



USGS project update

The Mesozoic portion of the former **USGS Menlo Park Invertebrate Collection**, now housed in UCMP's off campus Regatta Collections Facility, required extensive re-organization. After assigning stratigraphic ages to each locality this past summer, we have spent the fall rehousing these fossils into new archival specimen boxes arranged in steel museum drawers and cabinets. Approximately 17,000 specimens from a collection of over 100,000 have been rehoused, resulting in ten cabinets full of spectacular Jurassic and Cretaceous fossils collected from the San Francisco Bay Area to the southern coast of England. Along the way, we have reunited many "stray" fossils stored in separate drawers, moved Alaskan fossils back to UCMP on campus, and continue to be impressed with the diverse and abundant fossils collected at many localities and their stunning degree of preservation.

One exception to the UCMP's stratigraphic arrangement of localities and fossils are the systematic collections, such as Cliff Nelson's Ph.D. thesis collection of *Neptunea* (see also <http://www.ucmp.berkeley.edu/blog/archives/3407>). Other systematic collections include Mesozoic taxa such as *Buchia*, *Trigonia*, and *Inoceramus*, as well as ammonites.

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Dave Straus



Cataloging-the-archives project reaches a milestone and looks to the future

By David K. Smith

Though the UCMP collections are mainly focused on the fossil relics of Earth's deep history, the institution also houses many "specimens" from the recent past. Because the collections date back to 1869 and beyond, they include many documents relevant to the history of California and of paleontological research—dig photographs, field notes, and a wide variety of material revealing fascinating connections between the process of science and its social and cultural milieu. However, this archival material had never been formally cataloged and was left in further disarray after the move from McCone Hall to the Valley Life Sciences Building in 1995. **The Cataloging Hidden Special Collections and Archives grant** from the Andrew W. Mellon Foundation aimed to change that.

Now, after three years of grant support, more than 80% of the archival material has been cataloged and is ready to reach a broader audience. One of the primary goals of the grant was to create online finding aids to allow researchers and other interested

parties to easily search for and locate any of the thousands of items housed in the UCMP archives. This historical treasure trove includes detailed field notes, annotated papers and maps, original drawings, scientific illustrations, newspaper clippings, collections ledgers, photographic documentation of specimens and field sites (16 mm film, lantern slides, glass negatives, 35 mm slides, and prints), professional and personal correspondence, research notes, administrative documents, manuscripts, and more. Check it out for yourself at <http://ucmpdb.berkeley.edu/archon/index.php>.

The project was eye-opening to UCMP workers because no one realized quite how many historical records had been squirreled away over the years, and they number in the thousands. For anyone interested in University of California history, digging into the archives was an exciting experience. You never knew what you were going to find next!

Museum staff and volunteer interest in

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2013 UCMP publications

Communicating science to both colleagues and the general public is an essential ingredient of the UCMP mission. Through journals, presentations at professional meetings, articles in the popular press, interviews, workshops, lectures, and even science cafés, members of the UCMP community share their research that ultimately contributes to a greater understanding of the history of life. This list of 2013 peer-reviewed articles represents a portion of that effort. UCMP alums are indicated by asterisks; † indicates a deceased alum.

Alupay, J.S., S.P. Hadjisolomou, and R.J. Crook. 2013. Arm injury produces long-term behavioral and neural hypersensitivity in octopus. *Neuroscience Letters* 558 137–142. [published online November 2013] doi: 10.1016/j.neulet.2013.11.002

Amugongo, S.K.,* and **L.J. Hlusko**. 2013. Impact of maternal prenatal stress on growth of the offspring. *Aging and Disease* 4(5). [published online September 2013]

Barnosky, A.D. 2013. Climate change. Pp. 735–747 in N. MacLeod (ed.), *Grzimek's Animal Life Encyclopedia: Extinction*. Gale, Detroit.

Barnosky, A.D. 2013. Mammals (modern). Pp. 365–373 in N. MacLeod (ed.), *Grzimek's Animal Life Encyclopedia: Extinction*. Gale, Detroit.

