



Priscum

Newsletter of the
Paleontological Society



Paleontological Activism

Special points of interest:

- PS Research Grant awardees
- GSA Annual Meeting Topical Sessions
- PS Short course on paleoclimate research announcement
- Data Dryad
- Paleocollections Digitization Workshop
- Book reviews

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By Sandra Carlson¹ and Philip Gingerich²

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Summer is here—are you still formulating a New Year's resolution for 2012? We have a suggestion: become an activist on behalf of paleontology! Paleontological activism, unlike trying to lose weight or get more exercise, requires only a slightly more intense commitment to the discipline to which we have chosen to devote ourselves. In the current climate of ever-inflating expectations—for obtaining funding, for publishing research, for training students—it is becoming increasingly critical that we look up from our work at hand, and consider ways, big and small, that we can contribute significantly to maintaining the vitality of the field of paleontology. It isn't an overstatement to claim that the future of the field depends upon this kind of action, taken individually, and as an entire community.

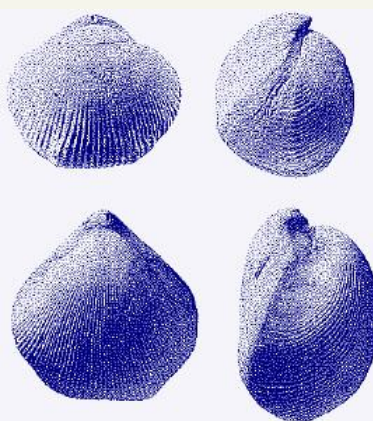
If you love paleontology, please share that enthusiasm with others at your institution, in your community, and across your state or country. Enthusiastic and informed children are more likely to consider science, paleon-

tology in particular, as a choice for a serious hobby, for course work in high school, for a major in college. Curious and informed undergraduates and graduate students are more likely to come up with ideas that can transform our field in innovative and exciting ways. Energized and informed voters are more likely to encourage others to support initiatives that support science. Becoming ambassadors for the field of science that we particularly love is a valuable avocation, for both professionals and 'amateurs' alike.

Here are some suggestions that we urge you to think about, seriously, and act upon. We are certain that most have occurred to you at some point in time. If you have contributed in this way before, take a moment to appreciate your own generosity, and please consider acting on any again. If you have not, then let 2012 be the year that you take the step to act on at least one of them. Everyone has a talent or skill in some particular area of science and science education that can be shared and appreciated—take the time to think about ways you can contribute that will be enjoyable and meaningful to you, and then

take action. Individual actions on behalf of paleontology are tremendously important. Coordinated efforts on behalf of the entire field are essential for the health of paleontology.

(continued on page 2)



Paleontological Activism (continued)

- Mentor a child who loves fossils. Mentor a child who has never seen a fossil. Introduce them to the beauty of the fossil record.
- Visit a classroom (preschool, elementary, middle or high school), more than once, and establish yourself as the fossil/evolution/paleontology resource for the school. Get to know the science teachers at the school and offer yourself as a guest speaker, or occasional in-class assistant. Invite the class to see your lab or collections at your institution.
- Make yourself available to home-school groups to engage students in paleontology.
- Present a community show-and-tell lecture or discussion on a paleontologically interesting locality that you visited, or topic of recent interest, even if it isn't directly related to your line of research. Help to demystify science in current events.
- Volunteer at a local university or museum: help to prepare fossils out of matrix, or organize a collection, or unpack boxes of fossils, or keep computer records up to date, or meet with visiting school groups.
- Host an open house for the community at your institution — organize a fossil hunt; give a public lecture on your research; lead a field trip to local areas of geological or paleontological interest.
- Develop a website or start a blog or create an app on paleontology topics.
- Make a movie about research you are engaged in and most excited about, and post it on YouTube. Write a paleontology song and post it.
- Write a book for a popular audience, for children or adults, conveying directly or indirectly why you love what you do.
- Volunteer to serve on a Paleontological Society committee; organize a Short Course at the Paleontological Society and Geological Society of America annual meeting; host an upcoming NAPC meeting.
- Reach out to other societies in the geological community (e.g., Society of Economic Paleontologists and Miner-

alogists, American Geophysical Union) and biological community (e.g., Society for Integrative and Comparative Biology, Society for the Study of Evolution, Ecological Society of America, Society for Conservation Biology, Society of Systematic Biologists), and demonstrate through your actions the natural synergy among geology, biology, and paleontology.

“Consider ways, big and small, that you can contribute significantly to maintaining the vitality of the field of paleontology”

- Work on DETELON, or STEPPE, or Transitions—any one of several different initiatives established in association with the Paleontological Society recently to work in concert to increase research funding for paleontology.
- Volunteer your time and effort to the National Science Foundation. Review grant proposals that you are sent. Accept invitations to serve on grant proposal review panels.
- When writing proposals, consider broader impacts as seriously as you do intellectual impacts. They matter tremendously to the future health and welfare of paleontology.
- Contact your elected representatives at the national, state, and local levels. Offer your expertise on general issues in science, or on specific legislation in paleontology.
- Establish yourself as a reliable, trusted resource for your representatives to draw upon.
- When in Washington, D. C., make an appointment to meet with congressional staff from your district. Let them know that you are actively committed to

paleontology, and science in general, and are willing to help them in their work to improve funding and increase awareness of our field.



Paleontology as a science will be richer and more vital because of your efforts. Become a paleontological activist!

Are you taking advantage of all your membership benefits?

The Society is pleased to announce that all members are eligible for substantial discounts on books published by many university presses, as well as the *Treatise on Invertebrate Paleontology* and publications of the Palaeontological Association. We are grateful to the publishers for their generosity!



Log into the Members-Only PS page (rock.geosociety.org/membership/paleo/) for discount codes. Note that these discounts are for Society members only. Please do not distribute!

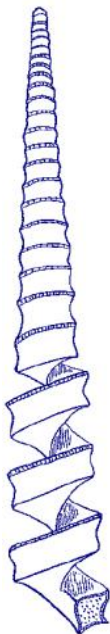
Columbia University Press: Receive a 20% discount on paleontology titles. For a full list of titles on sale, please visit www.cup.columbia.edu/subject/40/35. You can also access this list by clicking on "browse subjects," then selecting "Science" and then choosing "Paleontology" from the drop-down menu. After selecting the titles you wish to order, enter the discount code in the "redeem coupon" box. The box appears on the page after you enter your shipping and billing information and includes simple instructions.

Indiana University Press: Receive 30% off list prices of Indiana University Press books (sale items excluded). Enter the discount code at checkout. View their paleontology titles here: www.iupress.indiana.edu/paleontology

Johns Hopkins University Press: Receive a 25% discount when you use the discount code. This applies to all publications marketed by JHU Press. Website: www.press.jhu.edu

Princeton University Press: Society members receive 20% off any Princeton University Press title. Please click here for details: www2.allenpress.com/pdf/PrincetonUniversityPress.pdf. For orders in the US/Canada: Enter the discount code in the Catalog Code box during checkout on our website, or, call 1-800-777-4726 (mention keycode PO4434). Outside the US/Canada, visit press.princeton.edu/ordering.html for more information.

University of Chicago Press: Receive a 30% discount when you use the discount code. This applies to all publications marketed by the University of Chicago Press books division. Website: www.press.uchicago.edu



Treatise on Invertebrate Paleontology: Members are eligible for a 20% discount on hard-copy volumes of the *Treatise on Invertebrate Paleontology*. To receive your discount, you will need to order by fax (785-864-3636) or phone (785-864-3338) and provide the code Paleosociety2010. See the Treatise website www.paleo.ku.edu/treatise for prices and availability.

Palaeontological Association: Discounted member rates on publications of the Palaeontological Association (www.palass.org).

**PS Members
receive
discounts on
books and
other
materials!**

2013 North American Paleontological Convention?

It is time to begin planning the 10th North American Paleontological Convention, which will be held during the summer of 2013. Two or three possible venues have been suggested, but no firm plans have yet been made. So, this message constitutes a request for proposals and/or suggested sites for NAPC 2013. Please send your proposals and/or suggestions by email (or any other way) to Mark A. Wilson, Department of Geology, The College of Wooster, Wooster, Ohio 44691 or by e-mail at mwilson@wooster.edu

Distinguished Lecture Program

Linda C. Ivany, Councilor-at-Large

The Paleontological Society is proud to support the Distinguished Lecturer Program, with the goal of bringing outstanding scientists to colleges, universities, and public events to speak about cutting-edge paleontological research, evolution, and the nature of science. The long history of life on our planet offers countless opportunities to explore the mechanisms and fascinating consequences of evolution, extinction, and ecosystem change. The response of the world's biota to global climate change has become an important issue today, and paleontologists can provide an important perspective on this from research in the deep-time record. Through this program, we hope to increase the visibility of paleontological research and to communicate its unique insights to the community at large. We support three lecturers each year on rotating, two-year terms. Each is known as an excellent speaker who communicates the interest and importance of his or her work in paleontology especially well to both academic and public audiences. Speakers offer talks appropriate to a general, non-specialist audience and talks geared to academic disciplinary fields. Current speakers are listed below, with their subject areas and contact information. Additional information is available at

www.paleosoc.org/speakerseries.html.

Peter Wilf (2010-2012), Pennsylvania State University
(pwilf@psu.edu)

- *Ancient biodiversity at the end of the world: Paleogene floras of Patagonia rediscovered*
- *Insect-damaged fossil leaves show how food webs respond to ancient climate change and extinction*
- *Fossil angiosperm leaves: paleobotany's difficult children prove themselves*

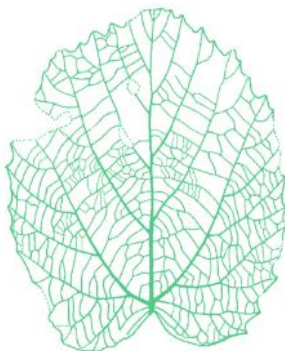


image by Kirk McCoy, Los Angeles Times

Patricia Kelley (2010-2012),
UNC at Wilmington
(kelleyp@uncw.edu)

- *Teaching evolution with integrity and sensitivity*
- *Evolution and creation: conflicting or compatible?*
- *The arms race from a snail's perspective: evolution of the naticid gastropod predator - prey system*



Gene Hunt (2011-2013),
Smithsonian Institution
(hunte@si.edu)

- *Understanding the fossil record of evolution: from Darwin to today*
- *Climate change and body size trends in deep-sea ostracodes*



The Distinguished Lecturers have agreed to make themselves available on an expenses-only basis; no honorarium is required. The Society provides up to \$400 toward speaker travel to give lectures. The host institution is expected to cover on-site expenses, including meals and lodging. Travel support is currently available on a first-come, first-served basis, but this process may be amended if demand is high. To request a speaker, contact that individual directly. If you have questions about this program, please feel free to contact Dr. Linda Ivany at lcivany@syr.edu.

The Society will cover up to \$400 towards travel for a speaker to visit your department

Thanks to Peter Wilf and a welcome to Dena Smith!

Peter Wilf's term as a Distinguished Lecturer ends December 2012 and this is your last chance to invite him. He will be replaced by Dena Smith (Dena.Smith@colorado.edu), Curator of Invertebrate Paleontology at the Museum of Natural History and Associate Professor of Geological Sciences at the University of Colorado, Boulder. Thanks to both for their service!

2011 Paleontological Society Student Research Grant awardees

Mid-America Paleontology Society (MAPS) Outstanding Student Research Award

Allison Hsiang (1st place awardee)
(Yale University)

Back to the water: Hadrosaur paleoecology elucidated by oxygen isotopic composition of apatitic phosphate

Trisha Spanbauer (2nd place awardee)
(University of Nebraska - Lincoln)

The climate-evolution connection: The relation of climatic forcing to the distribution and morphological variability of a dominant phytoplankton species in the Andes

Rosemary Bush (3rd place awardee)
(Northwestern University)

Ground-truthing a paleoclimate proxy: Do n-alkanes really reflect climate?

Richard K. Bambach Award

Nicholas Famoso
(University of Oregon)

The evolution of occlusal enamel complexity in Middle Miocene-to-Recent Equids (Mammalia: Perissodactyla) of North America

Arthur J. Boucot Award

Emily Wooton
(University of California, Riverside)

A high resolution paleontological, ichnological, and chemostratigraphic study of the Late Devonian biocrises

Kenneth E. & Annie Caster Award

Camilla Crifo
(Miami University, Ohio)

Vein density, a proxy to assess forest structure in the fossil record

Marissa Drehabl
(University of Iowa)

The effects of climate change on the evolution of Cretaceous terrestrial ecosystems

Maria Gold
(American Museum of Natural History)

Bird brained? Reconstructed brains reveal how dinosaurs took flight during the Mesozoic

Carlie Pietsch
(University of Southern California)

The role of the habitable zone in shaping the benthic macrofaunal recovery from the end-Permian mass extinction

Judith Sclafani

(University of Georgia)

Using Hubbell's neutral theory to test the species-area relationship in the Late Ordovician of Laurentia

G. Arthur Cooper Award

Jessamy Doman
(Yale University)

Paleoecology at the origin of hominins: the faunal evidence, 5-7 Ma

Rodney M. Feldmann Award

Michael Donovan

(Pennsylvania State University)

Anomalous insect-feeding diversity: evidence for host switching or colonization?

