Paleobiology, PAS, Warsaw, Poland

Tiiu Märss: *Ultrasculpture on the exoskeleton of early agnathans and fishes* • Tallinn Technical University, Tallin, Estonia

Tamara Nemyrovska: *Middle Pennsylvanian conodonts and problems of correlation between Eastern Europe and North America* • National Academy of Sciences of Ukraine, Kiev

Evgeny Perkovsky: *The Rovno Amber: new lagerstätte – clue to understanding of amber faunas and new possibilities for stratigraphy* • National Academy of Sciences of Ukraine, Kiev

Evgenii Popov: *Study of the Middle Jurassic chondrichthyan fishes from Kostroma Province, NE Central Russia* • Saratov State University, Saratov, Russia

Sergei Rozhnov: *New Ordovician crinoids from the Baltic region* • Paleontological Institute, RAS, Moscow, Russia

Milos Siblik: *Middle Liassic brachiopods and development of brachiopod assemblages of the Northern Calcareous Alps* • Institute of Geology, AV CR, Prague, Czech Republic

Sverlana Syabryaj: *Palaeobotanical and palaeolandscape reconstructions on Tertiary amber bearing formation on the northwestern slopes of Ukranian Shield* • National Academy of Sciences of Ukraine, Kiev, Ukraine

Andrey Zhuravlev: *3D modeling of historical structure of conodont elements (Order Ozarkodinida)* • All-Russian Geological Research Institute, St. Petersburg, Russia

PS Grants-In-Aid Renamed in Memory of Stephen Jay Gould

In recognition of Stephen Jay Gould's contributions to the field of paleontology and to the Paleontological Society, the PS Council (June, 2002) approved the following motion: "The Paleontological Society Grants-in-Aid shall be renamed the Paleontological Society Stephen Jay Gould Grants-in-Aid."

Gould served as President of the Paleontological Society in 1987. His contributions to the field have been recognized by the Society in 1975 with the Schuchert Award and in 2002 with the Paleontological Society Medal (posthumously). Stephen Jay Gould was a consummate teacher with a deep concern for students. Thus the PS Council found the renaming of the student grants program to be a fitting way to honor his memory.

The Paleontological Society Stephen Jay Gould Grants-in-Aid support research by undergraduate, graduate, and postdoctoral students engaged in any field or aspect of paleontological research. Applications are due in February of each year. Grantees must be members of the Society.

The endowment for the Student Grants-in-Aid is currently worth $48,000, which provides only 17% of the funding for the annual awards totalling $14,000. Your generous gift to the Paleontological Society in memory of Stephen Jay Gould will help build the endowment from which Gould Grants are awarded and better secure the future of paleontology.

Paleontological Society Grants-in-Aid Awards, 2002

During 2002, the student grants-in-aid awards committee, chaired by Danita Brandt, with members Sandy Carlson, John Groves, and William Hammer reviewed 50 proposals from paleontology students in the U.S. and 5 foreign countries. The Society had funds to make 24 awards of $500.00, and two grants of $1,000 were awarded with funds provided by the Mid-America Paleontological Society. Grants were awarded to 1 undergraduate (of two who had applied), 6 of 15 Masters candidates, and 19 of 58 Ph.D. candidates. Additional information about the Grants-in-Aid as well as application material can be accessed at http://www.paleosoc.org/grantin.html.

The following students received funding:

Outstanding ($1,000 awards):

Kenneth Angielczyk UC, Berkeley
The critical role of *Dicynodon* in Permo-Triassic biostratigraphy

Julie Trotter Australian National University
Conodont geochemistry—proxies for understanding palaeonenvironments, bioevents and geoevents of the Palaeozoic

$500 awards:

Campbell, Matthew Indiana University
Systematics and Phylogenetics of Late Paleozoic Pyramidelloidea

DeSantis, Michael University of Cincinnati
A taphofacies model for Middle Cambrian trilobite assemblages from the Great Basin (Utah and Nevada) and southeastern Idaho

Dornbos, Steve Univ. of Southern California
The paleoecology of the Chengjiang fauna: Response of Early Cambrian benthic metazoans to increasing levels of vertical bioturbation

Dunn, Michael Ohio University
The Mid-Carboniferous floral break: A crucial and enigmatic episode in the evolution of the terrestrial ecosystem

Farke, Andrew SD School of Mines
Paleontology and palynology of the Lower Cretaceous Fall River Formation, South Dakota

Ferguson, Chad University of Cincinnati
Long-term changes in the spatial fidelity of time-averaged subfossil molluscan assemblages

Fitzgerald, Paul UC, Davis
Clade-based examination of extinction selectivity in terebratulide brachiopods

Fraiser, Margaret USC
Early Triassic bivalve takeover of marine benthic environments

Garcia, William University of Cincinnati
A phylogenetic analysis of Anthracosauria and implications for early tetrapod evolution

Gupta, S.Neal University of Bristol
Factors controlling the distribution and chemistry of fossils and sedimentary organic matter in Miocene diatomites at St. Bauzile, Ardeche, France

Harper, Jennifer UNC, Chapel Hill
Taxonomic and phylogenetic analysis of the Gastrochaenoidea (Mollusca, Bivalvia)

Hermsen, Elizabeth Cornell University
Fossil history of the Saxifragaceae *sensu stricto* and their woody relative, Cretaceous to Pleistocene

Hicks, Melissa UNLV
Correlating Early Cambrian archaeocyathan-built reefs across North America and China: influences on the global demise of archaeocyathan-built reefs

Huntley, John UNC, Wilmington
Testing escalation in preferred naticid prey from the Cretaceous through the Pleistocene, US gulf and Atlantic coastal plains

Kinchloe, April UC, Boulder
Diversity of spiders in amber

Mah, Chris University of Illinois
Evolution in the Goniasteridae: starfish phylogeny constrained by the fossil record

Manship, Lori Bowling Green St. University
Applications for paleontological classification of ammonitic sutures

Marcot, Jonathan University of Chicago
Evolutionary consequences of the radiation of the Ruminantia (Mammalia: Artiodactyla)

