

Faculty News 2007



Mary Anderson presenting the Langbein Lecture, San Francisco, December 2007. (Courtesy of Boris Shmagin)

MARY ANDERSON

In February, we were saddened by the death of **Mary W. Stoertz**. Mary received the PhD in 1989 under **Ken Bradbury** and me. See the article on p. 22 for more information about her life. Hydrobadgers, led by **Bill Simpkins** and **Laura Toran**, convened a session in her memory at the GSA conference in October in Denver. Husband **Doug Green** presented a paper co-authored with Mary. Many hydrobadgers attended the session including **Richelle Allen-King**, **Maureen Muldoon**, **Ken Bradbury**, **Randy Hunt**, **John Faustini**, **Dave Krabbenhoft**, **Daniel Feinstein**, **Chunmiao Zheng**, **Charlie Andrews**, **Joe Yelderman**, **Todd Rayne**, **Yu-Feng Lin**, and **Wes Dripps**. Some of us went out to dinner afterwards to remember how Mary had enriched our lives. It was a bittersweet event.

In April, I caught up with hydrobadger **Erik Webb** in Albuquerque. Later in the year, **Mike Cobb** finished the MS and began a new job in Philadelphia. In July, I officially became a named professor and adopted the title C.S. Slichter Professor. Charles Sumner Slichter, a professor of mathematics at UW-Madison from 1886-1934, conducted field, laboratory, and theoretical work on groundwater and made seminal contributions to the theory of groundwater flow and describing dispersion of solutes. In December, I spent time catching up with hydrobadger **Bob Sterrett** in Orlando where we both participated in the NGWA Expo conference. That same month, I presented the Langbein Lecture at the AGU fall meeting in San Francisco (see photo). The lecture (*Benchmarks in Hydrogeology in the 20th Century*

Unexpected Payoffs) was webcast live and is archived at <http://www.agu.org/webcast/fm07/>. I was pleased to see several hydrobadgers while in San Francisco, including **Tom Johnson**, **Rich Manser** (and family!), **Galen Kenoyer**, **Joe Yelderman**, **Melissa Masbruch**, and **Yu-Feng Lin**.

JEAN BAHR

2007 was a year for transitions in my research group. In June, shortly after the completion of my field hydrogeology course, **Drew Gower** left for six months of field work in Burkina Fasso to study the interactions between small irrigation reservoirs and the groundwater system. **Jeff Wilcox** defended his PhD in July and moved to North Carolina where he is now an Assistant Professor at UNC-Asheville. **Laura Craig** completed her MS in August and now is working in the Yucatan as a Fulbright Scholar, collaborating with researchers we met during the 2006 field trip. September brought three new advisees in the hydrogeology program, **Cassidy Miller**, **Meg Dickoff**, and **Andy Leaf**, and also a new advisee in Water Resources Management, **Dalayna Tillman**. Cassidy is working with me and **Eric Roden** on a study of nitrate and iron cycling in riparian wetlands. Meg and Andy are starting on projects related to geochemical changes in groundwater induced by aquifer storage and recovery systems. Andy is also pursuing a double degree with WRM and will be joining Dalayna and others this summer in a practicum in New Orleans, led by **Herb Wang**.

In addition to teaching Field Applications in Hydrogeology last summer, I also enjoyed two weekend field trips with the Earth Science section of the PEOPLE program and participating as a leader in **Heather Macdonald's** NAGT workshop for grad students and post-docs preparing for an academic career that was held in Madison.

I completed a four-year term on GSA Council last May and was anticipating a bit of a break from Society duties. To my surprise, I was asked in November to be on the ballot for GSA Vice-President (and for President the following year). Barring an unexpected write-in campaign for someone else, I'm more or less assured of election

since the VP and President have only a single candidate on the ballot. So it looks like the first few years after my term as Department Chair ends will be busy with a new set of interesting challenges.

PHIL BROWN

Last year at this time I noted that snow had finally come to the Midwest—boy what a difference a year makes. I have not seen my bike since Dec. 1 this winter where the past three years I have ridden almost all winter—going a bit stir crazy here. But the spring semester is starting anyway with four classes on tap and some interesting research taking place in my lab. The field of Economic Geology continues to boom and many jobs go unfilled in all sectors of the industry—great time to try out being a field geologist with a financial purpose!

Mineral commodity prices, and in particular gold, have created a strong demand for geologists willing to try the real world of mineral exploration and production. **Matt Riederer** has completed a Masters degree program working on the fluid inclusions and ore mineralogy of the Midas gold veins in NE Nevada. He is beginning a job with a mining company outside of Duluth exploring for nickel ores in the Duluth Complex.

I have four undergraduates doing senior theses with me on various mineral deposit related subjects—the lab is wonderfully busy and I would like to thank Matt Riederer for all the help he has given the students over the past nine months.

In June-July I was the director for four weeks of Field Camp in Park City. The five-school consortium drew 45 students this year. Summer 2007 was the 41st anniversary of Camp at the Chateau. UW continues to send only about 20-25% of our



Jean Bahr and Heather Macdonald at our 2007 GSA GeoBadger alumni reception in Denver. (Mary Diman)

graduates to Field Camp although I am as convinced as ever that this class is the true capstone experience for Geology majors and I do all I can to convince students that it is a mistake to skip camp to save a few dollars.

In November I spent a week in southern China teaching part of a fluid inclusion short course and seeing a little of the countryside. China is indeed a long way from here and the air quality left a little to be desired but my hosts were wonderful and the experience was great.

My teaching schedule continues to be full and varied. I taught the “Minerals as a Public Problem” (resources for the non-geologist) class in the fall to 45 undergrads and grads signed up through the department and the Nelson Institute. The combined Earth Materials course is undergoing significant changes this spring and hopefully next year I will be able to relate positive results of the change effort. Enrollment in the White Lake mapping course continues to yoyo between 3 and 12 students depending on the year—(Gary and Hanny continue to offer amazing hospitality and the experience is treasured by all the students lucky enough to have the good sense to attend the course.)

A quick update on my family. Jason continues to work for Epic computer and still lives two blocks from us, a nice happenstance. Peter graduated from Grinnell College a year and a half ago and is

currently doing all the heavy lifting for the rest of the family – he is in his second year teaching middle school math in Washington D.C. with Teach for America. Yikes. Karin, to my great surprise (and pleasure) has become a geology major at Carleton and did a study abroad course on Montserrat in the Caribbean during June and July. Kris and I went down to visit after her course ended and I was able to be her field assistant while she collected samples for her senior thesis. She will graduate this spring and then, who knows.

CHARLES W. BYERS

This year, for the first time, I took part in a First-Year Interest Group. The FIG program puts together a small group of freshman that stay together in several classes, getting to know one another via a shared academic experience. In this case, the group took a seminar course in the History of Science department (“Making Meaning in an Evolutionary World,” conducted by Prof. Lynn Nyhart), learning about evolutionary theory in Darwin’s day. The students also were enrolled as a special discussion section in Philosophy 101, in which they read the great philosophers from the Greeks through Kant to Sartre. Finally, the group was a discussion section with me in G110 Evolution and Extinction. We spend the first third of the course in a historical review of the development of the theory of evolution, from the first understandings of fossils up to punctuated equilibrium and mass extinctions. Then after surveying the history of life and human origins, we close out the semester with genetic engineering, global climate change, and the possibilities of life elsewhere in the universe. The intent of the FIG approach is to give new students a personal connection to professors and to other freshmen, and to emphasize the unity of knowledge across the institutional boundaries of the college. It was fun seeing all the youthful enthusiasm.

ALAN CARROLL

The majority of my group’s research continues to focus on the Eocene Green River Formation, which includes students **Lauren Chetel, Jen Walker, and Eric Williams**. This work includes projects on the long term evolution of volcanics and oil shale in the Green River basin (Lauren Chetel), lake-type evolution of the Tipton Member (Jen Walker), the origin of lacustrine depositional cycles (**Wasinee Aswasereclert**), and the significance of fluvial-deltaic facies within the Wilkins Peak Member (Eric Williams).