Barnosky, A.D. 2013. Palaeontological evidence for defining the Anthropocene. In C.N. Waters, J.A. Zalasiewicz, M. Williams, M.A. Ellis, and A.M. Snelling (eds.), *A Stratigraphical Basis for the Anthropocene*. Geological Society, London, Special Publications 395. doi: 10.1144/SP395.6

Blois, J.L., P.L. Zarnetske, M.C. Fitzpatrick, and **S. Finnegan**. 2013. Climate change and the past, present, and future of biotic interactions. *Science* 341(6145):499–504. doi: 10.1126/science.1237184

Clemens, W.A. 2013. Cf. *Wortmania* from the Early Paleocene of Montana and an evaluation of the fossil record of the initial diversification of the Taeniodonta (Mammalia). *Canadian Journal of Earth Sciences* 50(3): 341–354. doi: 10.1139/e2012-055

Clemens, W.A., and J.A. Lillegraven. 2013. Interpreting stratigraphic relationships and Laramide structural history of the northeast-

ern margin of the Hanna Basin (Wyoming): *Meniscoessus* (Mammalia, Multituberculata) exposes its faults. *Rocky Mountain Geology* 48(2): 143–167. doi: 10.2113/rsrocky.48.2.143

Clemens, W.A., and T. Martin. 2013. Review of the non-tritylodontid synapsids from bone beds in the Rhaetic Sandstone, southern Germany. *Paläontologische Zeitschrift*. doi: 10.1007/s12542-013-0201-5

Encinas, A., P.A. Zambrano, **K.L. Finger**, V. Valencia, L.A. Buatois, and P. Duhart. 2013. Implications of deep-marine Miocene deposits on the evolution of the North Patagonian Andes. *Journal of Geology* 121(3): 215–238. doi: 10.1086/669976

Erwin, D.H., and **J.W. Valentine**. 2013. The Cambrian Explosion: The Construction of Animal Biodiversity. Roberts and Co., Greenwood Village, CO. 406 pp.

Estes, J.A., R. Steneck, and **D.R. Lindberg**. 2013. Exploring the consequences of species interactions through the assembly and disassembly of food webs: A Pacific-Atlantic comparison. *Bulletin of Marine Science* 89(1):11–29. doi: 10.5343/bms.2011.1122

Finger, K.L. 2013. Miocene foraminifera from the south-central coast of Chile. *Micropaleontology* 59(4–5):341–492.

Finger, K.L. 2013. California foraminiferal micropaleontology. Pp. 125–144 in A. Bowden, F.J. Gregory, and A.S. Henderson (eds.), *Landmarks in Foraminiferal Micropaleontology: History and Development*. The Micropalaeontological Society, Special Publication 6. Geological Society, London.

Finger, K.L., A. Encinas, and S.N. Nielsen. 2013. Comment on 'Evidence for an Early-Middle Miocene age of the Navidad Formation (central Chile): Paleontological, paleoclimatic and tectonic implications' of Gutiérrez et al. (2013, *Andean Geology* 40(1):66–78). *Andean Geology* 40(3):571–579. doi: 10.5027/andgeoV40n3-a10

Finnegan, S. 2013. Quantifying seafood through time: Counting calories in the fossil record. *The Paleontological Society Papers* 19:28.

Glenn, D., **M.J. Pakes**, and **R.L. Caldwell**. 2013. Florescence in Arthropoda informs ecological studies in anchialine crustaceans, Remipedia and Atyidae. *Journal of Crustacean Biology* 33:620–626.

Goldstein, A., P. Asher, S. Cozzens, C. Manduca, E. Pyle, E. Riggs, K. Turekian, and **L. White**. 2013. Preparing the Next Generation of Earth Scientists: An Examination of Federal

Education and Training Programs. The National Academies Press, Washington, DC. 94 pp.