Rieboldt, Sarah UC, Berkeley
Upper Cambrian inarticulate brachiopods from the Great Basin

Tomescu, Alexander Ohio University
In situ land plant fossils in the Early Silurian (Llandoverian) Massanutten Sandstone of Virginia

Tumarkin, Allison Univ. of Pennsylvania
Evaluation of periosteal aging in the Canada Goose (*Branta canadensis*)

Turner, Alan University of Iowa
A new species of *Araripesuchus* from the Late Cretaceous of Madagascar: Implications for Gondwanan historical biogeography

Watson, Elizabeth UC, Berkeley
Paleoenvironment of a Holocene tidal marsh near San Jose, California

Zuykov, Michael St. Petersburg Univ., Russia
Porambonites and related brachiopod genera in the Ordovician of East Baltic

The Paleontological Society Distinguished Lecturer Program

By Christoper G. Maples, Councilor

Each year the Paleontological Society selects outstanding scientists whose works encompass a wide variety of paleontological topics as Paleontological Society Distinguished Lecturers. Each Distinguished Lecturer has national and international stature in paleontology, has traveled widely, and has published extensively. Each is also known as an excellent speaker who can communicate the interest and importance of their research topics. This program is intended to make available lecturers for inclusion in departmental speaker series or other college and university forums.

The Paleontological Society Distinguished Lecturers, topics, and short abstracts of presentations for the 2002-2004 academic years are listed below. Additional information is available on The Paleontological Society homepage at: http://www.paleosoc.org/speakerseries.html. If your department is interested in inviting one or more Distinguished Lecturer to your institution, please contact the speaker directly. Although financial arrangements must be made directly with each speaker, all Paleontological Society Distinguished Lecturers have agreed to be available on an expenses-only basis.

The Paleontological Society hopes that you take advantage of this opportunity. Paleontology is a dynamic discipline, and these speakers will certainly convey the excitement and timeliness of our science. If you have any questions regarding the Paleontological Society Distinguished Lecturer program, please feel free to contact me at: cmaples@indiana.edu.

ACADEMIC YEARS 2002–2003 DISTINGUISHED LECTURERS

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Simultaneous Illumination - Phylogenetic Approaches toward Crocodylian History

Crocodylians are often dismissed as “living fossils” little changed since they first appear in the

Mesozoic. Although a limited number of morphotypes have arisen during the group's history, crocodylian phylogeny is much more dynamic than often acknowledged. A phylogenetic approach reveals a complex biogeographic history. By considering both fossil and molecular estimates of divergence timing, the geographic distributions of most extant crocodylian lineages require the crossing of a major marine barrier at least once—for example, three different lineages crossed the Atlantic during the Late Tertiary.

Studies of diversity over time suggest that crocodylian diversity showed two diversity peaks—one in the Eocene, and another in the Miocene. A phylogenetic perspective reveals differences between these peaks. Clades with minimum origination dates in the Cretaceous or Early Tertiary are morphologically uniform, but geographically widespread. Crocodylian faunas during the early Tertiary tend to be phylogenetically composite. In contrast, crocodylian faunas of the later Tertiary tend to be more endemic. Climate change is usually seen as the primary agent behind crocodylian diversity changes over time, but increased separation between continental land-masses during the later Tertiary may have prevented widespread dispersal of specialized clades, allowing multiple endemic radiations to occur. This suggests that tectonics may be partially responsible for an increase in crocodylian diversity early in the Neogene.

A phylogenetic perspective enhances our interpretation of temporal patterns, because the biogeographic details recovered from the calibrated phylogeny are not evident from counts of taxa over time. And re-examination of curated specimens is critical for the recovery of these patterns, as taxonomic philosophies have fluctuated over time, and published classifications may not mirror phylogenetic relationships. (Talk can be given for general, intermediate, and specialist audiences)

The Science of Sue

The skeleton of FMNH PR2081 (popularly known as "Sue") is the largest, most complete, and best preserved *Tyrannosaurus rex* ever collected. It reveals structures thought to be absent from tyrannosaurids and other derived theropods (such as a proatlas arch), but also suggests that some features thought to be present in tyrannosaurids were not present at all (such as the bony sternum). There are several abnormalities, including healed fractures in the trunk ribs and fused caudal vertebrae that appear not to result from fracture. Exostotic bone in the fused caudals grew around caudal muscular bands, preserving a natural mold of the tail musculature. None of the abnormalities on the jaw are healed bite marks.

A high-resolution computed tomographic (CT) analysis of the skull generated 748 2-mm-thick slices. Inspection of both the raw slices and 3-D models generated from them allowed the preparation team to see obscured objects before they were manually exposed. These images reveal internal details not previously accessible in intact tyrannosaurid skulls, such as the ossified medial wall of the maxillary antrum and the internal morphology of the pneumatic recesses, which may have communicated with pneumatic chambers in the neck vertebrae. They also permit the creation of a digital endocast that goes beyond those made through destructive means by preserving nerve pathways all the way through the braincase and internal details of the otic capsule. It reveals an interesting combination of ancestral and derived features relative to the brains of living dinosaurs and other archosaurs. The endocast confirms the presence of a large olfactory nerve and reveals greatly enlarged olfactory bulbs relative to those in other nonavian theropods, suggesting that smell was emphasized in the sensory repertoire of *Tyrannosaurus*.

A chevron bone was found during preparation that fits between the first two tail vertebrae. The absence of this bone was one reason "Sue" was thought to be female. A close examination of other criteria used to sex dinosaurs reveals further interesting complications. (Talk can be given for general, intermediate, and specialist audiences)

Differing Temporal Expectations for Crocodylian Phylogeny: Molecules versus Stratigraphy

Different sources of temporal information—the stratigraphic distribution of fossils and molecular distances between extant species—can yield very different estimates. These do not represent "conflict" in the same sense that different data sets may support different trees, as temporal estimates are limited by known incompleteness (the fossil record) and labile assumptions (a priori estimates of molecular evolutionary rate). Moreover, disparity may result more from failure to address the same phylogenetic question with different data sets.