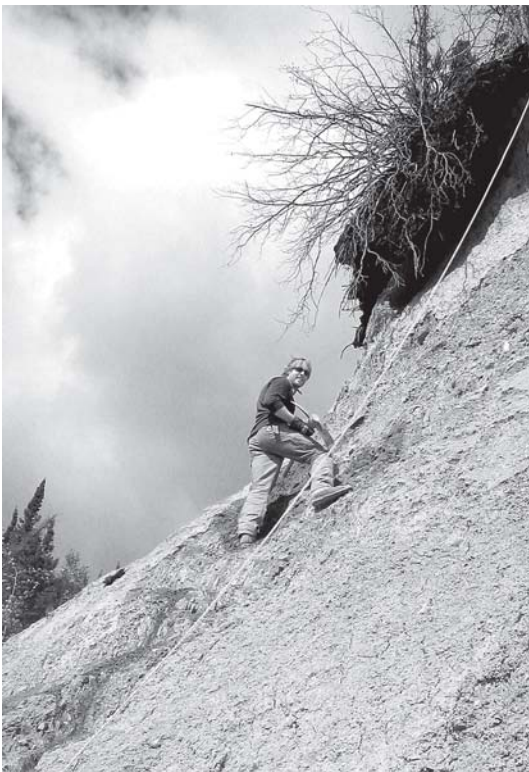
We’ve also begun new collaborations involving radiogenic detrital provenance (**Amalia Doebbert**, working in **Clark Johnson’s** lab), and the origin of quartz cements in lower Paleozoic sandstone (involving John Valley’s student **Andrew Trzaskus** and the ion microprobe). The larger sedimentary geology/paleontology program got a huge boost from the hire of new faculty member **Shanan Peters**. Shanan has really helped to re-energize the group, and I think he fits very well with the traditional strengths of the Wisconsin School of sedimentary geology (including a strong component of field work).

Energy has become a hot topic on campus, and for the past two years I’ve taught the Energy Resources course to packed classrooms. I’ve also been increasingly involved in the UW Energy Institute, a university-wide group that meets regularly to discuss ways to foster interdisciplinary research, education, and outreach. One of our bigger accomplishments was the production of two instructional videos for the FIRST Lego League “Power Puzzle”, an international event involving approximately 100,000 students ages 9-14 (available at <http://webstreamer3.doit.wisc.edu/lego/>). Geological carbon sequestration has also been a subject of considerable interest, and I’m exploring possible future research projects in this direction. Interest in oil shale is also on the rise, reaching highs last seen in the late 1970s. UW-Madison will participate in the newly formed Center for Oil Shale Technology and Research (based at Colorado School of Mines).

At home I’m kept continually exhausted chasing after our son Liam (age 2), and when possible I sneak out to fly my homebuilt airplane. Last summer I also tried my hand at air racing, entering the Airventure Cup (Dayton to Fond du Lac), an event held in conjunction with the Oshkosh Experimental Aircraft Association fly-in. I managed to take third place in my division of nine airplanes, average ground speed 220 mph (slightly wind-aided).

CHUCK DEMETS

In 2007, I took a much needed sabbatical break from teaching and administration and instead invested all of my time in research. The year was filled with research highlights, including the completion of three geodetic networks in Mexico and El Salvador that now-retired staff member **Bill Unger** and **Neal Lord** built over the past three years, and publication of five research papers that document my work on the earthquake cycle in various parts of the western hemisphere. The vast majority of my time was



New faculty Anders Carlson collecting Sky Pilot Till samples deposited by the Laurentide Ice Sheet in northeastern Manitoba along the Nelson River.

(Courtesy of Anders Carlson)

consumed with research and manuscript writing for a new model of present-day global plate motions, a project that I initiated in late 1999. Assembling the 200+ page first draft of the figures and text required more than eight months of full-time effort. The first revision took another three months of partial effort, and there is still much more to be done.

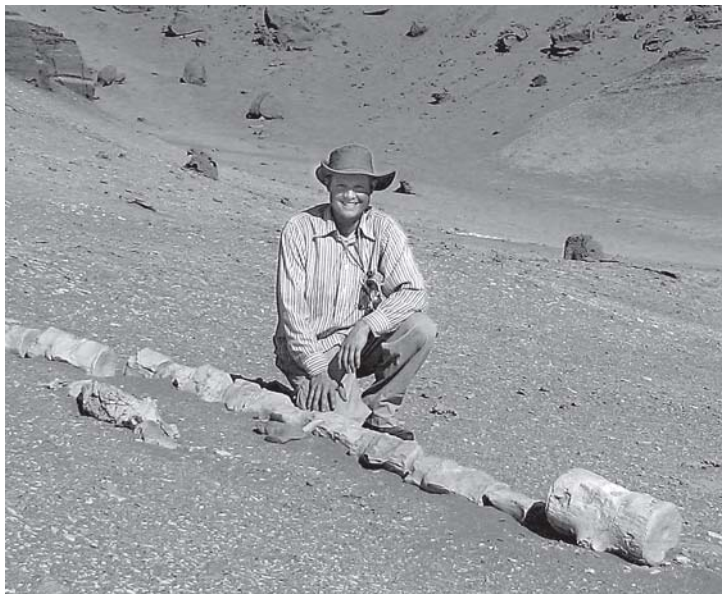
My three caballeros, **Daniel Alvarado, Francisco Correa-Mora, and Manuel Rodriguez** continued their graduate work under my tutelage this past year. Each is pushing forward tectonic research into the earthquake

cycle and long-term deformation in Central America and Mexico. Much of Francisco's research and modeling is presently trained on the recently discovered phenomenon of aseismic transient deformation in subduction zones, which occurs frequently in Francisco's study area in southern Mexico. Our body of work on the topic is growing and has yielded interesting insights into the inter-relationships between earthquake rupture zones, interseismic frictional coupling along subduction faults, and their respective relationships in space and time to zones of aseismic transient slip.

On a personal note, I took my wife Lynn, two 'tweens, and one teen on great hiking trips to Joshua Tree and Zion national parks and a wonderful cultural experience in San Francisco in 2007. If you haven't experienced Joshua Tree or Zion, I recommend both very highly.

KURT FEIGL

In 2007, I successfully completed my startup. My lab, room 114 in Weeks Hall was renovated in January. It adjoins those of **Professors Cliff Thurber and Chuck Demets**, forming a convivial work space for geophysicists. Frequently seen there is graduate student **Joe Kington**, who came to UW-Madison on the advice of **Tim Masterlark** (UW-Madison PhD 2000) from U. Alabama, where Tim is now a professor. The lab space fosters scientific discussions that lead to publishable ideas and funded proposals. For example, Professors Cliff Thurber, **Herb Wang**, and I learned that the National Science Foundation will fund our proposal entitled, "Triggering of earthquakes over long times and distances: models for the June 2000 sequence in Iceland". In addition, I also taught two new courses, "Eye in the



New faculty Shanan Peters on the Eocene in Egypt in November.
(Courtesy of Shanan Peters)

Sky: Monitoring Earth by Satellite" (G&G 118) and "Practical Aspects of GPS Surveying" (G&G 444) which turned out to be both popular for the students to take and stimulating for me to teach. In the fall, I proudly watched Samuray Akarvardar, whom I had been advising in Toulouse, defend her PhD thesis in Istanbul on the Friday following Thanksgiving. That is to say I spent turkey day in Turkey. In December, I attended the fall meeting of the American Geophysical Union (AGU) in San Francisco, where the department sponsored the first, but certainly not last, gathering of Geobadgers in the Bay area (see page 23).

JOHN FOURNELLE

Major activities for 2007 included: having the new Hitachi S3400 variable pressure SEM pass the final acceptance test—it has become a heavily utilized instrument by a large number of Weeks Hall denizens; presentation of research (problems of secondary fluorescence in Ti-in-zircon thermometry) at the annual Microscopy and Microanalysis meeting (Ft. Lauderdale in August...no comment); organizing a session at the winter AGU meeting on Problems in Electron Microprobe Analysis; being a co-organizer of a three-day conference on Electron Backscatter Diffraction that will occur in Weeks Hall in May 2008, that will bring together ~75 individuals from both materials science and geology to discuss this relatively new analytical technique. On the way back from AGU (taking the Amtrack home: a well recommended trip) my wife Judi and I stopped in Portland, Oregon and spent a day with Everett Glover (Ph.D. 1977, director of UW probe and SEM lab 1966-1992) savoring some culinary delights in Portland.