Jasmin Saw

(Petronas University of Technology)

Plio-Pleistocene coral reef communities from the biodiversity hotspot of Malaysian Borneo

Steven Jay Gould Award

Matt Jarrett

(University of South Florida)

Dominance of the Lilliput Effect at the K-Pg Event and the evolutionary significance

Daniel Lawver

(Montana State University)

Fossil and modern turtle eggshell: testing the validity of eggshell characters in cladistic analyses

Trisha Smrecak

(Michigan State University)

A test of the epibiofacies model: assessing impacts of changing marine conditions on encrusting organisms

N. Gary Lane Award

Rachel Bowles

(Western Kentucky University)

*A morphological and geochemical study of the modern ostracode *Cyprideis americana*: Toward a reliable paleosalinity proxy for marine saline lakes.*

Paige Kercher

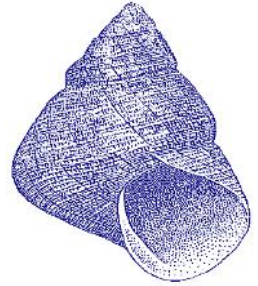
(University of California, Davis)

Determining the efficacy of brachiopod calcite as a recorder of environmental conditions

Mathew Knauss

(Bowling Green State University)

Quantifying ontogenetic variability of ornamentation in Hoploscaphtes (Jeletzkites) spedeni using GIS as a morphometric tool



2011 Student Research Grant awardees

Richard Osgood Award

Lauren Milideo

(Pennsylvania State University)

Actualistic taphonomy of cold and temperate climates: applications to Pleistocene paleontology

Allison R. "Pete" Palmer Award

Andrew Hawkins

(Virginia Tech)

Using a silicified fauna to isolate the collection component of the lithification bias

Adam Jost

(Stanford University)

Constraints on ocean biogeochemistry during the end-Guadalupian extinction from stable calcium isotopes

James M. & Thomas J. M. Schopf Award

Natasha Vitek

(University of Texas at Austin)

Environmentally correlated variation in box turtles across both time and space

Steven M. Stanley Award

Michael Meyer

(Virginia Tech)

Regional scale redox fluctuations and their impacts on life across the Ediacaran-Cambrian boundary, South China

Robert J. Stanton & James R. Dodd Award

Max Christie

(Pennsylvania State University)

The ecological effects of species invasion

Harry B. Whittington Award

Neo McAdams

(University of Iowa)

Sampling, imaging, unrevealed data, and phylogeny: What are we missing and what are the consequences?

Ellis L. Yochelson Award

Brendan Anderson

(University of Kansas)

Investigating Burgess Shale-type preservation utilizing organic geochemistry

Abigail D'Ambrosia

(University of New Hampshire)

Continental effects of carbon cycle perturbations during the early Paleogene: Links to extreme temperature shifts and mammalian physiological change

Chelsea Korpanty

(University of North Carolina Wilmington)

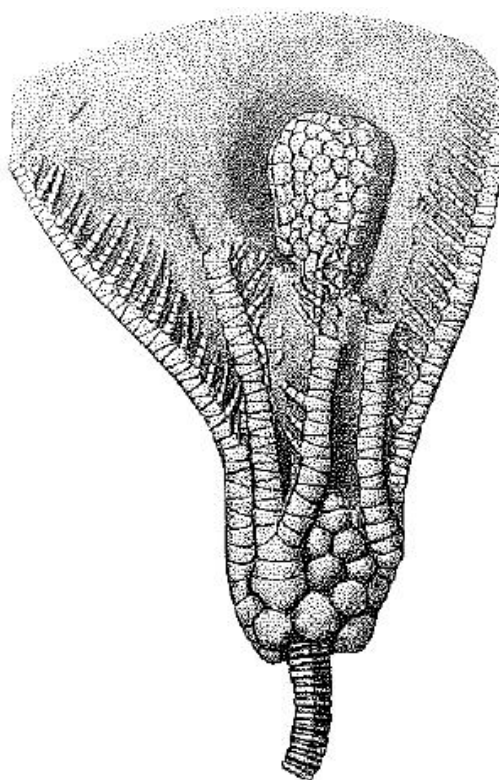
Live-dead fidelity of molluscan assemblages in declining seagrass habitats: Siliciclastic versus carbonate environments

Gregory Stull

(University of Florida)

Whole-plant reconstruction of an extinct tropical vine (Iodes sp.; Icacinaceae) from the Eocene of Wyoming

Congratulations to all of our awardees and good luck with your research!



Student membership

There are many benefits to student membership in the Society, including opportunities for research grants, travel grants, and now even poster awards at Society meetings. Check www.paleosoc.org/students.html for additional benefits. The current student representatives are Andrew Haveles (University of Minnesota, have0118@umn.edu) and Sarah Tweedt (University of Maryland, TweedtS@si.edu). And for those of you on Facebook (whether student or not!), keep up on the latest Society news at www.facebook.com/group.php?gid=5775384341.

2012 GSA Topical Sessions with sponsorship by the PS

T134. Advances in Cenozoic Foraminiferal Biostratigraphy, Chemostratigraphy, and Paleoecology

[SEPM (Society for Sedimentary Geology); The Cushman Foundation for Foraminiferal Research; The Micropalaeontological Society; The Gryzbowski Foundation; Paleontological Society]

T135. Advances in Mesozoic Foraminiferal Biostratigraphy, Chemostratigraphy, and Paleoecology

[SEPM (Society for Sedimentary Geology); The Cushman Foundation for Foraminiferal Research; The Micropalaeontological Society; The Gryzbowski Foundation; Paleontological Society]

T136. Advances in Paleozoic Foraminiferal Biostratigraphy, Chemostratigraphy, and Paleoecology

[SEPM (Society for Sedimentary Geology); The Cushman Foundation for Foraminiferal Research; The Micropalaeontological Society; The Gryzbowski Foundation; Paleontological Society]

T137. The Evolution of Biomineralization [GSA Geobiology & Geomicrobiology Division; GSA Mineralogy, Geochemistry, Petrology, and Volcanology Division; Paleontological Society]

T138. Fossil Preservation, Biological Evolution, and Environmental Change at the Dawn of Animal Radiation: An Examination of Geobiological Events across the Ediacaran–Cambrian Transition [GSA Geobiology & Geomicrobiology Division; Paleontological Society]

T139. Divided Oceans and Connected Continents: Advances in Geology and Paleontology of the Tropical Americas [Paleontological Society]

T140. The Big Kill: Paleobiological, Geochemical, and Modeling Studies of the Permian–Triassic Boundary Mass Extinction [GSA Sedimentary Geology Division; Paleontological Society; GSA Mineralogy, Geochemistry, Petrology, and Volcanology Division; GSA Geobiology & Geomicrobiology Division]

T141. Pantropical Paleontology of the Marine Cenozoic [Paleontological Society]

T142. Topics in Paleoecology: Predation/Biotic Interactions, Fidelity/Taphonomy, and Community Ecology/Whole Organism Paleoecology

[Paleontological Society; GSA Geobiology & Geomicrobiology Division]

T143. Out of Our Depth: The Paleontology, Ichnology, and Sedimentology of Deeper Water Environments in the Ancient Tropics [Paleontological Society]

T144. Virtual Paleontology: Computer-Aided Analysis of Fossil Form and Function [Paleontological Society; GSA Geobiology & Geomicrobiology Division; The Palaeontological Association]

T145. The Origins of Arthropod Diversity: Phylogenetic Insights from the Living and the Dead [Paleontological Society]

T146. The Future of Quantitative Paleontology: Biometry, Computer Vision, and Machine Learning [Paleontological Society]

Start thinking about 2013, GSA's 125th anniversary!

GSA commemorates its 125th anniversary in 2013. Look for year-long celebrations and special events to observe this milestone. The annual meeting in Denver will be no exception, and it's not too early to start thinking about paleontology-themed Pardee Keynote Symposia and technical sessions. The deadline for submitting sessions is January 8 (2013), and the Paleontological Society has funds available to defray the costs of inviting guest speakers. Contact Tom Olszewski (olszewski@geos.tamu.edu) for additional information. To submit a GSA session for 2013, visit gsa.confex.com/gsa/2013AM/sessionproposals.epl.



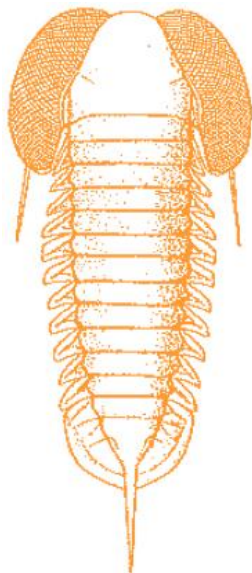
2012 GSA
ANNUAL MEETING & EXPOSITION

4-7 November | Charlotte, North Carolina, USA

Paleosociety Student Ambassador Program (PSAP)

By Sean Cornell, Northeastern Section Chair

Despite our efforts, many college students are still unaware of careers and professional development opportunities in the area of Paleontology and Historical Science. Many are unsure of how to pursue such careers if they are so inclined. The new PS Student Ambassador Program helps in many ways:



- It provides a forum to enhance the training of future paleontologists and science education leaders.
- It creates networking opportunities between students and academic professionals, museum professionals, and government professionals.
- It hosts student competitions or provides a forum for students to grow and develop professional skills.
- It provides a forum for enhancing knowledge of post-baccalaureate & post-M.S. education opportunities.
- It introduces students to service-learning.
- It encourages participation of minorities and underserved students in the geosciences.

Perks of membership:

- Opportunities for networking and resume development at PS events.
- Eligible for selection as Student Representatives to regional PS section councils and/or national council.
- Participate in PS Ambassador training and/or field experiences.
- Ambassadors will receive a small budget to fund their outreach/program efforts.
- Benefit from opportunities to enhance professional education (i.e. learn about graduate schools, grant writing, cutting edge research, field experiences, etc.).
- Improve communication skills.
- Expand knowledge of geosciences research programs.
- PSA's to be announced in *Priscum* or in one of the other PS journals.
- PSA's ambassadors could receive graduation regalia to wear during commencement ceremonies.

How to apply:

- Applicant must be a full-time undergraduate (junior or senior status) or a M.S. student who is a current student member of the Paleontological Society and is

sponsored by a Society member. (Each college/university is eligible for up to two student ambassadors in any given year.)

- Applications must demonstrate potential to contribute to the mission of the Paleontological Society and demonstrate potential for service and initiative for developing professional skills and networking.
- Applications will be reviewed by the PS Education Committee in cooperation with regional PS chairs.
- Application forms are available at: www.paleosoc.org/StudentAmbassApplication.pdf
- Please contact Dr. Sean Cornell at Shippensburg University (srcornell@ship.edu) with any questions.

Deadline for application:

Open until all PS Ambassador positions are filled.

Paleontological Society Ambassadors responsibilities:

1. Successful candidates will be expected to complete at least 25 hours of service to the Society per semester (or a total of 50 hours per year). Service could take the form of, but is not limited to:
 - Campus and public outreach activities in face-to-face and online formats (i.e. Facebook, website development, or writing short news articles for *Priscum*),
 - Publicizing/sharing PS mission with schools, universities, public, etc.,
 - Developing programs and events to peers and the public in local region, or
 - Volunteering at national and regional GSA-PS meetings, such as by helping plan displays and staff information booths, promoting PS-sponsored theme and topical sessions, assisting in judging of poster award programs, and/or working under the advisement of their PS-sponsor and regional PS section chair.
2. Participate in meeting activities to expand networking opportunities, such as by attending the PS short course, participating in PSAP Student Field Conference(s), or participating in NAPC, IPC, or other paleontology-themed conferences or events.

The PS Student Ambassador Program helps promote paleontology while helping train future paleontologists

The Paleontological Society is now on Facebook!

Search for Paleontological Society in Facebook, or click on the Facebook icon



Fossil preservation: The new Dryad data archive

by Peggy Schaeffer (Communications Coordinator, Dryad and NESCent)

Perhaps it's understandable that paleontologists are committed to preserving the scientific record, since they spend a lot of time and energy finding and extracting shreds of evidence millions of years old. Now, thanks to a partnership between Dryad and The Paleontological Society announced last year (Callaway 2011), coupled with strong data archiving policies adopted by their two journals (*Paleobiology* and *Journal of Paleontology*), a rich trove of data will be available for future researchers to unearth from Dryad.

For both journals, authors will be instructed to deposit the underlying data at the time the manuscript is submitted, so that editors and referees will be able to review it prior to acceptance. Once published on Dryad, the data will be independently discoverable and citable, while at the same time prominently linked both to and from

the original article. Researchers will be able to track the reuse impact of their data, independent of the citation impact of their article, by monitoring downloads from Dryad.

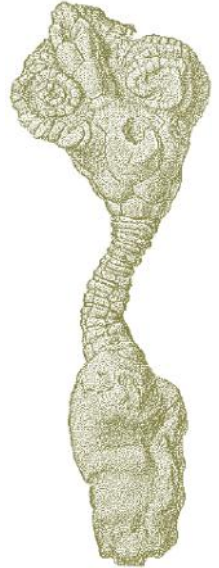
Here's an example from a recent issue of *Paleobiology* to sink your teeth into:

Article: Meachen-Samuels, J.A. 2012. Morphological convergence of the prey-killing arsenal of sabertooth predators. *Paleobiology* 38 (1): 1-14. [doi:10.1666/10036.1](https://doi.org/10.1666/10036.1)

Data: Meachen-Samuels, J.A. 2012. Data from: Morphological convergence of the prey-killing arsenal of sabertooth predators. Dryad Digital Repository. dx.doi.org/10.5061/dryad.h58q6

Literature Cited:

Callaway E (2011) Fossil data enter the web period. *Nature* 472, 150. <http://dx.doi.org/10.1038/472150a>



Call for nominations for Society Awards

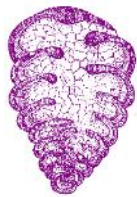
The Paleontological Society encourages members to nominate individuals for the three awards made by the Society:

- **The Paleontological Society Medal**, the most prestigious honor bestowed by the Society, is awarded to a person whose eminence is based on advancement of knowledge in paleontology.
- **The Charles Schuchert Award** is presented to a person under 40 whose work reflects excellence and promise in the science of paleontology.
- The **Harrell L. Strimple Award** is given for contributions to paleontology by an amateur; that is, by a person who does not derive his/her livelihood from the study of fossils. Click [here](#) for additional details.



The deadline for receipt of nominations for each Award is normally January 15. Nominations received after that date will be held for the next year. Nominations for the Paleontological Society Medal and the Schuchert Award should be sent to the Past President, with a copy to the Secretary. Nominations for the Strimple Award should be sent to the President-elect, with a copy to the Secretary. Nominations will be accepted only as a single PDF file incorporating all nomination material and letters of support.

Nominations should include a letter of nomination, outlining the contributions of the candidate and their contributions to the field. Nominations should include a CV (for the PS Medal and the Schuchert Award) and up to **five** letters supporting the nomination. Nominations will be active for three years after receipt, but may be updated yearly, at the discretion of the nominator.



