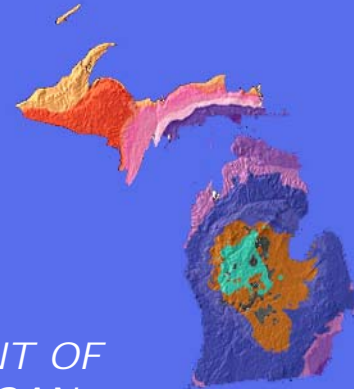


GEOSCIENCE NEWS

FOR THE ALUMNI AND FRIENDS OF THE DEPARTMENT OF
GEOLOGICAL SCIENCES, THE UNIVERSITY OF MICHIGAN

FALL 2005



BRUCE WILKINSON AND STUDENTS CORING HOLOCENE SEDIMENTS IN FLORIDA BAY

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GREETINGS FROM THE CHAIR

On January 1st, I will assume the duties of Chair of Geological Sciences. The first order of business is to thank **Joel Blum** for his five and one-half years of service to the Department. During Joel's tenure as Chair, the Department has grown, occupying more space and adding new faculty. Previous to this past year, six new faculty had been hired (**Todd Ehlers, Chris Paulson, Udo Becker, Ingrid Hendy, Jeff Wilson** and myself). During this past year, the Department made four offers to perspective faculty and hired three! **Jeroen Ritsema** of the Department de Sismologie,

Institut de Physique du Globe was selected as the first recipient of the Henry Pollack Chair. Jeroen is a seismologist, well known for the application of tomography and thermal modeling of the Earth's interior. **Nathan Niemi** and **Marin Clark**, both presently at the California Institute of Technology, will join the faculty as assistant professors this winter semester. Nathan is a structural geologist with a speciality in geodesy and crustal deformation. His current research focuses on rates and magnitudes of extensional deformation in the Great Basin. Marin is a structural geomorphologist whose research focuses on deciphering mechanisms and timing of deformation in the deep crust. Her work on transient landscape of the southern Sierra Nevada was recently featured in *GSA Today* (v. 15, pp. 4-10). Marin and Nathan bring their strengths to our expanding efforts in the field of neotectonics. These excellent hires are all the more remarkable when one considers the financial constraints on the University of Michigan. Joel has done a remarkable job as Chair, even agreeing to extend his term by one semester to accommodate my own schedule. Faculty, students and alumni owe a great deal to Joel. Always generous with his time, he is also the new Director of Camp Davis.

As I look ahead to the next three years, I see my job as guiding the Department through a period of transition. In addition to the recently hired faculty, the Department will add new faculty as others retire. **Bruce Wilkinson** and **Phil Meyers** have already announced their retirement dates, and others will certainly follow. This is, of course, an opportunity to evolve in new directions, always building on previous strengths, but it will not be an easy matter to maintain the reputation of the Department in the face of so many changes. A succession of chairs, **Henry Pollack, Rob Van der Voo** and **David Rea**, have each made the Department a better place for their colleagues and students. The challenge is to be sure that the Department maintains, and even exceeds, its previous high standards in teaching and research even through the loss of highly productive and distinguished colleagues. Having so many new faculty means that we will need to review and revise our course offerings and curriculum, establish new programs, and be sure that we attract the best students to the Department. We have a strong base and excellent reputation, but other universities are improving and expanding their geoscience programs into new areas. We have to be sure that we are leading the way for our profession.

Finally, I am new to the Department and thus cannot have had the connection to the alumni and Department history that other colleagues have. Please help me by stopping by my office when you are on campus and telling me about your history with the Department and advise me about opportunities for our future. Help to educate me so that I become part of the great Michigan tradition.

Rod Ewing, Chair

A handwritten signature in black ink, appearing to be 'R. Ewing'.

NEW FACULTY JOIN THE DEPARTMENT

Marin Clark (Assistant Professor, Geological Sciences) joins us from the California Institute of Technology where she has been working as postdoctoral scholar in the Division of Geological and Planetary Sciences. Her broad interests are in geomorphology, plate tectonics, and geodynamics. Her research focuses on how topography and erosion relate to deformation of the continental lithosphere.



Nathan Niemi (Assistant Professor, Geological Sciences) is joining us from the California Institute of Technology where he has been working as a member of the professional staff in the Division of Geological and Planetary Sciences. His current research interests are in the fields of structural geology, tectonics, and field geology, with an emphasis on understanding modern Earth deformation through neotectonic studies and the application of GPS geodesy to tectonic problems.



Jeroen Ritsema (Associate Professor, Geological Sciences) will join us from the Institut de Physique du Globe de Paris where he has been working as professor in the Dept. de Sismologie. Dr. Ritsema is a seismologist interested in the structure of the Earth's interior and the global-scale processes that shape the geologic landscape. He studies earthquake-generated seismic waves to constrain temperature and compositional variations in the mantle due to global-scale mantle convection.



HONORS AND AWARDS: ALUMNI, FACULTY AND STUDENTS



William Bartels (MS '81, PhD '86), a professor of geological sciences at Albion College, was awarded the Arnold G. Langbo Trustees' Professorship. Bill is a national authority in paleontology. He has received research grants from the Pew Foundation, the National Geographic Society, the National Park Service, and the National Science Foundation. Bill was also named Albion's Phi Beta Kappa scholar in 1996.

Bill Bartels (center)

Joel Blum (faculty) was elected to GSA Fellowship on 14 May 2005 and was one of 40 members elected. Joel and other honorees were recognized at the Presidential Address and Awards Ceremony at the GSA annual meeting in Salt Lake City, Utah.



The Institut de France, on behalf of the French Academy of Sciences, has announced that **Professor Clara Castro** is the recipient of the *2005 Alfred Verdaguer Award*. You will find Clara listed as such on the academy web site:

http://www.academie-sciences.fr/prix/prix_thematiques_gal.htm

The award can be given to people in any field, including literature, science and arts. Clara received this prestigious award because of her work in noble gas geochemistry and hydrogeological numerical modeling. The citation for this award stresses how her work has resolved an issue that has been full of contradictory statements on the helium and heat fluxes for more than 20 years.

Rod Ewing (faculty) was again honored for his contributions to mineralogy. He was also a Distinguished Lecturer for the Mineralogical Society of America, visiting 10 universities in Europe and North America. He was chosen to present the Deer-Howie-Zussman Lecture at the University of Manchester, England.

Chris Palenik (PhD '04) was honored by the Rackham School of Graduate Studies on April 28 with the Distinguished Dissertation Award. Chris worked on his dissertation, entitled "Isotopic Composition and Neutronics of the Okelobondo Natural Reactor" with Professor **Rod Ewing**.

John Valley (MS '77, PhD '80) was awarded the distinguished "Charles R. Van Hise Professor of Geology" at the University of Wisconsin, Madison. The award of this named professorship is quite rare at U-W Madison, and in most cases go to far more senior people.

Alex Piotrowski (MS '99) recently began a two year post-doctoral fellowship at Cambridge University under the tutelage of Prof. Harry Elderfield after completing his PhD at Lamont Doherty Earth Observatory in New York. His current research focuses on developing isotopic proxies for better understanding the role of ocean circulation in rapid climate change. This has involved the examination of Nd isotopes on Fe-Mn oxides coatings in the sediment, producing records with much higher resolutions, nearing those from more-conventional nutrient proxies such as carbon isotopes in benthic forams. The results of his research endeavors were published in a recent issue of Science.

Scott Tinker (MS '85) received the Distinguished Service Award presented by the AAPG for his singular and beneficial long term service to the organization. Scott, who currently serves as the Director of the Bureau of Economic Geology in Austin Texas continues to demonstrate his commitment to his academic, governmental and societal pursuits.

Al Levinson (BS '49, MS '49, PhD '52) was recently honored by the naming of a new mineral *Levinsonite-(Y)*, in an article published in *Geochemica et Cosmochimica Acta*. Three of the authors of this article, Drs. **Rouse, Peacor and Essene**, have long been associated with the Geology Department at the University of Michigan. **Al Levinson**, Emeritus Professor at the University of Calgary, has played a pivotal role in the naming convention for rare-earth minerals. In addition, he has had an exceptionally productive career with substantial contributions to classification of minerals, exploration geochemistry, and gemology. His continuing interest in diamonds is exemplified in his article in "The Nature of Diamonds", edited by George E. Harlow (1998).

The Department continues its contributions to the Joint Oceanographic Institutes' Distinguished Lecture Series. Last year **K. C Lohmann** was chosen to present his research to eight national universities. We

are honored this year to announce that **Ted Moore** (Professor Emeritus) has been chosen as a Distinguished Lecturer for 2005-2006, presenting “**The Once and Future Warm Earth: A Paleoceanographic View**”. This lecture will address predictions of climatic warming in the near future which, if true, will approximate the very warm conditions of the early to mid Eocene. By studying the early Paleogene world he considers what may be in store for us and presents a perspective of the processes by which such a warm climate is developed—and ended. Ted has already begun his tour of lectures and expects to visit 9 or 10 universities during the Fall and Winter terms.

In July Deans Terrence McDonald (LSA) and Rosina Bierbaum (SNRE) appointed **Robert Owen (faculty)** as the next Director of UM’s Program in the Environment. There is some degree of curricular overlap between the Program in the Environment and Geological Sciences, and Bob plans to work closely with Rod Ewing to bring the two units closer together for the mutual benefit of both.

Joaquin Ruiz (PhD ’83) received the 2004 Medal of Merit from the American Mining Hall of Fame. The award was presented by the Mining Foundation of the Southwest at a banquet in December 2004. Attending the award presentation were **Susan Beck (PhD ’87)** who is the Department Chair at University of Arizona and **George Davis (PhD ’71)** who is currently serving as the Provost at UA.

Lora Armstrong, (BS ’05) was chosen as one of the Outstanding Student VGP Presentations at the Fall meeting of the AGU. Her paper was entitled: “Liquidus Phase Relations in Pyrolite at Pressures of the Transition Zone”. She is currently a graduate student at Bristol University in the UK.