DANA GEARY

I organized UW-Madison's second annual Darwin Day for February 2007. We had a morning of great talks and an afternoon of special displays at the Geology Museum. Once again, the event stimulated a lot of interest in evolution and publicity for the department.

My grad students are going in diverse directions: **MaryRuth Kotelnicki** is studying the trace fossil record of her beloved trilobites from the "sweep" of the Paleozoic; **Erik Hoffmann** is working on the shell chemistry of zebra mussels; **Matt Kuchta** is looking at Pleistocene land snails of the upper Midwest; **Laura Mitchell** is beginning a project on limb dimensions of various archosaurs; and **Paul Mayer**, when

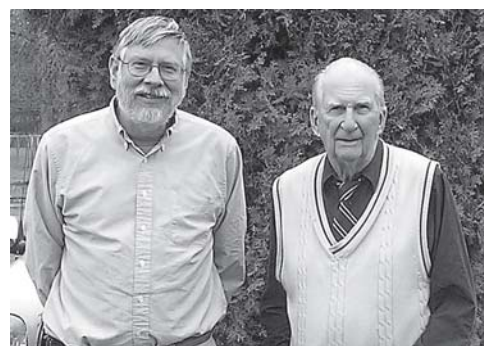
not rangers in the Grand Canyon, is studying Devonian brachiopod communities. Undergrad **Carrie Levitt** is working on an offshoot of Laura's project, looking at the proportions of various components of crocodylian limbs.

We had a wonderful family trip to Iceland in July. Amazingly, Iceland does have a couple of fossil sites, but we were unable to find them. Beautiful hiking anyway, and great birds!

In addition to trying to keep everything else afloat, I am still working with Imre Magyar on several Lake Pannon projects. Keeps me busy.

LAUREL GOODWIN

Our department offers tremendous opportunities for interaction. I thought about that point a lot in 2007. It crossed my mind when I joined **Bob Dott, Gordon Medaris**, and colleagues at the Wisconsin Geological and Natural History Survey in trying to persuade the DOT not to blow up Point of Rocks. I thought about it again when Gordon, **John Valley**, and I explored breccias in



John Fournelle and Everett Glover, current, and former (1966-92) directors of the Cameron Microprobe and SEM labs.
(Courtesy of John Fournelle)

the Baraboo Quartzite. Two different qualifying exams with colleagues **Cliff Thurber**, **Harold Tobin**, **Chuck DeMets**, and **Kurt Feigl** left me with a sense of privilege. In how many places could I spend a couple of hours with a large group of individuals who care about subduction-zone faults? We had to translate a bit for one another since we speak different languages, but that adds to the learning experience. In this context, you will note some overlap between my report and **Basil Tikoff's**. We continue to share lab space, a subset of students, and conversations about everything from science and teaching pedagogy to advising philosophy. (And we don't always speak the same language either.)

People came, people went, and the structure group got bigger last year. **JoAnn Gage** and **Kathy Staffier** both completed their MS degrees. Both worked in central Australia (affectionately known as "Oz") with Basil and me. The experience changed them. Kathy married an "Ozzie bloke" in October and now lives in Queensland. JoAnn mastered a manual transmission with the stick on the left, and rapidly began considering starting off-road NASCAR. She canned that idea, and instead will focus her PhD study on the interaction between deformation and metamorphism in a field site closer to home, in California. **Jennie Cook** completed another field season on the San Gregorio fault in California. She has collected some very interesting data recording changes in fault-zone deformation of sediments with lithification and, potentially, strain rate.

PhD student **Chloe Bonamici** arrived in fall to take over the Oz project. She came with an MS from Northern Arizona University and a wealth of experience in reading the structural record of partially molten rock deformed in extension. **Melodie French** also came in the fall, from Oberlin College, with a degree in physics and a focus on geology. She will work on an MS with Harold Tobin and me, evaluating the relative importance of hydrologic versus mechanical heterogeneity in fracture formation in sandstones. Colorado State University grad **Evan Heckler** arrived in January 2008, ready for a different MS Oz adventure.

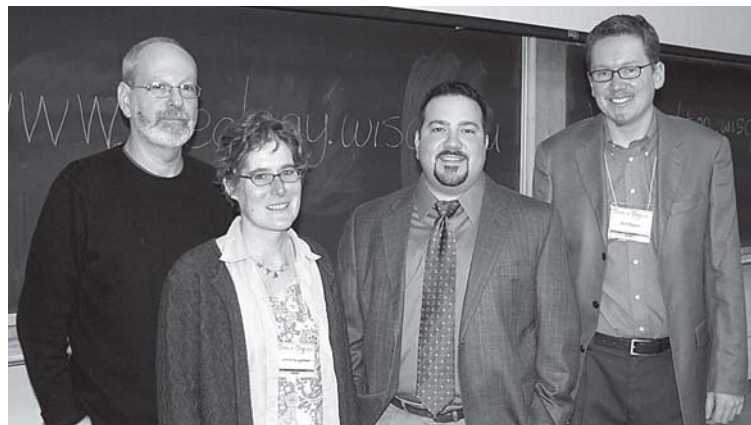
JoAnn and Jennie completed internships with BP in the summer and fall, respectively. Each of their experiences was extremely positive. There's nothing like being tossed into a project with societal and monetary implications to help you learn to think on your feet, focus, and prioritize. And there's nothing like success in such an endeavor to build confidence.

As is evident from the above narrative, I continue to be interested in petrophysical controls on localization of deformation at all levels of the continental crust. The primary branches of

my research program are 1) understanding controls on failure of granular porous media and its implications for fluid flow, and 2) learning to read the rock record of rheology of the middle and lower crust. I'm looking forward to exploring these areas further with the team we have in place for 2008.

CLAY KELLY

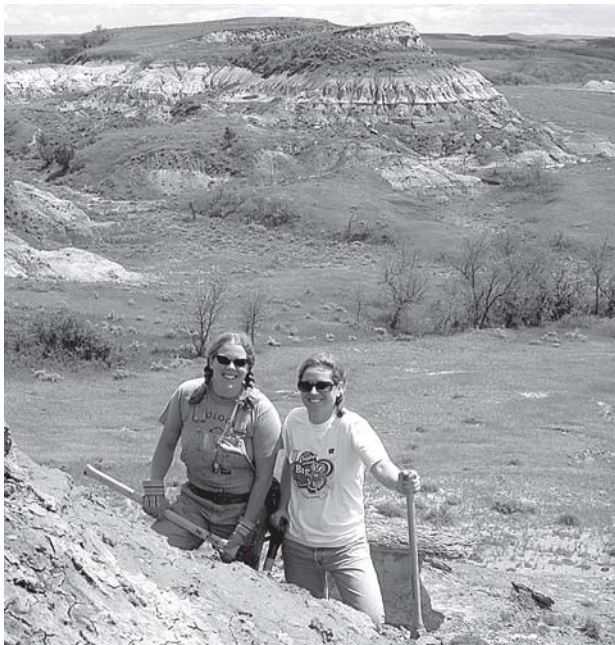
The year 2007 wrought significant change for both my graduate students and myself. Most of our research efforts have been focused on studying geologic records of an ancient global warming event that punctuated the Paleocene-Eocene boundary (PEB) some 55 million years ago. Various lines of geological evidence have established that this transient episode of global warming was intimately linked to a rapid release of massive quantities of carbon into the ocean-atmosphere system, a phenomenon not unlike that unfolding today due to fossil fuel emissions. **Elizabeth Clechenko** kicked things off in 2007 with the successful defense of her PhD dissertation. Liz's dissertation focused on stratigraphic sections exposed in the Williston Basin of western North Dakota spanning the Paleocene-Eocene boundary (PEB). The main objectives of her research were to compile carbon isotope and clay mineralogical data through these sections to constrain the stratigraphic interval correlative with the aforementioned PEB event and to determine if chemical weathering of continental rocks intensified in response to this "super greenhouse climate state". Thus far, Liz's hard work has yielded two significant publications with a third planned for submission; however, I think it's safe to say that the most treasured accomplishment of both Liz and her husband (**Cory Clechenko**) was becoming the proud parents of their daughter, Lily. Liz and family have since moved to Houston, TX where she is employed by Conoco-Phillips. An important offshoot of Liz's dissertation was relating the clay mineralogical changes to the hydrologic history of the basin, which became the centerpiece of **Eric Shullenberger's** MS thesis. Eric gave an outstanding presentation at a national meeting of the Geological Society of America on



