GEOSCIENCE NEWS

for the Alumni and Friends of the
Department of Geological Sciences
University of Michigan, Ann Arbor, Michigan

December 2000

In this Issue:

Greetings from the Chair

It is hard for me to believe that only a little over a year has gone by since my family and I moved to Ann Arbor. It already feels like home—and in many ways it seems as though I've lived here much of my life. It was an easy transition to make—a world class department and university, a faculty and staff that warmly welcomed us, terrific students, great collegiate sports, and Zingerman's Deli! The move of my laboratory and research program went very smoothly thanks to the hard work and dedication of those who uprooted their lives in New Hampshire and made the move with me. I owe a debt of gratitude to research associates Dr. Bjorn Klaue and Dr. Andrea Klaue, and graduate students Stephen Peters and Andrew Jacobson.

I share my enthusiasm for Ann Arbor and the University of Michigan with my family. Our swift transition to "maize and blue" can be evidenced by the ease with which you can rotate one letter of the slogan mgoblue to get mgoblum. Friends back in New Hampshire used to remark that our blood ran green based on our children's enthusiasm for Dartmouth College sports, and the involvement of my wife and I in the Dartmouth community and alumni association. I am happy to report that after a short period in which we resembled blue-green algae, the Blum family's blood now runs blue.

Having described how quickly I feel that I have become integrated in the department and Ann Arbor, I do realize that most of you reading this newsletter are still wondering who this new guy is, and what his term as Chair will mean for the future of the department.

The department has flourished during the past five years under Dave Rea's leadership and I have had the good fortune of taking over an intellectually vibrant program that is well positioned to continue its leadership role in the Geological Sciences through the next decade. Our faculty is as strong as ever, and we are in the midst of two new faculty searches—one in Landform Evolution and a second in Marine Geology. The University has also given us a much-needed enhancement in our administrative and office staff. Jane Ginopolis is our new Administrative Manager, and is playing a key role in financial and personnel management in the department. Ann Titus is our new executive secretary, and among her many responsibilities has taken on the role of coordinator of alumni affairs.

I am a strong advocate of the importance of field camp and feel that it is essential to keep our students in touch with methods of field investigation in this age of increasingly high-tech laboratory science. Luckily, the department has Camp Davis, which is a true treasure and is situated in one of my favorite locations in the Rockies. Over the years I have spent a lot of time in the area surrounding field camp first as a college student rock climbing in the Wind River Range and the Tetons, and later as a Professor leading fieldtrips and carrying out field research projects. I am working to increase the faculty involvement at Camp Davis and hope to enhance the utilization of the facility for teaching, research and alumni reunion activities.

Finally, I wish to conclude with a few thoughts on the future of our field. We are living in an exciting time in both the Geological Sciences and in the sciences in general. I feel strongly that the days of geologists working in relative isolation from other fields are over. We have entered the age of interconnectedness, where disciplinary boundaries are becoming blurred, scientific advances are increasingly occurring due to non-traditional collaboration, and recipients of public funding are being asked to integrate and synthesize their research and teaching efforts with the needs of society. This puts an institution like the University of Michigan at a strategic advantage, because at such a large research university the opportunities for research connections with colleagues in other Departments, Schools and Colleges are limitless. The Geological Sciences department is particularly well postured to move in this direction due to our creative and diverse faculty, our outstanding research facilities that can act as catalysts for interdisciplinary endeavors, and the profoundly interdisciplinary nature of the inquiries that we make into the complex workings of our natural environment.

Sincerely,

Joel D. Blum
Chair and Professor

Virtual Geology at U–M

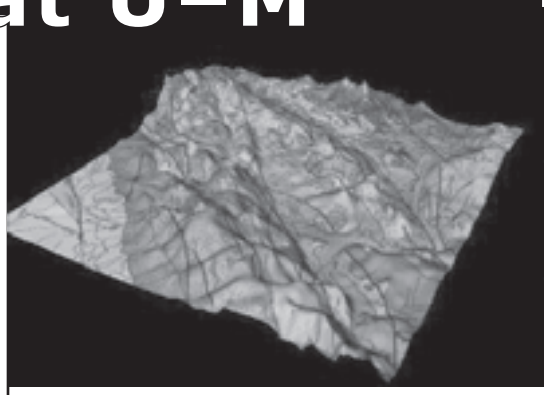
By Peter van Keken

A collaborative group in the Geology Department uses advanced visualization and immersive virtual reality (VR) to better understand the structure and dynamics of the Earth. The group is based on collaboration between **Peter van Keken** and **Paul Morin** that was initiated in the summer of 1990 at the Minnesota Supercomputer Institute in Minneapolis.

The main focus was initially on the scientific visualization of mantle convection modeling, in particular to better understand the nature of 2D and 3D time-dependent convection. This was expanded with data visualization projects such as earthquake hypocenters distribution and seismic tomography. A major enhancement to our ability to visualize these 3D structures came with the use of the University of Michigan Media Union's CAVE which allowed us to immerse ourselves in the data, with immediate benefits to our understanding of the nature of solid earth structure.

Our current effort is both research and teaching oriented. Our approach is to try to use software and hardware that is easily available and provide visualizations that can be viewed across multiple platforms to allow for broad dissemination while at the same time maintaining the ability to optimally use the advanced visualization techniques. This philosophy has served us well in the past. As new observational data and numerical models are obtained we can use off-the-shelf and cost-effective software (such as NAG Explorer) to provide the 3D and time-dependent objects. These can be viewed, for example in Inventor or QTVR format on a wide variety of platforms, which allows us to inspect these on hardware ranging from intermediate workstations to the CAVE, while also providing a seamless integration through PCs and Macs into the undergraduate and graduate curriculum.

Research applications include the visualization of earthquake hypocenters, seismic tomography, and convection and mixing in the Earth's mantle. An educational focus has been on mapping geological information onto topography (see figure). The CAVE allows for immersion into these visualizations, which provides the interesting opportunity to have virtual walk throughs and fly-overs, as well as interactive visualization of GIS (geographical information systems) data.



Research applications include the visualization of earthquake hypocenters, seismic tomography, and convection and mixing in the Earth's mantle.

To learn more about the Department's visualization effort, please visit:

http://www.geo.lsa.umich.edu/~keken/VR

which contains an interactive display of some recent applications. A free CD that contains this information is available upon request.

Please contact ***Peter van Keken*** *(keken@umich.edu) for more information.*

Honors, Awards, Kudos

Catherine Badgley, Research Scientist in the Museum of Paleontology and Director of the Environmental Sciences program in U-M's Residential College, has been elected Secretary of the Society of Vertebrate Paleontology.

Earl E. Brabb (MS '52) was honored by a day-long symposium titled Landslide Mitigation: A World View, at the meeting of the Association of Engineering Geologists in San Jose in September. The symposium was organized by Earl's friends in the International Landslide Research Group, which Earl founded and spearheaded. Earl recently retired from the U.S. Geological Survey after more than 40 years of service.

Bruce R. Clark (U-M Faculty 1968-78) has been appointed to the Seismic Safety Commission of California. The Commission's objective is to improve the safety of citizens through cost-effective measures that decrease earthquake risk to life and property. Ever since leaving U-M, Bruce has been with Leighton and Associates, a geotechnical consulting firm in California, where he is now the President and CEO.

Carl Henderson, manager of the Department's Electron Microbeam Analysis Laboratory (EMAL) was selected to receive an LS&A Staff Award for Excellence. The award was in recognition of his superior technical expertise, his initiatives in servicing and improving the analytical instrumentation and his work with users from throughout the University. EMAL has the reputation of being one of the most user-friendly labs on campus.

David W. Mogk (BS '75) was awarded the 2000 Excellence in Geophysical Education Award at the American Geophysical Union's Spring Meeting Honors Ceremony in Washington, DC. The award acknowledges a sustained commitment to excellence in geophysical education. Dave is on the faculty at Montana State University in Bozeman. The citation for this award noted that his most far-reaching accomplishment in Earth Science education "has been marshaling representatives of the entire geoscience educational community to formulate a unified vision of Earth science education. Recognizing that the Earth sciences could not play a central role in science education if they did not work together as a group, Dave urged the AGU to draw together educators from all of the disciplines in its membership to craft a vision for the future of undergraduate Earth science education. The resulting report, published in 1997 and titled Shaping the Future of Undergraduate Earth Science Education — Innovation and Change Through an Earth System Science Approach, has influenced changes on scales from individual classrooms to nationwide programs."