Different temporal predictions for crocodylian phylogeny illustrate all of these points. In the most famous disparity, fossils have long been used to indicate a Mesozoic divergence between *Gavialis gangeticus* (the Indian gharial) and any other living crocodylian, whereas molecular distances have suggested divergences as recently as 20 million years. Reevaluation of the fossil evidence makes any divergence in the Cenozoic unlikely, and this disparity may result in large measure from an invalid assumption of clocklike evolution over the entire group. Other comparisons calibrated by fossils - especially among caimans—suggest unreasonably high rates of molecular evolution, and indicate the presence of significant ghost lineages in the fossil record. Addition of new fossil information can recalibrate hypothesized rates of evolution, and the degree of revision can depend not only on the temporal distance between fossils, but on the distance between the relevant fossils and the Recent.

Finally, some indicated disparities stemmed from a lack of rigorous phylogenetic hypotheses for some fossil groups. Molecular distances indicated a Late Tertiary divergence within the widespread genus *Crocodylus*, long thought to be an ancient group; close examination of fossils assigned to *Crocodylus* instead suggests a divergence among living *Crocodylus* no earlier than the Miocene. (Talk can be given for general, intermediate, and specialist audiences)

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Coastal Plain Stratigraphy: It Isn't Just Layers Any More (and Probably Never Was)

Studies over the last two decades in the stratigraphy of the Atlantic Coastal Plain have shown that simple models of stratigraphic units (and their related aquifers and confining units) being thicker downdip and pinching out updip are seldom accurate. Discontinuous lenses of sediments are as common as simple continuous layers, and wide thickness variations are the norm. Current work in South Carolina has led me to speculate that anomalous patterns of erosion preserved in Paleocene and Eocene sediments represent scour caused by an eddy system of the predecessor of the present Gulf Stream. I will also bring up any new developments in the ongoing study of the stratigraphy of the sediments filling the Chesapeake Bay impact structure. (Semi-technical, for stratigraphers and hydrologists)

Biostratigraphy, Paleoecology, and Biogeography: What's Signal? What's Noise?

Biostratigraphers love the lowest and highest stratigraphic occurrences of taxa (FADs and LADs). But not all FADs and LADs are created equal. In any given stratigraphic succession, some taxa first occur because they evolved in that area at that time. Others first occur for purely ecological reasons or due to immigration. Instead of bemoaning the ecological misfits, we should use them, but not for biostratigraphy. The technique of graphic correlation is explained. I demonstrate how it easily tests the hypothesis of synchroneity. Nonsynchronous FADs and LADs should immediately be excluded from further consideration for correlation. But they should not be excluded from the overall analysis. A diachronous event cries out for paleoceanographic, paleoecological, or post-depositional interpretation. Dinoflagellates from the Miocene of Florida illustrate concepts such as climatically influenced patterns of immigration. (Semi-technical, for geologists and paleontologists)

Dinoflagellates: My Favorite Fossils

Dinoflagellates are organisms that cause red tides in modern seas. The dinoflagellate *Pfiesteria* has been called the "cell from hell" by the news media. Dinoflagellates are common in the fossil record from the Late Triassic onward. In many instances, when the sediments are too far downdip to have good pollen and too far onshore to have a good calcareous microfossil assemblage, dinoflagellates provide key biostratigraphic and paleoecologic information. (Not too technical, for geologists and biologists, and interested amateurs—everyone will learn something)

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Is the Late Ordovician Mass Extinction an Artifact of Stratigraphic Resolution?

The Late Ordovician mass extinction was contemporaneous with rapid advance and retreat of continental glaciation in Gondwana. Integrated, multidisciplinary, high-resolution study of shelf and basin stratigraphic successions in central Nevada and comparison with data from other tropical paleoplates indicate that, while habit loss and resulting pulses of extinction were driven by rapid glacioeustatic sea-level and associated oceanographic changes, extinctions were gradual, diachronous, and sporadic. The Late Ordovician was a time of major biotic crises, but not of sudden global extinction.

An Actualistic Model of Graptolite Biogeography

The Finney-Berry model of graptolite biogeography views graptolite biogeography from a new perspective, focusing attention on the habitat in which graptolites flourished rather than on the differentiation of faunas into provinces and biofacies. It emphasizes the dynamic and ephemeral nature of graptolite habitats, in contrast to previous models in which graptolite faunas were segregated laterally by water-mass specificity or vertically by depth zonation into rather static biotopes. Moreover, the Finney-Berry model has important implications with regard to dispersal, provincialism, and the nature of the graptolite record.

Gold, Graptolites, and the Paleogeographic Affinity of the Roberts Mountains Allochthon

Graptolite faunas of the Pacific Province were first described in large part by Australian paleontologists of the late 19th and early 20th centuries, because graptolite biostratigraphy was critical for recognizing structures and thus directing exploitation of the Victorian gold fields. A similar situation exists today in the Carlin Trend of north central Nevada where annual gold production approaches 5 million ounces. Gold is hosted largely by Silurian-Devonian carbonate rocks of the lower plate of the Roberts Mountains thrust, but ore bodies in surface outcrops of lower plate rocks have largely been exploited. Future exploration efforts are now in areas where lower plate rocks are covered by the Roberts Mountains allochthon, composed of a thick, structurally complex, poorly exposed, deep-water, stratigraphic succession of Cambrian-Devonian age. Exploration efforts require that these rocks be mapped to determine depth to lower plate rocks and through-passing structures; geologic mapping is dependent on understanding the stratigraphic succession; and graptolite biostratigraphy has proven to be the most effective means of reconstructing the stratigraphy and recognizing distinctive stratigraphic intervals. Reconstruction of the stratigraphic succession and comparison with the coeval rocks of the lower plate demonstrate that the Roberts Mountains allochthon is not an exotic terrane. Its stratigraphic succession accumulated in deep-

water outboard of the carbonate platform along the Cordilleran margin of Laurentia, and several distinctive sedimentological event can be recognized in both the basinal and platform successions.

