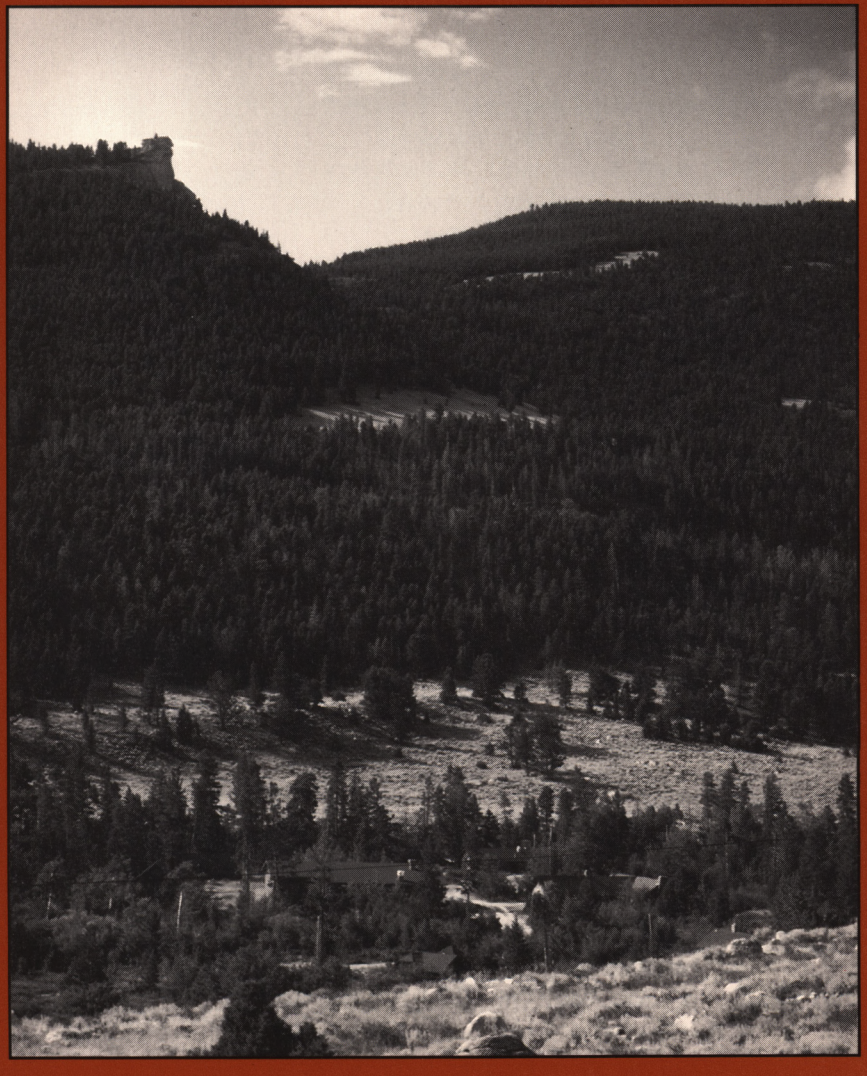
GEOLOGICAL SCIENCES

ALUMNI NEWSLETTER NOVEMBER 1996



UNIVERSITY OF MISSOURI-COLUMBIA

GEOLOGICAL SCIENCES

ALUMNI NEWSLETTER 1996

Editor: Glen R. Himmelberg.
Composition: Marsha Huckabey.
Editorial assistance: Tom Freeman.

On the cover: Camp Branson, where we hope to see you at the 1997 field camp reunion.

Roster

Assistant Professors
Mian Liu (University of Arizona, 1989)
Geophysics
Timothy Lyons (Yale, 1992)
Aqueous Geochemistry
Carol Wicks (University of Virginia, 1992)
Hydrogeology

Associate Professors
Robert L. Bauer (University of Minnesota, 1982)
Precambrian geology
Joseph F. Engeln (Northwestern University, 1984)
Geophysics

Professors
Raymond L. Ethington (University of Iowa, 1958)
Conodont biostratigraphy
Tom Freeman (University of Texas, 1962)
Carbonate petrology
Glen R. Himmelberg (University of Minnesota, 1965)
Chemical petrology
William D. Johns (University of Illinois, 1952)
Clay mineralogy
Peter I. Nabelek, (SUNY Stony Brook, 1983)
Trace-element geochemistry
Kevin L. Shelton (Yale, 1982)
Economic geology
James H. Stitt (University of Texas, 1968)
Trilobite biostratigraphy
Michael B. Underwood (Cornell, 1983)
Sedimentology