Guest speakers at Darwin Day 2007 were Elliott Sober (Philosophy), Janette Boughman (Zoology), Michael Muehlenbein (UW-Milwaukee, Anthropology), and Bret Payseur (Genetics). (Neal Lord)

this subject, and his presentation was recognized by the society as being one of the top student abstracts of the entire conference. Eric received his MS degree at the end of the spring semester and has subsequently gotten married and is now working for Chevron in Houston.

A flurry of activity brought the year to a close. **Laura Mitchell** completed her MS degree in December. Laura's thesis was focused on collecting micropaleontological and stable isotope data from a deep-sea core recovered off the coast of Antarctica that also preserves a record of the same PEB global warming event seen in the Williston Basin. Her research provides the first evidence showing that subtropical plankton with warm-water affinities migrated into the Antarctic region prior to the massive carbon release marking the PEB. This finding will undoubtedly fan the flames of controversy surrounding the PEB warming event. Laura is now a continuing PhD student here in our department under the supervision of **Dana Geary**. **Tina Nielsen** successfully defended her PhD dissertation in the month of December as well. Much like Laura's research, Tina's dissertation research used deep-sea cores to study the dynamics of carbon release and sequestration during the PEB warming event. One facet of Tina's research employed stable isotope geochemistry as a stratigraphic tool to gauge the degree to which sediment mixing has altered the original sedimentary record of the PEB event. Another dealt with demonstrating how selective dissolution stemming from the episode of ocean acidification associated with the PEB event has biased the fossil record of marine calcareous plankton. Tina presently has two manuscripts under review with two others planned for submission. Not to "one up" Liz Clechenko, but it is noteworthy that Tina gave birth to two bouncing baby boys (Craig and Jack) while completing her dissertation. Tina and family will be moving to Houston this coming fall where she will be starting a position with BP-Amoco. As you can see, my



Liz Clechenko and Tina Nielsen taking a break from clearing off an outcrop spanning the Paleocene-Eocene boundary (PEB) in the Williston Basin, North Dakota. The PEB is marked by the bright-colored strata exposed in the face of the butte behind them. (Clay Kelly)

graduate ranks have been depleted thanks to numerous graduations and a vigorous private market; nevertheless, I have managed to recruit two new, promising MS students (**Katie Horst** and **Andy Fraass**). Lastly, I am pleased to report that I was promoted to Associate Professor with tenure during the spring of 2007. After six long years, I'm finally off the tenure bubble and we can start sinking some serious roots in place that we already call home: Madison, WI.

ERIC RODEN

Our second full year at UW brought with it a sense of becoming well settled into the department, and of the many outstanding possibilities for microbial geoscience research both within and outside of my own laboratory. Our cadre of postdocs and students pounded away at various aspects of microbial redox metabolism in environments as diverse as a Pliocene-age volcanic tuff in Idaho, acid/hypersaline lake sediments in Australia, chemical sediments downstream of the well-known acid mine drainage site at Iron Mountain in California, and shallow groundwater aquifers at Dorn Creek just west of town in Middleton. In addition, we made extensive progress on bench-scale, experimental reactor studies of microbial metabolism and mineral transformation in uranium-contaminated and pristine subsurface sediments. Along the way a myriad of experiments were conducted to isolate and probe the physiological and phylogenetic properties of pure bacterial cultures present in various natural

samples. Thus our basic *modus operandi* of combining field and laboratory studies to elucidate the contribution of microbes to geochemical cycling is in full swing. The new UW-based NASA Astrobiology Institute award that started in 2007 will provide yet another exciting venue for both field and laboratory-based research, and will allow for expansion and deepening of collaborations between the isotope geochemistry, mineralogy, low-temperature/interfacial geochemistry, and geomicrobiology groups within the department. This award perfectly complements ongoing NSF-sponsored interactions amongst these groups. Geomicrobiology will no doubt be close to the center of action in the new project,

and it is going to be both a pleasure and an honor to associate with the many world-class scientists (both within and beyond Geology and Geophysics) involved in it. The interactions will include teaming with Geology museum personnel to incorporate microbial aspects into our education and public outreach programs on the general subject of "biosignatures" in Astrobiology. This outreach program and the NAI in general dovetail nicely with the undergraduate course I've been developing (since spring 2006) on Life in Earth's Extreme Environments, in which we discuss a variety of ancient and modern environments on Earth that provide models for possible microbial ecosystems on other worlds.

NITA SAHAI

It was invigorating to be back in the classroom in fall 2007 after my sabbatical the previous academic year. We had an enthusiastic and engaged group of students in Geo 303: Fluids and Sedimentary Processes, a required course for the undergraduate majors that I have co-taught with **Charlie Byers** since 2001. Charlie announced his retirement at the end of the semester, and we will miss his unique teaching style and knowledge of geology in future years. I am honored to have taught with him. I also thoroughly enjoyed the Astrobiology seminar that involved almost all the geochemistry group faculty and most of our students and post-doctoral associates. The seminar was one of the many academic and outreach activities that are occurring and planned around

the new NASA Astrobiology Institute (NAI) at our department, lead by PI **Clark Johnson** and co-PIs including **Brian Beard**, and **Eric Roden**, **John Valley**, **Huifang Xu** and myself. The NAI has energized us to work even more closely with each other on issues relating to the preservation and identification of biosignatures in the rock record on Mars and on Earth in the early co-evolution of the atmosphere, hydrosphere, geosphere and biosphere.

I am very pleased by the thematic issue of the magazine *Elements on Mineralogy and Geochemistry* (MMG), that I guest edited in December 2007. *Elements* is the pre-eminent international magazine of mineralogy, geochemistry and petrology, and is jointly sponsored and published bimonthly by the Mineralogical Society of America (MSA) and by a dozen or so other international mineralogy societies. As stated on the magazine's web-site, <http://www.elementsmagazine.org>, "Every issue explores a theme of broad and current interest in the mineral and geochemical sciences." The MMG issue of *Elements* follows on volume 64 in the *Reviews in Mineralogy and Geochemistry Series* that I edited in 2006. This emerging subject area is described in an article in the present issue of the *Outcrop*. I am also pleased to note that, this past year, *American Mineralogist*, the journal of the MSA has started accepting articles in the MMG area and invited me to join their Board of Associate Editors.

In May 2007, I represented Wisconsin at the Congressional Visits Day, in Washington D.C. Organized by the American Geological Institute and about twenty other scientific associations nationwide, the aim of the visit was to highlight, to members of the U.S. Congress, the importance of funding research and development in Science, Technology and Mathematics (STEM) for national security, and for maintaining international competitiveness.

Among the students in our Interfacial Biogeochemistry group, **Mark Stevens** successfully defended his MS thesis on identifying the forces controlling cell-membrane interactions with oxide mineral surfaces, of relevance to immune-system cell interactions with orthopaedic implants in the human body, and the design of biocompatible coatings for implants. **Tim Oleson**, **Nianli Zhang** and **Jie Xu** continue to make good progress in each of their topics of research. Our South African post-doc, **Donald Mkhonto**, is using computational molecular modeling techniques to understand amino-acid and organic acid adsorption on steps at the calcite {10¹4} cleavage surface, and peptide adsorption on hydroxylapatite crystal faces in order to under-

stand the mechanisms of calcite and bone biomineralization. We anticipate several publications from the efforts of our group this year.