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Events at the Cenomanian-Turonian Boundary: The Dissection of a Mass Extinction

The Cenomanian-Turonian boundary has long been recognized as an interval of major biotic change, and is coeval with one of the largest rises in sea-level to have occurred in the post-Palaeozoic. The association between mass extinction in the marine realm and sea-level change is well documented, but perplexing, since it seems implausible that sea-level change could actually cause a major extinction. However, large scale cycles of sea-level change can and do alter the ratio of shallow to deep marine continental shelf deposits preserved in the rock record both regionally and globally. Events around the Cenomanian-Turonian boundary in western Europe are reviewed in terms of geographical and ecological patterns and a phylogenetic framework for sea urchins is used to investigate the roles of sampling and extinction in deriving these patterns. This approach introduces a surprising degree of uncertainty about the size, duration and even the reality of the mass extinction event.

Megabias in the Marine Fossil Record and Its Implications for Charting the Geological History of Diversity

Patterns of origination, extinction and standing diversity through time are inferred from tallies of taxa preserved in the fossil record. This approach generally assumes, however, that sampling of the fossil record is effectively uniform over time. Although recent evidence suggests that our sampling of the available rock record has been very thorough, there is also overwhelming evidence that the rock record available for sampling is itself distorted by major systematic biases. Data on rock outcrop area compiled for post-Palaeozoic sediments from western Europe at stage level show a strongly cyclical pattern corresponding to first and second order sequence stratigraphical cycles, and changes in standing diversity and origination rates over timescales measured in 10s of millions of years turn out to be strongly correlated with surface outcrop area. Many of the taxonomic patterns that have been described from the fossil record conform to a species/area effect. Whether this arises primarily from sampling bias, or from changing surface area of marine shelf seas through time and its effect on biodiversity remains problematic.

The Paleobiology of Echinoids

Echinoids have a wonderfully complex endoskeleton that is a trove of information for palaeobiologists. Their skeletal ultrastructure provides a means of reconstructing soft tissue with confidence and the microarchitecture of structures such as tubercles and pore-pairs can be analyzed in terms of their biomechanical function. This talk will review the sorts of evidence that can be called upon when trying to reconstruct the autecology of fossil echinoids.

ACADEMIC YEARS 2003–2004 DISTINGUISHED LECTURERS

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The Ecology of Pennsylvanian-age Tropical Coal Swamps

Tropical peat-forming environments, or mires, were among the most prominent features of Late Carboniferous terrestrial landscapes. These habitats were home to a unique wetland flora that specialized in low nutrient conditions and high water tables. The dominant plants comprise five major groups. The bizarre tree lycopsids were spore-producers, dominant during the Early and Middle Pennsylvanian; they are bark supported and similar to colonial organisms in construction. The spore producing marattialean tree ferns dominated Late Pennsylvanian mires; they are root supported. Other locally important groups were the seed-producing medullosans and cordaites, and the spore producing sphenopids. Major extinctions at the Middle-Late Pennsylvanian boundary entirely restructured these mires and led to a major decline in wetland landscape heterogeneity. The ecology of this transition reveals lottery-like dynamics, the ascendancy of opportunists, and shortening of resource gradients.

Decline and Fall of the Primeval Forest: Rainforest Replacement During the Permo-Carboniferous Transition

The transition from the Carboniferous to the Permian brought about major vegetational changes in the tropics, reflective of long term trends in warming and drying. These changes correspond, in part, to the termination of southern hemisphere glaciation. During this transition, a tropical wetland biome is replaced by a biome characteristic of seasonally dry conditions. The two biomes share few species in common, and the transition begins episodically during the Late Pennsylvanian. By the later Early Permian, a third biome can be detected, yet more adapted to xeric conditions, that replaces the seasonally dry biome, and that contains a number of precocious “Mesozoic” taxa. The plants of each subsequent biome are progressively more derived evolutionarily, suggesting a strong relationship between landscape position and evolutionary innovation in the terrestrial biosphere.

Evolutionary Assembly and Dynamics of Tropical Forests During the Paleozoic

The major classes of vascular plants appear during the Middle to Late Devonian. These classes represent distinct body plans. They also occupy different parts of the lowland resource gradient. Lycopsids occupy wetlands. Seed plants occupy terra firma settings. Sphenopsids are most abundant in aggradational environments. Ferns are opportunistic weeds. This pattern develops as the groups begin to appear and is set by the early part of the Carboniferous, probably contributing to the termination of evolutionary innovation at the class-level scale of architectural distinctiveness. The overlap of high-level phylogenetic lineages with ecological centroids is unique to the late Paleozoic and confers a distinct constraint on ecosystem dynamics that lasts through the Carboniferous and into the Permian. Incumbent groups retain their ecological dominance within their respective spheres until environmentally induced extinctions eliminate or significantly reduce their "hegemony," opening up resources for colonization by members of other groups. The ultimate rise of seed plants to dominance in many kinds of environments was made possible by these extinctions rather than inherently superior biology.

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Tales from the Clam: What You Can Learn about Climate, Growth, and Ancient Seawater from Multi-Annual Records Archived in Molluscan Shells

Improvements in our ability to incrementally sample accretionary carbonates at very high resolution have opened the door to many fruitful avenues of research. Biogenic carbonates from long-lived macrofauna are ideal for this approach, for they record in their shell chemistry the changing conditions experienced throughout the lifetime of the animal. Stable isotopic profiles across multi-year growth trajectories go beyond the single analyses typical of microfossil research and can therefore yield estimates not only of mean temperature but also of seasonality, a crucial variable controlling the biogeographic distributions of organisms today. In addition, these records provide a clock by which to measure the changing growth rates of organisms, and hence can provide the information often needed for ecological and evolutionary studies. A smorgasbord of recent research on clam chemistry illustrates the applications of this approach to studies of past climate, ontogeny (life history), and the composition of ancient oceans.