Professors Emeriti
Walter D. Keller (University of Missouri, 1933)
Clay mineralogy
A. G. Unklesbay (University of Iowa, 1942)
Paleontology
George W. Viele (University of Utah, 1960)
Tectonics

Staff
Nathan Chao, Research Specialist
Linda Garrison, Senior Secretary
Marsha Huckabey, Administrative Associate I
Louis M. Ross, Senior Electron Microscopist

Library
Stephen Stanton, Library Assistant II

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From our department chair. . .

The past year was one of excitement, hard work, and change. Major activities ranged from refining our departmental strategic plan to celebrating the success of our colleagues. I am especially pleased that our tradition of excellence continues to be recognized with prestigious awards presented to alumni, faculty, and students. Details of these awards are presented elsewhere in this *Newsletter*, so I will not repeat them here. Let me say, however, that we have others that are equally deserving and I am confident that their achievements, too, will be recognized in the future.

At the request of the MU administration, we have devoted considerable time and effort this past year to developing our department's strategic plan. With the downturn of hiring in the petroleum industry, many departments across the nation are de-emphasizing the traditional curriculum in geology in favor of one that concentrates on environmental sciences. We have not done so. Instead we have chosen to retain our traditional core curriculum with options that allows students to tailor their studies to areas of interest. We believe that this approach allows students to prepare for their career paths of choice and also provides them with the background to change career paths in the future. Our field studies course at Camp Branson remains the capstone of our curriculum. Changes and advances in the geological sciences, however, have resulted in changes in the field camp instruction (see article on Camp Branson). Currently, most of our students find employment in the environmental industry. However, last year, through the efforts and recruiting of Tom Moore (MA '81), we placed two of our students, Wendy Metcalf Straatmann and Tim Keller, with Phillips Petroleum Co.

Our strategic plan calls for us to strengthen our research emphasis in geochemistry. We will continue research in the traditional fields such as sedimentology, paleontology, geophysics, and petrology, but we will focus our resources to create a nationally recognized program in fluid/rock geochemistry. We believe this is a discipline of unlimited application, including oil and gas generation and maturation, origin and extraction of mineral deposits, environmental remediation, and climatic change. We believe this focus will provide our department with an unparalleled opportunity to contribute, through teaching and research, to a range of changing societal needs.

On the personnel front, there were several changes during the past year. We are fortunate to have two visiting scientists with us. Susanne Gier, an assistant professor from the University of Vienna, arrived last January for one year to collaborate on research with Bill Johns; and Ed van Hees, a post-doctoral candidate from the University of Michigan, joins us this fall to work with Kevin Shelton. Ann Holmes, who was a member of our faculty for two years, left in July to accept a lectureship with Columbia University to teach in an undergraduate environmental program at Biosphere 2 in Tucson, Arizona. We will miss Ann. She made many contributions to our department in the short time she was here. Probably the most critical change for our department was the resignation of Nathan Chao. Nathan was with our department for thirteen years, and those of you who know Nathan also know that he was one person who approached being indispensable. On a particularly sad note, Norm Smith (BA '51, FC '54), a member of our Development Board and a true friend of our department, passed away last summer. Norm gave so much to our department and to his community of Lafayette, Louisiana. We will miss him.

Our Geology Development Board elected new officers at its spring meeting. Ernie Knirk (BS '65, MA '70, FC '62), who served two terms as board chairman, passed the gavel to Scott Raymond (BS '72, MA '74, FC '71). Scott had been vice chairman, an office now held by John Van Brahana (MA '68, PhD '73). I look forward to working with Scott and Van, and I also want to take this opportunity to thank Ernie for the many contributions he has made to our Development Board and to our department.

Most surprising this summer was the dismissal of Charles Kiesler as chancellor of this campus and the retirement of George Russell as president of the University System. Melvin George and Richard Wallace have been named interim President and Chancellor, respectively. Although these events were unexpected, our department and the campus continue to move forward with hardly a pause. I believe this speaks to the confidence in our interim officers and the strength and stability of the faculty and staff, who are the heart of any university.