BRAD SINGER

The year began with a ten day field trip in January to Guatemala with **Clark Johnson**, current M.S. student **Sarah Greene**, and former visiting student **Rudiger Escobar-Wolf** from Michigan Tech. The

main focus was on collecting samples from both Santa Maria Volcano in northwestern Guatemala. This large symmetrical stratocone is made mostly of basaltic andesite—the common lava type erupted in subduction zones. In October, 1902, however an enormous explosive eruption of dacite occurred, blanketing the landscape with up to a meter of ash. Since 1902 a large dacite dome complex grew in the 1902 eruption crater and remains quite active. On the very first day in the field we ascended the 3772 masl summit of the stratocone to sample its youngest lava flow. We next embarked on a ten mile backpacking trip over some pretty rough terrain into the dome complex to collect a sequence of dacitic lavas erupted between 1922 and today. Camping for two nights on an active dacite dome is something I am sure none of us will not forget. We were treated to numerous eruptions from the Caliente dome only about a km from our tents. At night we watched red-hot pyroclastic flows down the west face of the steep dome. After hiking out of the 1902 crater, we were fortunate to find a new road cut through the 1902 ash fall deposit and collected a suite of samples representing the second largest eruption of the 20th century. My proposal with **Brian Jicha** to the NSF to study the long-term evolution of Santa Maria was funded, and this allowed **Sarah Greene** and I to work closely with **Noriko Kita**, **John Fournelle**, and **John Valley** to develop methods using the new Cameca 1280 ion probe in the WiscSIMS laboratory to measure water concentrations in tiny melt inclusions within plagioclase phenocrysts in the 1902 pumice. Our hope is that this will tell us about the depth at which this deadly body of magma was stored prior to the catastrophic eruption. The geochronologic part of **John Hora's** dissertation study of Parinacota Volcano in northern Chile was published in the Geological Society of America Bulletin and garnered the cover of the March-April issue.



Donald Mkhonto, Tim Oleson, Nita Sahai, Nianli Zhang, and Jie Xu. They are the fall 2007 Interfacial Biogeochemistry Group. (Mary Diman)

Clark Johnson and I organized a seminar on the geophysical and geochemical structure of the Canary Islands archipelago during the spring semester. I then led a group of nine students on a geologically spectacular two week field excursion from May 19-June 1, to the Canary Islands of Tenerife and La Palma that you can read about elsewhere in this issue.

The highlight of the year for me was a two week visit to China in early July. I was invited to present recent work on geodynamo behavior done with the department's Senior Research Scientist **Ken Hoffman** at a meeting in Beijing on Paleomagnetism and the Earth's Deep Interior, sponsored by the Chinese Academy of Sciences new Paleomagnetism and Geochronology Laboratory. I also gave two talks directly to Academy members on the research program in my geochronology laboratory in Madison. This meeting was a fantastic opportunity to explore mutual interests and forge new collaborations with several leading Chinese geologists and geophysicists. I plan to return to China in 2008 to pursue joint research on Pleistocene volcanism and Cretaceous basin evolution with several Chinese scientists. Daughter Zoe and wife Teri accompanied me and had time to take in many sights in Beijing, as well as the impressive city of Xi'an and the famous Terra Cotta Army from first Qin dynasty.

In late July it was back to the Aleutian Islands with lab manager **Brian Jicha** for new field work and sample collecting on Seguam, Koniuiji, and Tanaga Islands where we continue to investigate volcano growth and chemical evolution of arc magma. This two week trip was based largely from the US Fish and Wildlife Service vessel the **Tiglax** (Eagle). Sadly, we learned on this trip that captain Kevin Bell, with whom we had sailed twice before across the Aleutians, had brain cancer, from which he eventually died. Kevin's seamanship and professionalism will be sorely missed by many Aleutian researchers.

The fall was spent writing up several papers on findings from my research on the last several hundred thousand years of paleomagnetic field behavior and hosting Ken Hoffman with whom I organized a seminar on the geodynamo. It was also nice to see so many UW alumni, including **Bill Cassata**, **Mike Smith**, **Ben Laabs**, **Rebecca Poulson**, and **Stephanie Maes** at the fall AGU meeting in San Francisco.

CLIFFORD THURBER

2007 was a year of major departures, with research scientists **Haijiang Zhang** and **Heather DeShon** leaving UW for MIT and Memphis, respectively, and post-doc **Yunfeng Liu** returning to China. New post-doc **Guoqing Lin** joined my research group in July, and a search for a second post-doc is now underway.

This year had so many highlights, it's hard to know where to begin. Grad student **Jeremy Pesicek** defended his PhD prospectus in the summer on a multi-dimensional (seismic, gravity, geodetic) study of the 2004 great Sumatra earthquake, and gave a great talk on his preliminary Sumatra seismic tomography results at the fall AGU meeting. The talk was part of an excellent special session organized by former post-doc **Heather DeShon**. Over the summer, grad student **Ninfa Bennington** defended her MS thesis on the attenuation structure of the crust surrounding the SAFOD drill site. Former undergrad **Justin Brown** (now a second-year grad student at Stanford) presented exciting results on the hot topic of non-volcanic tremor at the fall AGU meeting. My "Treatise on Geophysics" chapter on seismic tomography, co-authored with Jeroen Ritsema of Michigan, appeared in print and was featured by publisher Elsevier at the annual GSA and fall AGU meetings. I also had a paper on a worldwide survey of Double Seismic Zones published in *Science* lead-authored by former post-doc **Michael Brudzinski**, now an assistant professor at Miami University, Ohio) and three papers appeared in the *Journal of Geophysical Research* two on regional-scale seismic tomography studies of portions of California and one on a detailed studies of the seismicity and 3D internal structure of Redoubt Volcano, Alaska.

The other major milestone this year was the completion of our work related to the San Andreas fault zone drilling project, known as SAFOD. After six years of intensive field work aimed at guiding the SAFOD borehole to its "target" earthquakes about 3 km below the surface, a multitude of drilling problems (including a doubling of drilling

costs) prevented some of the drilling goals from being attained, but sections of core crossing the Pacific-North America plate boundary and two actively deforming fault zones were brought to the surface. I was able to view all the cores at a workshop in Menlo Park in December. It was rewarding to see close-up the fruits of so many years of our effort.

BASIL TIKOFF

While 2007 was a good year, 2008 is better. If that doesn't get you to read to the bottom of this article, I'm not sure what will.

Spring semester 2007 saw the graduation of **Bryn Benford** and **JoAnn Gage**. Bryn studied deformation associated in the western Idaho shear zone in the Owyhee mountains, south of where it had been previously mapped. For those who are wondering, "Owyhee" is the old spelling of "Hawai'i." Apparently, the basalt flows of the western Snake River plain reminded someone in Idaho of Hawai'i. Anyway, Bryn did a very nice job of mapping and some geochemical analysis, and we are still contemplating the implications of her work. JoAnn studied a granulite-facies shear zone in the Mt. Chapple area of central Australia. I don't have any good stories about that, except that it is close (by Australia standards) to Mordor, which is a place I feel strangely compelled to visit (named so by geologists in the 1970s because it has a striking resemblance to Mordor pound in Tolkien's *Lord of the Rings*). JoAnn did a great job of showing that deformation occurred at a granulite facies conditions and how strain was accommodated during high-temperature deformation. Since finishing, Bryn has decided to stay to work on a PhD on neotectonics in Jamaica (co-advised in some fashion by myself and **Chuck DeMets**) and JoAnn is going to work on the interaction of deformation and metamorphism in eastern California (co-advised by myself and **Laurel Goodwin**). **Kathy Staffier** also decided to move on to greener pastures in Australia, after finishing a Masters degree. If this paragraph seems like it is long and winding, I will blame sleep deprivation (see below).