The Eocene-Oligocene Transition – Insights to Climate Change and Causes of Mass Extinction from Stable Isotope Analyses of Biogenic Materials

From both a biological and climatological perspective, the Eocene-Oligocene transition is one of the fundamental turning points in Cenozoic earth history. Global cooling brought on by tectonic and oceanographic changes took place on both gradual and episodic time scales, and affected the global biota in a variety of ways, culminating in mass extinctions at both the middle-late Eocene and Eocene-Oligocene boundaries. Stable oxygen isotopic analyses of molluscan shell and fish otolith carbonate reveal the pattern of climate change throughout this transition, in terms of both mean annual temperature and seasonality. Ongoing research in the US Gulf Coastal Plain, the Antarctic Peninsula, and the Belgian Basin highlight differences in the pattern of climate change from low to high latitudes. High-resolution data from the Gulf Coast in particular suggest a causal link between increasing seasonality, cooler winters, and the ongoing faunal extinctions.

Perspectives on the Current Status of Long-Term Faunal Stability... Is Coordinated Stasis Still Coordinated?

Coordinated stasis is a pattern of taxonomic and ecologic stability of faunal assemblages over geologic time proposed to typify the record of many shallow shelf sequences. The suggestion that patterns of punctuated equilibria may characterize not only the morphological evolution of species but also the sorting of taxa into relatively stable long-term associations was met with initial skepticism, some of it rather acerbic. If such a pattern can be substantiated, however, the implications are significant and far-reaching for paleobiology and ecology. Since its introduction, workers in various areas of paleontology have conducted studies that have bearing on the issue. Data from the Paleogene of the US Gulf Coast and the Devonian of New York illustrate the complexity of the problem.

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The Latitudinal Diversity Gradient – The Past is the Key to the Present

Understanding the factors that influence biodiversity remains the central issue of the life-sciences. This is true more than ever, given the alarming rate of extinction in the Recent. As such, paleontology needs to attack the relevant problems of biodiversity at all scales of space and time. The latitudinal diversity gradient, in which the number of species decreases away from the Tropics, is arguably the most widely-recognized and well-studied pattern of biodiversity. The diversity gradient is recognized among both plants and animals, and both on land and in the ocean. Understanding the gradient would be a major step forward in understanding diversity. But, despite over a century of research, there still are a dozen or more competing hypotheses to explain the pattern. Although several studies have demonstrated that the latitudinal diversity gradient exists at different points in time during the Phanerozoic, few

studies have examined how the gradient changes *through* time. Such a deep-time approach provides an opportunity to test some of the competing hypotheses in a manner unavailable to the ecologist. An example using Carboniferous brachiopods suggests that (a) the latitudinal diversity gradient probably is not simply a function of diversification and expansion away from the Tropics, and (b) that the study of diversity gradients may be a useful, new tool for inferring paleoclimate.

Escalation in the Paleozoic: A 400 Million Year Old Murder Mystery

Escalation, the hypothesis that a species' enemies get progressively more dangerous through time and so become the primary agents of natural selection, may be a fundamental explanation for observed evolutionary and ecological patterns. However, virtually all of the hard evidence supporting escalation has come from the Cretaceous to Recent. Study of Paleozoic predator-prey systems, which involve taxa related only distantly to modern predators and prey, provides a second, independent, test of whether escalation can be generalized as an evolutionary "law". During the mid-Paleozoic, predation appears to intensify, and plausible prey taxa seem to adapt to this increase. But is this general pattern rigorous proof of escalation? The present work illustrates some of the problems inherent in analyzing predation in the fossil record, as well as techniques to solve those problems. The current results provide insight into escalation in the mid-Paleozoic at multiple scales, from detailed bed by bed analysis of prey morphology and traces of predation to global trends in diversity, morphology, evolution, and extinction.

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Quantitative Modeling of Taphonomy and Time-Averaging: Beating the Odds to Create a Fossil Record

The distribution of shell ages in a marine deposit places a limit on the temporal resolution of questions that can be addressed using fossil material. In modern marine settings, shell ages can range over 100's to 1000's of years despite extremely rapid rates of destruction. Although time-averaging can obscure short-term variations, it can also serve to filter random "noise", thereby increasing the strength of long-term conditions during accumulation. In order to take full advantage of time-averaging, it is necessary to understand the processes that influence how fossils accumulate and to develop a sampling strategy that takes account of the time-averaged nature of the fossil record. The age range of modern shells is thought to be due to mixing of recent shells with sub-fossil material from below the taphonomically active zone (TAZ) but above the depth of final burial (DFB). The degree of stratigraphic mixing and the effectiveness of taphonomic destructive processes can be modeled stochastically to determine their influence on shell age distributions. This simple quantitative model provides a basis for predicting the degree of time-averaging in different settings where different sedimentary and taphonomic processes operate. In addition, the model provides a means of examining long-term reworking rates in different settings based on the distributions of shell ages. Lastly, a simple sampling strategy based on binomial probabilities indicates that even very modest samples (as low as 29 specimens) can provide information on the range of ages in a fossil accumulation. In order for fossil data to make full use of the "noise filtering" property of time-averaging, a sample should include individuals from the full range of the age distribution. Sufficient sample sizes are therefore relevant for not only actualistic study of shell age distributions, but also to make sure that ancient fossil accumulations, whose age distributions cannot be evaluated directly, are sufficient.

Testing for a Relationship Between Paleocommunity Recurrence and Taxonomic Turnover

The connection between ecological community structure and rates of evolutionary change is of long-standing interest to ecologists and paleoecologists. Such a relationship could have profound influence on diversity at both global and regional scales with significance for patterns of coordinated stasis and onshore-offshore origination and extinction gradients. In order to test for a relationship between ecological structure and evolutionary change, it is necessary to measure both in more than one community. This was undertaken using brachiopod and bivalve assemblages of the Pennsylvanian-Permian Midcontinent (focusing on Kansas and Nebraska). The study interval has a strongly cyclic ("cyclothemic") stratigraphic architecture that provides a temporal framework of sequence stratigraphic units significantly finer than the duration of the average species. In addition, paleoecological analysis indicates that the two groups examined, bivalves and brachiopods, were segregated environmentally – bivalves favored nearshore settings while brachiopods favored settings that were more open-marine. Community structure in each of these two biofacies was evaluated quantitatively by measuring the degree of recurrence of genus associations between fourth-order depositional sequences (genetic stratigraphic packages bounded by unconformities). Bivalve-dominated and brachiopod-dominated communities do not show a significantly different degree of recurrence in this case. Using compiled literature, museum, and field data, taxonomic turnover (change in taxonomic composition through time) was also evaluated for both groups. Although they do not show significantly different degrees of background turnover, they do show significant differences in episodic turnover: bivalves experienced a regional first appearance event during the lower Missourian and brachiopods underwent a regional extinction event during the lower Wolfcampian. Despite showing no difference in community structure (as measured by recurrence), the two paleocommunities have different histories of regional turnover, suggesting that community structure and change in taxonomic composition through time are not closely related in this case.