David Rea (U-M Faculty 1975-present) has received the Alumni Achievement Award from the Geosciences Department of the University of Arizona. Dave earned his MS from Arizona in 1967, and currently serves on the Arizona Alumni Advisory Board.

Eric Tohver, current PhD candidate, won a Student Research Grant from the GSA in the 2000 competition.

Arlo B. Weil, currently a PhD student in paleomagnetism and tectonics, was awarded the Outstanding Student Paper Award by the Geomagnetism and Paleomagnetism Section of the American Geophysical Union, at the 2000 Spring meeting in Washington, DC.

Alumni News

Haig Kasabach (BS '57, MS '59) from Hamilton, New Jersey, retired on February 1, 2000, after 16 years as New Jersey State Geologist. He has been elected an Honorary Member of the Association of American State Geologists and attended the June meeting in St. Louis. In April Haig was honored to receive the American Water Resources Association "Peter Homack Award", which is given to one person each year who has made "outstanding contributions toward a multidisciplinary understanding and management of water resources in New Jersey". Since his wife Carol retired in December as the Director of the Lutheran Office of Governmental Ministry for New Jersey, they have planned a geologic adventure to Iceland in August 2000 and a trip to Turkey in the Fall 2000. Haig continues to serve as a Trustee of the Sterling Hill Mining Museum in Ogdensburg, NJ. This non-profit foundation has preserved the famous Sterling Hill Mine (Franklin Mine is no longer accessible) and its vast array of fluorescent minerals, as well as providing an accredited earth science curriculum for continuing education for teachers and introductory material for students.

Ed Poindexter (BS '52, MS'53, PhD '56) has retired from the Army Research Laboratory in New Jersey, and has settled in Chelsea, Michigan just a few miles west of Ann Arbor.

Bob (BS '50, MS '51) and Na**ncy Dott (B**S '51) are hoping to sail to South Georgia Island in late February to revisit that remote geological sliver of the Andes left stranded in the South Atlantic Ocean. Bob had done geological work on South Georgia many years ago, and the king penguins and fur seals have been asking about him ever since. South Georgia, as inveterate Antarctic buffs know well, was the target of Sir Ernest Shackleton's open boat journey from the Antarctic Peninsula, seeking help after the sinking of his ship HMS Endurance in the icepack of the Weddell Sea in 1915.

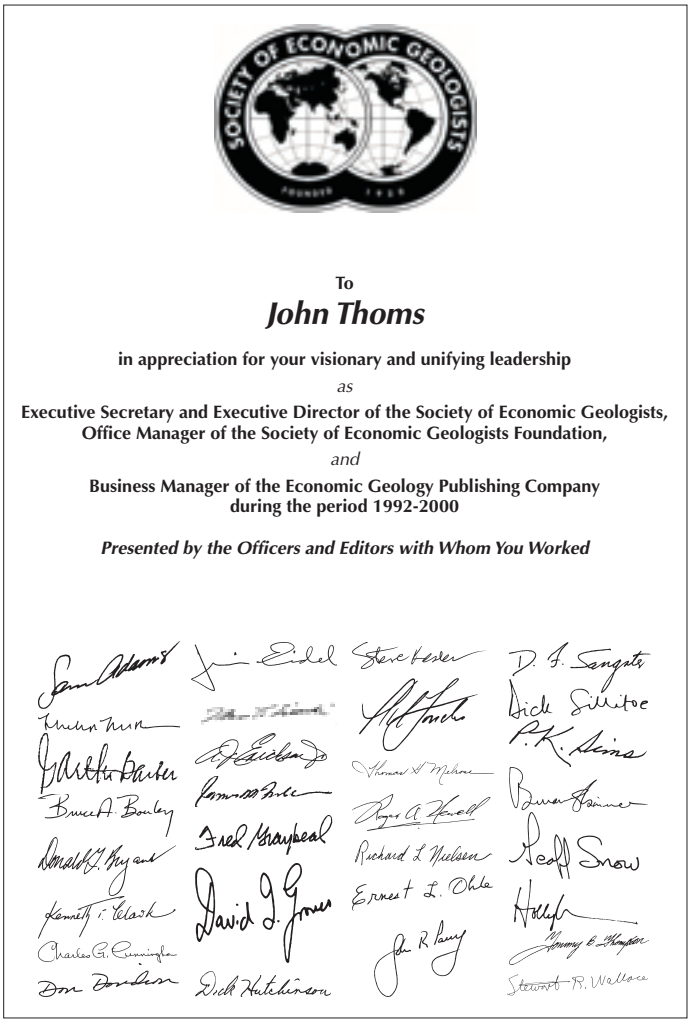
Dar (MA '64, PhD '69) and Su**e Spearing are** leading the good life in the National Park Service. Dar is a summertime ranger in Rocky Mountain National Park, and a wintertime ranger in Joshua Tree National Park in California.

Tim Kurtz (MS '69) writes from Janesville, Wisconsin that he has changed houses but not employers. He is still with the Gas Technology Institute. He sends regards to Don Peacor, Eric Essene, and Henry Pollack.

John Thoms (PhD '65) retired on April 1 as Executive Director of the Society of Economic Geologist after eight years in the post. John is the latest in a long line of Michiganders to have helped out at SEG. **Bill Kelly**, **Stew Turneaure**, **Stewart Wallace** (MS '48, PhD, '53) and **Steve Kesler** have served as President of the Society, **Antonio Arribas, Sr.** is the European Vice-President, and **Ray Coveney** (MS '68, PhD '72), **Bob Blair** (MS '60), **Bruce Nesbitt** (MS '76, PhD '79), **Alex Brown** (MS '65, PhD '68) and **Francois Robert** (Post Doc '80) have served on Council. Alex and Ray, along with **Greg Arehart** (PhD '92), **Jeff Huspeni** (MS '81), **George Ireland** (BS '90), **John Muntean** (MS '89), **Erich Petersen** (PhD '84), **Bob Seale** (PhD '89), **Antonio Arribas, Jr.** (PhD '92) have recently served on committees. Everyone tries to make a contribution to their society, but John outdid them all.

During his time at SEG, John took the Society from an "office" consisting of filing cabinets in the basement of home to a multi-room operation with more than 10 full time staff and responsibilities ranging from member services through publication to sales. As the organization grew, John took on additional jobs of Office Manager for the SEG Foundation and Business Manager of the Economic Geology Publishing Company. His last contribution to the organization was to come up with a building to house the entire operation.

For the last year, John has been supervising design and construction of the new SEG Headquarters Building, which was funded by donations from an Anonymous Donor, known only to John. This building, with 8,000 square feet of office space on the main floor, is located in Littleton just south of Denver and has an unobstructed view southward to Pikes Peak from its conference room. As you might suspect, John did not disappear from the SEG scene when he retired. He just changed hats and became the first official fund raiser that the Society has had. This has allowed him to retain an office in the Headquarters Building and keep an eye on the operation that he created.



To

John Thoms

in appreciation for your visionary and unifying leadership

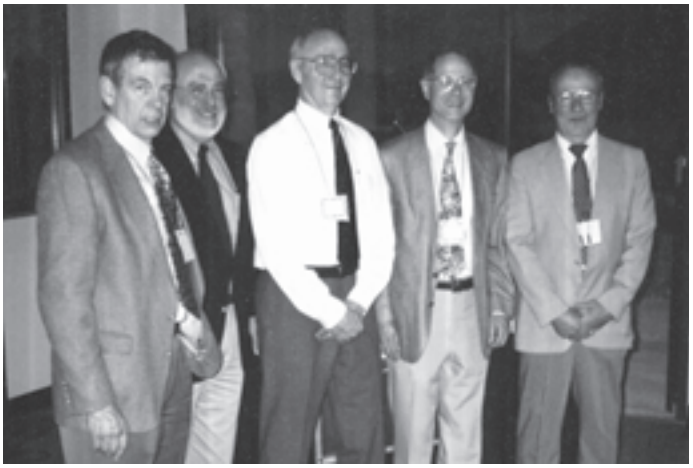
as

Executive Secretary and Executive Director of the Society of Economic Geologists,
Office Manager of the Society of Economic Geologists Foundation,

and

Business Manager of the Economic Geology Publishing Company
during the period 1992-2000

Presented by the Officers and Editors with Whom You Worked



Left to right: Bob Blair, Ray Coveny, John Thoms, Steve Kesler, Tom Melrose.