The Department recognizes several graduate students who received GSA Research Grants for 2005. These present and former students include: **Douglas Boyer (BS ’03); Jerome Guynn (MS ’03); Samuel Haines (PhD Cand); Lixin Jin (PhD Cand); and Jennifer McIntosh (PhD ’04).**

Lynn Walter was selected as a Geochemistry Fellow. This honor is bestowed jointly by the Geochemical Society and the European Association for Geochemistry “in recognition for outstanding contributions to geochemistry”. The number of fellows annually selected is less than 10. Only four others in the department have received this honor (**Alex Halliday, Phil Meyers, Jim O’Neil, and Jim Walker**).

Eric Essene was named the William C. Kelly Distinguished Professor and **Pilip Ginerich** was named the Ermine Cowles Case Distinguished Professor by the College of LSA.

Graduate and Undergraduate Achievement Awards — 2005

John Dorr Graduate Academic Achievement Award: **Jason Smerdon (PhD ’05)**. This is a department-wide award acknowledging excellence in research and academic achievement.

Outstanding Graduate Student Instructor Award: **Kate Keller (PhD Cand)** and **Carmen Nezat (PhD Cand)** received this award which acknowledges excellence in teaching as a Graduate Student Instructor in courses offered by the Department.

Undergraduate Academic Excellence Award: **Brian Ellis (BS ’05)** received this year’s award which recognizes students with excellent academic accomplishments, rigor of coursework taken, and participation in independent research within the Department.

Alumni Undergraduate Award: **Monamie Bhadra (BS ’05)**, a senior in the Department received this award based on her high level of involvement and commitment to the intellectual life of the department.

Camp Davis Field Geologist Award: This award was received by **Heather Whittington (BS ’05)** based on her overall performance and accomplishments in the advanced field course at Camp Davis.

CHESTER B. SLAWSON MEMORIAL FUND REACHES GOAL

Marking its 40th anniversary in 2004, the Department's Chester B. Slawson Memorial Fund has reached the goal envisioned by its founders: an endowment adequate for an enduring and significant grant program in honor of Professor Slawson. The Fund surpassed \$500,000 in 2004, enough to support an annual student fellowship. The very first Slawson Fellowship was awarded in the Fall 2004 term to Mr. **Gerald Pollack**, and the selection process for the next recipient is now underway.

Professor Slawson (1898-1964) was unusual in his dedication to the personal problems of students and young post-docs in the then-existent Department of Mineralogy, and of those he met as a general academic counselor for the College of Literature, Science, and the Arts. His dedication was notable even within the erstwhile Departments of Mineralogy and Geology, which, like our present Geological Sciences, were known for warm student-faculty relations.

His rapport with students is well illustrated in an informative example. Among many attentions to student problems, Professor Slawson often lent money to them, with no explicit agreement for repayment. Nonetheless, every loan was fully repaid. During a period of unusual financial stress for students, he posted a \$100 bill (a large amount in those days) at a location known only to the students, with the understanding that it was for their emergency needs. The bill disappeared and reappeared numerous times over a long period.



Quite understandably, a number of our departmental alumni were much saddened by his untimely death in March 1964, and upon leaving the funeral services, vowed and conceived a substantive memorial to him. Among those participating in the formative stages of the resultant Slawson Fund were **Alfred A. Levinson, Allen F. Corey, Alice (Seguare) Corey, Edward H. Poindexter, Armando A. Giardini, Joel R. Shappirio**; and **Prof. Reynolds M. Denning**. There was agreement among the group that the purpose of the Fund should be "aid to students in the tradition of Professor Slawson." Recipients were to be engaged in study or research, broadly constrained by some relation to mineralogy. Al Levinson, a day or two after the funeral, took the pivotal step of establishing the Fund, in person, at the University gifts office.

The Fund to an unusual extent has been a "grass-roots" effort; it did not enjoy any single dominant start-up gift. The above-named and other alumni fans of Prof. Slawson have steadfastly maintained its growth over these 40 years, sending many individual donations ranging from \$3 to \$30,000, with an average of \$500. In the 1990s, **Don Peacor (Professor Emeritus)**, Fund faculty representative for a time, inspired the final, enhanced goal of an annual fellowship, and exhorted the one last push, which put it over the top. Prof. Joel Blum, Department chairman, promptly initiated the fellow selection process to kick off the long-dreamed-of consummation of Fund objectives. Several of the founding alumni recently met in Altadena, CA, to celebrate and reminisce.



Some of the Slawson Fund founders met in February 2005 to celebrate the success of the Fund and reminisce about Prof. Slawson and Geology and Mineralogy in the 40's and 50's. From left to right: **Allen F. Corey** (BS Geology '49, MS Geology '50, PhD Mineralogy '54); **Alice Corey** (BS Chemistry '45, MS Mineralogy '51); **Ed Poindexter** (BS Mineralogy '52, MS Mineralogy '53, PhD Mineralogy '56); and **Al Levinson** (BS Geology '49, MS Geology '49, PhD Mineralogy '52).

RESEARCH CONFERENCE HELD AT CAMP DAVIS

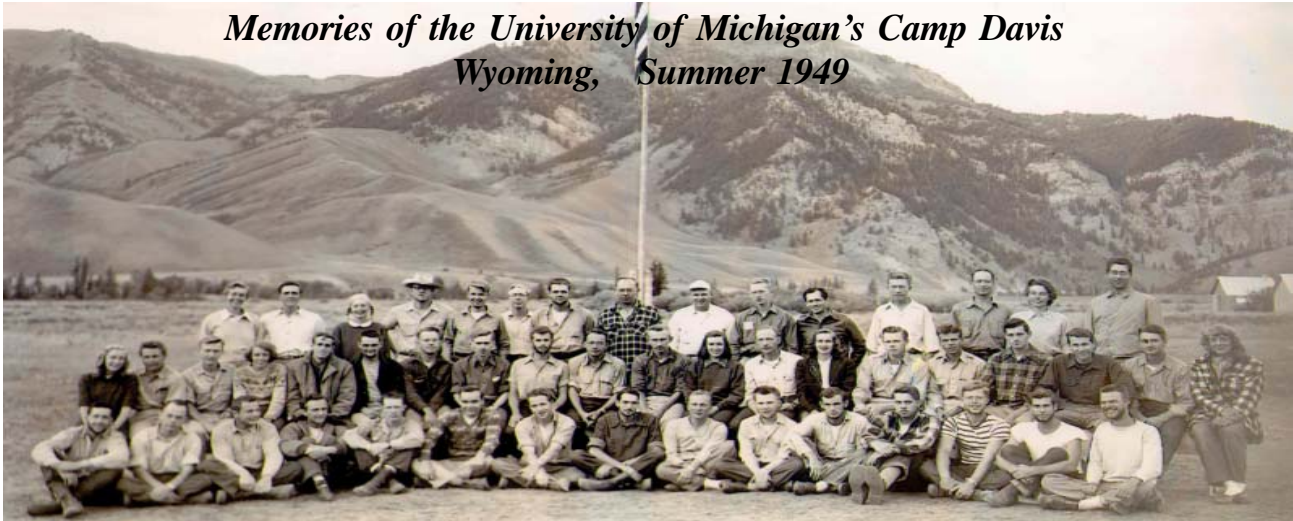
Between August 12-16th, a three-day research conference to honor the career of Professor Ian Carmichael (emeritus from U.C. Berkeley and adjunct at U. of Michigan) was held at Camp Davis, a few days after the undergraduates finished their field courses and headed back to Ann Arbor. The conference was sponsored by 23 of Ian Carmichael's graduate students, including U of M faculty member, **Becky Lange**. There were 48 earth scientists who made their way to Jackson, Wyoming for this event, including former U-M faculty member, **Richard Arculus**, currently at the Australian National University; also in attendance was U-M faculty member, **Youxue Zhang**. People came from all over: a total of three from Australia, one from Europe, one from China, two from Canada, and the rest from the U.S. The majority of the attendees are faculty at universities, whereas five are from the United States Geological Survey.

For three days, there were thirty-four talks throughout the morning and early afternoon, as well as in the evening after dinner. This left the afternoons free for hikes, river-rafting, and long discussions about "life" and "rocks" (one and the same?). The lecture room in the new classroom building was just the right size for this group of 48 to listen to the talks comfortably, there was plenty of room to put up the fourteen posters, and access to email was appreciated by all. **Chris Malvica** and his cooking staff provided delicious meals as always. Every evening from 5:30-6:30, there was an abundance of beer and wine for an official Happy Hour prior to dinner. After the evening session of talks, the group reconvened around the campfire, for further discussion (and plenty of singing) until well past midnight. All in all, it was a roaring success and a great illustration of what a fantastic facility we have at Camp Davis.

One of the most positive outcomes of this event was the widespread appreciation among all who attended was that our Department is deeply committed to its undergraduate field program. This is in stark contrast to what these colleagues report regarding their own institutions. There was much discussion and general agreement that the geology undergraduates at U-M, as a consequence of their field courses at Camp Davis, will be at a distinct advantage when competing for jobs in the environmental, mining, and petroleum sectors of private industry, as well as at the USGS and academic institutions. So, in addition to a great research conference, the event was also an opportunity to spread the word among the academic community about the vibrancy of the Camp Davis undergraduate field courses.

ALUMNUS PROFILE – CHARLES R. HOHEISEL (BS '50; MS '55)

Memories of the University of Michigan's Camp Davis Wyoming, Summer 1949



Charles Hoheisel is the 4th student from the right in the front row.

As I remember, the geology class left Ann Arbor, in a caravan of 1948/49 Chevy four door sedans. I was one of the student drivers. The exact geology stops on the trip to Camp Davis are now rather vague after nearly 56 years. But I think we stopped at the Driftless Area of Wisconsin, the Black Hills and Badlands of South Dakota, Devils Tower, Wyoming, and Yellowstone and Teton National Parks. I remember an overnight stop at or near Sheridan, Wyoming, where many of us bought cowboy hats and wore them the rest of the summer (I still have mine). As I recall, near Sheridan, we stayed in log cabins with stone fireplaces and with a creek nearby. .