I am pleased to announce that two more named endowments have been established in our department. We now have the *Carl B. Rexroad Geological Sciences Endowment Fund* and the *John and Betty Marshall Opportunities for Excellence in the Geological Sciences* fund. Carl Rexroad is a conodont paleontologist who received his BA ('49) and MA ('50) from our department and who is currently with the Indiana Geological Survey and Indiana University. A profile of John Marshall is presented on pages 35–36. We were also fortunate this year to make the first *A.G. Unklesbay Travel Award.* Mian Liu was provided funds to visit Death Valley, California, and the Grand Canyon, Arizona, to enhance his teaching of our Surficial Processes course. This year we will also award the first *Edmond A. and Mary L. Raymond Scholarship* and the first *Wallace B. Howe Fellowship.*

We are making final plans for our Camp Branson reunion to be held on July 11, 12, and 13, 1997. The response has been terrific; we expect 200 or more former students, friends, and their families. If you plan to attend, and we encourage you to do so, but have not yet let us know, please do so soon so we can include you in our mailing of final details and plans.

In closing let me say I greatly enjoyed meeting with alumni and friends at the annual meetings of AAPG in San Diego and GSA in New Orleans. I really do find it rewarding to meet department alumni. Support for our department has been outstanding, and I want to take this opportunity to thank everyone for his or her moral and financial support. Your contributions help to support all aspects of our department such as field trips, scholarships and fellowships, and equipment purchases. Support such as yours is essential and greatly appreciated.

Enjoy the *Newsletter* and keep us informed of your activities. Drop by our alumni receptions at the annual meetings of GSA and AAPG, and if the opportunity arises to be in the vicinity of Columbia, please stop by to see us. I also urge you to check out our home page on the World Wide Web: http://www.missouri.edu/~geolwww.

Best Wishes,

Glen R. Himmelberg
Chairman and
E.B. Branson Professor

Tracy Arm, southeastern Alaska—part of the central metamorphic belt currently being studied by Glen Himmelberg.

Faculty and staff news

(In their own words)

Faculty

Bob Bauer served another year as director of Camp Branson (see section of the *Newsletter*) and spent the last month of the summer working with his graduate students in the Laramie Range in southeastern Wyoming. Terri Zeman completed a second summer of field work toward her MS, and Todd Byrd completed his first summer of MS field studies examining the complex deformation and metamorphism in the Elmers Rock greenstone belt. Ken Tomlin, currently an MU undergraduate student, served as field assistant for Bob, Terri, and Todd. Ken had the distinction of having a close encounter with a mountain lion (ca. 20 meters) while he, Bob, and Terri were working in some of the high country. (Good thing the lion looked well fed.) Bob reported on some of the work in the Laramie Range at the Rocky Mountain GSA meeting in Rapid City last spring. He will also be leading a field trip in the Laramie Range, with faculty at the University of Wyoming, in association with this fall's national GSA meeting in Denver. In order to further collaborate with UW faculty on the Laramie Range project, Bob is spending part of this fall semester as a visiting professor in the UW Geology and Geophysics Department.

Joe Engeln continues to look at the Earth both from space and from below ground. He recently submitted a paper on strain rates near the New Madrid Seismic Zone and is preparing for another round of observations to be able to place better constraints on that system. Xudong Xin completed his master's thesis on the tectonics of transform faults, and he and Joe are working to publish those results. In addition, Joe is working with Carol Wicks and Todd Halihan to publish Todd's thesis. He also continues to look at the effects of subducting lithosphere on overlying continents. Patrick McClung and John Hoke are both working with him on interpreting satellite data in Missouri. This fall he will be serving on a NASA panel that will review the satellite tracking program. Joe had a productive summer writing papers and proposals as well as teaching geophysics and GPS for a week at the field course. He also spent 10 days in Maine with a group of Missouri teachers, co-directing an environmental workshop that included geology, oceanography, and biology. As Director of Undergraduate Studies, Joe has helped complete the preparation of "clusters" for incoming freshmen and helped the department review and renew its curriculum. Though the changes were minor, the new curriculum will make it easier for students to avoid conflicts and semesters in which they do not have the prerequisites for preferred courses.