John's retirement really became official in June at the dedication ceremony for the Headquarters Building. This gathering, which was organized by John, attracted several hundred SEG members, including Bob Blair, Ray Coveney, and **Tom Melrose** (BS '58, MS '59), as well as Steve Kesler. Guests toured the new building, applauded enthusiastic dedication speeches, and ate a complimentary dinner. At the end of the dinner, a semi-impromptu roast for John emerged. It started with a large photo display of John's career, including his days at Michigan, but quickly moved on to extemporaneous contributions from a number of guests regarding John's limited strengths and numerous apparent shortcomings. John held up well through the entire ceremony and was still alert enough to introduce his family, including children and grandchildren, to the group at the end. He and his wife, Jean (who has also put in many hours on behalf of SEG), were presented with several gifts, including a desk-top replica of the new building that can be used to store hammer, compass and other field gear, and a plaque signed by the many Society members that he has worked with over the last eight years. When not in the new SEG building, John and Jean can be found in Gunnison, where they have a second home and family to visit.

Henry F. H. Ku (BS '64, MS '66) has retired from the USGS Hydrogeology Office on Long Island after some 35 years, and taken up residence in Milpitas, California.

Steven Catlin (BS '78) has switched careers again! Steven has earned his California teaching credentials and will begin teaching physical science at Johansen High School in Modesto, California, starting Fall 2000. Steven and his wife Daina spent 6 weeks in southern Africa (mostly Zimbabwe) in June and July 2000.

Ken Van Dellen (MS '78) writes to us from Kenya! He says that "I'm volunteering this term as visiting faculty here in Nairobi. I've reverted to teaching basic biology and environmental science, which I taught the last couple of decades before my retirement [from Macomb Community College]. Of course, I had to get acquainted with the local geology, so I visited the Department of Geology at the University of Nairobi. I had met one of the geologists at the Nairobi Choral Society (and subsequently participated in a performance of Handel's Messiah as a fundraiser for the Nairobi Hospice), and he gave me a grand tour, including the seismic station, linked to the world by satellite. He let me borrow his prized copy of *Geology of East Africa*, and as I browsed it I noted a familiar name (Nyblade & Pollack, 1990).

Life is full of tradeoffs, and being here means missing GSA, but I am getting some exposure to the East African Rift and associated volcanics. I'm also learning to appreciate tapwater, both in quantity and quality. Ours hasn't been on more than half of the time I've been here. The gas station up the street has water for washing cars, though. So it's a little like the haves and have-nots."

Tom Brocher (BS'75) is now a Co-Project Chief for Earthquake Hazard Investigations in the Pacific Northwest for the U.S. Geological Survey. After years of struggling to obtain high quality geophysical data at Yucca Mountain, Nevada, Tom feels that he must have died and reached geophysical Nirvana by working in the Puget Lowland, Washington, where geophysical methods work extremely well due to large contrasts in the physical properties of the rocks there. His most recent work there was a strong motion site response study based on recording the implosion of the Seattle Kingdome stadium in March 2000 using 200 seismographs deployed every 8 or 9 blocks throughout Seattle.

Tom's wife, Anne Okubo (U-M BA '77), was honored by the posthumous award of the Medal of Honor to her father, a medic in the all Japanese-American 442nd Regiment, on June 21, 2000, at the White House by President Clinton. Tom reports that all 17 members of the Okubo family were thrilled and excited to meet the President.

Gordon Wood (MS '73) from Katy, Texas, retired from BP Amoco in December, 1999. He is presently employed by Exxon-Mobil as a Technical Writer/Editor.

John Greene (BS '63, MS '70) and wife Jean were in Ann Arbor for a meeting of the LSA Visiting Committee in October. John visited a bit also in the Department, but was kept busy by the College most of the time. After the meeting John and Jean headed to the Upper Peninsula to visit Jean's mother, and continued on down the west side of Lake Michigan for a complete circum-navigation. John and Jean continue to enjoy their Mountain Greenehouse in Silverthorne, Colorado.

Tim Cross (MS '70) is still on the faculty at Colorado School of Mines in Golden, and in a new residence in Evergreen.

Chad McCabe (BS '76, MS '82, PhD '85) has made the long move across country, leaving Seattle for the beautiful fall colors of Deerfield, New Hampshire.

Carol McCarus-Rector (BS '83) was in Ann Arbor visiting family and let us know of her new abode in Allegany, New York.

Ricardo Presnell (MS '83) visited the Department in October and spoke to Steve Kesler's class on Mineral Resources, Economics and the Environment. Ricardo is in charge of new projects for Kennecott Mining Company, the U.S. arm of the large English mining group, Rio Tinto. He is currently based in Reno.

Don Medwedeff (BS '81) and family have uprooted from Arco and Texas to settle in Danville, California near Don's new position with Chevron in San Ramon.

Lisa Kraemer (MS '98) and her husband Spencer are enjoying living in "The Big Easy", New Orleans. Lisa is a geologist/human health risk assessor for ERM-Southwest, an environmental consulting company. Spencer finished his MS in Public Health at Tulane, and will be starting the Tulane Environmental Law Program in the Fall 2000. They just bought their first home in New Orleans in the Spring 2000.

Donggao Zhao (PhD '98) accepted a job at the University of South Carolina, where he manages the Electron Microscopy Center.

Leah Joseph (MS '97) is now teaching in the Department of Geoscience at Hobart and William Smith Colleges in Geneva, New York, with responsibilities in the introductory Earth science classes, including oceanography.

Hailiang Dong (PhD '97) is now settled into his new position at Miami University in Oxford, Ohio.

David Stenger (MS '97) has started his second year in the Kenan-Flagler Business School at University of North Carolina and spent the summer working on minerals research with Lehman Brothers in New York.

Jerry Dickens (MS '93, PhD '96) is returning from Australia to begin an Associate Professorship at Rice University in Houston. Jerry will begin his new position in 2001.

Jim O'Neil (Faculty '88 – '96) visited the Department in October to confirm that things were still going well and to talk over plans for a book on geochemistry with prospective co-authors, Steve Kesler and Phil Meyers.

Weiming Zhou (PhD '95) has started a new job as a software engineer with Motorola in Chicago.

Ed Van Hees (PhD, '00) was in the Department briefly in September to talk to Steve Kesler and Eric Essene about final aspects of his long-awaited PhD dissertation and related research projects.

John Hoaglund (Visiting faculty, 1998-2000) is now a Research Associate in the Earth and Mineral Sciences Environment Institute at Penn State. He invites all the Maize and Blue faithful to State College to watch the Wolverines eat up the Nittany Lions.

Linda Ivany (Museum of Paleontology, 1997-2000) has settled in at Syracuse University in New York, and has now called for her horses to be delivered from Bruce Wilkinson's farm where they romped for many years.

In Memoriam

Jay Rane Pray (BA '35) passed away on July 7, 2000 in Laguna Hills, California at the age of 89. Jay is survived by Shirley, his wife of sixty-one years, and many children, grandchildren, and great-grandchildren. He lived most of his life in the Ann Arbor/Whitmore Lake area working in the real estate field.

Fall Pre-Cambrian Field trip

Eric Essene ran a field trip with eight grad students in mid-September this fall. They stayed at Pancake Bay campground on Lake Superior, Killarney campground on Lake George 70 km southwest of Sudbury, and Killbear campground on Georgian Bay near Parry Sound. These campgrounds now remain open much longer, so no one has to sneak in anymore. The field stops included outcrops of the Keweenawan basalts, Gowganda tillites near Elliot Lake, Huronian sediments with shatter cones and pseudotachylytes in Sudbury, the Grenville front and its mylonites, high grade gneisses within the Grenville including the famous "dragon outcrop", and marble breccias near Miners Bay. The rocks from Miners Bay were studied in separate publications by **Bernie Housen** (PhD '89) and **Zach Sharp** (MS '84, PhD '88). Many of these stops mark the sites of previous incursions by U-M geologists, and they are still there despite repeated attacks with eight pound sledgehammers and power drills!

Dear Friends:

We live in a time of great change. This phrase is so overused these days that its frequent repetition can be distracting, if not outright annoying. As geoscientists we know and understand change as a fundamental character of the Earth. Amid rapid change, however, there are enduring rhythms. Students return to Ann Arbor every fall; football is played on sunny Saturday afternoons, and Eric Essene and Bruce Wilkinson take their students on field trips to study crustal evolution and Quaternary outwash.