At the end of spring semester, we jumped in the vans and had a fun Paleontology-Structural Geology fieldtrip to Dinosaur National Park and anywhere of any geological interest between here and there. This was the second **Clay Kelly**-Basil Tikoff extravaganza to the same area, which is always entertaining. The weather really didn't cooperate, which is a nice way of saying that the weather really stunk. However, the rocks were great. The best part of the trip is that it was the first coordinated UW-Madison and UW-Milwaukee field trip. The structural geology professor (Dyanna Czeck), the two paleontology professors

(Margaret Fraiser and Stephen Dornbus), and some seriously social UWM graduate students added a lot of interest and excitement to the trip. Next time we do a combined paleontology-structural geology fieldtrip with UWM, we are going somewhere warmer.

Chloe Bonamici recently joined the structural geology group, having finished a Masters at Northern Arizona University. She is going to be working in central Australia, and has the dubious honor of trying to make sense of our sample collection from the area. **Evan Heckler** also joined the structure group, technically starting in January 2008. He is going to work on constraining rheology of naturally deformed rocks from a very cool outcrop in the Mt. Isa area of Australia (not close to anything, really). Both Chloe and Evan are co-advised by **Laurel Goodwin** and myself.

Paul Riley found a thesis project, which I suppose is news. He is going to be working on fracture development in Yosemite National Park, in collaboration with A. Brad Murray (Duke University).

I also realize that I am getting to be an "old man" (shades of things to come, see below) in the department. So, here is a bit of news of people who have moved on: **Stephanie Maes** got a tenure track job at the College of St. Rose (NY). **Cheryl and Blair Waters-Torney** had a son, Liam, and **Scott and Tanya Giorgis** had a son, Benedict. There seems to be something in the air (hmmm).

Ok, so this finally brings us to 2008. Oliver Hotchkiss Tikoff was born on January 2, 2008. I know this is not technically 2007, but since I missed the tax break, the least I could do is sneak him into the **Outcrop**. He was born about three weeks early and caught his parents totally unprepared (despite both being scientists, we were convinced that he was going to be late). We are thrilled to have him. We will be even more thrilled when he learns what night is and considers sleeping through it.

JOHN VALLEY

The department's ion microprobe lab was selected by NSF this year to be the Wisc-SIMS National Facility for Stable Isotope Geochemistry. A new operating grant will allow us to hire additional scientists to assist users of the lab. **Noriko Kita**, **Taka Ushikubo**, **Reinhard Kozdon**, **Philipp Heck**, and **Jim Kern** are pushing the limits of analysis and science at Wisc-SIMS. The lab is integral to research by many, including several UW-Geology students: **Ian Orland**, speleothems and paleoclimate; **Andy Trzaskus**, quartz cements and permeability in arenites; **Erik Hoffmann**, growth rates of zebra mussels; **Penny Lancaster** (MS 2007) migmatites; and **Sarah Greene**, water

in magma and explosive volcanism. Wisc-SIMS is also heavily involved in WARC (The Wisconsin Astrobiology Research Consortium), the Department's new program in Astrobiology that is directed by **Clark Johnson** and involves five UW faculty and many staff (see cover article). One WARC project involves study of the Earth's oldest known diamonds that were discovered last summer by a German group as inclusions within detrital zircons from Western Australia that are as old as 4.2 Ga. **Huifang Xu**, **Hiroshi Konishi**, **Mike Spicuzza**, and I have confirmed this startling discovery and will analyze diamonds at UW to test various far-reaching hypotheses. For instance, if ion microprobe analysis shows low carbon isotope ratios, this would push the earliest evidence for life back by 500 million years. Likewise, if mineral inclusions are found within the diamonds by electron microscopy, this could show that the diamonds formed by ultra high-pressure metamorphism in thickened lithosphere, which would challenge all existing thermal models for the Early Archean. It's exciting precisely because we don't know what we'll find; all of the possibilities we can imagine are surprising.

HERB WANG

My role as faculty advisor for the Water Resources Management (WRM) practicum involved overseeing a spring seminar, summer work in New Orleans, and a final project report, which is nearing completion. The project is a study to examine the feasibility of a restoration of a former cypress forest just north of the Lower Ninth Ward. **Laura Craig**, who received a degree in hydrogeology and WRM, was the lead project manager. **Maitri Venkat-Ramani** and **Dave Schaper** visited in July. Maitri provides a story on the project for the Outcrop, which she has also described in Day 687 of her blog (<http://vatul.net/blog/index.php/1394/>). Maitri is a talented journalist. **Tom Holley** and his daughter, Claire, who is a junior at the University of Colorado, visited over the 4th of July. Over the year we gained also from the expertise of Nelson Institute alum Rob Moreau, director of the Turtle Cove Research Station-Manchac Swamp. The former Homestake Mine in Lead, SD was selected by NSF in July to be the location to develop a Deep Underground Science and Engineering Lab (DUSEL). Before the selection I had been part of the team giving presentations on the geomechanical aspects of the project to the NSF site selection committee. Since July I have become intrigued with using fiber optic technology to measure deformation in the many kilometers of drift, a technology already used by **Mary Anderson** and **Chris Lowry** for measuring temperature in streams. **Steve Carlson** at Livermore Labs has been looking at fiber-based,

strain-gage devices for borehole application. In visits to Fermilab with Chris, Dante Fratta (GLE), and **Randy Hunt** and Mike Fienen (USGS), I have also become intrigued with long-baseline tiltmeter data collected by Fermilab physicist Jim Volk. He operates precise water-level sensors 300-feet below surface in a tunnel where neutrino beams are aimed at the Soudan mine in northeastern Minnesota. Semi-diurnal differential vertical motions of 10 micrometers amplitude over 90 meters distance are clearly visible in his data, as are monthly tests of a sump pump in the tunnel. Physicists are interested in ground motions to keep particle beams collimated to 5 nanometers in size.

Danica Dralus completed her MS in May on two-phase (air and water) experiments done in sand tanks at Livermore. In the fall I co-taught hydrogeology with **Randy Hunt** for the third time. Also in the fall I chaired a review committee of the geophysics program at Lawrence Berkeley Laboratory. Jim Berryman, a UW-Madison physics alum, heads that department. I continued my part-time job as associate dean in the College of Letters & Science in which capacity I have become involved in a project of the Center for the Humanities called "What is Human?" which bridges the humanities and the sciences.

HUIFANG XU

After a year-long evaluation and bidding process, we have ordered a state-of-the-art field emission-gun scanning transmission electron microscope (STEM) and high-resolution TEM, a Titan 80-200 STEM/HRTEM from FEI. The new imaging system will benefit our research and graduate training in mineral science as well as materials science and life science greatly. This year, a new NASA astrobiology

research project (Leader: **Professor Clark Johnson**) injects fresh energy to our multi-disciplinary research programs.

Graduate student **Rakesh Yeredla** in Materials Science Program finished his master's thesis in spring. His thesis work has resulted in two peer reviewed articles (published in *Nanotechnology* journal and *Journal of Physical Chemistry*) with focus on improving quantum efficiency of photocatalytic hydrogen production and organic pollutant decomposition. His discovery has important implications for enhancing the photocatalytic activity of titania for environmental remediation, increasing the quantum efficiency in photo-voltaic (PV) solar cells and other photo-assisted processes. Graduate student **Emily Freeman** has studied nano-magnetite and smectite clays from weathered basalt layers in Snake River area of Idaho, in order to reveal possible microbial involvements in the nano-magnetite formation. Graduate student **Kuang-Sheng Hong** has been working on transforming mechanical energy into hydrogen energy directly using "smart" crystals. Kuang is also working on photocatalytic production of oxygen and hydrogen using semiconductor minerals. The study will help us to better understand the atmosphere history of early earth. Graduate student **Tina Hill** and **Fangfu Zhang** joined my research group in August. **Tina** started her research on micro- & nano-phases in plagioclase and mechanisms for causing pleochroic phenomena in sunstones. Fangfu has started research on studying aragonite formation at ambient environment and roles of microbes on carbonate composition and morphology in order to understand the possible biosignatures from microbial activities preserved in carbonate minerals. Post-doc **Hiromi Konishi** has

worked on X-ray diffraction and HRTEM of both natural materials and engineered materials. He just published an article about new orthorhombic polymorphs of triple chain silicate and mixed double/triple chain silicate. He also investigated the similar mineral assemblage in the oldest rock from Isua, Greenland. Hiromi is also studying diamond inclusions in zircon crystals from Jack Hill, Australia using focused ion beam and TEM methods.