While at Camp Davis, we had class field trips, to climb up to the Teton Glacier, and I remember looking down on Phelps Lake and a Rockefeller home there. Of course there was a “field trip” to the Cowboy Bar in Jackson, Wyoming. At Davis, we were divided into groups of three or four for field mapping. Our group mapped an area in the Gros Ventre Mountains. (I still have the map and 35 mm slides somewhere). The cabins at Camp Davis were nearly new in 1949, sheet metal with double-decker bunks. I remember two of my cabinmates were **Roger Hubbell** and **Tom Newport**.

As I recall, the class Chevy caravaned to several geologic stops, and the brakes of the Chevy I was driving failed. It was a choice of gently bumping the stopped Chevy ahead of us to stop or likely rolling over a cliff. We bumped the car ahead. Dr. Goddard was in that car and was not too happy about the bump. There was slight damage to our Chevy. I still remember two people turning and looking out the rear window of the bumped car.

Roger Hubbell and I tried trout fishing in some of the tributary creeks of the Hoback River but without success. Some of the professors that summer were: **Goddard, Garrels** (from Northwestern University, **Walker, Wilson, Chronic, & Higgins**. **Armand Eardley** stopped by Camp for a few days. He was leaving U. of M. and going to teach at the U. of Utah. I earned six units of “A” that summer and it was the highlight of my life up to that time.

After Camp was over, **Bob Klinger** and I decided to hitchhike to the West Coast rather than return to Ann Arbor with the Chevy caravan. As I recall, we made it as far west as Libby, Montana, where we were stuck for nearly 24 hours. No one would pick us up. Finally we decided that one of us would stand on either side of the road and whatever direction offered us a ride we would take. A truck going east picked us up - so much for the West Coast! A day or so later we again were stuck on the eastern plains of Montana and spent much of the night resting in a ditch, between running up to the road and putting out our thumbs as headlights came down the road. We finally, somewhere in North Dakota, took a Greyhound Bus home to Michigan.

Postscript:

After graduation in June 1950 from U-M, I spent three months in the Snyder, Texas, Oil Boom, as a roustabout. Our crew worked at the Holly #1 oil well fire and saw Red Adair Sr. in action to put out the fire - with NITRO!

In October 1950, I entered the U.S. Air Force, and was discharged in November 1953. In February 1954, I returned to U-M. as a geology graduate student on the GI Bill. The summer of 1954 was spent in Colorado with my new bride. My Masters Thesis involved a mapping project in the foothills of the Sangre de Cristo Mountains west of Redwing, Colorado (I believe my work was incorporated in **Ed Stover's** PhD Dissertation). Rhoda and I lived in a two-room log cabin that summer, with an irrigation ditch as a water supply, a Coleman stove for cooking, a Coleman lantern for light, and of course an outhouse. Baths were either in the ice cold irrigation ditch or a sponge bath with hot water heated on the Coleman.

I received my Masters Degree in February 1955, and we moved to Salt Lake City, Utah, employed by Standard Oil of California (now Chevron-Texaco), as an exploration field geologist. I worked in Utah and Nevada. I best remember mapping around the edges of Bryce Canyon National Monument. Later we were transferred to the Standard Oil Office in Salinas, California, and I was assigned to study the geology of Northern Santa Barbara County, Santa Maria and Santa Ynez Valley. I mapped from Surf/Lompoc on the coast to Lake Cuchuma, from the crest of the Santa Ynez Mountains to the crest of the San Rafael Mountains. My supervisor and I proposed one oil drilling project south of Lompoc, California, and the Company leased the land (under an assumed name), but shortly thereafter the U. S. Government stopped all private development in our proposed drilling area because of the establishment of Vandenburg Air Force Base and missile program.

In August 1958, we moved to Long Beach, California, and began teaching geology at Long Beach City College. I retired from LBCC after 31 years of very enjoyable teaching. We, now at 76, have lived in the same home for 39 + years in Cypress, California.

The enclosed photo is the 1949 Camp Davis Group. I am the one with the big feet sticking out in front (size 11). *Charles is the 4th student from the right in the front row.*

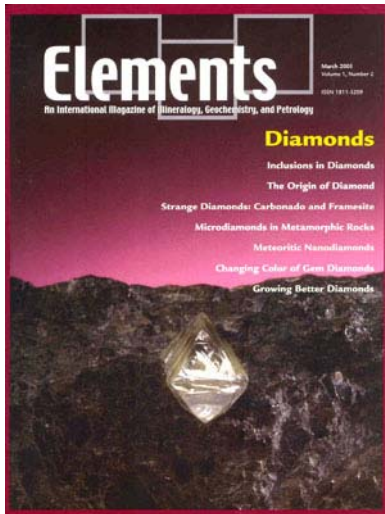
CULTURE COMES TO CAMP DAVIS

History and Literature of the American West

Jackson Hole area has for decades provided geology students an ideal educational laboratory, with some of the most complex and diverse bedrock geology and land forms in the country. Five years ago the range of educational opportunities was expanded to take advantage of the area for the study of Rocky Mountain Ecosystems and the environment. This past summer course offerings were expanded further to provide humanities students with learning opportunities at Camp Davis. **John Knott**, Professor of English, and **Phil**

Deloria, Professor of history and American culture, team-taught for the first time a course on the literature and history of the American West. Course topics included the literature and history of Native Americans, trappers and homesteaders, tourists and park rangers, and finally to skiers and naturalists. We hope that the Camp Davis curriculum will continue to expand in these innovative ways, welcoming students from a variety of LSA departments and majors.

A NEW JOURNAL



ELEMENTS

On April 23rd, 2004, the new interdisciplinary magazine, *Elements*, was born in the Department of Geological Sciences at the University of Michigan. *Elements* is a joint publication of the Mineralogical Society of America, the Mineralogical Society of Great Britain and Ireland, the Mineralogical Association of Canada, the Geochemical Society, and the Clay Minerals Society. The new Editors, **Rod Ewing** (University of Michigan), Ian Parsons (University of Edinburgh), Mike Hochella (Virginia Tech) and Pierrette Tremblay, the Managing Editor, met in room 3504 of C.C. Little to create the magazine from scratch: selecting the title, designing the format, and determining the content for the first six issues. The first issue of *Elements* appeared in January, 2005, and will be published bimonthly.

Elements is meant to be a bridge between the sub-disciplines of mineralogy, geochemistry and petrology. Each issue is thematic, with a guest editor, who invites contributed articles that are written by experts in the field for the broader scientific community. The first issue was on fluids in planetary systems. Future issues will be devoted to topics as diverse as diamond, the geochemistry of the origin of life, toxic metals in the environment and the relationships between large igneous provinces and climate change. Of course, there will be regular features, news of the societies, awards, books reviews and a meeting calendar.

The first four issues have been published and have been very well received. New societies have immediately joined: the European Association for Geochemistry, the International Association of Geochemistry, and the Societe Francaise de mineralogie et cristallographie. Affiliated organizations now include the International Mineralogical Association and the European Mineralogical Union. Presently, *Elements* goes to over 8,000 individuals and 1,200 libraries around the world. You can receive a copy of *Elements* by joining any of the participating societies. *Elements* was recently given the Outstanding Publication Award of the Association of Earth Science Editors.

The participating societies want *Elements* to become a voice for the geosciences in the broader scientific community – an important idea that started at the University of Michigan.

CAMP DAVIS ALUMNI GETAWAY 2006 JACKSON HOLE WYOMING

The Department welcomes you to participate in the next *Camp Davis Alumni Getaway*, scheduled for very early-August 2006. This event will be an opportunity for alumni and friends to visit the Camp Davis area, staying in the camp facility after the departure of the field camp students. The concept driving this adventure is a desire to share this spectacular resource with our alumni, faculty, and friends - to provide a venue where alumni can refresh their knowledge of the geologic features of western Wyoming, and continue to strengthen their ties within the U of M community.

Camp Davis, it is located just south of Jackson Hole, allowing easy access to Yellowstone and Grand Teton National Parks. Camp Davis can serve as a base for your independent excursions around this region, or as a reunion where you can reacquaint yourself with old friends and the current U-M crew. Several sight-seeing, field trips, and hiking activities have been organized to areas of the Teton and adjacent Gros Ventre Mountains, and local outfitters will provide float trips and wildlife excursions. For additional information on dates, costs and activities, visit the Department's website <http://www.geo.lsa.umich.edu/> and follow the link to Alumni Getaway 2006.

RECENT CONTRIBUTORS TO THE DEPARTMENT

The Department is grateful to the individual donors, the corporations and the foundations, who have helped to expand the opportunities available to students and faculty.

Individual Contributors

Margaret and Lawrence Allard
John and Camille Amoruso
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Gordon and Judith Barnes
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NEW MASTODON IN TOWN!

by Daniel C. Fisher

Research in the geosciences often forces us to deal with phenomena on a piecemeal, sample-by-sample basis, if only because the subject of our interest is too abstract, too large, or too remote, for direct confrontation. Oh sure, we do our best to integrate isolated observations into a larger conceptual whole, whether through explicit modeling, graphing point-values against a relevant variable, or some other form of generalization. Against this backdrop of bit-by-bit encounters with reality, we've learned to savor those rare times when, for a moment, or in a certain context, some large part of an original system stands unveiled before us.



The Buesching mastodon (foreground) and the Owosso mastodon (background) greet visitors to their exhibit opening, May 20, 2005, at UM's Exhibit Museum of Natural History. The Buesching skeleton stands almost ten feet high at the shoulder. Photo by Jesse Ortega.

For twenty-five years I've worked with the bones and tusks of mastodons and mammoths, trying to clarify their lives and deaths, trying to generate better reconstructions of their behavior, and trying to understand their extinction. I've looked at skeletal mounts or reconstructions that conveyed other people's views of what mastodons were like, but they always seemed stiff, wooden, with none of the spark that must have animated those bones. I could spot the anatomical inconsistencies that hinted at what was wrong, but you can't just dial to a new reality "in your head." Bone shapes and articular relationships are just too complex for that.