Consistent with the theme of rhythms amid change, the Geological Sciences Alumni Board, at its recent annual meeting in Ann Arbor, addressed issues that relate to the long-term health and success of the Department. As in many other institutions, our Geological Sciences Department is entering a period of transition, as several faculty members who have been so important to the growth and success of the Department over the past few decades are approaching retirement. This period of transition also comes at a time when the scientific focus of national policy is shifting toward such issues as climate stability, resource sustainability, the impact of geological process on human and ecosystem health, and human impacts on the life-sustaining systems of the Earth. Hence, along with the transition to a new Chair of the Department, Joel Blum, the Alumni Board meeting seemed a propitious time for the Board to offer its thoughts and advice on the future dimensions and scientific foci of the Department. These topics are likely to occupy the Board for the foreseeable future.

The only constant in all of this is the need for financial resources. The Board is reminded annually of the profound value of alumni giving and the large positive impact such giving has on student support, field trips, and the overall intellectual fervor of the Department. There are many activities that would not happen without your support. All of these affect directly the quality of the educational and research experiences of undergraduates and graduate students alike.

I hope that you will join me again this year in giving generously to the Department of Geological Sciences, and thereby help to further enhance the educational and research excellence of the Department.

With best regards,
Steven R. Bohlen (MS ’77, PhD ’79)
Chair, Alumni Advisory Board

“We are reminded annually of the profound value of alumni giving and the large positive impact such giving has on student support, field trips, and the overall intellectual fervor of the Department.”

Michigan at Sea in the ODP

Over the past few decades the University of Michigan geologists have been important participants in the Ocean Drilling Program and its predecessor, the Deep Sea Drilling Project. **Bob Owen, Dave Rea, Phil Meyers, Jeff Alt, K. C. Lohmann,** and **Ted Moore** have all participated in at least one two-month drilling leg of these programs, with Jeff Alt holding the record for having gone out eight times! Jeff, Dave and Ted have all served as co-Chief scientists on one or more of the legs. Ten of our graduate students have also been out to sea on ODP cruises. They have benefited not only in adding an exciting element to their research, but also in forming close working relationships and friendships with an international community of scientists. ODP estimates the cumulative value of Michigan's involvement in the program, as of last year, at $8.7M.

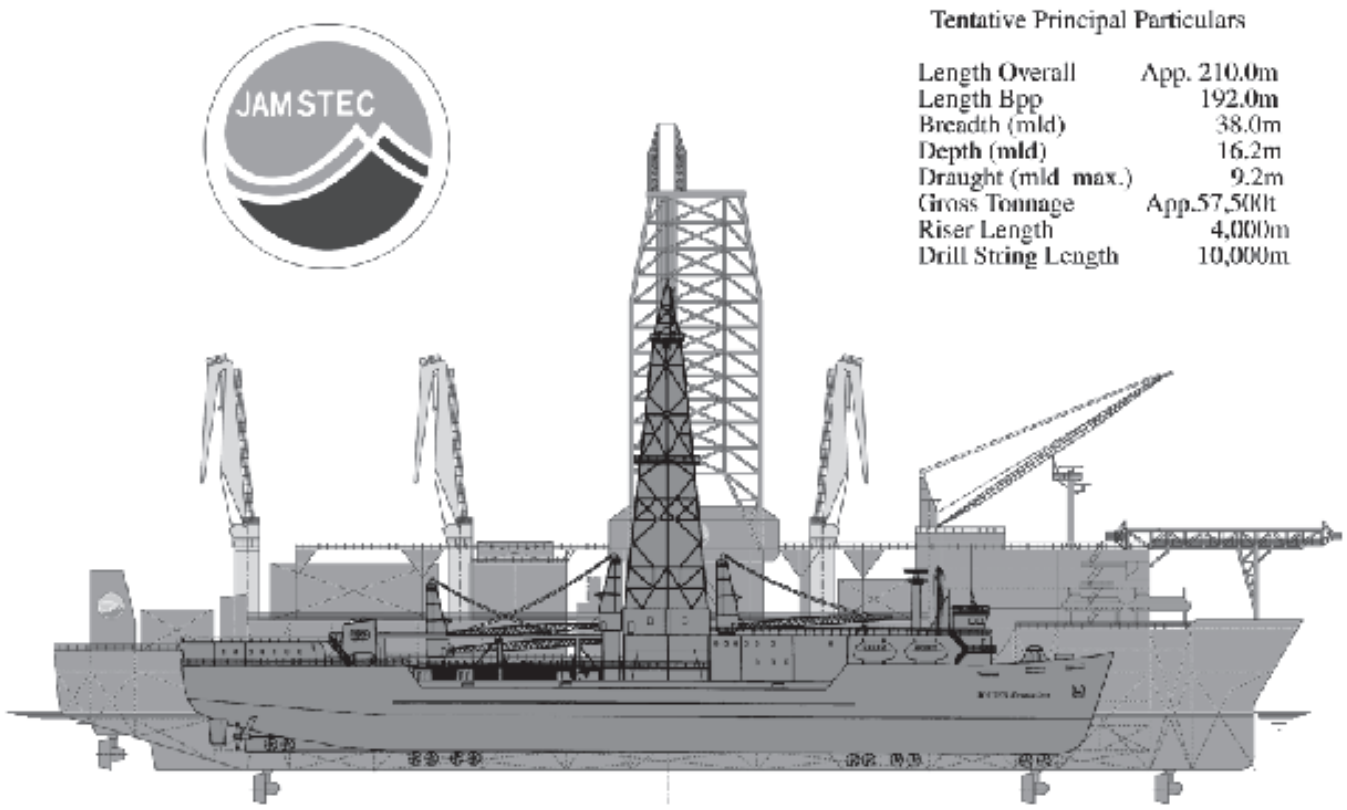
U-M geologists have not only submitted successful proposals to use the drillship for scientific investigations, they have also served on numerous international committees and working groups that evaluate proposals and guide the course of the program. At present **Dave Rea** is serving on the ODP Science Committee, which evaluates and ranks the proposed drilling projects and determines what actually gets done in the program. **Phil Meyers** and **Larry Ruff** provide advice concerning scientific measurements made on board ship, and drilling through the seismogenic zone, respectively. Old friends of the U-M geosciences community, **Richard Arculus** (Faculty '83 -'89) and **Bernie Housen** (MS '90, PhD '94) are both serving on one of the panels that mentors proponents and helps them develop their ODP proposals, and **Tom Janecek** is just finishing up a term as chair of the ODP Scientific Measurements panel that oversees the shipboard laboratories and laboratory equipment. Most recently, the President of our Alumni Board, **Steve Bohlen** (MS '77, PhD '79), has accepted the job of President of the Joint Oceanographic Institutions, the organization that oversees the running of the Ocean Drilling Program (see the article elsewhere in this newsletter).

The U-M geologic community thus has had, and continues to have, a large influence on the present Ocean Drilling Program. It will also have a strong influence on the new Integrated Ocean Drilling Program (IODP) that will start up in 2003 as ODP winds down. Ted Moore is chair of a committee that is developing the scientific advisory structure, the management structure, and a ten-year scientific plan for this new program that will operate two primary ships. One ship is being provided by the US National Science Foundation. It will be an updated and improved version of a riser-less drill ship similar to the one that is now in use in ODP. The Japanese government, through their Science and Technology

Agency, is in the process of building a brand new riser ship that will operate with full well control in waters as deep as 2500 m. This ship will be on the cutting edge of drilling technology used in oil exploration. As well-control technology develops in the coming decade plans are to push the water depth limit of this ship out to 4000 m and beyond.

The penultimate draft of the IODP Science Plan has recently been completed, with the help of **Dave Rea** who served on the Science Planning Working Group of Ted's committee. That draft is now on the web at ***www.iodp.org*** for you to read and comment on. It focuses on three main thematic areas: 1) the deep biosphere and the sub-seafloor ocean, 2) environmental change, processes and effects, and 3) solid earth cycles and geodynamics. Within these three scientific themes there are several initiatives that will receive special emphasis in the first ten years of drilling. These include: 1) the deep biosphere, 2) gas hydrates 3) extreme climates, 4) rapid climate change, 5) continental breakup and basin formation, 6) large igneous provinces, 7) drilling through the ocean crust to the Moho, and 8) drilling into the seismogenic zone.

There are exciting times ahead for those who wish to turn to the oceans for their geological research, and there are plenty of opportunities for U-M geologists who wish to participate in the new IODP.



It is with great pride that we announce the appointment of Steven **R. Bohlen** (MS '77, PhD '79) to the position of President of the Joint Oceanographic Institutions and Executive Director of the Ocean Drilling Programs

Steve Bohlen Appointed President of Joint Oceanographic Institute

Steve is currently Associate Chief Geologist at the U.S. Geological Survey (USGS). He succeeds Admiral James Watkins (USN retired) who stepped down as President of JOI on October 1. Steve is also the current chair of the Department's Alumni Advisory Board.