Grieco, T.M., **O.T. Rizk**,* and **L.J. Hlusko**. 2013. A modular framework characterizes micro- and macroevolution of Old World monkey dentitions. *Evolution* 67(1):241–59. doi: 10.1111/j.1558-5646.2012.01757.x

Head, J.J., G.F. Gunnell, **P.A. Holroyd**, **J.H. Hutchison**,* and R.L. Ciochon. 2013. Giant lizards occupied herbivorous mammalian ecospace during the Paleogene greenhouse in Southeast Asia. *Proceedings of the Royal Society B: Biological Sciences* 280(1763):20130665. doi: 10.1098/rspb.2013.0665

Hickman, C.S. 2013. Crosseolidae, a new family of skeneiform microgastropods and progress toward definition of monophyletic Skeneidae. *American Malacological Bulletin* 31(1):1–16. doi: 10.4003/006.031.0101

Hickman, C.S. 2013. Interacting constraints and the problem of similarity in gastropod structure and function. *American Malacological Bulletin* 31(1):155–168.

Hickman, C.S. 2013. *Intaglicollonia*, a new name for the Eocene gastropod *Nebalemia* Hickman, 1974 (Gastropoda: Coloniidae). *The Nautilus* 127(4):160–161.

Hlusko, L.J., J. Carlson, D. Guatelli-Steinberg, K.L. Krueger, B. Mersey, P.S. Ungar, and A. Defleur. 2013. Neanderthal teeth from Moula-Guercy, Ardèche, France. *American Journal of Physical Anthropology* 151(3):477–491. doi: 10.1002/ajpa.22291

Hutchison, J.H.,* M.J. Knell, and D.B. Brinkman. 2013. Turtles from the Kaiparowits Formation, Utah. Pp. 295–318 in A.L. Titus and M.A. Loewen (eds.), *At the Top of the Grand Staircase: The Late Cretaceous of Southern Utah*. Indiana University Press, Bloomington.

Irmis, R.B.,* **J.H. Hutchison**,* J.W. Sertich, and A.L. Titus. 2013. Crocodyliforms from the Late Cretaceous of Grand Staircase-Escalante National Monument and vicinity, southern Utah, USA. Pp. 424–444 in A.L. Titus and M.A. Loewen (eds.), *At the Top of the Grand Staircase: The Late Cretaceous of Southern Utah*. Indiana University Press, Bloomington.

Jablonski, D., C.L. Belanger, S.K. Berke, S. Huang, A.Z. Krug, K. Roy, A. Tomasovych, and **J.W. Valentine**. 2013. Out of the tropics, but how? Fossils, bridge species, and thermal ranges in the dynamics of the marine latitudinal diversity gradient. *Proceedings of the National Academy of Sciences USA* 110:10487–10494.

see PUBLICATIONS on page 6



Congratulations to our new Ph.D.s!

Jean Alupay completed her dissertation (Caldwell Lab) on “Characterization of Arm Autotomy in the Octopus, *Abdopus aculeatus*” (d’Orbigny, 1834) and is now a postdoctoral scholar at the University of Southern California. Supported by an NSF INSPiRE grant, Jean joins a collaborative project with linguists, biologists, and engineers to investigate dynamical principles animal movement.

Theresa Grieco, has moved on to a postdoctoral position in Joy Richman’s lab in the Department of Oral Health Sciences at the University of British Columbia Dentistry School. Theresa’s dissertation (Hlusko Lab) title is “The Developmental Basis of Variation in Tooth and Jaw Patterning: Evolved Differences in the *Silurana (Xenopus) tropicalis* Dentition.”

Kaitlin Maguire accepted a postdoctoral position in Jessica Blois’ lab at UC Merced. Kaitlin’s dissertation is titled “Understanding the Paleoecology and Niche Dynamics of Mammals in the Mascall Fauna (Middle Miocene), Oregon.”

Joey Pakes is now a lecturer in the Department of Integrative Biology at UCB and her dissertation (Caldwell/Lindberg Labs) is “Anchialine Cave Environments: A Novel Chemosynthetic Ecosystem and its Ecology.”

Welcome!

To new UCMP Research Associate **Susumu Tomiya**, Postdoctoral Scholar, Field Museum of Natural History, Chicago.

To new UCMP Museum Associates **Anne Boersma**, a volunteer assisting with the curation of the Texas slide collection of foraminifera, and **Nan Xin**, a volunteer translating the Evolution 101 section of the *Understanding Evolution* website into Mandarin.

Other News

A celebration of science!