**2012 Paleontological Society Short Course:
“Reconstructing Earth’s Deep-Time Climate
– The State of the Art in 2012”**

Saturday November 3, 8:15 AM–4:15 PM, Charlotte NC

Co-Sponsored by the GSA, SEPM, and Cushman Foundation

Edited by Linda C. Ivany (Syracuse University; lcivany@syr.edu) and
Brian T. Huber (Smithsonian Institution; huberb@si.edu)



Recent advances in paleoclimate research have produced a plethora of new and powerful climate proxies that could be integrated into organism-environment studies in deep time. This new generation of techniques offers the potential for truly quantitative estimates of paleotemperature, enabling us to address ever-more sophisticated questions about ancient environments and non-analog earth systems. These new techniques can lead to many new opportunities for collaboration, and their application can lead to important advances in our collective understanding of organism-environment systems.

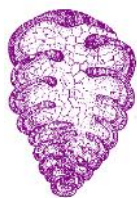
The influence of climate change on biological systems has always been of interest to paleontologists, but the subject has become ever more important in recent years as our planet experiences a climate shift of geological proportions. Increasingly, paleontologists have been called upon to use the fossil record to provide insights about the responses of ecosystems and their component taxa to changes in climate of a magnitude that has not been recorded in the data-rich Holocene, or even Quaternary. Predictions that the Earth will, in the not-too-distant future, experience temperatures comparable to those of ‘supergreenhouse’ intervals such as the Pliocene, Eocene or Cretaceous, make studies of the deep-time record more critical than ever. Paleontologists are eminently qualified to integrate faunal data with paleoclimatic data to provide new insights on the future based on what we can learn from the past.

Short course presentations will review both new and long-applied methodologies for understanding climate in ancient marine and terrestrial environments. This will be a true short course, with the goal of providing a solid introduction to the basics of paleotemperature reconstruction. Presentations will be given by those involved in proxy development at a level appropriate to a geologically literate, but non-specialist audience. Talks and the associated short course volume will provide background

and perspective for paleontologists and other earth historians hoping to complement their work with published paleoclimate data or to produce new climate data as part of an integrated research program. Particular attention will be given to the biological influences, assumptions, uncertainties and confounding problems associated with proxies that are used to reconstruct paleotemperatures of ancient terrestrial and marine environments.

Speakers and their topics include:

- Oxygen isotopes in foraminifera: a tool for paleoclimate (**Paul Pearson**, Cardiff University)
- Applying oxygen isotope paleothermometry in deep time (**Ethan Grossman**, Texas A&M University)
- Laser ablation on carbonates (**Steve Eggins**, Australian National University)
- The $d^{18}O$ paleothermometer applied to phosphate oxygen measurements of bioapatite (**Ken MacLeod**, University of Missouri)
- Use of Mg/Ca ratios as a seawater temperature proxy (**Tim Lowenstein**, Binghamton University)
- Clumped isotopes paleothermometry (**Hagit Affek**, Yale University)
- GDGT thermometry: Lipid tools for reconstructing paleotemperatures (**Jessica Tierney**, Columbia University)
- Reconstructing paleoseasonality from accretionary skeletal carbonates (**Linda Ivany**, Syracuse University)
- Reconstruction of terrestrial environments using stable isotopes in fossil teeth and paleosol carbonates (**Benjamin Passey**, Johns Hopkins University)
- Climate reconstruction from leaf size and shape: new developments and challenges (**Dana Royer**, Wesleyan University)
- Progress in modeling past greenhouse climates (**Matthew Huber**, Purdue University)



**2012 Paleontological Society Short Course:
“Reconstructing Earth’s Deep-Time Climate
– The State of the Art in 2012”**



The short course will run from 8:15 a.m. to 4:15 p.m. on November 3, with 15 minute breaks during the morning and afternoon sessions and a break for lunch. *Coffee and snacks will be available during the talks and a free beer reception in the same room will immediately follow the end of the talks*, thanks to generous co-sponsorship by The Society for Sedimentary Geology (SEPM), the Geological Society of America (GSA), and the Cushman Foundation for Foraminiferal Research.

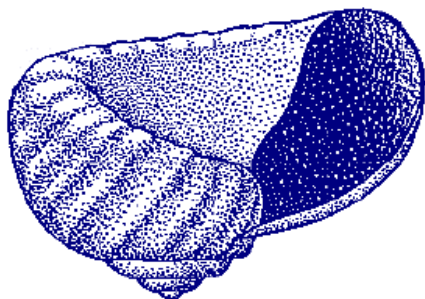
Published course notes will be available at a very reasonable price at the short course itself, and by email order afterwards. People who order copies of the course notes on the day of the course will receive free shipping of the volume.

There is a GSA theme session the following morning that will dovetail nicely with this short course:

- **T124. Oceans and Climates through Earth History: From Proxy Reconstructions to Model Assessments (Posters)** – Sunday Nov. 4, AM

The poster session is sponsored by the Paleontological Society, the Cushman Foundation, and the Geochemical Society, and is being co-organized by Miriam E. Katz, Beth A. Christensen, David P. Gillikin, and Alicia C.M. Kahn. Interested parties are strongly encouraged to submit abstracts on their research. This will be an opportunity to continue the discussions begun during the short course the day before.

We look forward to seeing you in Charlotte!



**2010 Quantitative Methods in
Paleobiology short course
reprinted**

Due to overwhelming demand, the Quantitative Methods in Paleobiology 2010 short course edited by John Alroy and Gene Hunt has been reprinted and is available for \$25 from the [PRI website](http://PRIwebsite). Additional on-line content remains available at www.paleosoc.org/shortcourse2010.html

**The Origins of Arthropod Diversity:
Phylogenetic Insights from the Living
and the Dead**

For those attending (or even thinking about attending) the annual GSA meeting this fall in Charlotte, North Carolina, Jo Wolfe and Thomas Hegna would like to invite you to the Paleontological Society-sponsored topical session, "The Origins of Arthropod Diversity: Phylogenetic Insights from the Living and the Dead" (T145). Arthropod phylogeny has long been fraught with problems and the origin of the major groups of arthropods are still appallingly enigmatic. However, over the last ten years, both paleontologists and neontologists have worked together to bridge the historical divide between their disciplines and bring order to the arthropodan chaos. This session seeks to highlight integrative approaches to unraveling arthropod phylogeny—work that combines data from both the living and the dead.

You are invited to submit all manner of abstracts related to arthropod evolution. The intention of the session is to capture the diversity of approaches to studying arthropod evolution, not that each talk by itself be integrative. See you in Charlotte!

Paleocollections Digitization Workshop

26-28th April 2012, Florida Museum of Natural History, University of Florida (FLMNH)

Approximately 100 million fossil specimens exist in natural history museums in the U.S., but only a tiny fraction of these (<10%) are digitized and therefore accessible for research, education, and outreach to downstream users. With other ongoing national (and international) collections digitization initiatives, the need therefore exists to better understand how paleontological collections ("paleocollections") will advance specimen digitization for the 21st century. To this end, we hosted a NSF-funded workshop on April 26th to 28th 2012 to assess the status and future of digitized collections within the paleontological community.

Approximately four dozen participants included representatives from 27 institutions in the U.S. with curatorial responsibility for collections at various stages of digitization, stakeholders from the neontological community, and two NSF Program Officers: Judy Skog (BIO) and Rich Lane (GEO-EAR). After introductions, background, and framing, the workshop sessions focused on three themes: (1) tools, databases, and portals; (2) digitization and workflows, and (3) research applications and Grand Challenges. These sessions included keynote talks (Jere Lipps, Nelson Rios, Tim Rowe, and Bruce Lieberman), shorter focused talks about collections, three hour-long breakout group sessions, open discussion, and wrap-ups. At the end of the meeting on Saturday, we had an open discussion about Grand Challenges and "next steps" that can be taken by paleocollections to move forward with coordinated specimen digitization efforts within our community, as well as with the neocollections communities. Specific next steps that we identified included: (1) hosting digitization sessions, training, content, and/or related activities at appropriate professional meetings (such as SPNHC, NAPC); (2) reaching out to fossil clubs in the U.S.; and (3) forming an iDigBio Working Group.

Results from the post-meeting evaluation indicated that participants felt the issues related to collections digitization were critical and relevant. While participants were generally satisfied with the workshop, the surveys also highlighted the need for continued activities that promote paleocollections digitization.

Evening activities included an icebreaker, tour of the three paleocollections (invertebrate, paleobotany, and vertebrate) at the FLMNH, and a SKYPE-enabled after-dinner talk by Nick Pyenson (with help from his laser cowboys) about his *in situ* digitization of Neogene whales from Chile, with the un-



Afternoon breakout session discussing the Grand Challenges of Paleocollections for the 21st century.

veiling of a 3-D "printout" of a scale-model of one of the specimens.

We thank NSF for funding this workshop (project EF 123447), the speakers and participants for their input and enthusiasm, the iDigBio staff (Cathy Bester, Jason Grabon, and Kevin Love) and student assistants for coordinating the workshop, and Dr. Shari Ellis for conducting the formal evaluation.

Co-organizers: Bruce J. MacFadden (bmacfadd@flmnh.ufl.edu) and Pam Soltis (psoltis@flmnh.ufl.edu), iDigBio Co-PIs, Florida Museum of Natural History, University of Florida

For appropriate links, if you are interested:

Google working documents developed at the meeting, <http://tinyurl.com/paleo2012>

General iDigBio project web site, <https://www.idigbio.org/>

Powerpoint talks presented during the workshop, see <https://www.idigbio.org/forums/idigbio-paleocollections-workshop-2012>

In addition to the resources above, a final workshop report will be submitted to NSF and also will be posted as a public document by iDigBio.

If you are interested in either participating in, or being informed about, an iDigBio Paleocollections Working Group, contact Bruce Lieberman at blieber@ku.edu.

Journal of Paleontology currently has no backlog!

Dear Paleontological Society Members,

The *Journal of Paleontology* currently has no backlog. This means that average time from submission to decision is 100 days, and from acceptance to print is 60-90 days.

The *Journal* publishes high quality specimen-based articles addressing all topics including: paleoecology, paleogeography, systematics, phylogeny and evolution of fossil organisms. All taxonomic groups are treated, including invertebrates, microfossils, plants, vertebrates, and ichnofossils.

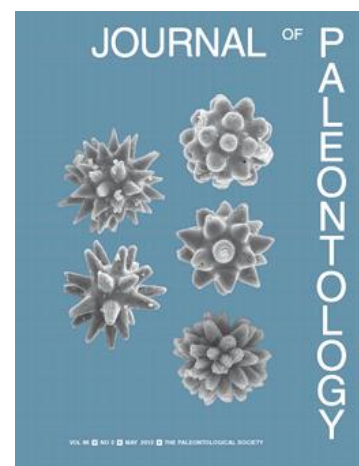
The coming issues of the *Journal of Paleontology* will be thinner than usual due to a lack of submissions (acceptance rate remains at ~65%).

Information about submission to the *Journal of Paleontology*:

www.journalofpaleontology.org/index.htm

Please support your society's journals.

Steve Hageman & Brian Pratt, Co-editors, *Journal of Paleontology*



Congratulations to the 2011 PS Poster Award recipients!

First Place

Pedro M. Monarrez and Adam Woods
(California State University, Fullerton)

Late Mississippian brachiopod community response to the onset of the Late Paleozoic ice age, Arrow Canyon, NV

Runners-up

James R. Thomka and Carlton Brett.
(University of Cincinnati)

Pelmatozoan attachment structures from a microbiohermal hardground in the Middle Silurian Osgood Formation, southeastern Indiana

Scott A. Mata, Cara Corsetti, Frank Corsetti, Stanley Awramik, and David Bottjer
(University of Southern California, Los Angeles)
Large early Cambrian sea anemone burrows from the upper member of the Wood Canyon Formation, Death Valley region, United States

Thanks to Dr. Peter J. Harries (Poster Award Chair)!

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Section news and updates

Southeastern Section

By Anthony Martin and Brad Deline, Outgoing and Current Section Chairs

The Southeastern Section held their 2012 section meeting of the Geological Society of America in Asheville, NC and is looking forward to the 2013 Southeastern Section meeting, which will be held in San Juan, Puerto Rico. The Asheville meeting had two successful paleontology-themed sessions. The first, "Applied and Environmental Paleontology: Using Fossils to Understand Modern and Ancient Environments" included presentations chaired by William J. Garcia and Scott P. Hippensteel, and also included a poster session. The second, "Conservation Paleobiology: Using the Fossil Record to Improve Living Species Conservation," was co-chaired by Michael L. McKinney and Rowan Lockwood).

Tony Martin used Twitter to "live tweet" both sessions, which resulted in wide dissemination of information provided by the talks given in each. Rowan Lockwood, co-chair of the Conservation Paleobiology session, also arranged for a lunchtime meeting of the participants before the session, which helped us to get to know one another better and establish connections. No paleontologically themed field trips were scheduled for the meeting, owing to limits imposed by the local geology.

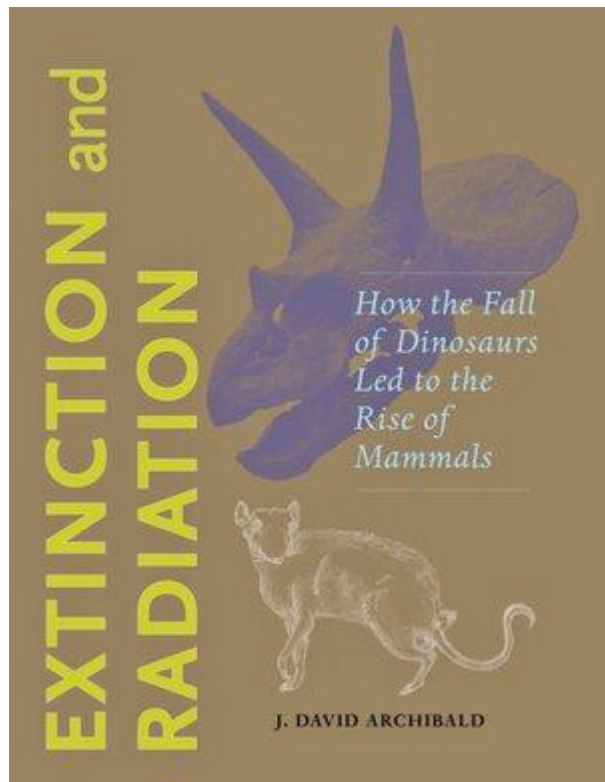
We anticipate that student travel grants will be in high demand for the San Juan meeting, owing to the added costs of airfares. And we plan to allocate more money to for travel grants to ensure that outstanding students without institutional support will still be able to present their research.