In October 2003, the Ocean Drilling Program will end, and a new program, the Integrated Ocean Drilling Program (IODP) with significantly expanded drilling and scientific capability will begin.

As President of Joint Oceanographic Institutions (JOI), and Executive Director of the Ocean Drilling Program, Steve will provide leadership and guidance to the JOI Board of Governors and JOI staff in all aspects of JOI's scientific ocean drilling programs and related research and education activities. JOI administers the Ocean Drilling Program, an international scientific research effort involving over twenty partner countries that cooperate in planning and funding scientific ocean drilling to recover rock, fluid, and biologic samples from the oceans sediments and crust. Scientists analyze these hard-won samples to understand a variety of geologic processes, including paleoclimate, paleooceanography, crustal structure, recycling of the lithosphere, tectonic history, and fluid movement in the crust and sediments..

Steve will manage the international aspects of the Ocean Drilling Program, as well as JOI resources and staff, which includes overseeing contracts for running the drillship and drilling program, shipboard laboratory operations, and archiving samples and scientific data. He will also oversee the functioning of the U.S. arm of the Ocean Drilling Program, the U.S. Science Support Program, funded by the National Science Foundation.

In October 2003, the Ocean Drilling Program will end, and a new program with significantly expanded drilling and scientific capability is planned to begin, the Integrated Ocean Drilling Program (IODP). Steve is responsible for preparing JOI to become a competitor for the NSF contract to administer the new ocean drilling program.

In addition to serving as Associate Chief Geologist at USGS, Steve has also served as Consulting Professor at Stanford University (1989-1995), Associate Professor at the Department of Earth Sciences and Space Sciences at the State University of New York at Stony Brook (1985-1988) and postdoctoral research fellow at UCLA.

As many of our alumni know, the University of Arizona and the University of Michigan have had a long and mutually beneficial relationship of service to and interactions with each other's geoscience programs.

Arizona Goes Totally Blue!

This special relationship has over the years involved a reciprocal sending of students and post-docs from one campus to the other, and serving on each other's Alumni Advisory Boards. In this latter context, both **George Davis** (PhD '71) and **Joaquin Ruiz** (MS '80, PhD '83) from U-A have served on Michigan's Alumni Advisory Board, and **David Rea** currently serves on Arizona's Geoscience Alumni Advisory Board. **Jim Zumberge** served on Michigan's faculty for some 12 years, and later led the University of Arizona as president. And **Larry Gould** (MA '23, ScD '25), on the faculty at U-M in the 1920s and later President of Carleton College in Minnesota, retired to Tucson and spent many scientifically productive years there in the U-A department. The geoscience building in Tucson is named the Simpson-Gould Building.

Slowly, Michigan geologists have infiltrated the power structure of Arizona to an unprecedented degree.

Slowly, Michigan has infiltrated the power structure of Arizona to an unprecedented degree. Just as this Newsletter is going to press we have learned that **Susan Beck** (PhD '87) has been appointed Chair of the Geoscience Department in Tucson. The previous Chair (seemingly for decades!) was **Joaquin Ruiz**, who has long been recognized for his strong leadership of the Arizona Department and for promoting the sciences in general. Joaquin just this year was tapped to be the Dean of Sciences in the University of Arizona administration. At even higher levels of the Administration **George Davis** has also been recently named Provost of the University, a position in which he functions essentially as the chief academic and administrative officer of the entire University. We at Michigan are very proud to see Sue, Joaquin and George achieve such recognition from their Arizona colleagues. *Can this intellectual flux from Michigan to Arizona be a prelude to some insidious plot to drain Great Lakes water to the Arizona desert?*

Bill Farrand and Jim Walker Retire

Bill Farrand retired from the University of Michigan on June 30, 2000. He served as Professor of Geological Sciences for 35 years, and as Director of the Exhibit Museum of Natural History for the past 7 years. Bill also had an appointment as Curator in the U-M Museum of Anthropology where he participated as a geoarchaeologist. In retirement, Bill will keep an office and small lab in the Museum of Anthropology.

As many of you know, Bill's early work centered on the glacial history of Michigan and the American/Canadian Midwest. He studied landforms and their evolution, the crustal rebound that occurs after the ice sheet load is removed from the earth's surface, and the history of glacial advances and retreats. He was among the first to apply the techniques of radiocarbon dating to elucidate the timing of these events. Much of Bill's scholarship lay at the interface between geology and archaeology, in fact, his career helped to define the field of geoarchaeology. He remains particularly interested in the sedimentology, stratigraphy, and paleoclimatology of prehistoric sites around the Mediterranean and has spent extensive periods of time working on sites in Syria, Jordan, Lebanon, Israel, Turkey, Greece and elsewhere in Africa and the Far East.

In honor of Bill's retirement, but without his prior knowledge, over $25,000 was raised to establish the William R. Farrand Lecture Endowment.

A celebration for Bill was held on June 9th in the Hall of Evolution in the Museum. Family members, former students, colleagues and others joined in a tribute to Bill's many contributions to the University and the Museum. In honor of Bill's retirement, but without his prior knowledge, over $25,000 was raised to establish the William R. Farrand Lecture Endowment. These monies will be used to sponsor an annual public lecture program at the Exhibit Museum of Natural History. The fundraising activities were co-chaired by two U-M graduates, **Wendy Burgis** (MS '70, PhD '77) and **Richard Redding** (BA '71).

The first William R. Farrand Public Lecture will be given on April 22, 2001 at 3:00 p.m. in the Rackham Amphitheater. **Jeffrey A. Wilson**, Visiting Assistant Professor of Geological Sciences and Visiting Assistant Curator in the Museum of Paleontology will give a lecture on "India's Cretaceous Dinosaurs" shortly after he returns from the field in India.

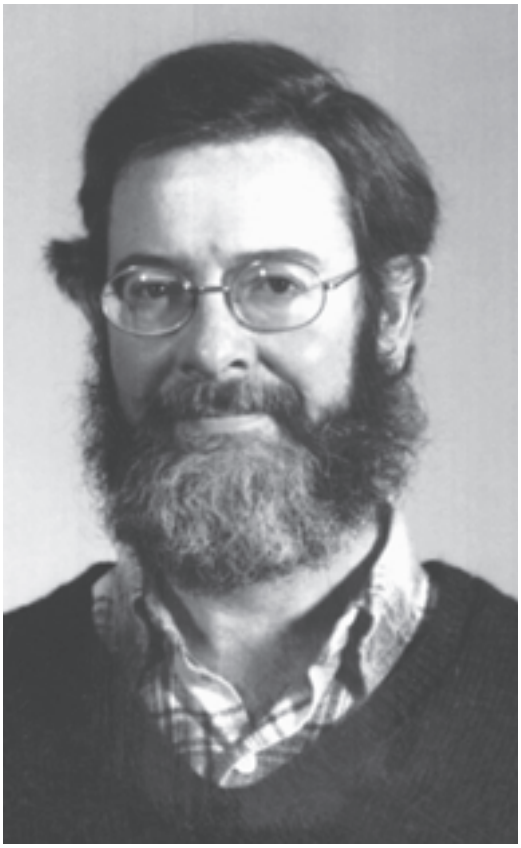
The Exhibit Museum hopes to raise $50,000 for the annual lecture endowment. Donations will be permanently invested in an endowment fund; the interest earned will be used to sponsor this lecture program intended for a general public audience. To contribute to the fund, contact Joan Wolf at joanwolf@umich.edu or call (734) 936-5834.

James C.G. Walker, Professor of Atmospheric, Oceanic, and Space Sciences in the College of Engineering and Professor of Geological Sciences in the College of Literature, Science and the Arts retired from active faculty status on May 31, 2000.

Jim received his BS degree from Yale University in 1960 and his PhD degree from Columbia University in 1964. Following postdoctoral appointments at Queen's University in Belfast and at the Goddard Space Flight Center, he served on the faculty of Yale University from 1974-80. He came to the University of Michigan in 1980.

Jim began his career by making fundamental contributions to understanding optical emissions and the energy balance of the Aurora Borealis. He then undertook ionospheric research through the use of backscattering radar, heading the Ionospheric Section at Arecibo. He is perhaps best known, however, for his studies on the origin and evolution of the Earth's atmosphere and the chemical composition of the oceans. He has made seminal contributions on the conditions necessary for the origin of life. His book, Evolution of the Atmosphere, has been widely used by both specialists in the field and atmospheric scientists alike. His later work has included interactions of carbon dioxide with the solid Earth and concomitant changes in surface temperature of the planet. He has been an active researcher both natural and anthropogenic climate change.