Stratigraphic Architecture of an Icehouse, Epeiric Platform: Climatic and Eustatic Influences in the Pennsylvanian-Permian Suc-

cession of the Midcontinent

The Late Pennsylvanian to Early Permian was a time of global, high-amplitude, and high-frequency glacioclimatic and glacioeustatic changes analogous to those of the Quaternary. The epeiric platform of the North America Midcontinent preserves a high-resolution record of the influence of these changes on depositional environments in a near-equatorial setting. The investigated interval includes the upper Wabaunsee, Admire, and lower Council Grove Groups in Kansas and Nebraska (~2.5 m.y.), where detailed outcrop study revealed a hierarchy of stratigraphic cycles. The finest level of cyclicity is represented by 51 meter-scale cycles with an average duration of 50,000 years. These high-resolution cycles are bounded by subaerial unconformities in nearshore settings and correlative conformities in offshore settings – i.e., they are very thin depositional sequences. Their lowstand systems tracts, observed only in the nearshore, are expressed as sandy, incised valley fills. Their transgressive systems tracts, which are dominated by carbonate deposition in both nearshore and offshore settings, can include nearshore evaporites, indicating relatively arid climatic conditions. Their highstand systems tracts, which are dominated by siliciclastic deposition in both nearshore and offshore settings, can include thin but persistent coals within deltaic coastal successions, indicating relatively humid climatic conditions. Within a single cycle, paleosols show evidence of return from relatively humid to relatively arid conditions during formation of the cycles' bounding surfaces. The meter-scale cycles in the study interval are stacked into five deepening-shallowing composite sequences, each bounded by large-scale angular unconformities. The stratigraphic framework developed here reveals that carbonate- and siliciclastic-dominated facies suites alternated through each meter-scale cycle in a non-Waltherian manner due to co-occurring climatic and sea-level changes. Relatively arid conditions coincided with times of fifth-order eustatic lows, whereas relatively humid conditions coincided with times of fifth-order eustatic highs. This is analogous to changes in monsoonal circulation through the Holocene, suggesting that cyclicity of this type, displaying coincident change in sea-level and climate, may be a common trait of platforms at times of icehouse global climate.

NEW BOOKS FOR REVIEW

This section of the newsletter includes lists of books and reviews received by the Books Review Editor for the Paleontological Society. Volunteered reviews will be accepted if concisely written and of general interest. Books listed may be requested for review with the understanding that the resultant review will be ready for publication of the next issue of *Priscum*. Contact the Book Review Editor: Greg Retallack, Department of Geological Sciences, University of Oregon, Eugene, OR 97403-1272: gregr@darkwing.uoregon.edu.

Bassett, M.G., King, A.H., Larwood, J.G., Parkinson, N.A. and Deisler, V.K., 2001, A FUTURE FOR FOSSILS. National Museum of Wales, Cardiff, 152 p., £14.50 (paper).

Carter, D.R. and Beaupré, G.S., 2001, SKELETAL FUNCTION AND FORM: MECHANOBIOLOGY OF SKELETAL DEVELOPMENT, AGING AND REGENERATION. Cambridge University Press, Cambridge, 318 p, $80.00 (cloth).

Dewing, K., 1999, LATE ORDOVICIAN AND EARLY SILURIAN STROPHOMENID BRACHIOPODS OF ANTICOSTI ISLAND, QUEBEC, CANADA. Palaeontographica Canadiana, No. 17, 143 p., $62.00 (paper).

Dunlop, D.J., and Özdemir, Ö., 2001, ROCK MAGNETISM: FUNDAMENTALS AND FRONTIERS. Cambridge University Press, Cambridge, 573 p., $49.95 (paper).

Eckhardt, R.B., 2000, HUMAN PALEOBIOLOGY. Cambridge University Press, Cambridge, 350 p., $80.00 (cloth).

Harbaugh, J.W., Watney, W.L., Rankey, E.C., Slingerland, R., Goldstein, R.H., and Franseen, E.K., editors, 1999, NUMERICAL EXPERIMENTS IN STRATIGRAPHY: RECENT ADVANCES IN STRATIGRAPHIC AND SEDIMENTOLOGIC COMPUTER SIMULATIONS. Society of Economic Paleontologists and Mineralogists Special Publication No. 62, 362 p., member $120.00, nonmember $170 (cloth).

Harris, P.M., Saller, A.H., and Simo, J.A.T., editors, 1999, ADVANCES IN CARBONATE SEQUENCE STRATIGRAPHY: APPLICATION TO RESERVOIRS, OUTCROPS AND MODELS. Society of Economic Paleontologists and Mineralogists Special Paper no. 63, 421 p., member $105.50, non-member $148.00 (cloth).

Hobbs, P.V., 2001, INTRODUCTION TO ATMOSPHERIC CHEMISTRY. Cambridge University Press, Cambridge, 262 p., $69.95 (cloth), $24.95 (paper).

Hodge, P., 2001, HIGHER THAN EVEREST: AN ADVENTURER'S GUIDE TO THE SOLAR SYSTEM. Cambridge University Press, Cambridge, 247 p., $27.95 (cloth).

Levinton, J.S., 2001, GENETICS, PALEONTOLOGY AND MACROEVOLUTION (2nd edition). Cambridge University Press, Cambridge, 617 p, $150.00 (cloth), $54.95 (paper).