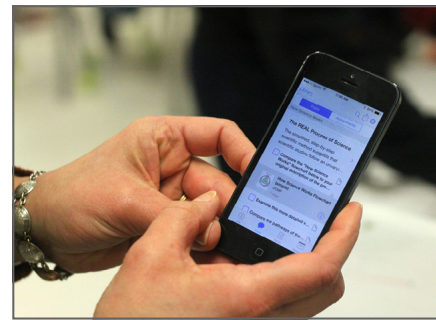
For the third consecutive year, UCMP joined Science@Cal as one of 150 interactive exhibitors in the [2013 Bay Area Science Festival](#) at AT&T Park. The November 4 event capped a 10-day celebration of science in the Bay Area drawing more than 30,000 people to AT&T Park. UCMP Assistant Director for Education and Outreach **Lisa White**, graduate student **Tripti Bhattacharya**, and volunteer C.J. Dunford highlighted fossils that lived at the Park way before the Giants!



Staffing the UCMP table at the Bay Area Science Festival are (from left) Tripti Bhattacharya, CJ Dunford, and Lisa White.

How Science Works hits 10,000 downloads!

In 2013, UCMP partnered with the California Academy of Sciences to develop a new method for delivering content from the *Understanding Science* website. [How Science Works, an iTunes U course](#) designed for the iPad, was launched in August 2013. An important milestone was reached in January 2014: 10,000 downloads! The course is designed primarily for middle and high school science educators to broaden their own knowledge and understanding of science, and to provide resources for their students. One of the contributors to the course is Betsy Barent, a middle school teacher in Omaha, Nebraska and frequent user of *How Science Works* on both iPad and iPhone devices in her 8th grade science classes. Students are finding it to be a new and exciting way of engaging in science. Barent was featured in her local



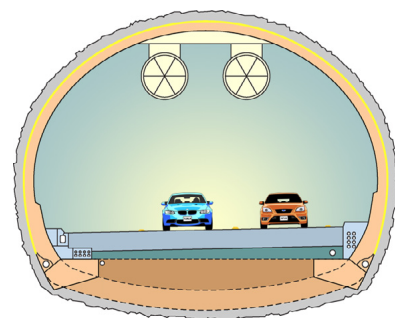
Middle school teacher Betsy Barent demonstrates how to use the iTunes U course on her smart phone.

newspaper, [the Beatrice Daily Sun](#), describing how she uses embedded videos, PDFs, and related assets in the iTunesU course to encourage students to collect evidence and practice strategies leading to testable hypotheses.

Barent states “In small groups they discussed what the current hypothesis is and what evidence led them to that hypothesis. They had to use skills that scientists use when they can’t see what is happening in real time—use what they know to figure out what they don’t know!” 🐞

Web notes

UCMP launched a new web feature, “[The geology and paleontology of the Caldecott Tunnel’s Fourth Bore.](#)” With funding provided by an agreement between the UCMP and CalTrans, the website (designed by UCMP graphic artist **Dave Smith**) features the geologic and tectonic settings, engineering challenges, and the fossil preparation and curation process done by UCMP staff and students. 🐞



To learn more about the archiving grant, check out these links.

Grant-related blog posts on the UCMF website:

- Jan 19, 2011: *UCMP awarded three-year grant to catalog our archives*—<http://www.ucmp.berkeley.edu/blog/archives/1029>
- Dec 15, 2011: *The Amber Files*—<http://www.ucmp.berkeley.edu/blog/archives/2210>
- Jan 24, 2012: *The Amber Files: Words from the University Explorer*—<http://www.ucmp.berkeley.edu/blog/archives/2223>
- Mar 9, 2012: *Cataloging the archives: Unearthing a type*—<http://www.ucmp.berkeley.edu/blog/archives/2505>
- Apr 17, 2012: *Cataloging the archives: Geology camp 100 years ago*—<http://www.ucmp.berkeley.edu/blog/archives/2711>
- Aug 6, 2012: *Cataloging the archives: Chaney, the Emperor and Metasequoia*—<http://www.ucmp.berkeley.edu/blog/archives/3063>
- Feb 8, 2013: *Cataloging the Archives: Three Fine Trikes*—<http://www.ucmp.berkeley.edu/blog/archives/3147>
- Sep 4, 2013: *Cataloging the archives: Paleontology specimen exchange*—<http://www.ucmp.berkeley.edu/blog/archives/3614>