Within the University, Jim has been a strong supporter of environmental studies, having served as director of environmental studies in LS&A for seven years, from 1991-98. Through his teaching, he has made countless students aware of the relevance and importance of our interactions with, and influence upon, the environment. Jim was honored with an Arthur F. Thurnau Professorship in 1993.



Jim was honored with an Arthur F. Thurnau Professorship in 1993.

By Henry Pollack

The home of the Department of Geological Sciences on the U of M campus is the C. C. Little Science Building, named for **Clarence Cook Little**, the sixth president of the University of Michigan in the period 1925 - 1929. Little was the president of the University of Maine for three years prior to coming to Michigan. On the Maine campus in Orono there is also a C. C. Little Building.

C. C. Little, U of M's Sixth President

It was during Cook's administration that the University purchased the 120 acres in Wyoming that today serves as Camp Davis, the Department's summer field camp.

At Michigan Little's tenure was short and stormy; he was an opinionated and relatively young man who did not always consult his faculty elders about university policy. Notable aspects of his time as President was his decision to build the modern Michigan Stadium, the Big House as it is affectionately known today. And, it was during Cook's administration that the University purchased the 120 acres in Wyoming that today serves as Camp Davis, the Department's summer field camp.

Quite aside from C. C. Little's career in academic administration, he also had a distinguished career as a biologist. In a recent millennium essay Michael F. W. Festing and Elizabeth M. C. Fisher (in Nature 404, 815, 2000) provided insights and perspectives about his contributions in biomedical research. Below are extracts from that essay.

"In 1909 Clarence Cook Little, an undergraduate at Harvard, wanted to study coat-color inheritance in mice. He got some brown mice, and produced a pure line by mating brother with sister. At least 17 Nobel prizes, two major scientific tools (monoclonal antibodies and gene-targeted strains), profound scientific insights into the immune system, retroviruses, oncogenes, cancer, the inheritance of complex traits, and countless scientific experiments have flowed from his inbred, or 'isogenic', strains."

After leaving Michigan in 1929, "Little founded the Roscoe B. Jackson Memorial Laboratory in Bar Harbor, Maine. He had the foresight to make it a multidisciplinary laboratory doing research into all aspects of mouse biology, with a special emphasis on genetics. Two later Nobel prizewinners ascribed their interest in research to spending a summer there as high-school students.... When diseases such as cancer and AIDS are eventually conquered, isogenic mice and the understanding of oncogenes will have played an important part in the battle. The studies of more than eight Nobel prizewinning immunologists who used Little's isogenic mouse strains have led to enormous advances in immunology and the saving of many lives through organ and tissue transplantation."

U of M Geology in Headlines

A number of papers by folks in the Department have been published in Nature and Science over the past year, and have been widely noted in the national and international media. *Nature* and *Science* are weekly general science journals published in the United Kingdom and USA respectively, and are widely considered to be very prestigious venues for research to appear. Of course there are other journals widely recognized in the geological sciences that also have published very significant papers by U-M faculty, students and research staff, and we plan to feature some of those in subsequent newsletters.

The recent articles in *Science* and *Nature* (listed below) have attracted much attention. They cover extraordinarily diverse topics, and provide one measure of the breadth of scholarship in the Department.

Peter Wilf of the Museum of Paleontology and colleagues wrote about "Timing the Radiation of Leaf Beetles: Hispines on Gingers from Latest Cretaceous to Recent", in *Science* 289, 291-294, 2000.

Shaopeng Huang, Research Scientist in the Department, and Henry Pollack described "Temperature Trends Over the Past Five Centuries Reconstructed from Borehole Temperatures" in *Nature* 403, 756-758, 2000.

Linda Ivany of the Museum of Paleontology, Kacey Lohmann, and Bill Patterson (MS '91, PhD '95) now at Syracuse University exposited on "Cooler Winters as a Possible Cause of Mass Extinctions at the Eocene/ Oligocene Boundary" in *Nature* 407, 887-890, 2000.

Rod Ewing presented "Less Geology in the Geological Disposal of Nuclear Waste" in *Science* 286, 415-417, 1999.

Youxue Zhang reported on " A Criterion for the Fragmentation of Bubbly Magma Based on Brittle Failure Theory" in Nature 402, 648-650, 1999.

Dave Fox (MS '95) now at U-C Santa Cruz, **Dan Fisher**, and **Lindsey Leighton** (PhD '99) now at Indiana University, discussed "Reconstructing phylogeny with and without temporal data" in *Science* 284, 1816-1819, 1999.

Rob Van der Voo and colleagues hypothesized the existence of "Mesozoic subducted slabs under Siberia" in *Nature* 397, 246-249, 1999.

These papers were discussed in letters and editorials in the journals themselves, and were widely cited in the media. We know that articles and programs about these papers appeared in The Washington Post, New York Times, Los Angeles Times, Detroit Free Press, Milwaukee Journal-Sentinel, the San Diego Union-Tribune, and through dispatches from UPI, the Scripps Howard News Service, MSNBC, and CBS in many other papers in the USA. Accounts also appeared in Geotimes and National Geographic. In Canada articles appeared in the Toronto Globe and Mail, Edmonton Sun, Calgary Sun, Vancouver Sun, and London Free Press. In the United Kingdom one or another of these contributions was featured in articles in The Guardian, The Daily Telegraph, Birmingham Post, Edinburgh Evening News, The New Scientist, and the Economist as well as in dispatches in Reuters and in radio interviews on the BBC World Service. Elsewhere in Europe there was mention in the Agence France Presse in Paris, in the Suddeutsche Zeitung and Berlin Online in Germany, and the throughout China via the Xinhua General News Service.

Congratulations to all of the authors for waving the U-M Geological Sciences flag so visibly around the world!

Faculty, Staff and Student News

Eric Essene and his family just returned from eight months of sabbatical leave last term working with Craig Manning at UCLA. **Peter Tropper** (PhD '98), who did half of his PhD research in Craig's high pressure lab, visited UCLA for three weeks while Eric and his family were there. While on sabbatical, Eric studied Franciscan blueschists, jadeite and natrolite veins from New Idria, tektites and impactite melt rocks, and contact metamorphic rocks from Crestmore near Riverside. The Crestmore and Franciscan rocks remind Eric of a remarkable field trip around 1979 including **Steve Bohlen** (PhD '79), **John Bowman** (PhD '78), **Phil Brown** (PhD '80), **Skip Simmons** (PhD '73) and some others to some of the same localities after a GSA meeting in San Diego. This fabled trip was marked by Phil and Skip sliding rental cars though sharp curves on steep and muddy tracks getting to the nearly impassable benitoite locality. On the trip home from UCLA this summer Eric and his family avoided such routes but still had a lot of car trouble. They stopped to see Bernadette, Peter and **Joaquin Ruiz** (PhD '83), and **John Chesley** (PhD '93) at the University of Arizona. Joaquin is now Dean of Science as well as Chair of the Dept. of Geosciences. The Essene/Budai clan then visited daughter Michelle Essene (MD, family practice) and her husband Jeff at their new adobe house near Albuquerque. They spent some time with Sharon, Alana, Chloe and **Zach Sharp** (PhD '88), as well as **John Geissman** (PhD '80), **Martha Moses** (MSc '85) and **Dave Moecher** (PhD '88).

Several students are currently working with Eric on a variety of projects. **Cliff Claflin** (MSc '01) is studying orthopyroxenes in a contact aureole and from within the Stillwater intrusion in southern Montana with **Youxue Zhang** and Eric. Eric visited Cliff and the Stillwater this summer, and they went underground at the platinum mine there. The upper reaches of the Boulder River now provide far better trout fishing than the Stillwater River. **Dan Cor**e (PhD '02) has an interesting project underway on highly oxidized granites from porphyry copper associations with **Steve Kesler** and Eric. **Weidong Dong** (PhD '03), Youxue and Eric are studying cation ordering in pyroxenes. **Casey Donohue** (PhD '02) just published a paper on garnet-epidote oxybarometry in EPSL with Eric. Casey is just finishing a project with Teri Boundy (PhD '96), **Klaus Mezger** (U-M Postdoc, '90-91), Håkon Austrheim (Oslo) and Eric on eclogite facies marbles from Western Norway. Håkon, Teri and Eric originally collected these rocks on a field trip to Hølsnoy, Norway, in 1992. Casey is also doing experiments on Zr substitution in almandine with Eric and Craig at UCLA. **Zeb Page** (MSc '01) has begun a project with **Sam Mukasa** and Eric on eclogites fron North Carolina. **Eric Tohver** (PhD '02) has begun a project with **Ben van der Pluijm** and Eric on Brazilian rocks of Grenville age. Ben visited Brazil this summer, and Eric hopes to spend some time in the field there next year.