The informal business meeting of the Southeastern Paleontological Society in Asheville was well attended, with about 40-45 people, nearly half of which were students. At this meeting, the section passed on leadership from Tony Martin to Brad Deline, nominated a chair-elect for 2013, and discussed possible field trips and theme sessions for the San Juan meeting. We are pleased to report that the chair-elect for 2013 will be Gwen Daley (Winthrop College). Also, we proposed that theme session on the paleontology of the Caribbean and Bahamas, and discussed possible field trips that could visit both modern intertidal and subtidal environments in the area, as well as fossil localities. We agreed that coordination with Puerto Rican paleontologists would be key in organizing both sessions and field trips, and several of us have contacts within that community to ensure we are all communicating with one another before proceeding with any further plans.

We look forward to seeing section members in San Juan, Puerto Rico in March, 2013!

Book reviews



A review of Archibald, J.D. 2011. *Extinction and Radiation: How the Fall of Dinosaurs Led to the Rise of Mammals*. Johns Hopkins University Press, Baltimore, MD. 120 pp. (\$58.50 cloth with 10% PS discount.)

Reviewed by John C. Briggs (Oregon State University)

J. David Archibald, now an Emeritus Professor at San Diego State University, first began publishing on fossil mammals in 1972 and has produced a prolific series of works on mammals, including their anatomy, distribution, and evolution. In addition, he extended his research to dinosaurs and became fascinated with the relationship between the rise of mammals and the demise of the dinosaurs. Prior to the publication of his present book, Archibald was best known for two major works: (1) a monographic study of the mammals and geology of the Cretaceous-Tertiary Boundary in Garfield County, Montana (*University of California Publications in the Geological*

Sciences 122: 1-286, 1982) and (2) a book (*Dinosaur Extinction and the End of an Era: What the Fossils Say*, Columbia University Press, 237p., 1996).

This new book is organized into six chapters. Chapter one reviews the most recent data on what is known about dinosaur diversity decline during the last 10 million years of the Cretaceous in western North America, and the still problematic issues of determining what was happening to dinosaur diversity just before the end of the Cretaceous. Chapter two introduces Mesozoic, and especially Cretaceous, mammals, expanding our knowledge of how these animals managed to exist alongside the dinosaurs. Chapter three extends over the difficult and sometimes thankless task of trying to find the ancestry of modern mammals within the ranks of Cretaceous mammals. The fourth and fifth chapters review our current knowledge about how the major groups of terrestrial organisms fared at the Cretaceous-Tertiary (K/T) boundary, notably in western North America, and what the best supported hypotheses tell us about the cause of extinctions at this boundary. In the sixth chapter, Archibald reflects on the extinction of non-avian dinosaurs and the evolutionary diversification of mammals. In so doing, he discusses where and how these events may have taken place and why there is a seeming disconnect between the molecular and fossil evidence for the mammalian radiation.

Archibald's discussion about the causes of extinction at the K/T boundary is interesting in view of the many theories that have been proposed. The 1979-1980 papers by Louis Alvarez and coworkers provided the impetus for the examination of extinction causes that is still with us. Alvarez thought that a single impact by a comet was the mass extinction cause and could not understand why there should be any controversy. In their 1990 *Scientific American* article, Alvarez and Asaro referred to the comet strike as the cause of a "mass murder" that killed off half of all life on earth. But Newell in 1967 had already noted the K/T boundary was the time of a "mass extinction."

Book reviews

The term *mass extinction* soon became employed to designate all the major declines in generic diversity. In 1991, William Glen organized a symposium called the Mass Extinction Debates. I participated along with Digby McLaren, John Sepkoski, David Raup, Elizabeth Clemens, S. Clube, Herbert Shaw, Leigh Van Valen, Kenneth Hsu, and William Clemens. The proceedings were published as a book (*The Mass Extinction Debates: How Science Works in a Crisis*, Stanford University Press, 370p., 1994). By that time, many of the earlier theories for the extinctions had been eliminated and primary debate was between the advocates of a comet or asteroid collision and flood volcanism. But I argued that other causes may still be important and that the extinction losses were generally overestimated.

A few years later, I indicated (*Global Biogeography*, Elsevier, 452 p., 1995) that only one fundamental global event occurred gradually at a rate consistent with the tempo of the K/T extinctions: a regression in sea level probably caused by a cooling and shrinking of the mid-ocean ridges. Archibald, in his new book, called attention to a 2008 study by Peters (*Nature* 454: 626-629) that identified the ocean, with its ebbs and flows of sea level, as the primary cause of the world's periodic mass extinctions. Archibald finally determined, as the result of considerable analysis, that volcanism, marine regression, and extra-terrestrial impact were all important in the K/T extinctions. However, there are still arguments about which of these factors is the most important and there is even uncertainty about the timing of the impact event.

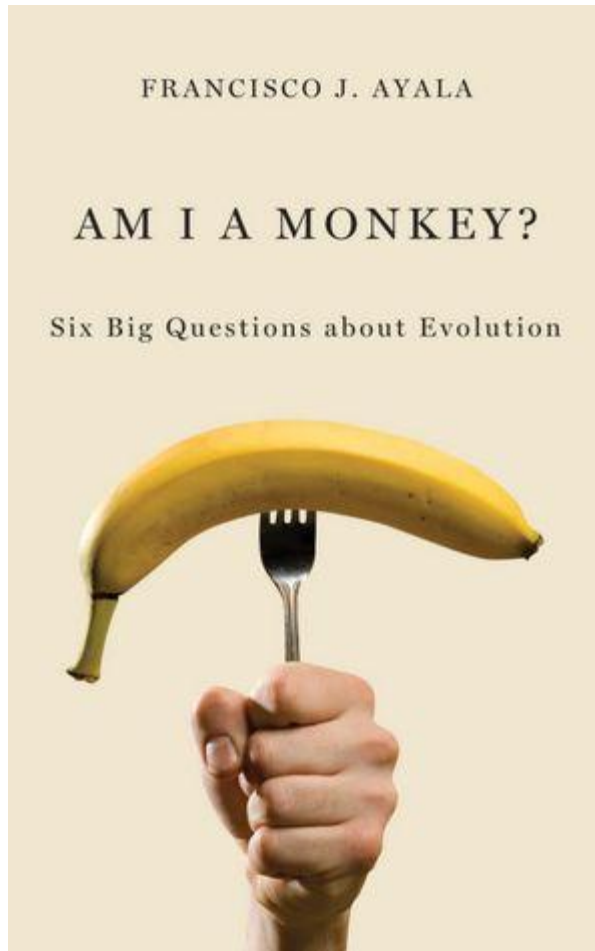
The final chapter reflects Archibald's expertise as it is devoted almost entirely to the modern mammals consisting of the eutherians and the placentals. He recognizes a post-K/T "garden of Eden" that prevailed for almost 10 million years. A dramatic surge of generic richness that began at the K/T boundary reached a peak in the Eocene, followed by a decline beginning in the Oligocene, and another peak in the Recent. In the early Paleocene, large

numbers of condylarth genera were produced with few distinguishing characteristics. But, with the inception of the Eocene, the global temperature rise apparently stimulated natural selection so that many of today's mammalian orders made their debut. The time of origin for the placentals has not been determined because of the large discrepancy between the fossil and molecular evidence. According to the fossils, not a single placental order is known prior to the K/T boundary. But molecular data indicate those orders range from about 80 to 100 million years old. Placentals may have originated in Gondwana but their post K/T diversification took place in Laurasia, so the latter appears to be the best bet for a center of origin.

In total, Archibald's book is a competent account of the state of our knowledge about mammal evolution and biogeography. In regard to the fate of the large dinosaurs, there is no clear connection between the two groups; i.e., there is no evidence of competition except that the mammals remained small and not very diverse as long as the dinosaurs still existed. The book itself is a handsome quarto volume illustrated by good drawings and graphs. It will be most useful to paleontologists, evolutionary biologists, and biogeographers. It will stand as a good example of what can be accomplished in academia where considerable time must be devoted to students, grant proposals, and other activities.



Book reviews



A review of Ayala, F.J. 2010. *Am I a Monkey? Six Big Questions about Evolution*. Johns Hopkins University Press, Baltimore, MD. 104 pp. (\$11.66 cloth with 10% PS discount.)

Reviewed by Kevin Padian (University of California, Berkeley)

Am I a monkey? The distinguished geneticist Ayala's answer to this first very important question is "No": monkeys, apes, and humans are primates, but apes are our first cousins, whereas monkeys are our second or third cousins. His line of reasoning would suggest that there was a radiation of apes that was separate from the hominid radiation, because (the author says) we are not apes; on the other hand, he acknowledges that chimps are our closest relatives. Then would the apes have had a sepa-

rate evolutionary origin from the monkeys? Ayala's view amounts to an acceptance of evolution but not of classification by monophyly, and it enables people to think that they are somehow different from apes (although apparently most closely related to chimps). This is outdated; it would probably make more sense to teach students, in the light of current evidence, that humans are a kind of ape and apes are a kind of monkey, and we're all primates.

The second question is "Why is Evolution a Theory?" Ayala manages in a very few pages to separate fact and theory in scientific parlance, to explain how science is done and how it progresses, and why this approach has been so compelling.

"What is DNA?" is the third question, a logical one for a geneticist, and also well explained. Ayala says that DNA "accounts for evolution as a consequence of DNA mutations" (p. 37), but there is much more to evolution than this, and so far much of the American populace is not convinced that showing that the hereditary basis of coat color in mice or bristles on the legs of fruit flies is the same thing as explaining the evolution of tetrapods, birds, and whales. I think that explaining those latter things will do more to get the unbiased public to understand and perhaps accept evolution than a discussion of DNA, but both are obviously needed.

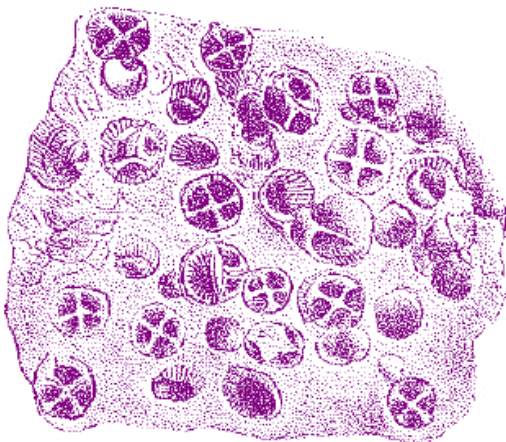
The fourth question is "Do All Scientists Accept Evolution?", but strangely, the author does not answer this question. One might have expected a review of surveys of actual scientists, perhaps an explanation that just because someone once got a degree of some kind in a science does not mean that he or she is a practicing scientist or knows much science at all, and the idea that science is not decided by votes but by the weight of evidence and tested methods. Instead there is a brief discussion of some fossils that have proven important in understanding evolutionary transitions, and another of molecular evolution.

Book reviews

These discussions are rather too short to provide much illuminating or convincing information, though.

“How Did Life Begin?” follows this, and it is a really first-rate, compact treatment of a very difficult field. Ayala lays out what we would have to know in order to resolve the question, and gives a fine précis of what we know and don’t know. If I had to give a non-scientist an introduction to the question, this would be it.

Ayala ends with “Can One Believe in Evolution *and* God?” The answer is of course yes, one *can*; but why people believe as they do is a different question. The author, once ordained as a Dominican priest, and the recent recipient of the Templeton Prize, follows the NOMA (“non-overlapping magisteria”) approach favored by Stephen Jay Gould and others, that science is limited to the natural world whereas “Religion concerns the meaning and purpose of the world and of human life, the proper relation of people to the Creator and to each other, the moral values that govern and inspire people’s lives” (p. 73). Here I think he is giving religion a free pass. Philosophy also treats the first as well as the second; philosophy and science (notably cognitive sciences) would have something to say about the second (depending on what “proper relation” means); and religion is not requisite to establishing or enforcing morality, if you consider that the moral basis of society, from the ancient Greeks to our own, comes from non-theistic reason (see Plato’s *Republic*).

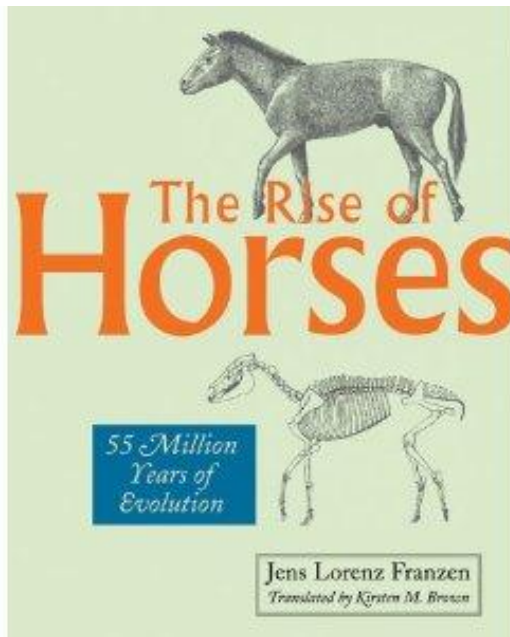


Ayala acknowledges that there are difficult questions here, particularly those relating to theodicy (if God is good, why is there so much suffering?). He takes Aubrey Moore’s position that evolution helped religion by showing that not all structures have to be perfect or optimally designed, and he thinks that although God could have created a perfect world, the fact that he did not makes it that much more interesting, and evolution is a great part of it.

For people of strong faith, this chapter will resonate. But it leaves a lot of loose ends, too. Ayala allows “revelation and religion” to “provide valid knowledge about the world” (p. 73), but this is a stretch. Valid knowledge would have to be universal, something that everyone could accept, like gravitation and how we discern colors. But different religions are both discordant in their beliefs and xenophobic in their treatment of others. As for “revelation,” this is usually a synonym for megalomania: see Charles Manson, Sun Myung Moon, and Oakland’s Harold Camping, who keeps predicting the end of the world and then appearing the next day, surprised and confused that he’s still standing. If science is not allowed to test the plausibility of anyone’s “revelation,” it’s a get-out-of-jail-free card for deluded charismatics.

And here, in the end, is where science may ultimately help religion. By understanding more about how the brain works and why we act in certain ways, why we tend to believe or prefer certain ways of thinking, and how we are socially conditioned as we grow, religions can be freed from the delusion that moral and ethical values are their exclusive provenience (as if philosophy didn’t exist). Studies of how behaviors traditionally associated with ethics and morality are distributed among human groups and other primates are providing a growing evolutionary context to questions long deemed exclusively in the religious domain. These are the hard questions that Prof. Ayala does not answer here. But some of his other answers are very good ones.