Grant-related articles appearing in UCMF News:

- January 2011: *The Mellon Foundation CLIR grant*—http://www.ucmp.berkeley.edu/about/ucmpnews/11_01/clir11_01.php
- May 2011: *Cataloging the archives: Update I*—http://www.ucmp.berkeley.edu/about/ucmpnews/11_05/clir11_05.php
- May 2012: *Saluting our volunteers*—http://www.ucmp.berkeley.edu/about/ucmpnews/12_05/volunteers12_05.php

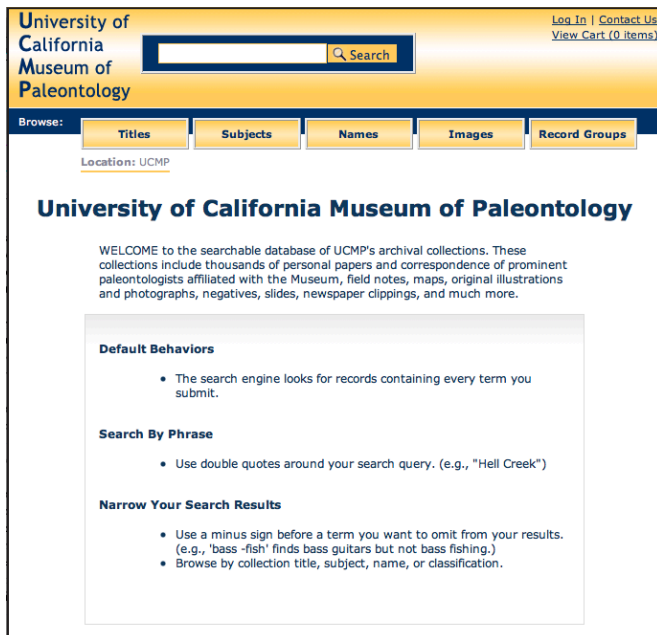
USGS from page 1



Some specimens from the USGS collection. Top: Inoceramid from Luna County, New Mexico, collected in 1976. Bottom: Trigonidae specimen from Shasta County, California, collected in 1893.

Many of our student workers have returned from last year, and the new students working on the project are a tremendous asset! UCMF volunteers Kathy Zoehfeld and Don Pecko continue to enthusiastically assist with tasks large and small, and always contribute great ideas!

All of the Mesozoic localities are now available in the UCMF locality database and the Cenozoic localities will soon follow. Please check out the new Researcher's Guide to the USGS Collection at www.ucmp.berkeley.edu/science/usgs_menlopark.php for more information!



Home page for UCMF's archival collections searchable database.

UCMP Invertebrate Collection crew

PUBLICATIONS from page 2

doi: 10.1073/pnas.1308997110

Kaufman, J.A., G.H. Turner, **P.A. Holroyd**, F. Rovero, and A. Grossman. 2013. Brain volume of the newly-discovered species *Rhynchocyon udzungwensis* (Mammalia: Afrotheria: Macroscelidea): Implications for encephalization in sensu. *PLoS ONE* 8(3):e58667. doi: 10.1371/journal.pone.0058667

Kent-Corson, M.L., **A.D. Barnosky**, A. Mulch, **M.A. Carrasco**, and C.P. Chamberlain. 2013. Possible regional tectonic controls on mammalian evolution in western North America. *Palaeogeography, Palaeoclimatology, Palaeoecology* 387:17–26. doi: 10.1016/j.palaeo.2013.07.014

Labandeira, C.C., **S.L. Tremblay**, K.E. Bartowski, and L. VanAller Hernick. 2013. Middle Devonian liverwort herbivory and antiherbivore defence. *New Phytologist*. [published online December 2013] doi: 10.1111/nph.12643

Lee, A.H.,* A.K. Huttenlocker, **K. Padian**, and H.N. Woodward. 2013. Analysis of growth rates. Pp. 217–251 in K. Padian and E.-T. Lamm (eds.), *Bone Histology of Fossil Tetrapods: Advancing Methods, Analysis, and Interpretation*. University of California Press, Berkeley.