Ray Ethington spent the winter semester organizing a class devoted to dinosaurs, which he taught owing to Jim Stitt's research leave. The class attracted over 50 students, probably none of whom learned as much as he did. He was so pleased with the outcome that he is conducting a reprise during the fall semester of 1996 with almost as many students as before. The dinosaur course is one of several in the department that is part of a package of courses from the departments of Anthropology, Biological Sciences, and Geological Sciences that has been approved as a "cluster" that will satisfy general education requirements for students not majoring in one of the sciences. The year involved some travel, about half of it for the SEPM Foundation for which this will be his last year as president and member of the SEPM Council. He continued his service on the international working group charged to identify a global standard of reference for the Cambrian-Ordovician boundary. Other travel was to chair meetings of the Friends of the Ordovician during the GSA convention in New Orleans and the North American Paleontological Convention in Washington, D.C. In the role of Chief Panderer [*sic*] of the Pander Society he assembled and distributed the annual newsletter (81 pages) to over 300 conodont enthusiasts throughout the world. Early August allowed a quick trip to the Roberts Mountains in Nevada to participate in an NSF funded project on Lower/Middle Ordovician and Upper Ordovician/Silurian boundary relations (as documented by conodonts of course, but with the aid of graptolites and anything else they can find). Work with John Repetski (USGS), Jim Loch (Central Missouri State University), and Paul Myrow (Colorado College) on Lower Ordovician conodonts of the mid-continent has occupied spare time as available.

Tom Freeman had what he understandably calls his most rewarding year ever in teach-

ing—receiving not one, but *three* prestigious teaching awards (see elsewhere in this *Newsletter*). In addition to Tom's daunting courseload of (a) Honors Principles (in which he teaches the lab as well as the lecture), (b) Auditorium Principles (both fall and winter), (c) Carbonate Petrology (when enrollment warrants), and (d) Historical Geology Writing Intensive, he plans to institute a new course—The Geology of Our National Parks—beginning next January. In preparing for his national parks course, Tom says that he would appreciate any photos, brochures, and/or other relevant information that you readers can donate! Tom's personal agenda for this past year included his and Peggy's touring the coast of Maine (and, of course, Acadia National Park!) with son Tom (of Rhode Island). The Freemans also spent numerous happy weekends with son Rob and his family, either in Kansas City or at the homeplace, *Los Balcones*, here on Perche Creek. Tom and Peg assure listeners, "one can't have too many grandchildren!" Tom and Peg, along with Rob and family, hope to see all of you alumni of Camp Branson at our reunion in Sinks Canyon next July. The Freemans are also planning a summer '97 trip to Spain to visit old friends there: Antonio Obrador (post-doc student, 1973) and family in Barcelona, and José Martin (post-doc student, 1977) and wife, Maria José, in Granada.

Glen Himmelberg devoted most of the past year to the myriad duties required of the Chair, which ranged from mundane to challenging. Fortunately, teaching by the Chair is allowed, so Glen continued to teach Optical Mineralogy, and he also taught four weeks of Low Temperature Aqueous Geochemistry for Tim Lyons while Tim was participating in an ODP cruise in the Caribbean. Glen continues his collaborative research with colleagues in the Alaskan group of the U.S. Geological Survey, although his rate of progress has been slowed by administrative priorities. The progress that was made can be attributed to the excellence of Tim Keller, who worked with Glen as a research assistant, and to the slower administrative pace during summer months.

Bill Johns has been teaching his usual offerings during this academic year. He has also been working with Susanne Gier, a post-doc funded by an UM Research Board grant, on surface properties of micas and clay minerals. He and Susanne presented a joint paper at the annual meeting of the Clay Minerals Society in June, and they travelled in late August to Banska Stiavnica, Slovakia where they gave another joint paper at the 14th Conference on Clay Mineralogy and Petrology of the Czech and Slovak National Clay Groups. Also at this meeting Bill was honored jointly by both groups as Distinguished Member, and was asked to present a plenary lecture at the meeting.