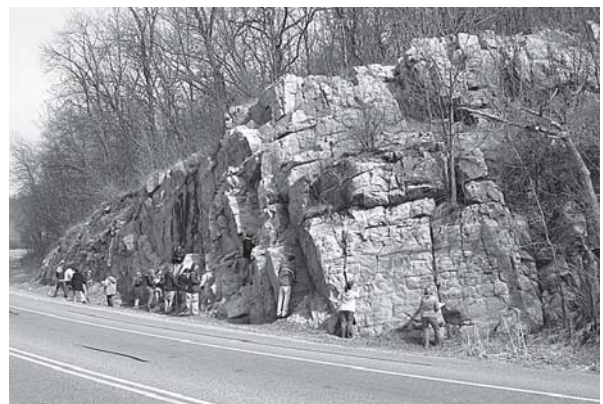
Undergraduate senior, **Jason Huberty**, has been working on phase transition of titania polymorphs, and crystal structures of nano-magnetite and magnetite/wuestite core/shell crystals. **Jason** just published an article about crystal size on brookite-to-rutile phase transition kinetics (in *Journal of Solid State Chemistry*). Undergraduate freshman **David Xu** applied his fresh "General Chemistry" knowledge into the study of binding strength between metal cations (Lewis acids) and organic ligands (Lewis bases). After he sorted thousands of published data, we have discovered natural quantitative indices for softness/hardness of Lewis acids and bases that can quantify chemical reactivity of Lewis acids and bases (including inorganic, organic and bio-molecules).

I am continuing to study crystal shape, crystal structure, stability, and reactivity of nano-minerals from both natural and synthetic systems. I also collaborated with **Professor Eric Roden** on microbe-induced nano-minerals, and with **Professor John Valley** on micro-diamonds in zircon. I taught "Crystal Chemistry" and "Gems" courses, and co-taught a course of "Earth Materials" with Professor **Phil Brown**, and seminar of "Microbial Mineralization" with Professor **Eric Roden**. ●

Saving Geological Landmarks

Basil Tikoff, Laurel Goodwin, Gordon Medaris, and Bob Dott, accompanied by State Geologist **Jamie Robertson** and **John Attig** of the state survey staff and alumna **Diann Kiesel** of the UW-Baraboo/Sauk County campus, challenged the planned demolition of an important outcrop to re-route U.S. Highway 12 in the Baraboo area. In May our delegation ardently pleaded the case for preservation to a diverse group of state, federal, and consulting highway engineers, DNR representatives, and others on the outcrop. The outcrop in question, known as the Point of Rocks, is one of our geological holy places on the South Limb of the Baraboo syncline at a tight curve in the highway. Many alumni will remember

stopping there to see both exceptionally well exposed sedimentary and tectonic structures near the top of the Baraboo Quartzite. Happily, our eloquence on the outcrop was sufficient to persuade the engineers to back off and develop an alternate alignment, which will spare these rocks. A new design was presented during the summer and land acquisition was to proceed thereafter. This experience has convinced many of us that geologists need to work vigorously for legal recognition of



Students at the U.S. Highway 12 curve outcrop of the Baraboo Quartzite (Courtesy of Diann Kiesel).

exceptional geological localities like the status achieved already for biology and archaeology. ●

Emeritus Faculty News 2007

NIKOLAS CHRISTENSEN

This past year has been another busy and important year for research. I've been involved in several research projects which have been supported in large part by NSF. During 2007 I continued my research on the seismic structure island arcs. Laboratory measurements have now provided complete velocity profiles of arc sections from Pakistan, southcentral Alaska, the Pacific Northwest and Cyprus. Knowledge of the velocity structures of these exposed arc cross sections gives valuable information on the importance of arc accretion in the formation of continental crust. Since these arcs also have exposed mantle sections they provide details on seismic anisotropy beneath arc crust as well as deformation mechanisms which have produced the anisotropy.

As part of a project funded by the NSF Continental Dynamics Program, I've completed detailed anisotropy measurements on suites of rocks from two major geologic provinces of Taiwan—the Slate Belt and Central Range. Taiwan is the result of the most active arc-continent collision in the world. Rapid uplift and erosion have exposed steeply dipping highly anisotropic metamorphic rocks. Our laboratory measurements are providing information on the relative contributions of the crust and upper mantle to teleseismic observations of shear wave splitting. An active on land seismic program in Taiwan begins this spring and marine seismic studies are scheduled for next year.

I have recently been funded by NSF's Marine Geology and Geophysics program, in collaboration with Patty Fryer and Vicky Hamilton of the University of Hawaii, to study serpentinized peridotites from the Mariana forearc region. The objective of this project is to provide detailed information on mineralogy, micro-textures and seismic velocities of serpentinized peridotites collected from the Mariana forearc region in order to understand the evolution of the forearc mantle wedge. In addition to high-pressure seismic velocity measurements, the samples will be analyzed using a variety of petrologic and geochemical techniques including MIR spectroscopy, micro-Raman mapping, and electron back scatter diffraction.

My work on the physical properties of rocks from the South Island of New Zealand, which began several years ago, was published as part of AGU Geophysical Monograph 175 dealing with the tectonics of New Zealand. The paper is a collection of physical property measurements of crustal rocks from the South Island of New Zealand and provides correlations of seismic properties with

chemistry, density, petrology, metamorphic grade and rock fabric. Emphasis is placed on the nature and pervasiveness of seismic anisotropy in the South Island crust. Data is presented from a novel seismic refraction experiment, termed the Southern Cross, shot in orthogonal directions across the Haast schist. The crust in this region shows 6% compressional wave anisotropy, in good agreement with the laboratory measurements.

ROBERT H. DOTT, JR.

The word "travel" best summarizes 2007 for me, but I shall mention only a few of my junkets. Early July found Nancy and me with most of our large family rafting for a week on the San Juan River through the Goosenecks Canyon in southeastern Utah. Son-in-law and department alumnus **Gary Gianniny** (MS 1990, PhD 1995) and his wife Cynthia Dott were our organizers and guides. They know this canyon like the palms of their hands because it was the venue for Gary's PhD dissertation under **Toni Simo's** direction, and Cynthia did her botanical PhD field work in a tributary canyon, Grand Gulch. Both of them teach at Fort Lewis College in nearby Durango, CO. The Pennsylvanian repetitive sequence exposed in the Goosenecks was as fascinating as ever.

August took us to the Upper Peninsula of Michigan for a Robertson family reunion, which included an afternoon boat trip on Lake Superior past the beautiful and geologically interesting Pictured Rocks composed of Upper Cambrian sandstones. These were studied by **Charlie Haddox** for his MS thesis (1982).

The Greek Isles were our next destination, where archaeology received more attention than geology. Nevertheless, our visit to Santorini fulfilled a forty-year dream. This famous caldera had a long and complex history of eruptions, the largest being around 1400 BC when the Minoan civilization was flourishing on Crete, Santorini, and other Aegean Islands. It has long been argued that this huge eruption exceeded even that of Krakatoa in 1883 and must have raised serious havoc for the Minoans thanks to ground shaking, tsunamis, and ash falls. Some believe that it contributed of the decline of Minoan culture.

Our greatest trip of the year comprised three weeks in November and December in Chile and Argentina. My longtime friend **Ian Dalziel**, who was a member of our faculty in 1963-66, had invited me to be co-leader of a field trip offered by the London Geological Society as part of the celebration of that Society's 200th anniversary. It was billed as "In the Footsteps of Darwin: The

Geology of Tierra del Fuego." Our group of fifteen first attended a conference on South American geology in Santiago, Chile. This was followed by a four-day field trip far to the south in Chilean Patagonia in areas where both Ian and I and students had worked in the 1960s and 1970s. It is a region underlain by Cretaceous flysch sediments, which include a spectacular complex of channelized coarse, deepwater conglomerates, which **Kevin Scott** (PhD, 1964) first studied and **Robert Winn** (PhD 1975) re-studied in 1975-76 as a post-doc with **Cristy Smith** (MS 1976) as his assistant. I was invited to speak to the field trip group about the origin of these conglomerates.