Looy, C.V. 2013. Natural history of a plant trait: Branch system abscission in Paleozoic conifers and its environmental, autecological and ecosystem implications in a fire-prone world. *Paleobiology* 39:235–252. doi: 10.1666/12030

Looy, C.V., and **I.A.P. Duijnste**. 2013. Characterizing morphologic variability in foliated Paleozoic conifer branches—a first step in testing its potential as proxy for taxonomic position. *New Mexico Museum of Natural History and Science Bulletin* 60:215–223.

Padian, K. 2013. Correcting some common misrepresentations of evolution in textbooks and the media. *Evolution Education and Outreach* 6:1–13. doi:10.1186/1936-6434-6-11

Padian, K. 2013. Why Study the Bone Microstructure of Fossil Tetrapods? Pp. 1–11 in K. Padian and E.-T. Lamm (eds.), *Bone Histology of Fossil Tetrapods: Advancing Methods, Analysis, and Interpretation*. University of California Press, Berkeley.

Padian, K., and E.-T. Lamm (eds.). 2013. *Bone Histology of Fossil Tetrapods: Advancing Methods, Analysis, and Interpretation*. University of California Press, Berkeley.

Padian, K., and K. Stein. 2013. Evolution of growth rates and their implications. Pp. 253–264 in K. Padian and E.-T. Lamm (eds.), *Bone Histology of Fossil Tetrapods: Advancing Methods, Analysis, and Interpretation*.

University of California Press, Berkeley.

Padian, K., E.-T. Lamm, and **S. Werning**.* 2013. Selection of Specimens. Pp. 35–54 in K. Padian and E.-T. Lamm (eds.), *Bone Histology of Fossil Tetrapods: Advancing Methods, Analysis, and Interpretation*. University of California Press, Berkeley.

Padian, K., M. de Boef Miara, H.C.E. Larsson, L. Wilson, and T. Bromage. 2013. Research applications and integration. Pp. 265–285 in K. Padian and E.-T. Lamm (eds.), *Bone Histology of Fossil Tetrapods: Advancing Methods, Analysis, and Interpretation*. University of California Press, Berkeley.

Peterson, D.E.,*† **K.L. Finger**, S. Iepure, S. Mariani, A. Montanari, and T. Namiotko. 2013. Ostracod assemblages in the Frasassi caves and adjacent sulfidic spring and Sentino River in the northeastern Apennines of Italy. *Journal of Cave and Karst Studies* 75(1):11–27. doi: 10.4311/2011PA0230

Porter, M.L., D.I. Speiser, A.K. Zaharoff, **R.L. Caldwell**, T. W. Cronin, and T.H. Oakley. 2013. The Evolution of complexity in the visual systems of stomatopods: Insights from transcriptomics. *Integrative and Comparative Biology* 53:39–49. doi: 10.1093/icb/ict060

Quental, T.B.,* and **C.R. Marshall**. 2013. How the Red Queen drives terrestrial mammals to extinction. *Science* 341(6143):290–292. doi: 10.1126/science.1239431

Rizk, O.T.,* **T.M. Grieco**, **M.W. Holmes**,* **L.J. Hlusko**. 2013. Using geometric morphometrics to study the mechanisms that pattern primate dental variation. Pp. 126–169 in G.R. Scott and J. Irish (eds.), *Anthropological Perspectives on Tooth Morphology: Genetics, Evolution, Variation*. Cambridge University Press.

Schulhof, M., and **D.R. Lindberg**. 2013. The ontogeny of the lower reproductive tract of the landsnail *Helix aspersa* (Gastropoda: Mollusca). *Organisms Diversity & Evolution* 13(4):559–568. doi: 10.1007/s13127-013-0138-2

Schweitzer, M.H., W. Zheng, T.P. Cleland, **M.B. Goodwin**, E. Boatman, E. Theil, M.A. Marcus, and S.C. Fakra. 2014. A role for iron and oxygen chemistry in preserving soft tissues, cells and molecules from deep time. *Proceedings of the Royal Society B* 281(1775): 20132741. [published online November 2013] doi: 10.1098/rspb.2013.2741

Simakov, O., F. Marletaz, S.-J. Cho, E. Edsinger-Gonzales, P. Havlak, U. Hellsten, D.-H. Kuo, T. Larsson, J. Lv, D. Arendt, R. Savage, K. Osoegawa, P. de Jong, J. Grimwood, J.A.