Book reviews



A review of Franzen, J. L. 2010. *The Rise of Horses: 55 Million Years of Evolution*. K. M. Brown, trans. Johns Hopkins University Press, Baltimore, MD. 224 pp. (\$61.20 cloth with 10% PS discount.)

Reviewed by Grant S. Boardman (University of Nebraska-Lincoln)

On its face *The Rise of Horses* sounds like it should be the successor to the now twenty-year-old popular work on the evolution of equids (MacFadden, B.J. 1992. *Fossil Horses: Systematics, Paleobiology, and Evolution of the Family Equidae*. Cambridge University Press, Cambridge, UK). Though admirable in many ways, *The Rise of Horses* does not present enough new information on the evolution of equids to replace *Fossil Horses* as the iconic treatise on the subject.

The prologue to *The Rise of Horses* gives us insight into Jens Franzen's personal relationship with equids; from his fondly remembered interactions with modern horses as a child in wartime Europe to the reemergence of his interest in them as a paleontologist at the beginning of a long and illustrious career excavating "dawn horses" at

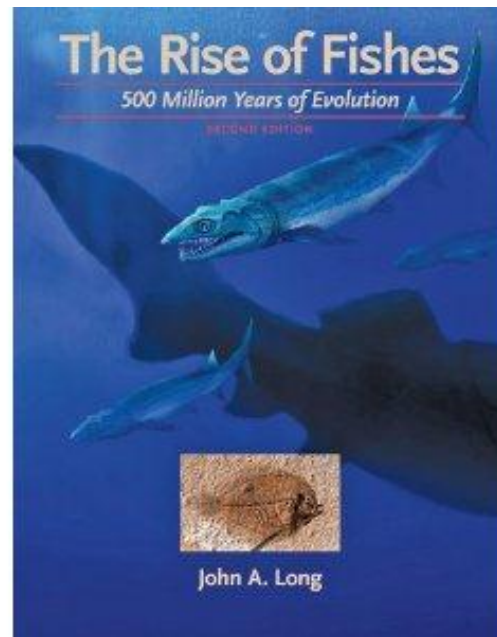
the UNESCO World Heritage Site of Grube Messel in Germany. His passion for the subject is clearly evident, despite what is certainly lost in translation from the original German. In much the same fashion as *Fossil Horses*, this treatment of the subject of equid evolutionary history begins by introducing horses as a group and describing the long and complex relationship between horses and man. Beyond this introductory chapter and a brief chapter on geologic time, Franzen dives right into his comfort zone with chapters centered on Europe during the Eocene. He does a particularly thorough job describing excavation of and work on the exceptionally well-preserved (with gut contents and preserved hair) equid remains from the middle Eocene German localities of Grube Messel, Eckfeld, and Geiseltal. My only complaint with regards to these otherwise excellent beginning chapters is the excessive use of the term "dawn horse" applied to the equids from Grube Messel and other middle Eocene sites, as they are not in fact the earliest horses. From this point on, however, the book loses focus and is presented in a less organized fashion. Franzen next covers classical functional aspects of horse evolution including the development of hypsodonty and the loss of toes in a confusing fashion favoring the FTE ("Frankfurt Theory of Evolution") over natural selection. The FTE claims that the internal drive towards energy efficiency is the primary catalyst for evolutionary change, rather than viewing evolutionary trends as adaptation to environmental changes. An outline of horse evolution, though thorough, is not presented until the last chapters of the book, after evolutionary trends and after a relatively lackluster review of fossil horses on the various continents. A rather oddly placed chapter dedicated to the other fossil and living perissodactyls and convergent "pseudo horses" does an admirable job but would have been better positioned near the beginning of the book or subsumed in the chapter introducing horses as a group.

The Rise of Horses would have benefitted from a more

Book reviews

synergistic approach in which taxon description and evolutionary trends were presented together in linear chronological context. To my mind it is also not entirely clear who the intended audience for this book is. Though it is not wholly a technical work based on its trappings (use of anecdote and lack of formal citation), it is also full of terms that never really get explained and are not likely to be found in the working vocabulary of a lay person. Like many popular works, it provides further reading associated with the listed chapters, and as a bonus to museum buffs like myself, it provides a list of museums (predominantly in Germany) that house equid fossils and exhibits showcasing the evolution of horses with a focus on the “dawn horses”.

This book is not, in my opinion, the successor to MacFadden's *Fossil Horses*, and perhaps it was never intended to be. I would note that I enjoyed reading large swathes of the book, and the European flare and centrism of the content and approach certainly adds to the appeal of *The Rise of Horses*. I found the opening chapters dealing with extremely well preserved equids from Grube Messel, Eckfeld, and Geiseltal to be the most interesting and informative, as I am not overly familiar with these localities and their spectacular fossils. If nothing else, its focus on the “dawn horses” of Grube Messel and other German sites affords *The Rise of Horses* a special place among the myriad of books dealing with horse evolution.



A review of Long, J.A. 2010. *The Rise of Fishes: 500 Million Years of Evolution*. 2nd ed. Johns Hopkins University Press, Baltimore, MD. 304 pp. (\$58.50 cloth with 10% PS discount.)

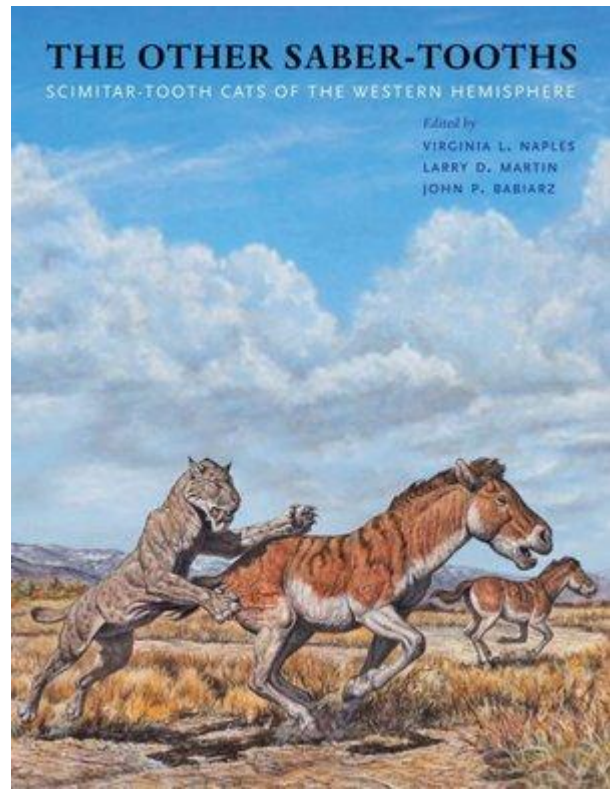
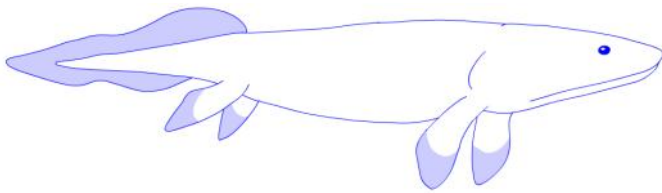
Reviewed by Mike Meyer (Virginia Tech)

The rise of fishes is a great book for understanding the development of fishes from the very first potential forms in the Cambrian to the tetrapods in the Devonian. It is a coffee-table-sized book that, after an introduction into the basics of geology and paleontology, has a chapter for each major group and evolutionary advancement in fishes. I especially liked the second chapter (“Glorified swimming worms”) going over what could be the earliest ‘fishes’, as this area of research is still advancing every year and very interesting. While the only complaint that I have about the figures is a prominent lack of scale bars, the book as a whole is abundant in large pictures, figures, charts, and reconstructions that greatly help the reader understand how each group helps tell the story of the evolution of fishes. The author has a knack for fitting a large amount of information onto a page despite the figures, and only in some parts does this make the text seem dense to read. Generally though the text is easy to read

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and flows well from chapter to chapter with small inserts in each highlighting traits specific to each group or evolutionary modification discussed.

The author also adds in little asides on the histories of not just the fossil, but of the circumstances surrounding certain fossil discoveries and researchers, which help draw the reader in when they are not expecting it. Additionally, the names of fossils from particular subsets of paleontology are always enlightening; it's obvious that paleoichthyologists have a sense of humor with fossils names such as *Barwickia downunda* (from Australia) or the early tetrapod *Eucritta melanolimnetes* (roughly translated as 'creature from the black lagoon'). The last third of the book is devoted to 'modern fishes' and the development of tetrapods and this is where some of the great reading can be found. One of the most powerful images used in this section can be found on page 238, which scales up a Devonian tetrapod skeleton to that of a modern human, creating a sort of 'Elpistostegalia sapiens' or 'Homo aquaticus' if you will, which does an amazing job of showing how little our general body plan has derived from those first tetrapods. Overall, while not a book for the novice, this book would make a great addition to any paleontological library.



A review of Naples, V.L., L.D. Martin, and J.P. Babiarz, eds. 2011. *The Other Saber-tooths: Scimitar-tooth Cats of the Western Hemisphere*. Johns Hopkins University Press, Baltimore, MD. 252 pp. (\$99.00 cloth with 10% PS discount.)

Reviewer: Cynthia D. Crane-Muston (East Carolina University)

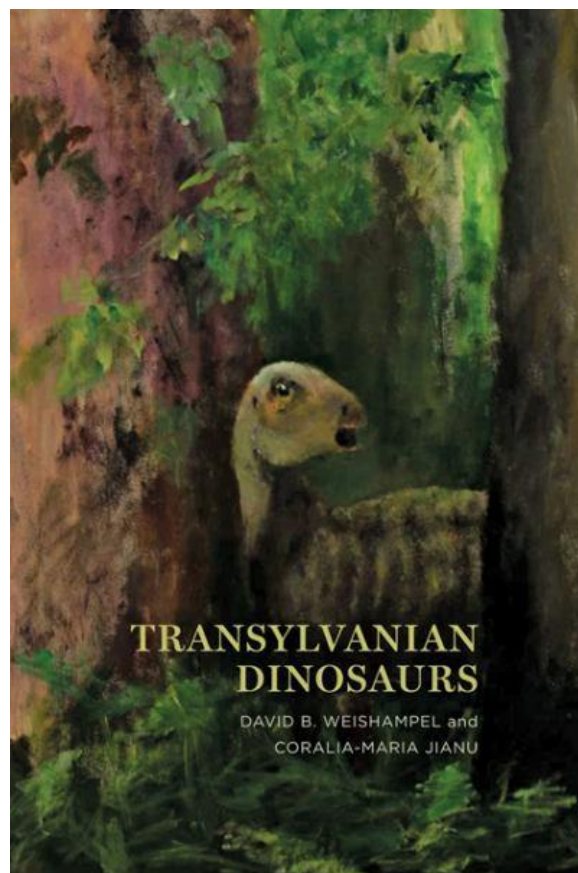
What an interesting read! This book includes a superb introduction to not only the saber-tooth cat that most of us acknowledge when the subject of saber-tooth cats comes up (*Smilodon fatalis*), but also introduces the lesser known scimitar-tooth cats (*Homotherium* and *Xenosmilus*) and offers up a comparison and contrast with *Smilodon*.

Beginning with an overview with the types of saber-toothed cats (the scimitar, dirk, and conical-tooth cats) and their range, population, and density, the book's stage has been set for a fascinating read. Chapters include in-

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interesting topics such as experiments on the bite radius and force of the saber-tooth cats, which help further define the prey-predator abilities, methods, and inherent nature of these large carnivores. Of particular interest is the introduction of a fairly recent discovery of a new type of saber-tooth cat: the cookie-cutter cat (*Xenosmilus hodsonae*). Also included are pathological and myological studies that assist in the interpretation of the predation methods and behaviors of these cats. In-depth osteological studies and genus-level comparisons are also presented throughout this book. Although some parts of this book can be somewhat technical in nature, the authors have eloquently explained the content to allow for readers with very little understanding of the subject matter to comprehend the scientific process and reasoning behind the studies.

This volume also includes excellent specimen sketches and photographs, supporting data tables, an appendix of measurement data, a glossary, and superb artistic reproductions of these saber-tooth cats. All of these extra features assist the reader with the superb knowledge and information presented in this book. Overall, this book is a very interesting read for those who are even remotely interested in the saber-tooth cats of North America. The layout, implementation of subsequent information, and flow of this volume shows the attention to both detail and quality of the work.



A review of Weishampel, D.B. and C.-M. Jianu. 2011. *Transylvanian Dinosaurs*. Johns Hopkins University Press, Baltimore, MD. 328 pp. (\$54.00 cloth with 10% PS discount.)

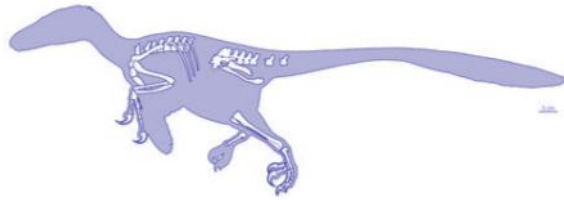
Reviewed by Stephen Brusatte (American Museum of Natural History)

Searching for dinosaur fossils in the enchanted shadows of the Transylvanian Carpathians is truly a magical experience. I've had the great fortune in my young career to work on Romanian dinosaurs and have done a bit of fieldwork in the Cretaceous of Transylvania, and although I don't like to play favorites when it comes to research, I must confess a special affection for Romania. The scenery is beautiful, the fossils are plentiful, our colleagues are generous and gregarious, and oh yes, the species we find there are among the most bizarre and puzzling in the entire 160-million-year fossil record of dinosaurs. Many of

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the Romanian dinosaurs are dwarves—including cow-sized sauropods orders of magnitude smaller than their iconic long-necked cousins—and others have heavily modified skeletons dripping with autapomorphies. For instance, the new carnivore *Balaur*, which was discovered by my colleague Mátyás Vremir a few years ago, has over 20 unique features that distinguish it from close cousins such as *Velociraptor*, including a double set of hyperextensible “killer claws” on its feet and a puny, fused hand whose function is mysterious to us.