Walter Keller's 'piling system' in his office is being cluttered (further cluttered?) by sorting, and possibly giving away, of old reprints of three types: (1) those sent to him by their worthy authors, (2) those accumulated by WDK from fellow faculty members (e.g., Branson, Mehl, Tarr) and alumni (e.g., Bill Rubey), and (3) those written by WDK since the time of his 1929 masters thesis. Do you want any of such reprints? If so, send a request pronto. Doc Keller is co-author of a manuscript on phosphate minerals in Missouri refractory clays hat has been accepted for publication in *Clays and Clay Minerals*. In April he was honored with membership in the Academy of the School of Mines and Metallurgy at Rolla. This diploma adds to the twenty-three plaques competing for space on his office wall. The mini-statue of the illustrious UMR Miner, a part of the Academy's award, now dignifies a corner of his desk. No objection has been raised to the expressed notion (in the September, 1995 JGE) that a smart *Novo sapiens* will follow us current *Homo sapiens-stupidens* correlating with the increase in entropy in the universe. The next geologic question for you smart alumnae-i is, "Why were the universe and *Homo* created?" Send your answer to Doc Keller for his reflection.

Mian Liu's best time in the last year was a field trip to the Grand Canyon and southern Utah, supported by an A.G. Unklesbay Travel Award. The natural beauty of the American west is so breath-taking that for a moment Mian was thinking of becoming a field geologist, but then the hot and humid Missouri summer convinced him that sitting in an air-conditioned computer lab is not so bad. He and Yunqing Shen, a Ph.D. candidate, have been investigating the geodynamic processes of Cenozoic extension in the western U.S. Their results indicate a common link between late Cenozoic extension in the Basin and Range province and uplifting in the Sierra Nevada and

western Colorado plateau, as suggested by recent seismic and gravity studies. These results are being presented at the GSA meeting in Denver at the end of October. This work is now being expanded to include tectonics in the central Andes and the Tibetan plateau. Not being able to attend the 30th Geological Congress in Beijing last summer was regretful, but Mian is planning to see some real mountains in Tibet next year. Mian taught Applied Geophysics, Surficial Geology, and Engineering Geology last year, and is looking forward to the new challenge of substituting for Bob Bauer in teaching Structural Geology next winter.

Tim Lyons' past year has been busy and exciting. Highlights include two months at sea as a geochemist aboard Leg 165 of the Ocean Drilling Program. The hours were long and challenging, but Tim received little sympathy from those left behind to brave the Missouri winter while he sailed the Caribbean. Last summer presented Tim with six wonderful weeks in Europe. Activities included research conferences in Switzerland and England, three productive weeks at the Swiss Federal Institute of Technology (ETH) in Zurich, fieldwork in the mountains of Italy, and an exploration of 20th century European art. At this writing, Tim is dealing with last-minute details before heading out to sea for a two-week adventure with one of his students, Anna Cruse. Tim and Anna will collect sediments from a small anoxic basin on the northwestern slope of the Gulf of Mexico. The ship is small and the seas can be rough, so they have been watching the weather channel diligently. Tim is beginning to fully realize the compensatory nature of an academic lifestyle—the pay may not be great and the hours are long, but... Thanks in large part to innumerable student contributions, the geochemistry lab has become a well-equipped facility and a focal point of student activity. Tim, Peter Nabelek and Carol Wicks have been aggressively pursuing funding for an ICP, the lab's final needed piece of major equipment. Tim feels fortunate to have three terrific graduate students—Anna Cruse, Jim Luepke, and Robby Valentine—all of whom are working on projects of broad interest. Undergraduate involvement in the lab remains high, ranging from invaluable assistance with diverse projects to the undergraduate thesis research of Gretchen Degler. Tim continues to enjoy teaching and remains involved with editorial responsibilities.

Peter Nabelek continues most of his research effort on the Proterozoic granite-metamorphic terrane of the Black Hills, South Dakota. He has several students working on projects ranging from igneous and metamorphic petrology to structural analysis. The structural work, which is in collaboration with Bob Bauer, is aimed at understanding the relationship of granite emplacement to crustal collisional that occurred during the Proterozoic. In addition to field work this past summer, Peter once again taught field camp for about ten days. Following field camp he spent two weeks camping and 4-wheel touring with Carol, Danny and Tommy in Idaho, Montana, and Wyoming. The highlights were camping on the rim of Hells Canyon, atop the Stillwater Complex in the Beartooths, and hiking in the Cloud Peak area of the Bighorns. The kids loved it and collected almost more stones than Peter does during his field work. Otherwise, things back in Columbia were pretty much the same as the previous year.