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*Designates a donation to the **William B.N. Berry Memorial Research Fund**

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LETTER FROM THE DIRECTOR



UCMP's impact on the literature

One measure of the significance of an institution is its contribution to the scientific literature. By this measure, use of our collections by past students, visitors and other scientists is truly impressive—in 2013 UCMP played a role in some 280 publications. Current UCMP students, postdocs, Museum staff, and faculty produced 53 peer-reviewed publications (listed in this newsletter), and some 82 publications in all. In fact, the list of UCMP publications is so long this year that the production team asked me to reduce the length of my letter!

As we start the New Year, I would like to thank everyone who contributed to UCMP this past year. Your contributions make a big difference to what we can do, and help make UCMP the vibrant community that it is.

On behalf of all UCMP, best wishes for 2014!

Sincerely,

Charles Marshall

PUBLICATIONS from page 6

Chapman, H. Shapiro, A. Aerts, R.P. Otiilar, A.Y. Terry, J.L. Boore, I.V. Grigoriev, **D.R. Lindberg**, E.C. Seaver, D.A. Weisblat, N.H. Putnam, and D.S. Rokhsar. 2013. Insights into bilaterian evolution from three spiralian genomes. *Nature* 493:526–531.

Tabor, N.J., C.M. Romanchock, **C.V. Looy**, C. Hotton, W.A. DiMichele, and D.S. Chaney. 2013. Conservatism of Late Pennsylvanian vegetational patterns during short-term cyclic and long-term directional environmental change, western equatorial Pangea. *Journal of the Geological Society of London Special Publication* 376: 201–234. doi: 10.1144/SP376.14

Tomiya, S.* 2013. Body size and extinction risk in terrestrial mammals above the species level. *American Naturalist* 182:E196–E214. doi: 10.1086/673489

Tomiya, S.* 2013. New carnivoraforms (Mammalia) from the middle Eocene of California, USA, and comments on the taxonomic status of *Miacis gracilis*. *Palaeontologia Electronica* 16(2; 14A). 29 pp.

Uhen, M.D., **A.D. Barnosky**, B. Bills, J. Blois, M.T. Carrano, **M.A. Carrasco**, **G.M. Erickson**,* J.T. Eronen, M. Fortelius, R.W. Graham, E.C. Grimm, M.A. O'Leary, A. Mast, W.H. Piel, **P.D. Polly**,* and L.K. Säilä. 2013. From card catalogs to computers: Databases in vertebrate paleontology. *Journal of Vertebrate Paleontology* 33:13–28. doi: 10.1080/02724634.2012.716114

Valentine, J.W., D. Jablonski, A.Z. Krug, and S.K. Berke. 2013. The sampling and estimation of marine paleodiversity patterns: implications of a Pliocene model. *Paleobiology* 39(1):1–20. doi: 10.5061/dryad.42577

White, J.W.C., R.B. Alley, D.E. Archer, **A.D. Barnosky**, J. Foley, R. Fu, M.M. Holland, M.S. Lozier, J. Schmitt, L.C. Smith, G. Sugi-hara, D.W.J. Thompson, A.J. Weaver, S.C. Wofsy, E. Dunlea, C. Mengelt, A. Purcell, R. Gaskins, and R. Greenway. 2013. *Abrupt Impacts of Climate Change: Anticipating Surprises*. National Academies Press, Washington, DC. 201 pp.

Woodward, H.N., **K. Padian**, and **A.H. Lee.*** 2013. Skeletochronology. Pp. 195–215 in K. Padian and E.-T. Lamm (eds.), *Bone Histology of Fossil Tetrapods: Advancing Methods, Analysis, and Interpretation*. University of California Press, Berkeley. 📖

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A University of California
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Where have all the species gone? The processes and patterns of extinction

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