Why are these Transylvanian dinosaurs so strange? They belong to well-recognized groups of dinosaurs that are common on other continents, yet their small stature and aberrant skeletons cry out for an explanation. Scientists have been intrigued by this mystery for over 100 years, dating back to the earliest dinosaur discoveries in Transylvania. The man responsible for these discoveries, the maverick Transylvanian scientist-slash-aristocrat-slash-spy Franz Baron Nopcsa, wove together many lines of evidence from anatomy, evolutionary biology, and geology to devise a provocative hypothesis: during the Cretaceous, Transylvania was an island, and the organisms living there were dwarfed and evolved bizarre skeletons because of the insular nature of their environment. Over the ensuing century, many additional fossil discoveries and a great amount of geological work have corroborated this hypothesis. Many of these discoveries were made by a long-term, international field project led by David Weishampel from the US and colleagues in Romania, including Dan Grigorescu, Zoltán Csiki, and Coralia-Maria Jianu. Through their work, Romanian dinosaurs are now some of the best understood Late Cretaceous dinosaurs worldwide, and Romanian dinosaur faunas are now seen as a stunning example of the “island effect” in an ancient ecosystem.



Weishampel and Jianu teamed up to write *Transylvanian Dinosaurs*, a general overview of the weird and wonderful dinosaurs of Romania that is both accessible to the public at large and valuable to research scientists such as myself who are working on Romanian specimens. Popular accessibility and scientific utility often seem to be mutually exclusive goals in books like these, but Weishampel and Jianu have done a nice job toeing this tricky line.

Their book provides a nice overview of the history of dinosaur discoveries in Romania, their personal experiences doing fieldwork, and the importance of the Transylvanian fossils in understanding

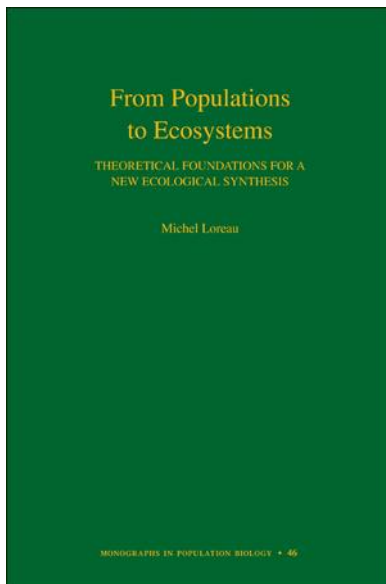
broader questions in evolution and ecology. For a more general audience, the book also provides a primer on comparative anatomy, dinosaur evolution, cladistics, and evolutionary rates analysis.

Some of these things will be elementary to more advanced readers, but Weishampel and Jianu are able to keep such readers interested by their thorough documentation of the entire Transylvanian Cretaceous fauna, including copious references to all of the major papers published over the past 100 years. They also do a brilliant job of succinctly summarizing the complex paleogeographic history of the Transylvanian area, which is critical to understanding when the region became an island, how large the island was, how the size of the island changed over time, and if/when the island had connections to larger landmasses.

This book succeeds because, more than anything, it is abundantly clear that the authors love Romania and the quest to discover new dinosaurs and new facts about evolution. This passion drips through the entire book, and helps link together the general and technical sections that may otherwise appear disjointed. This book is also a fine example of something that I always try, but rarely succeed, to articulate to colleagues in paleontology, evolutionary biology, and geology who don't work on dino-

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saur. Dinosaurs are relevant. Dinosaurs are important. Dinosaurs, within the context of their ecosystems and paleogeography, can tell us many neat things about how evolution works over long time scales. The island rule, faunas changing in concert with shifting continents and mountain building, heterochronic shifts in development affecting body size and morphology. The Transylvanian dinosaurs help us to understand all of these big issues, as Weishampel and Jianu's book conveys so well.



A review of Loreau, M. 2010. *From Populations to Ecosystems: Theoretical Foundations for a New Ecological Synthesis*. Monographs in Population Biology 46. Princeton University Press, NJ. 328 pp. (\$36.00 PB and eBook with 20% PS discount.)

Reviewed by: Ryan F. Morgan

At first glance, this book does not stand out from the crowd of other biology texts; rather, it appears to blend in, with a simple hunter-green-and-maize-colored backing. But don't let this simple cover fool you, this book packs a punch!

As outlined in the preface, Loreau set out to reconcile two functional subdisciplines of ecology; namely, population and ecosystem ecology. Using easy to read but concise

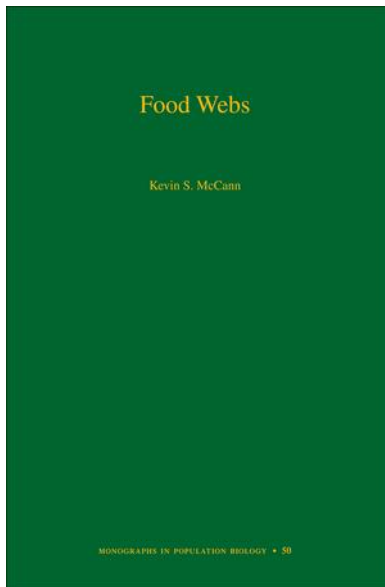
language, he explains the intricacies and relatedness between two separately formed but interrelated subdisciplines, and does so in a way that a rusty or unfamiliar researcher can follow. However, Loreau does not go so far as to sugar-coat the formulas and schools of thought presented in this monograph, but rather explains the background thought behind the formulation of each, and further explains how in reality (using both his clear language and some simple algebraic manipulations) these ideas are very similar, if not the same, in practice.

In nine chapters Loreau manages what would take most more than three times the space to cover and is judiciously concise. Starting with a synthesis of population and ecosystem approaches to ecology, including a very nice explanation of niche theory, Loreau goes into chapters focusing on topics as diverse as biodiversity and ecosystem function to the stability and complexity of ecosystems. Chapter 6, on material cycling and overall function of ecosystems, begins with classic ecosystem models dating back to the 1960's, but quickly moves into more complex and modern diagrams, but in a way that keeps the reader interested and is current to studies from a few years ago. The final chapter, which sets out to finish the job of unifying the two disciplines, almost seems unnecessary after having gone through the text and seeing the interrelatedness of the two. However, Loreau never fails to to surprise, and finishes by detailing both the shortcomings of the sciences, and explaining what needs to be done in the community at large to complete the task of reconciliation.

As a monograph, I found the text both informative and interesting, and certainly relied upon my background in population ecology and genetics in reviewing this text. In the classroom environment, I could see this text being used in a graduate seminar or perhaps a senior-level honors class in biology, ecology, environmental science, or any of the related disciplines (as a paleontologist, I would certainly recommend it!). The catch with this text is alt-

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though it is well written and clear, individuals lacking a strong background in the life sciences, particularly ecology, may have a hard time working their way through the formulas which Loreau so easily moves through. With an instructor to help guide through the formulas, however, this text would be ideal for teaching the science, and the text makes a wonderful reference for the future.



A review of Food Webs McCann, K. S. 2012. *Food Webs*. Monographs in Population Biology 50. Princeton University Press, Princeton, NJ. 250 pp. (\$79.60 cloth, \$36.00 PB and eBook with 20% PS discount.)

Reviewed by Jo Hellawell (University of Bonn)

McCann's monograph begins with a quote from the Harvard entomologist and naturalist Edward O. Wilson: "If species composing a particular ecosystem begin to go extinct, at what point will the whole machine splutter and destabilize?" This is a pertinent question as the global human population reaches seven billion and shows no sign of slowing its rapacious expansion; human impacts are dramatically altering natural ecosystems and the repercussions of this, now more than ever, require thorough exploration. World food production is set to double

in the coming decades, but the exact effects this will have on ecological sustainability and function as yet remain unclear. Food web theory allows us to address these crucial issues at various scales, from models involving a few interacting species up to entire ecosystems. McCann's book offers us a comprehensive overview of theoretical and empirical approaches to understanding food web dynamics.

The book is divided into three sections, the first giving us an introduction to ecosystem stability (and instability) with some necessary background mathematical information, laying the groundwork for the subsequent two parts which then take us up through the ecological hierarchy in vast detail, from the dynamics of small food webs to complex ecosystems. Well-illustrated, with black and white graphs and diagrams on almost every other page, the text is relatively clear and easy to follow, although it is quite technical and not aimed at the non-specialist. In particular, the chapter containing the background mathematics will perhaps be clear to mathematicians, but for those who are not it is a somewhat complex and unclear barrage of information. In my opinion, contextual case studies could have been provided at several prominent junctures throughout this chapter in order to make the theory more palatable to the "less mathematically-oriented reader" McCann was hoping to accommodate. Section one aims to set the scene for the rest of the book and overall this is successfully accomplished. However, the author constantly tells us what he is about to tell us and what he will tell us within the other, later chapters of the book, to such an extent that I felt a little editing should have been applied to remove some of the repetition.

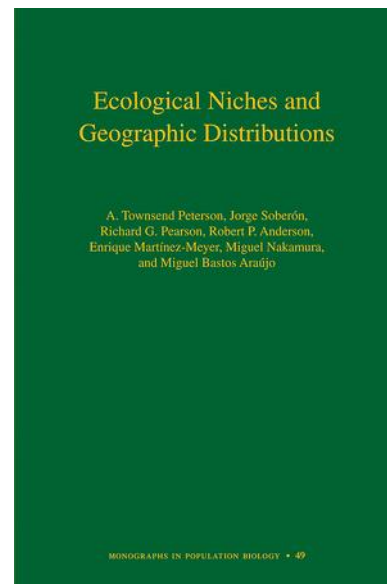
The remaining two sections of the book will be of most use to the paleontologist. Although prehistoric food webs are not addressed explicitly, such research is cross-disciplinary and requires a thorough understanding of modern ecological theories before it can be applied to the

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past. The general rules pertaining to ecological modules of extant systems and the recurring architecture at variety of scales are clearly laid out here, as well as an overview of classic food-web theory and whole-community matrices. In the latter chapters, larger-scale feedbacks such as nutrient recycling are detailed, as well as the stability of spatially expansive versus highly fragmented ecosystems. The role of adaptive behavior on food-web topology and the implications for the dynamics and stability of ecosystems are also discussed, before a brief look at human-driven rapid change and response. An understanding of many of these themes is vital for paleoecologists interpreting the effects of change, from local environmental change to widespread climate change, and the impact of mass extinction and recovery on ecosystems globally.

This is potentially an indispensable book for ecologists and paleoecologists alike, synthesizing food-web theory and outcomes from population-level up to whole-ecosystem-level approaches. McCann offers clear explanations of the dynamics of food webs using a mathematical approach, and while the book will be of particular use to graduate students, it may also be of substantial use to undergraduate students as an advanced but very thorough introduction to the subject. Dealing with the complexity of natural ecosystems is highly challenging and, as such, requires a range of theoretical and conceptual approaches, as well as empirical data, to attempt to resolve the dynamics. McCann brings together a wealth of literature, mathematics, and models to help constrain and understand the dynamics of natural systems. Having said that, this is a technical volume of a particular ilk which I feel can only warrant a limited audience. This is not a text book and therefore is not designed to be dipped into and read as individual chapters, but a monograph intended to be read from cover to cover. Being that the language is technical and it is not popular science, the book does not lend itself to bedtime reading, and at 250 pages is not a

quick read. Finding the time to plow through such monographs is not high on the “to-do” list for many busy academics, and is often impossible unless the reader has a prior advanced knowledge of the subject, thereby rendering the need for a comprehensive overview extraneous. However, with its accessible price tag, this book is bound to feature on the bookshelves of many graduate students who wish to educate themselves thoroughly on the subject.



A review of Peterson, A.T., J. Soberón, R. G. Pearson, R. P. Anderson, E. Martínez-Meyer, M. Nakamura, and M. B. Araújo. 2011. *Ecological Niches and Geographic Distributions*. Monographs in Population Biology 49. Princeton University Press, Princeton, NJ. 328 pp. (\$64.00 cloth, \$39.60 PB and eBook with 20% PS discount.)

Reviewed by Alycia Stigall (Ohio University)

During the past decade, ecological niche modeling (ENM) has burst onto the scene as an innovative technique for quantitatively analyzing biogeographic, ecological, and evolutionary research questions. The charge has been led, to a large degree, by the authors of this volume. Consequently, I had high expectations when I picked up this

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book. Certainly a theoretical and practical guide for developing niche models written by the researchers who pioneered these methods should be a seminal work. I was not disappointed.

This book is an impressively well written exposition of the conceptual foundation, practical implementation, and potential applications of niche modeling. At the outset, I should note that the emphasis of this book is on neontological instead of paleontological uses of ecological niche modeling. However, the theoretical framework, methodological discussion, and even most applications are directly transferable to analyses with fossil species.

ENM analyses estimate the ecological niche of a species (see below) based on the environmental conditions that occur at a set of known species occurrence points. The resulting niche models can be used to generate predictions of a species' geographic distribution (=species distribution modeling) or they can be analyzed directly to analyze various questions about niche constancy in space or time. As this research area has gained prominence, a dizzying array of algorithms has been generated and analyses have increased exponentially. Missing from this body of work, however, was a clear and detailed conceptual and practical guide for conducting ENM analyses. This book aims to fill that gap—and does so admirably.

The most important contribution of this volume is the clear and detailed theoretical framework that is developed in Chapters 2 and 3. Within ecology, the term

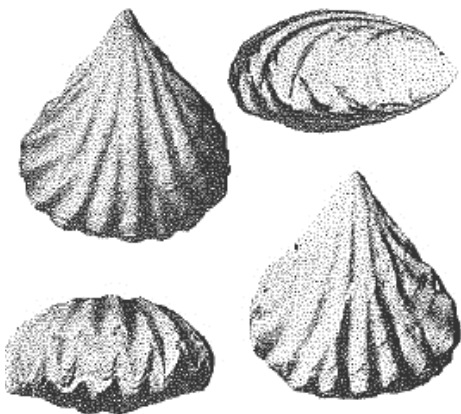
“niche” has historically been used to signify distinct concepts, including the suite of environmental conditions in which a species can maintain viable populations (=Grinnellian niche: this is what ENM attempts to reconstruct) and the role of species within the community (=Eltonian niche).

The relationship between a species' niche and its geographic distribution is also complex. Peterson et al. describe this relationship in terms of

Peterson's BAM diagram, which emphasizes that a species range consists only of the region where favorable biotic, abiotic, and movement (dispersal) conditions for the species overlap. This conceptual tool provides a powerful framework for considering which aspects of a species' niche is indeed reconstructed in predicted distribution maps within the various applications examined in the final section of the book.