The Cretaceous strata were intruded by a Miocene granitic laccolith carved by glaciers into the spectacular and increasingly well-known Torres del Paine (Towers of Paine). Our former faculty colleague, **Lukas Baumgartner**, now at the University of Lausanne in Switzerland, was to lead a hike up into the Torres to see the contact metamorphic effects of the intrusion, which he has been studying for several years. Illness kept Lukas at home, however, so his partner, **Benita Putlitz**, substituted for him. Benita reminded me that she had spent some time in our department in the late 1990s doing analyses in John Valley's lab and that she had met Lukas at that time.

Our London Society party next bid adios to the larger group and boarded a tour vessel in Punta Arenas on the Straits of Magellan for a five-day cruise through the fjords of Tierra del Fuego. We were able to go ashore in zodiac boats at five places and to examine key geological outcrops, several of which Charles Darwin had studied back in 1832-34. One of our stops was at Cape Horn, which I was astounded to find has become something of a tourist destination. When weather permits, the cruise ship sails around Horn Island, which I had expected, and puts the passengers ashore, which I had not expected! The tour company has built an elaborate boardwalk on the Cape. This was my third time around the Horn and my second time to land on it, but there was no boardwalk in 1974.

We left the ship at Ushuaia, Argentina known as the **Fin del Mundo** (End of the World). Originally a penal colony, it was a sleepy little port when I first sailed through the Beagle Canal forty some years ago, but it has morphed into a bustling take-off point for Antarctic cruises and growing skiing and tourist businesses. From Ushuaia we made a four-day overland trip to study the geology in southernmost Argentina where the Andean orogenic belt ends today. A joint project with Dalziel in 1973-74 showed that South Georgia



Dott and Dalziel in Tierra del Fuego, 2007. (Courtesy of Bob Dott.)

Island now 1000 miles to the east, was originally a part of South America, so was an extension of the Andean belt, which in turn connected with the Antarctic Peninsula. Bob Winn's PhD dissertation (1975) comparing the sedimentary rocks on South Georgia with those of this part of Tierra del Fuego was a key to the restoration. The island was attached slightly east of Ushuaia, so it was a thrill to stand at Lago Fagnano north of Ushuaia on the great fault zone separating the South American plate from the Scotia Plate, the latter of which had begun moving east about 30 million years ago carrying South Georgia along to its destiny of isolation in the South Atlantic Ocean and severing the connection with Antarctica.

In 2007 I again led several day-trips for lay groups to the Dells and Baraboo areas and also went on my first Friends of the Pleistocene trip to study Glacial Lake Oshkosh, but I shall not bore readers with details.

LOUIS J. MAHER

Dave Mickelson, Jim Knox and I visited Al Schneider (UW-Parkside) and went to the Kenosha Public Museum to see the Schaefer Mammoth. Back in the 1960's a farmer was using a ditch-digger to drain a low-lying field in Kenosha County. The machine struck a hard object that turned out to be an elephant tusk. It was sent to the department, and I extracted enough *Picea* pollen from the fossil to indicate it was at least 9000 years old. The mammoth was later completely excavated, and it was a delight to see the whole skeleton at the museum. It now has many C-14 dates that range around 12,500 yr BP. Its bones show the carcass was butchered.

I flew a rented Cessna to photograph the Niagara Escarpment east of Lake Winnebago for authors of a book about geology as seen along airline routes. They wanted a shot from 16,000 feet

but settled for 9,000.

Mickelson and I flew as photographers in a state-owned Cessna for a project that Dave developed to photograph the Wisconsin shorelines along Lakes Michigan and Superior. These photos will help evaluate future shoreline erosion rates. I sat in the back seat so that we could alternate shots. The back seat of a Cessna with the window open is cold and cramped. If **Charles F.**

Mansfield reads this, I want to sincerely apologize for putting him in that position during our 1966 air photo trips in the department plane!

Jane and I took an Elderhostel two-week rail trip from Montreal to Victoria in May and June. I telephoned former student **Charles Schweger** when we were in Edmonton; alas he was not at home. We also made our annual tour around Lake Superior in a small motor home, and we visited various parks in Wisconsin. We both enjoyed an Arboretum talk by **Cam Craddock's** student **Marcia Bjornerud** who read from her book *Reading the Rocks*

My direct flight to Denver to attend the GSA meetings took nine hours as the plane was hours late in reaching Madison—I missed the whole welcome session. I did really enjoy seeing a lot of former students at the alumni functions, especially **Dona Dirlam** who works at the Gemological Institute of America.

Oh, and I instructed **Brian Hess** how to close down the courtyard fountain for the winter. It was very pleasant to pass on that task.

GORDON MEDARIS

2007 was another busy year of travel, including snorkeling in Culebra and Vieques, touring Morocco for a month (highlights were the Roman ruins at Volubilis and petroglyphs in the Anti-Atlas), paddling in Wisconsin, Minnesota, and Florida, and a delightful three-week biking trip along the Rhine and Mosel rivers, where every night we drank Rhine wine from different vineyards, or as the Germans call them, *weinbergs*, because of the steepness of the valley walls where the grapes are grown.

In May I made my annual pilgrimage to the Lake Superior Institute on Geology, where **John Fournelle**, **Steve Guggenheim**, and I presented a paper on a Wisconsin occurrence of *agrellite*, a

rare mineral that occurs in alkaline complexes. In July I joined the Eclogite Mafia at the International Eclogite Field Symposium in Scotland, where **Tom Lapen** and I gave a paper on the Sandvik peridotite, Norway. This was followed by three weeks of field work and beer drinking in the Czech Republic, where research is continuing with Czech colleagues on topics Variscan.

In 2007 I coauthored four papers on a wide range of topics, including differentiating pedogenesis from diagenesis in Proterozoic and Cambrian paleosols (**Steve Driese** et al., *Journal of Geology*, v. 115, 387-406), the geochemistry of mantle xenoliths in central Europe (**Lukas Ackerman** et al., *Journal of Petrology*, v. 48, 2235-2260), the seismic properties of mantle xenoliths from the San Andreas fault zone (**Sarah Titus** et al., *Tectonophysics*, v. 429, 1-20), and the recognition of two different Proterozoic (Statherian) sedimentary units at Hamilton Mounds in central Wisconsin (Medaris et al., *Precambrian Research*, v. 157, 188-202), which contributes to a further understanding of the Proterozoic evolution of the Great Lakes region.

DAVE MICKELSON

I'm still enjoying an active retirement with a nice mix of writing, traveling, working on barn and house projects, and public presentations. A high point was helping Tom Hooyer, Bill Mode, and John Attig organize and run the Friends of the Pleistocene meeting in May. Quite a few former UW-Madison alumni attended. At the banquet we paid tribute to, and roasted, long-time friend and colleague **Lee Clayton**, who retired from the WGNHS last spring. I attended the INQUA Congress in Cairnes, Australia in July and saw several former students including **Steve Kite**, **Jeff Munroe**, and **Anders Carlson**. Vin and I really enjoyed seeing the South Island of New Zealand and some of Australia's east coast for a couple of weeks before the meeting. Other shorter trips included New England, to Michigan to meet **Pat** and **Kelly Colgan**, among others, for a consulting project, and Bayfield County, WI. I continue to work with the Planning and Zoning staff there to develop a scientifically defensible setback ordinance for the Lake Superior shoreline. Lou Maher and I flew and took oblique photos of most of Wisconsin's Great Lakes shorelines. These are now geo-located and posted on the web. My last official PhD student, **Betty Socha**, finished in December but I am still co-advising a couple of students. And, of course, we keep on learning. Vin and I have taken classes in woodworking, genealogy research, and building cordwood structures among others! ●