This past spring I finally had my chance to stand in awe before a large male mastodon. No, he wasn't alive, but thanks to a grand collaboration of faculty and staff, graduate students and undergrads, and volunteers from inside and outside the University, he represents the closest most folks will come to encountering the real *Mammuth americanum*. On May 20, as the final event of a "theme semester" on "Mastodons and the Ice Age" (which also included presentations on related subjects by geologists **Henry Pollack**, **Paul Koch**, and **Bill Farrand**), the Exhibit Museum of Natural History opened its new exhibit featuring our skeletal mount of the Buesching mastodon, an adult male found near Fort Wayne,

Indiana, in 1998. The Buesching Family and many other contributors to the project were welcomed to the Exhibit Museum, the last parts were added to the skeleton mere moments before the crowd arrived, and an evening presentation summarized current research on mastodons at UM. The mounted skeleton consists of fiberglass casts of the original bones, with an inconspicuous internal armature. The Buesching mastodon joined the adult female Owosso mastodon skeleton that has been on display since 1947. Along with various explanatory labels and a video kiosk still under development, they will be part of a greatly enriched exhibit of Pleistocene material in the Exhibit Museum's Hall of Evolution.

You don't need an anatomical background to be captivated by this skeleton. His size is imposing, though it's no more than average for males from the Great Lakes region. What grabs you most is his posture, his alertness, the freeze-frame sense that he's just caught wind of you and is turning to challenge whatever you might have in mind. Our success in capturing the dynamic of this moment reflects many hours of pouring over photographs of elephant behavior and anatomy, experiments with 3D digital models of the bones of this animal, reference to the mastodon trackway we excavated and documented at the Brennan site, in Saline, Michigan, in 1992, the consummate skill of preparators and illustrators working for the Exhibit Museum, and close collaboration among all involved as the mount began to take shape.

As one example to illustrate the novelty of the Buesching mount, his front and hind legs angle inward as they approach the substrate, instead of being planted in the wide stance characteristic of every other mastodon mount I have seen. Elephants stand and walk with their feet near their midline, and the Brennan mastodon trackway shows that mastodons moved this way too, but for some reason, mastodons have never been shown with such a narrow-gauge stance. When we designed the Buesching mastodon in this way, it made better sense of other aspects of his anatomy and implied a more dynamically maneuverable style of locomotion.

A project on this scale virtually always requires a broad range of contributions. Since 1998, graduate and undergraduate assistants and volunteers have helped to clean and stabilize bones and reconstruct one tusk damaged during excavation. Over fifty students in UM's Undergraduate Research Opportunities Program helped to digitize the bones, produce high-quality molds, cast parts such as foot bones that would be articulated and remolded for the final cast production, and process digital files to make 3D "rapid-prototypes" to fill in for bones that were missing on one side of the body, but present on the other. If the Buesching mastodon catches your eye on your next trip to the Museum, take a moment to stand and realize that you are probably looking at the most anatomically accurate mastodon to have taken shape in the last ten thousand years or so, and, with Ms. Owosso, the only mastodon couple on display anywhere. We wish them many happy years together!



*Picture stolen from
Robert Thom
John Klausmeyer*

FIELD EXCURSIONS – 2005

This year the Department was able to sponsor two major field excursions, South Florida and Scotland, for graduate and undergraduate students with the aid of the Field Excursion Endowment provided by an anonymous contributor. This endowment over the last several years has enabled the Department to extend its field offerings beyond the scope of the continental United States and to explore unique geological settings on other continents. The Department again thanks our generous donor who has provided this valuable resource to the graduate and undergraduates of Geology.

Geological Field Trip to the Scottish Highlands University of Michigan, May 2005

Scotland has been a long-standing attraction for geologists. The Scottish Highlands record events that formed several major orogens – Archean to Early Proterozoic rocks in the Northern Highlands, fragmental evidence of the Mid-Proterozoic supercontinent called Rodinia, followed by rocks metamorphosed during formation of the Caledonian mountain belt approximately 450 million years ago. The accompanying processes of faulting, deformation, melting and metamorphism dramatically changed the structure of the Earth's crust, which became subsequently exposed after relaxation, extensional faulting and massive landform changes. Scottish geology is also of great importance from a cultural-historical perspective; a significant amount of modern geological thinking on the role of igneous, metamorphic and tectonic processes was developed based on observations in the Scottish Highlands. The first modern concepts about the Pleistocene continental glaciation that covered much of northern Europe and the northern part of North America were based on observations in Scotland.

This year a group of sixteen Michigan geologists, lead by Profs. **Peter van Keken** and **Eric Essene** embarked on a ten day trip from Edinburgh to explore the Scottish highlands and find the classic outcrops and overviews that detail the complex geological history. Trip preparation included a semester-long seminar in which all participants reviewed the relevant geological literature and compiled a field guide which described the itinerary and geological background in detail. The trip was sponsored by generous support from a Departmental alumnus, a grant from the International Institute of the University of Michigan and student contributions.





Day 1: Edinburgh – Crianlarich The first day schedule was sufficiently open to accommodate the jet lag, with a slow journey from the Midland Valley graben to the heart of Dalradian highlands at Crianlarich. A visit to Doune Castle (of Monty Python’s Holy Grail fame) provided a welcome opportunity to stretch the legs. Rather fortuitously we had arrived during the annual castle party which brought puppeteers, a falconry show and lots of music to the otherwise normally quite understated castle. A short detour before arriving at the youth hostel brought us to Killin where the Falls of Doherty are of both scenic and geological interest. *Holli Frey, Abby Cox, and Nick Speyer near the Falls of Doherty in Killin, which were featured in Hitchcock’s “39 Steps”.*

Day 2: Crianlarich – Glencoe. The first full day exposed us to the stratigraphy of the Dalradian rocks that were buried and metamorphosed during the Caledonian orogeny. Of particular interest was the contact with the late orogenic igneous intrusions that formed the Ballachulish and Glencoe complexes. At Ballachulish we found excellent exposures of the well studied contact aureole, as well as the nearby Ballachulish slate, which was quarried extensively for roofing slate until the 1950s. Glencoe was the final stop before dinner and bed at the Clachaig Inn. The Glencoe Pass cuts through the Glencoe caldera that has been extensively modified by glaciation and provided some of the most spectacular mountain scenery of the trip (as well as an endless parade of tour buses).

Day 3: Glencoe – Skye The drive to Skye brought us first past the Great Glen Fault (which more or less separates the Dalradian to the southeast from the Moine metamorphic rocks to the northwest), Ben Nevis (granitic intrusion that forms the highest peak in the UK) and the parallel roads of Glen Roy, which are quite remarkable features documenting the lake levels in this valley during the last Ice Age. Past Invergarry we investigated the Moine metamorphic geology which dominates the Kintail landscape (Figure 2). The final part of the day featured a spectacular hike to outcrops of the eclogites that are part of the Lewisian inlier of Glenelg. These eclogites are record some of the highest pressures (indicating deep burial) in the Scottish Highlands. The clear weather greatly enhanced the enjoyment of the glacial scenery and vistas over the Skye Bridge to the highly distinctive Cuillin Mountain Range.



Looking west over Loch Garry toward Loch Quoich and the Five Sisters of Kintail. This area is in the Moine division, consisting primarily of meta-sedimentary rocks that were affected by both the Grenville (ca. 1 billion years ago) and Caledonian (ca. 450 Ma) orogenies. The foreground features the flat lying and topographically somewhat indistinct Loch Eil subdivision. The mountains in the background are part of the steeply folded Glenfinnan division.

Day 4 Skye A long morning hike brought us from near Elgol to Camasunary Bay, which provided excellent exposures of the Cuillin igneous complex. The walk brought us past lava flows and dikes cutting through Jurassic sediments, a fault contact between the Jurassic and much older Torridonian sandstone, followed by the transition into the heart of the complex. The Cuillins are remarkable in their mixed igneous origin. The sharp edged Black Cuillins are formed from mafic intrusion whereas the more gentle Red Cuillins are eroded out of felsic intrusions (Figure 3). The exposures north of Camasunary Bay provided some excellent insights into the magma mixing that occurred during its emplacement in the early Tertiary. The planned drive to view the glacial land slipped features of the Old Man of Storr and the Quiraing unfortunately had to be cancelled due to arrival of a major storm from the Atlantic which formed the first truly bad weather of the trip.



Panorama of Bla Bheinn. Tertiary intrusions dominate the landscape of a number of western islands. On Skye, the large distinction between the steep and angular outcrop of gabbroic intrusions of the Black Cuillins (left) and the much smoother and rounder hills formed by the granitic intrusion of the Red Cuillins (right) is readily apparent.

Day 5 Skye – Inchnadamph A long scenic drive from Skye brought us along the Moine thrust complex, which forms the western most extent of the Caledonian orogeny. The compression to the NW thrust Moine rocks over the stable foreland consisting primarily of Lewisian gneiss and Torridonian sandstone. Quartzites and limestones of Cambrian-Ordovician age provide a convenient décollement for the thrust, and along a fairly narrow region a strongly deformed and complex thrust sequence is exposed. The Durness limestone is one of the few rock types that provides soil of sufficient quality for agriculture and the few communities and roads in this remote part of the highlands primarily straddle the limestone exposures. This part of the trip provided excellent examples of the depositional environment and soft sediment deformation in the Torridonian, remarkable smoked salmon from the Loch Torridon smokehouse in Shieldaig, and a number of scenic, if slightly windswept, overviews of the ‘zone of complication’ below the Moine thrust. The final set of stops near Knockan Crag provided a good introduction to the Moine thrust and a direct exposure of the thrust at the visitor center.



Loch Maree overview. a) Slioch is a mountain sculpted out of the 700-1000 million year old Torridonian sandstone that unconformably overlies Lewisian gneisses of Archean age. The undulations in the unconformity (yellow) indicate the significant paleotopography on which the Torridonian was deposited. b) just to the east of Slioch the Kinlochewe thrust (in green) pushed Lewisian gneiss over Cambrian quartzites and Torridonian, using the weaker quartzites as décollement.