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BOOK REVIEWS

DINOSAUR IMPRESSIONS, POSTCARDS FROM A PALEONTOLOGIST, by Philippe Taquet (translated by Kevin Padian), 1998, Cambridge University Press, Cambridge, 244 p., $45.00 (cloth) $17.00 (paper)

In the past two decades, dinosaurs have become big business. All three *Jurassic Park* movies made hundreds of millions of dollars. Dinosaur paraphernalia is on sale everywhere, yet none of the profits go to supporting dinosaur research. The cable channels now carry science documentaries full-time, with frequent dinosaur programs on PBS, Discovery Channel, Science Channel, and others. Each of these documentaries tend to glamorize dinosaur research (as if that were the only aspect of paleontology), and a small handful of scientists have become media stars by their frequent appearances on such shows.

In this context, it is worthwhile to step back and realize the debt that today's dino-superstars owe to the previous generation of scientists who did not benefit from dinomania, but worked in relative obscurity and did not have camera crews recording their every move. Foremost of these is the French paleontologist Philippe Taquet, who spent most of his career at the National Museum of Natural History in Paris, and even served as its director. Back when dinosaur hunting was much less glamorous and well funded, Taquet was one of the few individuals braving harsh conditions in some of the remotest corners of the Earth to find new dinosaurs, and to fill in gaps of our knowledge of dinosaurs on several continents. In the late 1960s and early 1970s, he mounted a series of expeditions to the Sahara Desert in countries that were once part of French West Africa, especially Morocco, Algeria, and Niger. Twenty years before American paleontologists visited the region, Taquet discovered the first dinosaurs from the Lower Cretaceous of Niger, including the sail-backed iguanodont *Ouranosaurus* and previously unknown large sauropods. He followed this discovery with that of the gigantic crocodile *Sarcosuchus*, which has been much publicized recently when another scientist found additional specimens (the press seldom gives credit to Taquet's original discovery of the taxon, and acts as though the later American scientist was the first to find this amazing crocodile.). His next discovery was in the High Atlas Mountains of Morocco; once described, it became one of the largest sauropods found (since surpassed by even bigger sauropods elsewhere). All of these discoveries received credit in the French press over 30 years ago, and then were forgotten except by the specialists (or more likely, seldom noticed in the English-speaking world).

And that is a great pity, because Taquet is a great writer and storyteller, recounting both the trials and tribulations of field work in such hostile, forbidding, remote places, yet leavening his account with humorous anecdotes as well. His writing is graceful and fluidly written (in this excellent translation by Kevin Padian). Taquet manages to introduce the necessary scientific background when appropriate, without writing above the head of the intelligent layperson. Reading this book gives a valuable perspective on all the recent books by younger dinosaur specialists who act as if they were the first to travel abroad and find specimens in exotic places.

And what amazing places Taquet has worked! Not just western Africa, but several trips to Mongolia (long before the current stampede of American paleontologists), and even an expedition to Laos in the early 1990s (after the conflict over southeast Asia finally ended). Taquet's trips to Laos were like many of his others. He followed the early French geologists who, while doing reconnaissance mapping of the region, casually mentioned large bones in their report. Taquet then tracked down the exact spot where the bones had been found and made many more important discoveries. Each of these regions (Niger, Morocco, Laos, and so on) was relatively unknown so far as the paleontology of its Mesozoic faunas went, but thanks to Taquet, they are now important parts of the Mesozoic biogeographic puzzle.

Not surprisingly, the book is thoroughly French not only in its original language, but its attitude and ideas. When Taquet discusses ideas in geology, systematics, biogeography, and mass extinction theory, he clearly is more familiar with the ideas of his French colleagues than he is with the wider literature of the English-speaking geological community. For example, those of us who know the standard accounts of the early days of plate tectonics will be surprised to read Taquet's perspective on Xavier le Pichon's contribution versus those of American and British researchers who receive greater credit in the Anglophone world. His final chapter gives a history of the discovery of dinosaurs in Europe, with French scientists (justifiably focusing on Cuvier) given a lion's share of the credit. His account of the K-T extinction debate is conservative and clearly skeptical of the huge amount of research supporting the impact model (even for a survey written in 1994). The author and translator have compensated for this additional new information by adding an "Afterword" section that updates some of the post-1994 pre-1998 developments in dinosaur paleontology. Some of this skepticism toward the asteroid

impact model may reflect the inherent attitude of the entire vertebrate paleontology community, but it does seem as though Taquet is not as aware of this literature as those of us who read *Nature* and *Science* regularly.

These quibbles aside, this book is a "must-read" for anyone interested in dinosaurs, their discovery, and their discoverers. It is a valuable antidote to the current celebrity-driven version of dinosaur paleontology, which gives all the credit to a handful of glamorous media stars who are merely following in the footsteps of people like Taquet.

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GEOSPHERE-BIOSPHERE INTERACTIONS AND CLIMATE, edited by Lennart O. Bengtsson and Claus U. Hammer, 2001, Cambridge University Press, Cambridge, 302 p., $75.00 (cloth).

News of the death of the Gaia hypothesis was evidently exaggerated, because this slim edited volume revives many of its core issues. Martin Heiman for example begins with, "The climate of the earth is, to a considerable degree, controlled by the terrestrial biosphere". Iain Prentice in his contribution details, then summarizes, " The variety of conceivable interactions among the atmosphere, terrestrial biosphere and oceans is evidently vast. To establish which processes may be really important", well, that is really the question! Most authors in this collection shy away from that big question, although carbon dioxide does get a lot of attention. All fail to mention Gaia, taking a more empirical approach than James Lovelock, who has revised his Gaia hypothesis for the twenty first century with more of a carbon cycle approach in a beautifully illustrated volume published by the Gaia Society in 2000.

Many of the contributions are well summarized by David Schimel's memorable chapter opening, "Earth Systems Models have become a holy grail of the earth sciences". The religious fervor, arcane terminology and central mysteries of modeling are all explained in loving detail. I particularly enjoyed André Berger's modelling of carbon dioxide, sea level and vegetation in paleoclimatic fluctuation on Milankovitch time scales, which presented a variety of alternatives, and concluded that carbon dioxide is needed to augment temperature variations due to insolation.