Carl Henderson (Lab Manager for EMAL at U-M) and Eric have been very busy with trips to test and examine new electron microprobes. They went to Cameca in Paris this summer and to Japan to see the JEOL microprobe this October. A NSF proposal for a new electron microprobe was funded last fall. Eric and Carl hope to decide on the best machine and order it this fall.

Dan Fisher has been back in "official" capacity following a productive sabbatical spent mostly exploring some new dimensions of the problem of inferring phylogenetic relationships among organisms. The approach he has been developing is thoroughly compatible with use of stratigraphic data in the ways he has been advocating for some time, but it represents a new twist as well. It may even turn out to simplify such analyses, which become dauntingly complex when dealing with many different kinds of organisms. As usual, mastodons and mammoths refused to lay quietly at rest while Dan tried to concentrate on phylogeny. Last winter and spring produced an interesting site in the thumb of Michigan, and this autumn, Dan went to help the staff at the Paleontological Research Institution, in Ithaca, New York, excavate an amazingly complete and well preserved mastodon in eastern New York. At last sight, Dan was bundled in multiple layers and headed for northernmost Siberia, following the call of frozen mammoths.
Bon voyage!

Steve Kesler spent part of May with PhD candidate **Dan Core** sampling around large porphyry copper systems in central Chile, where Dan is working on ways to distinguish barren intrusive rocks from ones that formed ore deposits. In June Steve was in Denver to participate in the dedication of the new headquarters building of the Society of Economic Geologists. Numerous other Michigan alums were on hand, including **John Thoms** (PhD '65), who chaired the event, **Tom Melrose** (BS '58, MS '59), **Bob Blair** (MS '60) and R**ay Coveney** (MS '68, PhD '72). Later in the month, he visited Singapore for a firsthand look at how a successful economy can be based on imported mineral resources, even including water. In July, Steve went to Nevada to visit new MSc candidate **Bret Peppard** who is working on the newly discovered Ivanhoe epithermal gold-silver vein system. In August, Steve was at the International Geological Congress to participate in a symposium on Global Mineral Resource Assessment. In September, Steve and new PhD candidate **Patrick Herb** went to Montana to visit the Stillwater complex in preparation for developing a research project on formation of platinum deposits.

Photo shows Dan Core along with Paula Cornejo, Steve Matthews and Luis Mora of Sernageomin, the Chilean Geological Survey, while they were visiting the La Gloria pluton near Santiago.

Within the framework of the established collaboration between our Department and the University of Lanzhou in China, Research Scientist **Josep M. Pares** spent two weeks in Tibet, doing field-work aimed at understanding the timing of the uplift of the Tibetan Plateau. Along with new graduate student **Maodu Yan** and paleontologist William R. Downs (Northern Arizona University), the team has been sampling in the Guide Basin for magnetic stratigraphy purposes and locating new mammal localities that will help in anchoring the paleomagnetic record to the Global Polarity Time Scale.

Even the monks at the Herjia Lamasery (photo) succumbed to the experience of preparing hand samples for paleomagnetism.

Henry Pollack and his wife Lana together taught an undergraduate seminar on "The Science and Politics of Global Warming". Lana, as some readers may recall, was a Michigan State Senator from 1982-1994, and currently is President of the Michigan Environmental Council. Seventeen students and two faculty learned a lot from each other, and the marriage actually survived!

After classes ended in May, Henry went once again to Russia to work with colleagues there on reconstructing climatic history from subsurface temperatures as measured in boreholes. The vast stretches from the Ural Mountains across Siberia comprise an unequalled archive of climate change imprinted on the permafrost and in the rocks beneath.

In August, Lana and Henry accompanied a U-M Alumni Association group to Iceland and Greenland aboard the ship Clipper Adventurer. Iceland, sitting astride the mid-Atlantic Ridge, displays abundant young rifts and geothermal regions, as well as very recent volcanism that nearly closed the harbor at Heimayey. In Greenland, we were able to tread on the Amitsoq gneiss, the oldest rocks on Earth, as well as get up to the edge of the ice cap near Sondre Stromfjord. It was at Sondre Stromfjord that Professor W. H. Hobbs had set up a

field research station in 1928. He gave the place the name Camp Lloyd, after Alfred H. Lloyd, then Dean of the U-M Graduate School. The bay by the port at the end of the fjord he called Michigan Bay. It was quite a nice feeling to get into these remote areas and find Michigan history so prominently on the maps**.**

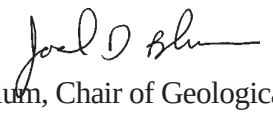
Rob Van der Voo celebated his 60th birthday this past Summer, and with help from **Ben van der Pluijm**, **Trond Torsvik** (Visiting Scientist, '95) of the Norwegian Geological Survey and **Conall Mac Niocaill** (Postdoctoral fellow '96-'98) of Oxford University, a two-day symposium was organized that included some twenty five scientific colleagues and former graduate students. Some terrific parties complemented the serious science. This year there are again two new students, one coming from Idaho, and one from China, who have joined Rob's research team. The new students are **Adam Collins**, who will be working on the paleomagnetism of Paleozoic rocks from Kazakhstan, in a collaborative project with Dr. Misha Bazhenov of the Geological Institute of the Russian Academy of Sciences. The aim is to unravel the displaced-terrane histories of island-arc components amalgamated into the Kazakhstan block. Adam went to the field for collecting already this past summer. The other new student is **Maodu Yan**, who joins us from Lanzhou University and who will be working with **David Rea**, **Xiao-Min Fang** (Visiting Scientist, 1996) and Rob to study the Neogene eolian deposits of western and central China. **Daming Wang** is now in his second year of work on the magnetic properties of ocean-floor basalts supervised by Rob and **Don Peacor**, whereas **Jingwei Si** is testing with Rob, Josep Parés and Xiao-Min Fang the occurrence of a Quaternary reversal, called the Blake Event, in Chinese loess and paleosol sequences. **Arlo Weil** continues to analyze the late Paleozoic deformation in Cantabria, Spain for his PhD thesis (to be defended soon, in Winter 2001) and the Precambrian paleomagnetism of rocks from the Grand Canyon, in collaboration with **John Wm. Geissman** (PhD '80 and adjunct faculty at U-M). Speaking of things Precambrian, one of Ben van der Pluijm's students, **Eric Tohver**, is now converted to paleomagnetism and is working on Grenville-aged rocks from western Brazil with what appear to be very interesting albeit preliminary results. With Trond Torsvik, Rob is exploring that most fundamental of paleomagnetic assumptions, namely that the geomagnetic field was purely that of a dipole. We are concluding that it was not, and that a significant non-dipole component of the field amounted to some 10% of the total field in late Paleozoic, Mesozoic and Early Tertiary times. This non-dipole field may cause errors of up to some eight degrees in the determination of paleomagnetic pole positions, which some people have suspected all along.

Camp Davis Alumni Getaway

Please mark your calendars! We are planning the first annual Geology Alumni Family and Friends Getaway at Camp Davis, near Jackson Hole, Wyoming. Although details remain to be worked out, we hope to start a new tradition of alumni camping in the week following the summer academic program. For the year 2001 this will mean a start date of approximately August 12th. For a reasonable fee (equivalent to a mid-priced motel and restaurant) we plan to provide the finest in Camp Davis accommodation and a full meal plan.Depending on interest we would also like to offer a schedule of activities including white water rafting, a scenic float trip, and trail riding (all at the going rate), as well as guided geology and naturalist hikes, children's activities, and a blend of seminars and discussions for intellectual enrichment. If you are interested in attending this summer and would like to receive an application form once they are available, please send an email or letter to the Dept. Office by February 1st, with the following information:

- Name, address and email (if available)
- Number in party
- Ages of children who might attend
- Interest in rafting, float trip, riding or hiking?
- Comments and suggestions

I look forward to meeting many of you in August.



Joel Blum, Chair of Geological Sciences
Send camp related email to atitus@umich.edu

Undergraduate Corner

The undergraduate student body has been and remains a central contributor to the strength and diversity of research activities in the Department. In this regard, it is interesting to consider the breadth of their involvement as research collaborators with the faculty and the spectrum of activities they undertake. Below are tabulated a series of current undergrads and the topics or their research.