Peterson and colleagues present a detailed discussion of these niche concepts and their relationship to species geographic distributions using set theory. The set-theory notation does require dedicated concentration to fully grasp; however, its use in this context is brilliant. The development of this notation provides a clear and succinct mechanism to discuss niche concepts both here and throughout the rest of the book—and the authors provide an incredibly helpful appendix of set-theory terms in case you need a refresher while reading subsequent chapters.

The second section of the volume addresses practicalities of niche modeling analyses, including data selection, model generation and calibration, model performance assessment, and translation of niche models into geographic space. In each chapter, the authors outline the conceptual issues, provide practical guidance on limitations and pitfalls of the analytical methods, and note future directions for methodological improvement. These

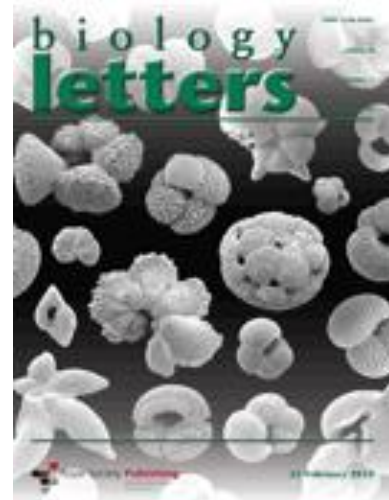


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chapters are essential for anyone interested in pursuing ENM analyses. The information is presented clearly and the extensive citations provide the foundation for more in-depth forays into the literature.

The final set of chapters provides examples of research questions that can be addressed via niche modeling. Each chapter includes explicit statements about the assumptions of each application (very helpfully expressed in set notation!), discussion of potential pitfalls, and tie in with historical theoretical context. These chapters focus on the process and practicalities of testing hypotheses related to reconstructing biodiversity, setting conservation priorities, estimating ranges for invasive species, understanding disease, and analyzing niche stability in evolutionary time. Paleontological data could (and in most cases has) been employed to analyze research questions in each of these arenas. Somewhat expectedly, the authors provide few paleontological analyses among their examples, and these are primarily restricted to Pleistocene taxa. No discussion of niche models generated using sedimentary data is presented (there are a substantial number of these now published for pre-Quaternary taxa), but these arguably fall outside the scope of this book as the target audience includes primarily neontologists.

Overall, this book is an instant classic and a critical read for anyone interested in this fast-moving field of ecological niche modeling. I have already assigned it as required reading to graduate students in my lab. Although the book deals almost exclusively with modern organisms, the concepts and methods are applicable to the fossil record—both in shallow and deep time. Reading the chapters, I could envision many more ways to employ these methods more fully within paleontological construct of “deep” time. Hopefully you will, too.



A review of Barrett, P. and A. Smith, eds. 2012. Models in Palaeontology: *Biology Letters* Special Feature. *Biology Letters* 8 (1) Free to access online: rsbl.royalsocietypublishing.org/site/misc/models_in_palaeontology.xhtml

Review by Dee Ann Cooper

Succinct, timely, readable and cross-disciplinary! These articles are superb, as are the formats of the journal and Royal Society Publishing's freely accessible website for this special issue.

As a field paleontologist, my fear of modeling has been greater than my fear of stepping on a sleeping “rock rattler”, finding fresh tracks of a black bear, or leaving my field notes at the wrong end of a “desert death march”. I am keenly aware that my modeling attempts, while mathematically sound, are not “up to snuff”. I have been afraid to expose myself, and my cherished field data, to interpretation by the dreaded “new generation” modelers. Schopf (1972. *Models in Paleobiology*. Freeman Cooper & Co, San Francisco, CA.) has been my trusted “standard”.

The first-rate Introduction to this series is co-authored by the organizers, Andrew B. Smith and Paul M. Barrett. Smith and Barrett present and summarize the eleven subsequent papers by explaining the necessity of modeling and by clarifying the differences between modeling form

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and function, diversity, evolutionary processes, and fossil-calibration effects on molecular clocks.

Opinion pieces by John R. Hutchinson and Philip S.L. Anderson *et al.* explain the various inherent challenges in drawing inferences of function from form in the fossil record. Hutchinson accurately concedes, “investigator attitudes toward models encompass a broad spectrum between extreme credulity and nihilism.” Anderson points out “all models are based on assumptions, and palaeontological models in particular require additional assumptions.”

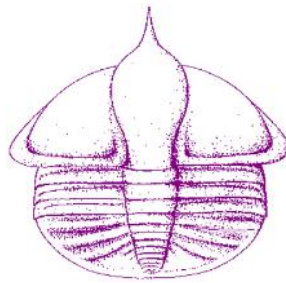
Three different approaches to modeling diversity are offered. Graeme T. Lloyd presents a simple model based on the premise that diversity is constant and “observed diversity is a product of the sampling proxy.” Roger J. Benson and Phillip D. Mannion pose a bivariate regression model that illustrates their recommendation that “appropriate methods to account for sampling biases” must be utilized no matter the size of a dataset. A model for time averaging in death assemblages by Thomas D.

Olszewski is particularly intriguing because he suggests “integrating the product of an influx time series and a post-mortem loss function”.

The five papers that illustrate how evolutionary processes can be modeled are equally diverse and instructive. “The probability distribution of the number of species within a genus as a way to infer rates of origination and extinction” is examined by Michael Foote. Foote focuses on taxonomic structure and validates his work by applying it to both extinct and extant species. Thomas H.G. Ezard *et al.* introduce a birth-death model that compares results when using different species concepts that “represent different ideas of what birth (speciation) and death (extinction) mean.” Of great use to me, personally, in Ezard *et al.* is their concise explanation of the different species concepts. Much to my

surprise and relief, Peter J. Wagner’s contribution uses simple inverse modeling to compare three models, and concludes that morphologic change is “more than a collection of Poisson processes”. Peter D. Roopnarine and Kenneth D. Angielczyk elegantly “argue that the rise and fall of species can result from a tragedy of the commons, wherein the pursuit of self-interests by individual agents in a larger interactive system is detrimental to the overall performance or condition of the system”. Last in this group, Andrew M. Bush and Philip M. Novack-Gottshall provide summaries of seven models that “represent major perspectives through which palaeoecological diversification can be interpreted” as “starting points” for theoretical analysis of empirical data.

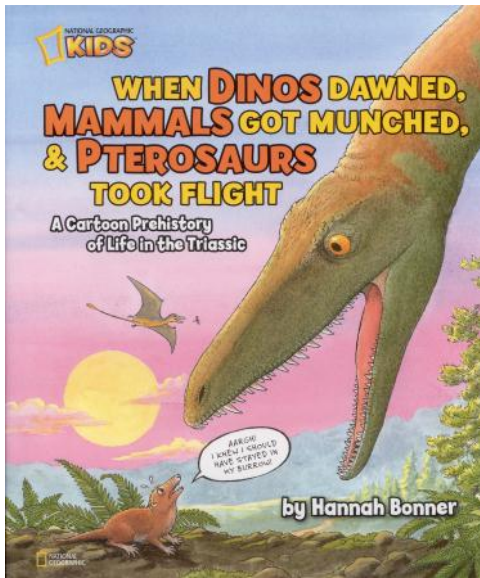
The final paper in this Special Feature, by Rachel C.M. Warnock *et al.*, addresses the incorporation of fossil data into molecular clock studies. Warnock *et al.* effectively illustrate that bias in the fossil record can only be perfected by modeling that is reinforced by more detailed attention to density distribution and sampling bias.



Has my “fear of modeling” been assuaged by this excellent “short course in modeling”? You betcha! Especially because every paper uses “palaeontological data as their starting point”. Am I ready to use “new generation approaches”? You betcha, again! Ever since I received this bound volume of *Biology Letters*

to review and discovered that the Special Feature was already “free to access” online, I have been harassing my husband and co-investigator (also a field geologist) to read the papers. He diplomatically rebuts that his part of the project is finished and my part of the project is the palaeoecological interpretation. We have been struggling with a paper about our newly-defined taxon range zone (huge dataset). Within these well-organized and well-written papers, I believe that I have found a “new-generation” model that I can use with confidence.

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A review of Bonner, H. 2012. *When Dinos Dawned, Mammals Got Munched and Pterosaurs Took Flight: A Cartoon Prehistory of Life in the Triassic*. National Geographic, Washington, DC. 48 pp. (\$17.95 cloth)

Reviewed by Gregory J. Retallack (University of Oregon)

Hannah Bonner is that rarest of birds, a paleontological cartoonist. She has also published whimsical takes on Devonian and Carboniferous life for kids. Now the Triassic gets the treatment. These witty, irreverent pages are ideal for the young dinosaur enthusiast in the family, but many details will surprise professional paleontologists.

My own paleontological studies began in Triassic rocks, and this book includes quite a few of my favorite things. It begins with the mother of all mass extinctions, and the various ways in which reptiles, molluscs, and plants survived. It then moves into the evolutionary diversification of plants and reptiles. The origin of dinosaurs within the diversifying array of reptiles features prominently. Other notable origins include the first flying fish (freshwater!), turtles, frogs, gliding lizards, and pterosaurs. Then there are the first reefs of modern corals and the earliest flies and mammals, before the terminal-Triassic extinctions.

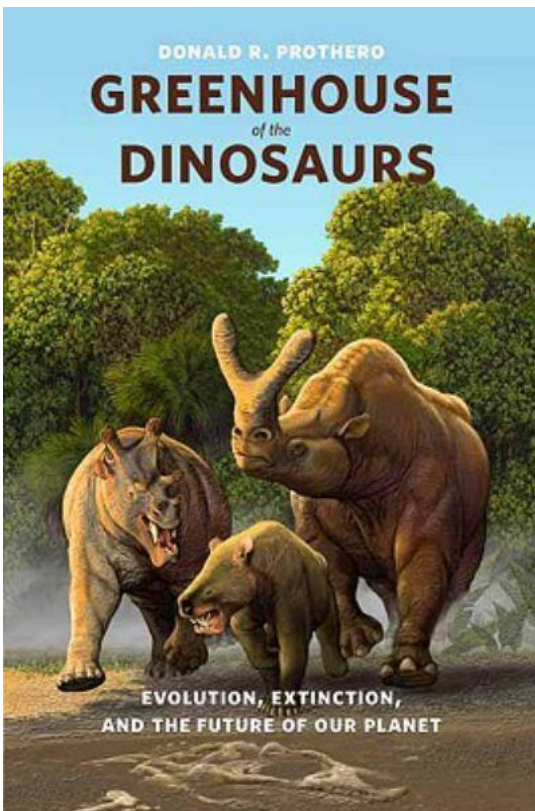
The Triassic has a compelling mix of bizarre and familiar creatures.

My favorite parts were the reconstructions of particular biotas, such as those of the Germanic Bundsandstein and Keuper, the Italian Dolomites, the Argentine Chañares Formation, Arizona's Chinle Formation, the Molteno Formation of South Africa, China's Guanling, and fissure faunas of southern England. My own research has taken me on pilgrimages to many of these places, and the way in which Bonner envisages them generally meshes with my own mind's eye.

Much of the humor in the book comes from anthropomorphic and anachronistic lampooning of print and television media: an approach increasingly adopted by museum exhibits on the history of life and ancient environments. These are, of course, completely unscientific approaches: so if you are a purist about these things you may not like this book. Then again, similar absurdist approaches are also the techniques of my favorite television shows, Comedy Channel's "Daily Show" and "Colbert Report," whose viewers have been proven by survey to be better informed about the news than viewers of conventional news programs. Humor can sometimes be a stretch, but it also can inform. Bonner's whimsical and eclectic choices of material will not fail to surprise professionals, and delight the young at heart.



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A review of Prothero, D.R. 2009. *Greenhouse of the Dinosaurs: Evolution, Extinction and the Future of our Planet*. Columbia University Press, New York, NY. 288 pp. (\$23.60 cloth with 20% PS discount.)

By Benjamin Burger (Utah State University)

Donald Prothero's book "Greenhouse of the Dinosaurs" is a lovely gem of a book that explores the personal and professional career of one of today's most prolific workers in our field. Prothero writes "This book is my own attempt to inject the human side of the profession into the story of the research topics I have had the great fortune to be involved in over the past 40 years." The research topics covered in the book are the same that have established Prothero's career centering on his brilliant work on the Eocene-Oligocene boundary, which occupies five of the ten chapters of the book. These chapters are the heart of the book, and give the reader a true sense of his extraor-

dinary dedication to paleontology. Throughout the book, we are reminded of the singular mindset required for a successful career in paleontology, the dedication and long years of study, and also the sporadic good fortune of finding those elusive remnants of ancient life we all seek. Many illustrious names of paleontologists and geologists grace the book, and Prothero outlines the influence these people had on his own studies. The book touches upon Prothero's career from a fourth-grade dinosaur enthusiast in southern California and his undergraduate education at the University of California at Riverside, to his NSF fellowship at Columbia University in New York and his experiences as a student of the late Malcolm McKenna at the American Museum of Natural History. The story skips through the struggles of finding early employment, teaching at Vassar College and Knox College, before finding permanent employment at Occidental College in California, where he has mentored numerous undergraduate students. Donald Prothero is known to most of us as an enthusiastic listener, having attended every annual meeting of the Society of Vertebrate Paleontology and the Paleontological Society at GSA since 1977/78. Perhaps what I admire the most in this lovely gem of a book is the final chapter, in which Prothero offers the frank talk, that we have all heard before, but is rarely put into print—it is hard to find employment as a paleontologist. Few succeed. One in ten PhD graduates finds a job in paleontology, and with the current economic depression, continued closures of paleontology and geology programs, and drop in science literacy among elected officials, it is likely even fewer now. Hope undoubtedly triumphs in the end, as he highlights the importance of paleontology in unlocking the historical nature of climate change and forecasting future changes that are yet to come. He ends with the following statement "Yes, becoming a paleontologist is a difficult task with long odds, but if you love fossils the way I do, the rewards are worth it." Surely the reward of reading this book is worth it as well.