Other contributions are reviews written for a general audience. Especially recommended are Paul Crutzen's account of disaster narrowly averted in the Antarctic ozone hole, Wallace Broecker's outline of the limits of oceanic carbon sequestration for the near future, Stephen Schneider's summary of the greenhouse effect and global warming and James Kasting's summary of atmospheric evolution from a Precambrian and planetary perspective.

Individual snippets of interest abound, for all the emphasis on the big picture. Meinrat Andreae, for example, points out that terpenes, and other volatile substances, released in great quantities naturally by plants to create the appearance of "blue mountains" the world over, are oxidized to low volatile aerosols by ozone from human NO_x pollution. Although the atmospheric effects of aerosols are complex, generally they produce climatic cooling.

This book is the result of a conference sponsored by the Pontifical Academy of Sciences in Rome November 9-13 1998. It seems ironic that such sophisticated and forward-looking science could be sponsored by such a traditional organization, when such technologically advanced nations as the United States refuse to ratify the Kyoto Protocol. This book is the state of the art on global change, with its references as young as 2000. Catch it while it lasts.

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THE FOSSIL VERTEBRATES OF FLORIDA, edited by Richard C Hulbert, 2001, University Press of Florida, Gainesville, 350 p. $39.95 (cloth).

This charming and beautifully illustrated volume takes us right to the details of Florida's fossil vertebrate record, yet fills in much general background of vertebrate evolution and osteology. It began as a series of pamphlets for the general public, and still retains much of the flavor of a general guide, including particular attention to differentiating criteria that come from years of museum experience. Yet it also is fully referenced, and does not shy from giving conflicting taxonomic interpretations. As a result it is an invaluable guide to the professional as well as amateur. I found it very helpful in identifying my own collections from the aptly named Bone Valley District and in my own research on late Miocene mammal fossils from eastern Oregon. It lays out very clearly why it is so difficult to identify isolated hipparionine horse and gomphothere teeth.

What Florida lacks in geological depth, with vertebrate-bearing rocks going back only to Eocene, it makes up for in breadth of fossil groups little known elsewhere. Particularly impressive is the state's fossil record of sharks, frogs, snakes, birds, bats and xenarthrans. The account of shark and ray teeth and spines captures well the biological diversity of this group and their intraspecific variability within the tooth bands of individuals and between the sexes. Large triangular shark teeth are commonly referred to *Carcharodon megalodon* and assumed to be related to great white sharks, but an alternative assignment, explained but not favored in this volume, is assignment to *Cacharocles* and relationship with extinct mako sharks (*Isurus hastalis*). The early Miocene (18 Ma) frog fauna of Thomas farm includes 13 species in all five families now living in Florida. Florida's fossil snakes are known largely from vertebrae, but range in age back to Eocene, and several diverse faunas are known from the Miocene on. Fossil birds also are diverse at Thomas farm, which has yielded anhinga, kite, chachalaca, turkey, dove, ibis, hawk, rail, barbet, roller-like bird and several passerines. A giant flightless bird (*Titanis walleri*) is known

from the late Pliocene site near Inglis. Best known is the bird fauna of 40 species from the Pliocene of Sarasota, including 130 articulated skeletons of the cormorant (*Phalacrorax filyawi*), perhaps killed by a red tide. Living Florida bats are all vespertilionids, but the fossil record back to the Oligocene includes vampire bats and three other families. Florida is especially famous for its xenarthrans (better known to me at least as edentates), which include armadillos, pampatheres, glyptodonts and sloths. Although commonly identified with Florida, these presumed South American immigrants arrived there only 9 million years ago.

I personally find the term "non-avian dinosaur" irritating, but for literary stylistic, rather than cladistic theoretical reasons. This term is not used in this book, which dismisses dinosaurs as unknown in Florida. Cladistic reasoning does intrude though, in the inclusion of birds as reptiles. The discussion of this point is an admirable outline of bird ancestry, but I warm to the concept of avian reptiles, about as much as to the concept of human fish or human worms.

The Fossil Vertebrates of Florida is an important resource for professionals and amateurs alike. With its clear and copious illustrations, comprehensive literature citation and treatment down to the species level, it is an important resource for identifying bones and teeth from the southeastern Cenozoic. It is full of detailed advice from years of museum experience with vertebrate fossils. Your university library needs a copy.

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Upcoming Meetings of Paleontologic Interest

2002

Oct. 27-30 Geological Society of America Annual Meeting. Denver, CO

Nov. 29-30 Reunión Anual de Comunicaciones de la Asociación Paleontologica Argentina. Diamante, ARG
cidzucol@infoshopdte.com.ar

Dec. 9-13 Secondary Adaptation of Tetrapods to Life in Water, University of Otago, New Zealand
http://www.otago.ac.nz/Geology/secad/secadmain.html

Dec, 15-18 46th Palaeontological Association Annual Meeting, Dept. of Earth Sciences, University of Cambridge, Cambridge, UK http://www.palass.org

2003

Jan. 25 Southern California Unified Malacologists (SCUM) VII: Annual Gathering, Laguna Hills Community Center, Laguna Hills, CA
cjstar1@earthlink.net

March 12-14 GSA South-Central and Southeastern Section Meeting, Memphis, TN

March 23–25 GSA North-Central Section Meeting, Kansas City, MO

March 27–29 GSA Northeastern Section Meeting, Halifax, Nova Scotia, Canada

Apr. 1-3 GSA Cordilleran Section Meeting, Puerto Vallarta, Mexico

April 4 Early/Middle Pleistocene Transitions: The Land-Ocean Evidence, Godwin Institute for Quaternary Research, University of Cambridge, Cambridge, mh300@cam.ac.uk

May 7-9 GSA Rocky Mountain Section Meeting, Durango, CO

June 3-8 Bioevents: Their Stratigraphic Records, Patterns and Causes, Caravaca de la Cruz, Spain

August 3-9 Third International Conference on Large Meteorite Impacts, Noerdlingen, BRD
http://www.lpi.usra.edu/meetings/largeimpacts2003/

Nov. 2-5 Geological Society of America Annual Meeting. Seattle, WA