Day 6 Inchnadamph The Moine thrust zone becomes wonderfully complicated near Loch Assynt which is the location of the Inchnadamph Lodge that provided our base for two nights. The area is of historical interest after the visits by the Victorian geologists Peach and Horne, who decided a Great Highland debate regarding the nature of the geological structure in favor of the ‘amateurs’ who saw large scale thrust faulting reflected in the stacks of rock layers in this region, rather than sedimentary processes favored by the ‘professionals’ of the Geological Survey. We were joined during this part of the trip by **Conall MacNiocaill (UM Postdoc ‘96)** who is currently a senior lecturer at Oxford. He is a local expert on the geology and guides large number of Oxford students annually through this area. The first part of the day provided us with great overviews of the Lewisian geology that was particularly well exposed at the ‘multi-colored rockstop’, which is a road cut that records multiple stages in the Lewisian geology just north of Laxford bridge. The Scourie dyke intrusion of 2.2 billion years ago provides another important geological marker, where later deformation in the dykes also indicates the presence of ancient shear zones in the now stable foreland. Several panoramic viewpoints provided good insight into the complex nature of the thrust zone, ranging from simple A-B-A type thrusting at Loch Glencoul to highly imbricated sections near Inchnadamph.

Day 7 Inchnadamph – Aviemore The second and final storm of our trip came through this night and morning and left us pretty much rained out for most of the day. This could be construed as fortunate timing that allowed us to break up a fairly long drive from the Assynt with a visit to the Glenmorangie distillery near the quaint Old Red Sandstone town of Tain. The sandstone provides a hard mineral quality to the groundwater in this area, which provides one of the characteristics of the Glenmorangie. We completed our low key day by a visit to Loch Ness which characteristically was hidden in a big mist (or was it rain?).

Day 8 Aviemore – Kirriemuir The Dalradian metamorphic geology is very well exposed along road cuts of the A9 between Perth and Inverness. A number of stops provided great insight into the deformational and metamorphic processes inside the core of the Caledonian mountain belt. The exposures included a full range from rocks recording only low temperature and pressure conditions to those showing the high temperatures leading to partial melting. The multi-stage deformation was very well recorded in the rocks around Dunkeld. The final stage of the day brought us back into the Midland Valley and a wonderful cliff side exposure of the Old Red Sandstone at Whitting Ness near Arbroath .



Abby Cox and Tanya Etont investigating the cross bedded psammite at the Stalchair road cut along the A9.

Day 9 Kirriemuir – Edinburgh The main quest for this day was to find the Barrovian sequence, which is the textbook description of prograde metamorphism as indicated by the ingrowth of a number of key minerals that occur only under certain pressure and temperature conditions. The rocks that contain the sequence are exposed along the North Sea and start at the Highland Boundary Fault just north of Dunnottar Castle near Stonehaven. While the index minerals were a bit harder to find than we had expected the sequence provided an interesting complement to the Dalradian seen the previous day.



Unconformity in the Old Red Sandstone at Arbroath. These sediments were deposited after the Caledonian orogeny following the massive erosion of the mountains to the north.

Day 10 Edinburgh. Edinburgh provided the perfect finish to the trip. The morning was spent exploring Arthur's Seat, which forms the towering hill at the east end of the Royal Mile. The intrusions that are now eroded out are of great historical interest, with Hutton providing some of the first correct insights into the nature of volcanic rock during the Scottish Enlightenment.

Soft Rock Field Trip Geology from Michigan to Southeast Florida

With the conclusion of winter classes and graduation ceremonies, the Department's Softrock Group rolled out on a twelve day trip with a total of twenty-five graduate and undergraduate students and faculty. This year's route snaked through the Midwest and headed southward through Kentucky, Tennessee, Georgia and Florida, with an ultimate destination of the carbonate environments of South Florida. Three faculty led the trip this year, **Bruce** and **Kacey**, and **Shanan Peters**, a Visiting Assistant Professor and Fellow of the Michigan Society. This excursion provides students both exposure to the geology of our country and a hands-on experience in observing and interpreting the stratigraphic record in a field context. In addition, this field experience complements coursework that is confined to the classroom in Ann Arbor. While the accommodations are rustic, the diversity of local eateries and spectacular scenery more than compensate for wet and cold nights on the ground.



We began the first day with an extended stop at the Pipe Creek Jr. Quarry in Indiana, which has the best exposures of Silurian-aged platform reefs present within the region. This reef is largely still limestone and provides an excellent perspective on the depositional and diagenetic fabric of Paleozoic reef systems. Our exploration continued southward in the Paleozoic units comprising regional scaled alternations between synorogenic foreland basin deposits and epicontinental carbonates, shales and sands. This year we specifically visited many of the classic localities in Kentucky, Tennessee, and Georgia including the Paleozoic sections



at Murfreesboro, Ringgold Gap, and Cloudland State Park. Unlike prior years, we continued along the southward to examine the Valley and Ridge and Piedmont provinces of the southern Appalachians and then into the Cretaceous-Tertiary Coastal Plain deposits of southwest Georgia. In addition to the more typical shallow marine sequences, we also focused on several localities rich in vertebrate remains. Despite the onset of wet weather, we finally made our way to northern Florida.

In Haile Quarry near Gainesville, we examined excellent quarry cuts in Eocene limestones that display deep karst fissures variably filled by Miocene to Pleistocene continental deposits. These karst fills contain abundant vertebrate fossils including giant sloths, turtles and alligators. As we moved toward the Tampa region, students had the opportunity to examine the Peace River Formation, a Miocene marine shale unit that contains abundant shark's teeth, and fish remains. After six days of a road trip, we finally arrived in the Plio-Pleistocene carbonates of south Florida with its karsted lagoonal facies in the Everglades, the cross bedded shoal oolites of Miami, and coral patch reefs of Key Largo.

To provide a first hand knowledge of the processes and patterns of carbonate deposits, the first day in the Keys was spent in Florida Bay examining Holocene shallow subtidal to intertidal sediments. This included extensive snorkeling in the Bay, examining the flora and fauna that comprise the carbonate sediment factory. While carbonate mud predominates, in the deeper water ten foot deep ponds that are interspersed between the mud ridges and keys, corallgal communities flourish on the hard substrate of the underlying Pleistocene bedrock. Because of increasing restrictions placed on any exploration in Park areas, it was difficult to find suitable places that we could legally excavate or take sediment cores. With a little luck we were able to punch several cores down through the Holocene sequence along the route of the Intercoastal Waterway. From these cores, Bruce Wilkinson helped students develop an onsite reconstruction of the geological history of this region by examining the transgressive and regressive sequences preserved from the lithified Pleistocene bedrock, to the overlying basal peats and shallow carbonate micrites (see cover photo). Other than the extreme sunburns that everyone seems to acquire on this excursion, this remains one of the most instructive areas to teach carbonate sedimentology.

On the following day we examined recent intertidal environment and Pleistocene limestone exposures on a road trip that terminated at Key West. The most memorable part of the trip was spending a half day on the barrier reef system. Although much of the shallow reefs is no longer living, the overall reef structure and associated facies patterns remain impressive. After a lavish banquet of grilled grouper and Kroger potato salad, we headed north for the return to Ann Arbor.

ALUMNI NEWS

Fred Haynes (PhD '86) and Patty Haynes Schnorr (MS '84) are now in St. John's Newfoundland, where Fred is a petrophysicist for the Hibernia offshore field. They returned to North America three summers ago, after working for Exxon-Mobil in Stavanger, Norway. Fred tells us that he and Patty can now watch the sunrise over Cabot Tower on Signal Hill from their kitchen window (when it isn't foggy!) about two km away. They often stroll down from their house and circle Quidi Vidi Lake, where the longest running sporting event in North America, the St. John's Regatta, is held the first Wednesday of August. Fred recently visited Ann Arbor with his son Thomas, who is a first-year student at University of Michigan this Fall.



Fred and Thomas Haynes

Erle G. Kauffman (BS '55, MS '56, PhD '61) retired this year at the age of 70 after a long and productive career as an academic and researcher. Upon graduation from The University of Michigan, Earle was employed immediately, and spent 20 years at the Department of Paleobiology in the Smithsonian Institution's U.S. National Museum of Natural History. While at the USNM, he taught, mainly in the evenings, for 19 years at George Washington University. Subsequently, he spent the next 15 years as Chairman and Professor at the Department of Geological Sciences, University of Colorado, Boulder, and 10 years at Indiana University's Department of Geological Sciences.

Earle's retirement was marked by a four-day long continuous party, beginning with a 100-person sit-down dinner followed by three more days of catered brunches at his house. He says: "It was a wonderful way to go out".

Earle was and continues to be a world renowned scientist. He won the Scientist of the Year award from the Rocky Mountain Association of Geologists (1977), the R.C. Moore Medal for Excellence in Paleontology in 1991, the Gilbert Harris Medal for Excellence in Systematic Paleontology (1997), and the William H. Twenhofel Medal for Excellence in Sedimentary Geology (1998). In 1981 he was honored with the "The Best Paper Award" with **Jim Steidtmann (PhD '68)** for a paper entitled "Are These the Oldest Metazoan Trace Fossils?". He also served as President of the Paleontological Society. Earle tells us that he will continue his productive life by coming in most days to do untethered, but taking time out for hiking, camping, going to concerts and plays, fishing and just tinkering about the beautiful, largely deer-proof gardens that spread across the 4.5 acres of his home.

Jeannette Stawski (BS-1998 SNRE) and Justin Ham (BS '87) welcomed Gretel Adelia Ham on March 25th, 2005. This is the first child for Justin and Jeannette. Gretel was born at Mott's at 7:55AM, weighed 9 pounds, and was 21.5 inches long.