Hans Hiser: *Global Plate Reconstructions in the Cenozoic: Using Satellite Altimetry*. Advisor, Carolina Lithgow-Bertelloni

Brian Shuck: *Oxygen and Carbon Isotope Analysis of Fish Otoliths: Did Pliocene Salmon Migrate to the Sea?* Advisor, Jerry Smith.

Zeina Joukhadar: *Migration Habits of Great Lakes Whitefish: $\delta^{13}C$ and $\delta^{18}O$ of Fish Otoliths*. Advisor, Jerry Smith.

Tracy Kolb, **Emily Johnson**, and **Tamara Gipprich**: *Geologic Maps as Geo-Odometers*. Advisor, Bruce Wilkinson

David Singer: *Global Hypsometry: the Roles of Tectonics versus Climate in Predicting Weathering Rates*. Advisor, Bruce Wilkinson

Tony Goodman: *Dynamics of the Great Lakes Fluvial System during Lake-level Lowstands*. Advisors, David Rea and Ted Moore.

Laura Holladay: *Magnetic Fabrics and Pencil Slates*. Advisors, Josep Pares and Ben van der Pluijm.

Laura Brunengraber: *Global Change Curriculum Development and Evaluation*. Advisor, Ben van der Pluijm.

Sarah Jacobson: *Wind and Climate Change: Evaluation of Loess and Fluvial Silts in the Pleistocene of China*. Advisor, David Rea.

Joe Groenke: *Ecological Reorganization of North American Mammals following Late Pleistocene Deglaciation*. Advisor, Dan Fisher.

Doug Boyer: *Mechanical Considerations in the Structure of the Mastodon Skeletal Structures*. Advisor, Dan Fisher.

Erin Himrod and **Ellen Dillon**: *Tusks of the Buesching Mastodon*. Advisor, Dan Fisher.

Ebere Azumah and **Peter Huff**: *A New Look at Leaves as Climate Indicators: The Relationship between Leaf Shape and Climate*. Advisor, Peter Wilf

Soft Rock Field Trip 2000

By K. C. Lohmann

From the Grand Canyon to Canyonlands National Parks

View of the White Rim Sandstone in Canyonlands National Park

This year brought about the most ambitious Soft Rock field trip to date, with a two week excursion to the Colorado Plateau. For many of our students this excursion was a unique opportunity to visit the classic sequence exposed in the Grand Canyon and to study the Mesozoic sequence and structure of the Colorado Plateau. This trip was supported with funds from the Field Trip Endowment, a fund established by a gift from one of our distinguished alumni, and a contribution from Conoco. In addition to 40 undergraduate and graduate students, Bruce Wilkinson, Kacey Lohmann, Linda Ivany, Carola Stearns and Tony Withers led the trip, providing logistical and geological support. By far, this was the best attended and most ambitious trip offered by the Department in the last 20 years.

View at the base of Angel's Landing Trail: See if you can find Waldo, one of the students.

To ensure that the maximum amount of field study could be completed in this region, the trip began with an arduous 33 hour drive to Gallup, New Mexico, where the group recovered with a night of camping at the base of the Navajo Sandstone. Though the drive westward was largely non-stop, we did manage several overviews of the Rio Grande Rift including short stops in some of the recent volcanic flows.

One of the major destinations of the trip west for folks from the Big House was Arizona's Big Hole, the Grand Canyon. Following an introductory excursion down Kaibab Canyon to the top of the Redwall Limestone, the group started out on a long one day hike deep into the Canyon on Bright Angel Trail. Most managed to descend as far as the lower reaches of the Phanerozoic section, while a few pressed on down the steep switchbacks in the Vishnu Schist, where some of the most spectacular geology and scenery was displayed.

Students emerging from their water adventure in the Narrows.

While most of us were accustomed to long hikes in the Tetons or other impressive mountain trails, the experience of what goes up (with effort) always comes down (with relative ease), did not prepare us for the long upward climb after a hot and dry day deep in the canyon. In total, the trip tallied more than 14 miles of trails in 100 degree weather.

Following the Grand Canyon, the group proceeded toward the North Rim, examining structures and the sedimentary sequence of the

eastern side of the Plateau. The second phase of the trip, the Mesozoic sedimentary sequence of southern Utah, began in Zion National Park. Here, the Wingate and Navajo Sandstones provided a spectacular natural classroom to examine the thick sequences of eolian deposits. The first day's hike ended in an obscure trail to Angel's Landing. We knew that we had a potential problem when the path suddenly became vertical, and chains were supplied by the park service to provide a sense of security. It does help to hold on when one overlooks a 1000 foot cliff on a 2 foot path with the potential of falling looming for each climber. In the end, everyone succeeded; those that were less comfortable with heights were helped by a cadre of more experienced field trippers.

Our visit to Zion offered the additional challenge of the Narrows, a stretch river cut deep into a canyon bordered by sandstone cliffs. About half of the group chose to take a short hike into the canyon, braving the ice cold waters and fast currents — a chilling moment not only for the hikers, but also for those who awaited anxiously for their return.

We proceeded eastward to Capitol Reef, where spectacular exposures of the Moenkopi and Chinle Formations allowed many to find collectable specimens of petrified wood and dinosaur bone in localities outside of the park.

From here, the trip gained some altitude as we ascended into the Tertiary section of Bryce Canyon. Camped high in the mountains around Bryce Canyon, the group had their only encounter with subfreezing night temperatures, an experience that tested the effectiveness of our equipment and our resolve for late night discussions around the campfire. On our hikes through Bryce, we would swarm over the paths, extending into a single column of geologists as far the eyes of the old professors could see. Along the way, passing tourists would commonly chant GO BLUE ,GO BLUE. I guess we made an impression.

The vistas from high on the rim of Canyonlands provided the perfect setting for synthesizing the regional geologic structure and sedimentologic history. Unlike lectures in the classroom, field teaching provided students with the opportunity to directly see the geologic and sediment structures and place these within a context of process and regional geologic history.

The final day of field tripping explored the unique features of erosion and wind sculpting in Arches near Moab, Utah. That evening, camped along a fast moving river, a field trip banquet of hotdogs and salads prepared everyone for the long 24 hour drive back to Ann Arbor.

Students scouring the outcrop for bone and petrified wood outside of Capitol Reef.

The serpentine column of UM students descend deep into the canyon at Bryce.

Bruce Wilkinson, far left, provides regional perspective to students in Canyonland National Park.

Eolian dunes exposed in the southern reaches of Canyonlands Park.

Fall Geology Club Picnic

The Geology Club of the Department again hosted the annual Fall Picnic to celebrate the beginning of the new term. This event has become one of the many activities that draw faculty, families and students together for a day of fun, food and entertainment. Beginning early afternoon with refreshments, sports and a barbeque, it progressed well into the early morning with a flaming finish of roasted marshmallows and cream pies.

Grads (left) and undergrad students (right) listen with fascination as Cindy Blum (far right) professes on the meaning of life

Even during times of frivolity, graduate students continue their research experimentation. Here, Kate Griffin performs partial melting experiments employing state of the art laboratory instrumentation.

Campfire Activities: Graduate students discover a new way to roast marshmallows. Melroy Borges (l) Cliff Claflin (r)

Lora Wingate, Boris Kiefer, Ann Hoenke and Mo Kreple discuss the process of convection in terms of fluid dynamics in low temperature media.

Entertainment: Peter Kaplan joins Brandon McElroy in a round of campfire songs. Perhaps they will have a career in the rock business afterall.

Time for Desert: Doug Boyer, Kate Griffin, Cliff Claflin, John Solum and Brandon McElroy (left to right) find eating pies difficult after a long evening of festivities.

Geoalumni Information

Use this form to update your mailing address or to provide information to be used in the Alumni News section of the *Geoscience News*. (Please type or print)

Name _____ Phone (___) _____

Residence Address _____
Street Address City State Zip

Business Address _____ Business Phone (___) _____
Position Company

_____
Street Address City State Zip

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

Degree _____ College or University _____ Year _____

Degree _____ College or University _____ Year _____

Degree _____ College or University _____ Year _____

Spouse _____
Year of Wedding

Child _____ Child _____
Name Birth Date Name Birth Date

Child _____ Child _____
Name Birth Date Name Birth Date

Child _____ Child _____
Name Birth Date Name Birth Date

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

Name _____ Phone (___) _____
Relationship

_____
Street Address City State Zip

Please send us any news of your "doings" to be included in the next newsletter; simply write below.

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