Course and fellowship announcements

Fall 2012 Internships in Panama—Geology and Paleontology of the Panama Canal

NSF-funded internships are available effective immediately for the Panama Canal Project (PCP)- PIRE (NSF-funded Partnership for International Research and Education) for United States citizens or permanent residents undergraduate or post-bac students to assist with collecting fossils and other fieldwork in the exposures along the Panama Canal (Panama).

Interns will live in Panama for a minimum of 4 months conducting fieldwork under the supervision of PIRE PIs and Postdoctoral Fellows at the Smithsonian Tropical Research Institute (STRI) in Panama City. Experience in Geological/Paleontological fieldwork and some level of bi-lingual (English/Spanish) competency is preferred.

This internship provides an excellent opportunity for students who might be considering taking a semester off between their studies to gain valuable research and international experiences.

PCP-PIRE internships include: \$1,000 monthly stipend; dorm style housing in Panama; relocation to/from Panama; travel to Panamanian field sites.



To apply, please contact Claudia Grant for further details at cgrant@flmnh.ufl.edu by **June 30, 2012**

PCP-PIRE is a U.S.-Panamanian partnership to document the ancient marine and terrestrial biodiversity and global climate change of the New World Tropics (NWT) preserved in the 25- million-year fossiliferous sequence in Panama, and promote international education, collaboration, and exchange. Research foci include the magnitude and timing of diversity change in the NWT; the biogeographic origins, relationships, and dispersal history of the Central American fauna and flora; antiquity of the rainforest; effects of global climate change on tropical biodiversity through time; and other fundamental questions related to the emergence of the Isthmus of Panama and its past on biodiversity.

PCP-PIRE is committed to diversity in education and encourages the application of women and underrepresented minorities.

Graduate Fellowships in evolutionary science and related fields at NESCent

NESCent is now including graduate training in its portfolio, by offering one-semester fellowships for graduate students to pursue research with a NESCent sabbatical scholar, a NES-

Cent postdoctoral scholar, or a NESCent Working Group. Deadlines are **January 1** (for a fall semester fellowship) and **July 1** (for a spring semester fellowship). For more information, please see our website at www.nescent.org/science/proposals.php.

Postdoctoral Fellowships in evolutionary biology and related fields at NESCent

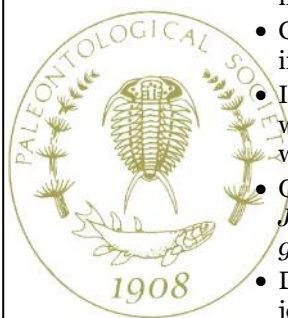
The National Evolutionary Synthesis Center (NESCent) is now accepting proposals for Postdoctoral Fellowships. We are looking to support innovative approaches to outstanding problems in evolutionary science. Proposals in any area of evolutionary science are welcome, but proposals in the following areas are of particular interest: Evolutionary Medicine, Synthetic Biology and Origins of Life, Evolution and the Social Sciences, and K-12 Minority Education in Evolution. Proposals are due **July 10** for two-year Fellowships that will begin no later than January 2013; we anticipate that award decisions will be made by the first week of October. For more information, please see our website at www.nescent.org/science/proposals.php.

Call for proposals—Sabbatical Scholars, Working Groups and Catalysis Meetings at NESCent

Proposals for Sabbaticals, Working Groups and Catalysis Meetings are now being accepted at The National Evolutionary Synthesis Center (NESCent). We are looking to support innovative approaches to outstanding problems in evolutionary science. In particular, proposals that have a clear interdisciplinary focus, or involve evolutionary concepts in non-traditional disciplines, are strongly encouraged, as are proposals that demonstrate international participation and a mix of senior and emerging researchers, including graduate students. Proposals are accepted twice a year, with deadlines on **July 10** and **December 1**. Proposals in any area of evolutionary science are welcome, but proposals in Evolution and the Social Sciences and K-12 Minority Education in Evolution are also being considered for the July 10 deadline (Proposals in one of these two areas must include "Targeted Initiative" in proposal title; see also www.nescent.org/news/newsdetail.php?id=225 and www.nescent.org/news/newsdetail.php?id=229). Proposals for Sabbaticals may be for up to a full year. We also accept proposals for short-term visits (2 weeks to 3 months; deadlines on January 1, April 1, July 1 and September 1). For more information, please see our website at www.nescent.org/science/proposals.php



Being a Society member brings many benefits!



Membership numbers

(updated June 2012)

- Support the advancement of the science of paleontology and understanding of the history of life on Earth through membership in the Paleontological Society.
- Gain cutting-edge knowledge of advances in paleontology.
- Interact and exchange ideas with the worldwide paleontological community while shaping the future of the profession.
- Online access to two premier journals—*Journal of Paleontology* and *Paleobiology*—included with membership.
- Discounted, members-only rates on print journals.
- Receive occasional *Paleontological Society Memoirs* with print subscriptions to the *Journal of Paleontology*, and *Paleobiology Memoirs* and other special publications with print subscriptions to *Paleobiology*.
- Members-only discounts on the *Treatise of Invertebrate Paleontology* and other paleontology books.
- Student research grants opportunities.
- Discounted member rates on publications of the Palaeontological Association (www.palass.org).
- Discounted member registration rates for annual and regional meetings of the Geological Society of America (GSA). Participate in paleontological topical sessions and other programs at GSA meetings.
- Opportunities to participate in North American Paleontological Conventions.
- Participate in supporting the Society's programs, awards, and publications; including:
 - ◊ Student research grants
 - ◊ International research grants to support those in Eastern Europe and republics of the former Soviet Union (PalSIRP Sepkoski Grants)
 - ◊ Student NSF travel grants, solicited and distributed by the Paleo Society
 - ◊ Educational outreach to K-12 children and the general public
 - ◊ ... and more

**Now's the time
to renew for
2012 or 2013!**



Year	Student	Regular	Retired	Emeritus	Spouse	Total
2012	335	841	122	92	8	1,398
2011	339	842	122	92	8	1,403
2010	295	940	134	89	10	1,468
2009	324	904	141	82	14	1,465

Ways the Society supports students

- Discount membership rates that include online access to both *Journal of Paleontology* and *Paleobiology*.
- Paleontological Society Student Research Grants for undergraduate and graduate student members of the Paleontological Society
- Discount rates on printed Journal and Short Course volumes for student members
- Student members get discount tickets for the Society luncheon at GSA meetings
- Student members are eligible for the Paleontological Society Student Poster Award at GSA



Thanks for your service!

It takes many people in addition to the Society Officers to make our Society work! Many thanks to those below who have spent served on various ad-hoc committees. If you would like to volunteer to help the Society, please contact the Committee Chair or any Society Officers.

Website coordinator: Dena Smith

PS Student Research Grant proposal reviewers:

Matthew Powell (Chair), Diana Boyer, Kate Bulinski, Edward Davis, Marc LaFlamme, Jocelyn Sessa, and David Sunderlin

PS Education and Outreach Committee:

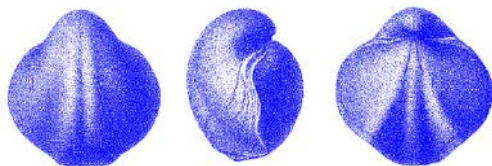
Peg Yacobucci (Education Coordinator), Danita Brandt, Phoebe Cohen, Sean Cornell, Dave Goldsmith, Alan Goldstein, Talia Karim, Joanne Kluessendorf, Steve Schellenberg, Judy Scotchmoor, Dena Smith, Dale Springer, Leif Tapanila

Joint Technical Program Committee:

Tom Olszewski (Program Coordinator) Seth Finnegan, Caroline Stromberg

Strimple Committee:

Ken Angielczyk, Kevin Boyce, Paula Noble, and Carrie Schweitzer



Want to purchase back issues of Society Special Publications?

Effective May 2009, Paleontological Research Institution in Ithaca, New York, assumed the role of publications sales agent for back issues in the PS Special Publications series. All previous publications are available for order (\$20 per volume plus shipping and handling) at the PRI Publications website. Starting with volume 16, volumes will be \$25.00 per copy. Order at www.museumoftheearth.org/publications/bookstore.php or contact Dr Paula M. Mikkelsen, PRI Director Publications (pmm37@cornell.edu) or by phone 607-273-6623, ext 20).

Books available for review

The following volumes have been received and are available to Paleontological Society members in exchange for writing a review for *Priscum*. Reviews should be informative, engaging, and 400–800 words long. The tone can be informal and casual, appropriate to recommending or critiquing a book to friendly colleagues. (Longer reviews are allowed, but please request ahead of time.) Reviews should be submitted by May 1 for inclusion in the Spring/Summer issue or Dec. 1 for inclusion in the Winter issue. **Reviewers must be a current member of the Paleontological Society before receiving review copy.** If you are interested in reviewing one of these volumes, please contact Phil Novack-Gottshall (pnovack-gottshall@ben.edu). Reviews will be assigned on a first-claimed basis.

Meyer, D.L. and R.A. Arnold. 2009. *A Sea Without Fish: Life in the Ordovician Sea of the Cincinnati Region*. Indiana University Press.

Patterson, B. D. and L. P. Costa, eds. 2012. *Bones, Clones, and Biomes: The History and Geography of Recent Neotropical Mammals*. University of Chicago Press.

Patzkowsky, M.E. and S.M. Holland. 2012. *Stratigraphic Paleobiology: Understanding the Distribution of Fossil Taxa in Time and Space*. University of Chicago Press.

Pietsch, T.W. 2012. *Trees of Life: A Visual History of Evolution*. Johns Hopkins University Press.

Sepkoski, D. 2012. *Rereading the Fossil Record: The Growth of Paleobiology as an Evolutionary Discipline*. University of Chicago Press.

Steyer, S. 2012. *Earth Before the Dinosaurs*. Indiana University Press.

Book publishers: Please contact Phil Novack-Gottshall (pnovack-gottshall@ben.edu) if you are interested in providing review copies for inclusion in *Priscum*, which has a readership of 1,500 professional and avocational paleontologists.

Upcoming events and deadlines

National Fossil Day

Oct. 17, 2012

2012 GSA Annual Meeting

November 4–7, Charlotte, NC

- Abstracts due Aug. 14
- Early registration deadline is Oct. 1
- FREE Paleontological Society Short Course (*Reconstructing Earth's Deep-Time Climate – The State of the Art in 2012*) occurs Nov. 3
- Paleontological Society Reception and Awards Banquet is Nov. 4, 5:30–8:30 PM (ticketed event)

2013 GSA sectional meetings

Northeastern: Bretton Woods, NH, Mar 18–20

Southeastern: San Juan, Puerto Rico, Mar. 20–21

North-Central: Kalamazoo, MI, May 2–3

South-Central: Austin, TX, Apr. 4–5

Rocky Mountain: Gunnison, CO, May 15–17

Cordilleran: Fresno, CA, May 20–22

Future GSA annual meetings

2013 - Denver, CO: October 27–30

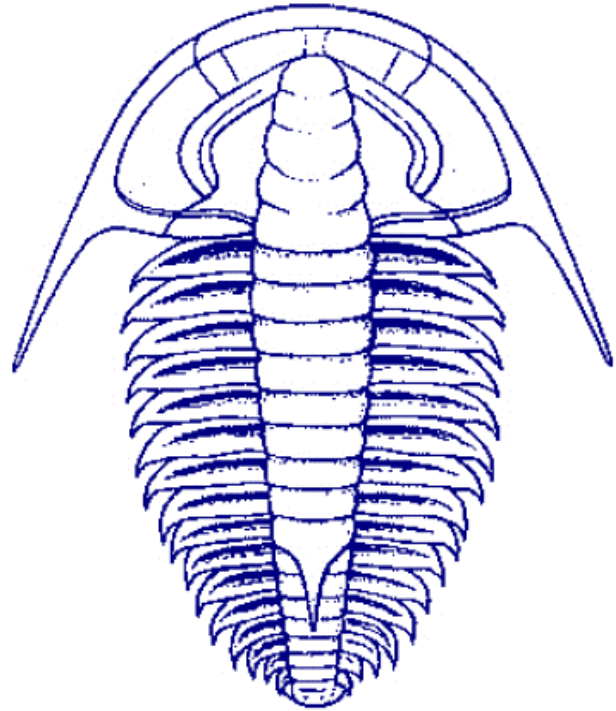
- This coincides with the 125th anniversary of GSA!
- Call for proposals due Jan. 8

2014 - Vancouver, BC, Canada: October 19–22

2015 - Baltimore, MD: November 1–4

Association of Applied Paleontological Sciences

Check <http://www.aaps.net/aaps-grants.htm> for details on individual grants and deadlines



Current Paleontological Society Officers

President: Philip D. Gingerich

President-Elect: Sandra Carlson

Past-President: Douglas H. Erwin

Secretary: Mark A. Wilson

Treasurer: Peter Harries

Councilor (Unrestricted): Linda Ivany

Councilor (Under 40): Alycia Stigall

Program Coordinator: Tom Olszewski

Education Coordinator: Peg Yacobucci

Student Representative: Andrew Haveles & Sarah Tweedt

Co-Editors, *Journal of Paleontology*: Steve J. Hageman & Brian R. Pratt

Co-Editors, *Paleobiology*: Bruce MacFadden, Douglas Jones, & Jonathan Bloch

Editor, *Special Publications*: Sara Marcus

Editor, *Priscum*: Philip M. Novack-Gottshall

Chair, *PalsIRP*: Ronald Parsley

Section Chairs

Northeastern: Alex Bartholomew

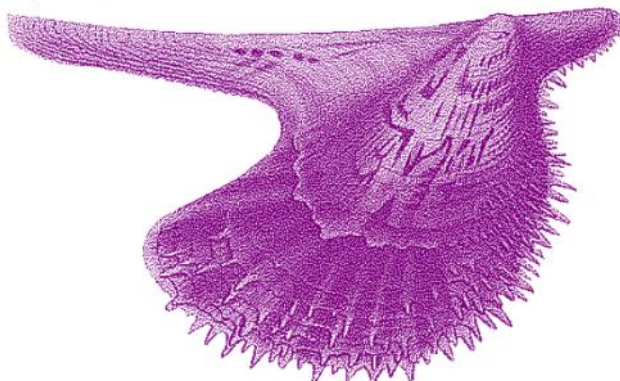
Southeastern: Bradley Deline

North-Central: Benjamin F. Datillo

South-Central: Currently vacant

Rocky Mountain: Leif Tapanila

Cordilleran: Nicole Bonuso



Priscum

Newsletter of the Paleontological Society

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