Earl Brabb (MS '52) has taken on a new assignment in his position as Emeritus Geologist at the USGS. He is tasked with preparing an explanation for the digital geologic map of the San Francisco Bay region, probably the most detailed and extensive digital geologic map extant of a highly urbanized and geologically very complex area. The map has been prepared in sections by different authors who provided a total of more than 400 geologic units. Earl's job is to simplify the explanation and provide it in language a high school teacher can understand, and in time for the Centennial Celebration of the San Francisco earthquake. The USGS will have an Open House where more than 20,000 people are expected. Because media interest in USGS geologic activities is already very high, the map is likely to play a prominent role. Meanwhile, his three volunteers in Menlo Park are digitizing all the paleontologic localities (estimated 25,000) for one of the digital layers of the map. Earl will also be giving his first

tectonic talk in thirty years to a joint AAPG/GSA meeting in San Jose with the title, “Not the Rosetta stone.” The paper outlines the discovery of Paleocene snails in a place previously considered to be geologically simple and entirely Cretaceous. After constructing a beautiful stratigraphic column thought to have the most complete Paleocene section in Northern California, he later discovered when the microfossils were dated that the section is complexly faulted, partly overturned, and contains rocks of Cretaceous, Paleocene, and Eocene age. Earl and his wife Gisele came to Camp Davis for the 2004 Alumni Getaway Retreat. He said, “I greatly enjoyed chatting with **Henry Pollack, Ken Keenmon, Jack Barnes**, and others at the Camp Davis reunion, and I went home with fond memories and a warm feeling.... and I admire the diversity of people and activities in the Department. Much, much better than when I graduated.

Despite having recently rotated off of the Department’s Alumni Advisory Board, **Jeff Huspeni (MS ’81)** is having a difficult time staying away from Ann Arbor these days as his son, Matthew, just began as an undergraduate at the University of Michigan.

Craig Johnson (MS ’81) reports that he is now 48 (!) and that he has been at the U.S. Geological Survey (USGS) in Denver for last 12 years. His work is based primarily in a stable isotope lab, and includes topics in economic geology and a wide variety of low-T, surficial problems. From time to time he does some collaborative work on hard rocks e.g., jadeitite with George Harlow and the geology of the Reading Prong. Overall, funding is tight and the future gloomy in the USGS, but his group continues to be well-supported because they help lots of people both within and without the USGS. They also do their best to kick ass scientifically. Craig’s married to Helene, and they have one son who is now 11 years old, a good kid. By the time he’s ready to go to college, Craig figures that tuition at the expensive schools will be about \$1 million per year (there goes his retirement savings!). He also runs into Michigan geologists constantly. **Steve Machemer (BS ’80)** works for the EPA in

the next building over. **Steve Bohlen (PhD ’79)** and **Wendy Gordon Sheridan (MS ’79)** came over for dinner a few years back now, but it was quite an event. Craig finds Michigan geology undergrads scattered around in the USGS and in companies of various sorts. Some even remember him from his stint as Camp Davis TA. From Craig’s perspective, Michigan geology has quite a big footprint on the profession.

Donna Surge (PhD ’01) recently moved to the piney woods of North Carolina from the wilds of Cornville last July. She holds a position as Assistant Professor of Paleoclimatology and Paleoecology at the University of North Carolina, Chapel Hill and remains quite active in research that using the chemistry of clam shell carbonate to reconstruct the paleoclimate of geological and archaeological sites throughout North American and Europe.

John Sweet (MS ’50) played an instrumental role in the discovery of the Prudoe Bay Oil Field, Alaska. He has recently written a book on the story of this discovery which provides an interesting account of the history of oil exploration in Alaska.

Bob Satin (BS ’54, MS ’55) Bob recently visited in Ann Arbor and shares a recent experience.

“In February 2005, my wife Susan and I were aboard the MV Marco Polo in the Drake Passage on our way back from Antarctica. We came down to the breakfast and at the table for 8, there were 2 empty chairs. We sat down and I was next to an oriental gentleman who was wearing a UofM sweatshirt. I turned to him and asked – Did you play hockey? He responded – Yes. I asked if he was **George Chin (BS ’54)** and told him that I had not seen him for 50 years. It was George! He and his wife Coral were amazed as were we all. Geologist of Michigan go on and on – and find each other.

The first *in situ* definitive mineralogy results from Mars may be possible with the Mars ’09 Science Laboratory Mission. **David Blake (MS ’80, PhD ’83)**, who is now working at NASA Ames Research Center, designed an X-ray diffraction instrument that has been selected for inclusion on a landed

Mars mission. His original CheMin XRD-XRF instrument, built in 1992, was fabricated from some old Debye-Scherrer camera parts that he found at Ames. The geometry of the spacecraft instrument is pretty much identical to a transmission microfocus camera, with the film replaced with an energy-dispersive CCD imager.

Laura E. Kaminski (BS '00) After graduation from the Department, Laura moved to Washington DC where she worked as a Flood Plain Consultant for a prime contractor of FEMA. In this position, she served as the primary contact person for congressional inquiries, providing written communications with clients. After two years, Laura returned to Ann Arbor, where she joined the Great Lakes Commisision as a researcher evaluating water usage and sedimentation issues related to the Great Lakes region. While continuing part time with the GLC, she currently is enrolled in the ERB program which provides a joint degree in Environmental Sustainability from SNRE and an MBA from the Ross Business School. Upon completion of the professional degrees, she intends to continue her work in the non-profit sector.

After departing UM in 1983, **Andrew Kopania (MS '84)** worked for Champlin Petroleum in the Denver area doing exploration and production geology in the Wyoming overthrust belt, the Denver-Julesburg basin, and eventually the Santa Maria Basin of central California. In 1987, he returned to UCLA (where he had received his BS in geology in 1981) to pursue a doctorate in environmental science and engineering. In 1989 Andy started working in environmental consulting in northern California, specializing in fate & transport of organic contaminants in groundwater. In 1991, he received his PhD from UCLA and has worked in the environmental field since. Andy currently operates his own company as a one-man shop providing technical expertise, litigation support and program management to help municipalities and private sector clients navigate through the complex California regulatory regime - and occasionally actually get a contaminated site cleaned up! In 1987 he was married and now has two kids, ages 7 & 10, so most of his and his wife's

time is spent volunteering at school and things like that. Andy still tries to keep track of what everyone from UM has been doing through the department newsletters.

It seems like it will be impossible to keep **Tex Ferrito (Camp Davis 440, '86)**, **David McCabe (Camp Davis '86)**, and **Kevin Mackey (BS '90)** away from the excitement at Camp Davis. Having participated in our Alumni Getaway every year it has been offered, this year they joined camp to donate their time and effort to help with the improvement of the Camp's infrastructure. Working closely with **Chris Malvica**, the Camp manager, they did their share of the grunt work to help in renovations and upgrading of the student and faculty cabins. Their heartfelt help is just what Camp Davis needed. We look forward to next summer when they return with their families to enjoy a week of 2006 Alumni Getaway activities.

Tom Tinker (BS '54, MS '55) and his wife Janice celebrated their 50th wedding anniversary with a family gathering on Mackinac Island.

**UPCOMING ALUMNI RECEPTION
AMERICAN GEOPHYSICAL UNION
SAN FRANCISCO, 7 DECEMBER 2005
Elizabethan D, Westin St. Francis Hotel
6:00 to 8:00 PM**

The Department of Geological Sciences cordially invites you to join us at the Alumni Reception that will be held during the Annual Meeting of the American Geophysical Union Meeting to be held in San Francisco, California. The reception will be held at the Westin St. Francis Hotel in room Elizabethan D from 6:00 to 8:00 pm. For more information about the meeting, visit the AGU conference site:

<http://www.agu.org>

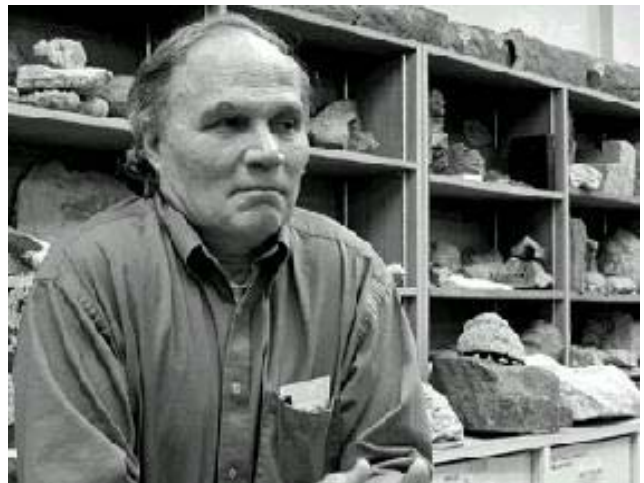
See you there!

Digby McLaren (PhD '51) emigrated to join the GSC in 1948 after two degrees from Cambridge University. The Canadian Survey soon sent him and several others to Ann Arbor to get a PhD. It was Survey policy that all of their professionals should have the PhD. Digby came while **Robert Dott (BS'50, MS '51)** was a student. Bob provides us with this perspective on Digby during his tenure at Michigan.

“It was immediately obvious that he was truly brilliant. He loved to provoke, and one day gave a noon talk about continental drift. He had been exposed to it at Cambridge in a friendly environment, and apparently judged that our rather provincial, very classic, and somewhat naive population needed to hear about this theory, which was anathema in the USA. Indeed we DID need to hear, for I, at least, had never heard of it at all until that day! So I owe a special debt to Digby. But he was a wonderful person in many other ways. He was very influential, having held many high offices, including President of GSA, and was very active in several International IUGS and UNESCO commissions. Michigan can and should be very proud of Digby McLaren!”

Margaret Stearns Bishop (PhD '33) passed away peacefully on May 17, 2005. Margaret began her career after earning a Ph.D in Geology at the University of Michigan where she was Phi Beta Kappa as an undergraduate. In 1933 she started as a geologist with Pure Oil in Chicago until the early 1940's when she and her husband, Barton, established the Bishop and Bishop Consulting firm in Michigan. In 1953 Margaret became a professor of geology at the University of Houston where she remained until her retirement in 1971. She will be remembered for her excellence in subsurface geology, her numerous contributions as Departmental Chair, and her unwavering commitment to teaching.

Jackie L. Watkins (PhD '58) died on October 26, 2004 in Wichita Falls, Texas after a long a productive career in the Geological Sciences. Jack received his PhD from the University of Michigan in 1958, after which time he began as an Assistant Professor at Midwestern State University. His wife says that when he began at MSU, “they handed him a box that was 2-foot by 2-foot with some rocks in it and they said ‘This is the department’. He built it to what it is today”. His contributions to this institution ranged from a diverse array of educational and research innovations, to serving as the chair of the Department from 1966 to 1981. Jack continued at MSU for forty-six years, and became the longest tenured professor in its history. In addition to his role in academic education, he also founded and was the President of Watkins Mineral Corporation from 1961 to 2004. Jack is survived by his wife of forty-nine years, Dorothy Watkins.



FACULTY NEWS

Last year **Bob Owen** finished his term as Associate Dean in LSA and he spent the 04/05 academic year on leave. Last winter he (and several others from UM) participated in a research cruise in the southwest Pacific aboard the R/V Melville (see article in this issue). The purpose of the cruise was to collect piston core samples as a prelude to a possible future ocean drilling cruise. The southwest Pacific is known as one of the worst weather areas of the world ocean, and the cruise participants can certainly testify to this — they were hit by two typhoons. Upon returning to campus in July, Deans Terrence McDonald (LSA) and Rosina Bierbaum (SNRE) appointed Bob as the next Director of UM's Program in the Environment. There is some degree of curricular overlap between the Program in the Environment and Geological Sciences, and Bob plans to work closely with the Department's new Chair, **Rod Ewing**, to bring the two units closer together for the mutual benefit of both.

After a sabbatical in the Fall of 2004, partially spent at the Norwegian Geological Survey in Trondheim, **Rob Van der Voo** returned to his teaching and research in the Department. The past Winter Semester he again taught the main introductory geology course with laboratories and discussion sections (117-119), whereas in the coming Fall he will repeat his usual graduate tectonics course that several alumni will remember as either GS 606 or 515. Rob's graduate student **Daming Wang** has defended his PhD thesis in August 2005. His thesis dealt with the magnetic properties of ocean-floor basalts and was co-supervised by Rob and emeritus **Prof. Don Peacor**. Daming's work was supported by a grant from the National Science Foundation. Graduate student **Maodu Yan** (working with Rob, **Prof. David Rea**, and **Prof. Josep Parés**), is also close to finishing and plans to defend in Fall 2005. His thesis work has involved magnetostratigraphic studies of the Neogene deposits of northeastern Tibet. He has also found that the study area rotated some twenty-five degrees clockwise during the mid-Miocene. **Sasha Abrajevitch** continues to work on the Paleozoic paleomagnetism of Kazakhstan, in a collaborative project with **Drs. Misha Bazhenov and Natasha Levashova**, who

will be Visiting Scientists in the Department for much of the coming academic year 2005-2006. They, as well as their colleague Kirill Degtyarev (also of the Geological Institute of the Russian Academy of Sciences), are supported by Rob's NSF funded project to work in Kazakhstan.

Graduate student **Jim Hnat** has finished his investigation whether vertical-axis rotations occurred in the Keweenawan Peninsula (they did not, but he is not unhappy about that as you can see in the accompanying photograph) and is now planning to determine whether changes in structural trends in the Tennessee-Alabama Appalachians correspond to declination variations caused by vertical-axis rotations. Jim is co-supervised by **Ben van der Pluijm** and Rob. Postdoctoral fellow **Phil**



McCausland has finished his project investigating North America's paleolatitudes in the latest Proterozoic and Early Cambrian and has returned to Canada; a new postdoctoral fellow from Spain has arrived. She is **Belén Oliva Garcia**, who comes to us from Zaragoza. She studies the paleomagnetism and tectonics of Cretaceous and earliest Tertiary carbonates in the central Pyrenees. Lastly, a new graduate student joined our group this past Winter: **Stephen Crabtree** is starting his research this Summer 2005 by collecting Early Triassic igneous rocks from the Oslo graben in Norway, in an attempt to improve the apparent

polar wander path for Europe. The ultimate goal of his projects is to test Pangea configurations for latest Permian and Early Triassic times.

Sam Mukasa has graduated a couple of Ph.D. students, taught several courses, and done a great deal of research-related traveling. **Chuck Carrigan (PhD '04)**, whose Ph.D. research focused on the geochronology and geothermobarometry of the Balkan terranes in Bulgaria, graduated in spring 2005, and accepted a tenure-track position at Olivet University in Bourbonnais, Illinois. **Zeb Page (PhD '05)** also completed his Ph.D., working with **Eric Essene** and Sam on the Franciscan Mélange rocks of northern California, and has accepted a 2-year postdoctoral fellowship to work with **John Valley (MS '77, PhD '80)** at the University of Wisconsin, Madison. **Tanya Shavalia (BS '05)** is completing an honors thesis with Sam this summer dealing with island arc volcanism on St. Lucia in the Caribbean, where she did fieldwork last summer. Tanya is returning to England this summer to pursue a graduate career at the University of London. Also since the last update, **Dr. Sung Hi Choi** joined Sam's group as a postdoctoral research fellow to work on Sino-Korean lithospheric mantle evolution using a large array of geochemical tools. She has also been engaged in geochemical research on Archean granulites from Antarctica and an alpine peridotite massif in Venezuela. Graduate student **Christopher Stefano** joined the group to undertake U-Pb systematics in biogenic carbonates and phosphates, and **Sarah Rilling** is giving up the scarlet and gray for the maize and blue this fall to pursue graduate research on Cenozoic volcanism in the Ross Sea embayment of Antarctica. All of these activities are taking place under the watchful eye of GIGL lab manager **Dr. Alex Andronikov**, who spent a few weeks in Alaska with Sam this summer to do field work in the Bering Sea Volcanic Province.

In the teaching arena, Sam has continued to teach the Isotope Geology course with **Kacey Lohmann**, as well as undergraduate petrology – alternating rather irregularly with **Becky Lange**. a mini course about Geologic Time, and a freshman

seminar called Evolution of the Earth. Sam has also revamped the Advanced Isotope Geochemistry course to be taught every other year to advanced graduate students. Finally, Sam remains involved with teaching Geology 440 at Camp Davis, and just returned from taking the class to the Stillwater Complex on a mid regional trip, the first time this has been done at camp in nearly 20 years.

Fieldwork and research once again took Sam back to Antarctica in January-February 2005, this time with former undergraduate student **Jill VanTongeren (BS '04)**, who is starting her graduate career in petrology and geochemistry at Columbia University this fall. Sam and Jill were part of a large multidisciplinary group that held a workshop in the Dry Valleys of Antarctica focused on development of the Jurassic large igneous province known as the Ferrar. Much invigorating discussion was generated by this group, and many partnerships have developed to work on new projects.



Jill VanTongeren's account of the Antarctic Expedition

In mid-January of this year, Prof. Sam Mukasa and I found ourselves being squeezed into a helicopter full of igneous petrologists, structural geologists, and geochemists. The helicopter was headed for the McMurdo Dry Valleys of Antarctica; the objective was to study the Ferrar Dolerites of the region. Sam and I were a part of a 25-person field laboratory led by long-time polar petrologist Bruce Marsh of Johns Hopkins University. The group included geologists from many different disciplines and 3 different countries, all interested in understanding the dynamics of the Ferrar magmatic system.

Antarctic research is made possible by NSF Polar Programs and by contract with Raytheon Polar Services. Despite the fantastic efforts by both parties, however, Antarctica doesn't always cooperate. The 25 of us, along with 100 others, learned that lesson the hard way. Our group was grounded in Christchurch, New Zealand for 10 days, waiting on stand-by each day and waking up at 4AM for the thumbs up or down. This time drastically cut into our original 3-week field time, but NSF and Raytheon provided very generous helicopter support and saw to it that our field season was not compromised by the delay. What we found was well worth the wait.

The Ferrar Dolerites are an incredible expression of large-scale magmatic activity associated with the breakup of Gondwana approximately 180 million years ago. The Ferrar has been appropriately termed the "Rosetta Stone" of magmatic intrusions. Due to the absence of snow and ice in the Dry Valleys of Antarctica, and the complete lack of vegetation in that region, the exposure of the Ferrar is complete. One can almost visualize emplacement schemes simply by looking outside of their insulated, and sometimes solar heated, tents - although this was definitely not the case with our group!

After completing a short, yet mandatory, "snow school" in McMurdo, including spending a

night out on the Ross Ice Shelf in self-made igloos, we were ready to board the helicopters and fly out to our base camp. The following two weeks were spent taking turns in the field and flying back to McMurdo to make and analyze thin sections. The ability to look at the samples while "in the field" was invaluable for improving our understanding of the system and mapping out where to go next.

Although the group got off to a somewhat stormy start, the workshop was wildly successful, bringing in new perspectives and sparking interest for future polar research in all participants. My involvement in the workshop has proved invaluable to my education and to my future interest in Antarctic geology. Through my interaction with each individual involved, and the geology that we were studying, I not only learned about the Ferrar Dolerites, I also learned many different field techniques, perspectives on magmatic systems, isotopic analyses, structural geology, and much, much more. My experience was certainly not unique, and everyone involved benefited from the perspectives and expertise of the other geologists who participated. Perhaps most of all, however, the chance to stand amidst some of the most breathtaking and inspiring geology in the world was enough to engender a lifetime of interest in Antarctica and the secrets it has yet to provide.



MICHIGAN IN THE SOUTH PACIFIC

Exploration in Rough Seas



Eight Michigan marine geologists were among the scientific party of 13 aboard the R/V *Melville* of the Scripps Institution of Oceanography for a 41-day research cruise to the far south Pacific. **Dave Rea** and **Mitch Lyle (BS '73)** were co-chief scientists of the cruise, and they were joined by **Bob Owen**, **Ingrid Hendy**, **Jamie Gleason (Research Scientist)**, **Jennifer Latimer (Post-Doc)**, **Andrea Stancin (Graduate Student)**, and **Steve Hovan (PhD '93)**. The South Pacific Latitudinal Transect (SPLAT) cruise sailed south from Tahiti on February 9th and returned there on March 21st. In between we surveyed and cored 19 areas as a prelude to a future Integrated Ocean Drilling Program cruise. Each survey area was between 1000 and 2000 km², mapped with swath-mapping tools to make a detailed contour map, and surveyed with seismic-reflection profiles. Much of the work was along 50° south latitude, one of the roughest regions in the world ocean. The ship encountered two extra-tropical typhoons, Olaf and Percy, and waves in excess of forty feet high. We all learned the meaning of the roaring 40's and the furious 50's. In spite of the bad weather, we were able to raise the best new set of cores from the region in the past 30 years or so, and look forward to a variety of exciting paleoceanographic analyses.



Michigan scientists on the Melville, left to right: Dave Rea, Jamie Gleason, Steve Hovan, Ingrid Hendy, Andrea Stancin, Bob Owen, Jennifer Latimer, Mitch Lyle.



Backs to the wind, Michigan scientists brave the high waves of the South Pacific encountered during one of three major storms during their journey.

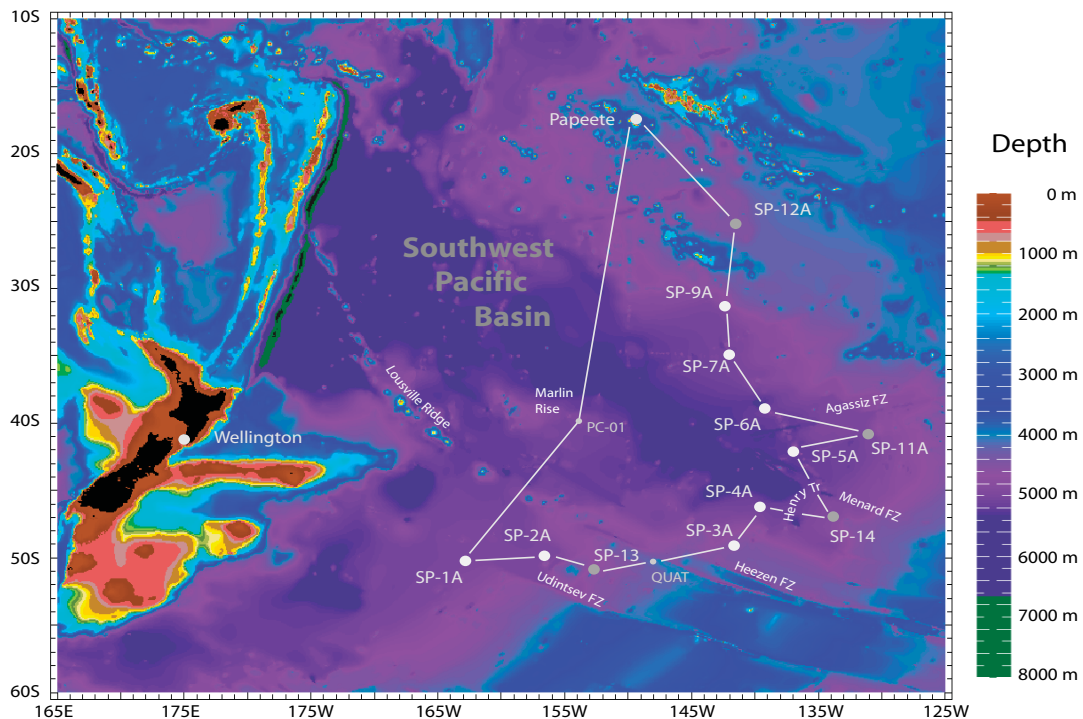
The SPLAT cruise covered the eastern half of the Southwest Pacific Basin, one of the most poorly known parts of the world ocean. Recall that a submarine ran into a seamount last February. We encountered dozens of small seamounts and two previously unknown ones the size of Mt. Ranier. Perhaps the most surprising result of the cruise is that we discovered and roughly defined a region of one or two million square kilometers that were devoid of sediment. This South Pacific Bare zone is essentially a 55-million year hiatus, and requires an unusual combination of non-depositional events. There is no similar place anywhere else in the World.

The research project that engendered the cruise is an effort to understand the global climate system during the last extended period of global warmth, the Eocene. A previous effort centered on the Eocene equator in the Pacific resulted in ODP Leg 199 in the fall of 2001 which focused on the equatorial oceanic and atmospheric circulation of that time period. This primary goal of the present project is to examine the sub-polar atmospheric and oceanic dynamics of the Eocene, how Earth entered the Eocene warm climates regime, how the warm climates were sustained, and how that regime came to a close at the Eocene – Oligocene boundary. We went south for this project because there was no open far north Atlantic in the Eocene, and any Eocene far north Pacific sediment is long since subducted beneath the Aleutian Arc.



Michigan women scientists, left to right: **Ingrid Hendy, Andrea Stancin, Jennifer Latimer.**

Map of Scientific Cruise to the South Pacific (by Mitch Lyle)



GEOCLUB ACTIVITIES 2005

A local source of renewable energy

by Frannie Skomurski, former Geoclub president

In a time when the limit of current oil reserves may be nigh and whispers of ‘a hydrogen economy’ float about, there is one constant energy resource that exists: the power of motivated students. U-M’s Geoclub is a well that taps into this rich resource to extract valuables such as department picnics and banquets, students led field trips, and public outreach events. Although the metaphor may be silly, the ability to coordinate large events for the department and the public by working together is dependent upon not one pair of hands but many.



One of the highlights of last semester came in the wake of a significant natural disaster: the December 26th Great Sumatran earthquake and resulting tsunami. In an attempt to understand the science behind the tragedy, a suggestion from Henry Pollack helped convert an ordinary Geoclub meeting into a Tsunami Symposium. The symposium was held on a weekday evening in January and was open to the public. Three guest speakers from the Departments of Geological Sciences (**Prof. Larry Ruff**), Anthropology (Daniel Birchok, M.S.), and the School of Public Health (Dr. Gregory Button) shared their respective expertise in the fields of seismology, Indonesian culture, and preventing the spread of disease following natural disasters. Talks were followed by an open question and answer session, fielded by panel members and chaired by **Prof. Henry Pollack**. Geoclub members helped to organize, advertise and staff the event; the overall success of which can be attributed to the collective efforts of all involved, from the department office staff, to students, faculty, guest speakers, and of course, the interested public.

The success of the Tsunami Symposium sparked student interest in organizing future geology-related public outreach events - a main focus of Geoclub activities this coming year. This fall heralds a changing of the guards as third year, PhD candidate **Franek Hasiuk**, and second year graduate student (and last year’s Vice-President) **Sara Tourscher**, assume the roles of Geoclub Co-Presidents. Both are former pop-machine gurus – coincidence? We also welcome **Stephen Crabtree**, a second year graduate student, who is taking over **J.P. Brandenburg**’s position of two years as Geoclub treasurer. The addition of an undergraduate representative, a position filled by **Monamie Bhadra** last year, helped Geoclub to tailor meetings to appeal not only to graduate students, but to undergraduates as well. In trying to address topics that are of interest to graduate students, undergraduates, and post docs alike, Geoclub will continue to be a resource for students and the department. Only time will tell what other riches lay waiting to be tapped in this local source of renewable energy.

THE GRADUATES

Doctor of Philosophy Degrees

Charles Carrigan	<i>Gondwana-derived Terranes and the Variscan Orogeny in Bulgaria: Zircon Geochronology and Thermobarometry.</i>
Erika Williams Carter	<i>Carbon Cycling and Mineral Weathering in Temperate Forested Watersheds: An Integrated Study of Solution and Soil Chemistries</i>
M. Katie Davis	<i>Fluid and Rock Interactions in Silicate and Aluminosilicate Systems at Elevated Pressure and Temperature</i>
Holli Frey	<i>Production of Andesite in the Western Mexican Arc: Constraints from Argon Chronology, Volume Analysis, and Geochemistry</i>
Frederick (Zeb) Page	<i>A Tale of Two Targins: Thermobarometry and Chronology of Eclogites from North Carolina and California</i>
Qiong Liu	<i>Equation of State for Carbonate Liquids and Fe₂O₃- and TiO₂-bearing Silicate Liquids</i>
John Solum	<i>Clay Neomineralization in Fault Zones: Extracting Information on Fault Properties and Timing.</i>

Master of Science Degrees

John Paul Brandenburg	<i>Convection with force-balanced plates and a mechanism for the preservation of degassed, depleted mantle lithosphere</i>
Nina Carranco	<i>Chemical and Mineralogical Characterization of Alpine, Sub-Alpine and Karst Soils, Sava Watershed, Slovenia</i>
Erik Kneller	<i>B-type Fabric in the Mantle Wedge: Insights from High-resolution Non-Newtonian Subduction Zone Models</i>
Travis Tenner	<i>The Albite Fusion Curve Re-examined: New Experiments and the Density and Compressibility of NaAlSi₃O₈ Liquid with Pressure</i>
Xiqiao Xu	<i>Reconstructions of Cenozoic Seafloor Ages: Implications for Sea Level</i>
Verjun Yong	<i>Heat Capacity and Phase Equilibria of KAlSi₃O₈ Hollandite</i>

Bachelor Degrees

Lora Armstrong	<i>Geological Sciences BS</i>	Kory Pund	<i>Geological Sciences BS</i>
Abigail Cox	<i>Geological Sciences BS</i>	Aaron Regberg	<i>Geological Sciences BS</i>
Leanne DeCraene	<i>Oceanography BS</i>	Bradley Ross	<i>Minor Earth Sciences BA</i>
Andrew Feldkamp	<i>Oceanography BA</i>	Tanya Shavalia	<i>Geological Sciences BS</i>
Androni Henry	<i>Environmental BS</i>	Nicholas Speyer	<i>Geological Sciences BS</i>
Gregory Krankurs	<i>Oceanography BA</i>	Caene Turner	<i>Earth Sciences BS</i>
Michael Pagel	<i>Geological Sciences BS</i>	Heather Whittington	<i>Geological Sciences BS</i>

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Position Company

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e-mail address _____ Would you like to be added to an alumni e-mail group? yes no

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Degree _____ College or University _____ Year _____

Degree _____ College or University _____ Year _____

Spouse _____ Year of Wedding _____

Child _____ Birth Date _____ Child _____ Birth Date _____
Name

Child _____ Birth Date _____ Child _____ Birth Date _____
Name

Child _____ Birth Date _____ Child _____ Birth Date _____
Name

Reference Address (name and address of parents, nearest relative, or someone who will be able to reach you)

Name _____ Relationship _____ Phone () _____

_____ Street Address City State Zip

Please send us any news of your "doings" to be included in the next newsletter; simply write below or include a note. Feel free to send a snapshot of yourself, your family, or an event that might be suitable to publish in the newsletter as well.

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