Kevin Shelton had a very busy year teaching three sections of Principles of Geology plus Economic Geology, as well as serving as Director of Graduate Studies while Jim Stitt was recuperating. Kevin has begun two new research initiatives: (1) geochemistry and dolomitization of Carboniferous rocks and their relationship to Pb-Zn-Cu ore formation in Ireland, and (2) geochemistry of Archean greenstone-hosted gold deposits in the vicinity of Yellowknife, Canada. The former of these projects "required" a ten-day visit to Ireland over spring break to develop an NSF proposal with UMR colleague Jay Gregg, who was a Fulbright fellow in Dublin. The latter of these projects, funded initially by a combination of University and industry grants, involved two weeks of fieldwork at gold mines in the Northwest Territories with M.S. student Todd McMenamy and new postdoctoral fellow Ed van Hees. While in Canada, Kevin presented a series of four research seminars to the local chapter of the Canadian Institute of Mining, as well as two "memorable" talks presented to nine exploration geologists in the bedroom of an Indian and Northern Affairs Program geologist's house. (With 22 hours of daylight in the far north, it was the only place dark enough to operated a slide projector.) Kevin is also busy editing manuscripts for two major special publications: (1) SEPM Special Publication "Basin-Wide Diagenetic

Patterns: Integrated Petrologic, Geochemical, and Hydrologic Consideration," and (2) the Society of Economic Geologists 75th Anniversary Volume "Carbonate-Hosted Lead-Zinc Deposits." Kevin continues to bring local, national, and international attention to our department as Associate Editor of two major journals—*Mineralium Deposita* and the *Geological Society of America Bulletin.*

Jim Stitt began what he expected to be an enjoyable 1995–96 academic year, continuing with his research on Upper Cambrian trilobites from the Black Hills. Little did he know how wrong that scenario was to be. In September, 1995, Jim was diagnosed as having colon cancer that had spread to his liver. He had surgery to remove the cancer, and made a good recovery. Three weeks after the surgery he began chemotherapy. Unfortunately there were numerous complications, with several hospital visits, that made this past year a very long one. Jim is sure that anyone over 50 should get a colonoscopy in an effort to be spared what he has gone through. Jim worked on his research as often as he could, completing revisions of a manuscript with Wendy Metcalf Straatmann on latest Cambrian trilobites from the Black Hills that will be published next March in the Journal of Paleontology. He also managed to get about half of his original research project completed. Doctors gave Jim most of the summer off, and he has regained much of his strength. He has resumed teaching again this fall. Unfortunately, Betty was diagnosed with breast cancer in June. She has had surgery to remove the cancer, and has begun follow-up chemotherapy. Daughters Tanya (of our MU Publications Office) and Merrilee (of Columbia's 3M plant) are close at hand, and Jim and Betty are enjoying having them in town. Jim and Betty are hoping for better days ahead.

Mike Underwood was on Research Leave during the 1995–96 academic year. During the fall, he traveled to Bavaria for a post-cruise meeting associated with ODP Leg 156. A field trip to the Austrian-Italian Alps was followed by a tour of Budapest, his mother's birthplace. Everyone in Hungary, as it turns out, is handsome or beautiful, and the food is terrific. JOIDES-related excursions included a meeting of the Sedimentary and Geochemical Processes Panel in Copenhagen and a meeting of the Tectonics Panel in Antalya, Turkey. During the spring, Mike spent six weeks in California. He hosted the TECP meeting near Morro Bay, led a three-day field trip along the Sur-Obispo coast, attended another SGPP meeting in La Jolla, spent spring break with wife, kids, and golf clubs near San Diego, did more field work, presented two invited lectures at the USGS, and made a nostalgic return as a visiting speaker to the University of California, Santa Cruz, (his alma mater, and home of the fighting Banana Slugs). Mike returned home for a long enough period to be honored as the recipient of the 1996 Chancellor's Award for Outstanding Faculty Research. Seldom remorseful, he then had the gall to spend most of the summer as a shipboard scientist on the *JOIDES Resolution* (ODP Leg 168 - Juan de Fuca Ridge hydrothermal experiment). Meanwhile, Gail completed another successful year teaching second grade at U.S. Grant Elementary School, Alexis graduated with distinction from Hickman High School and is now attending the University of Minnesota, and Nik finished junior high and assumed the role of the family's resident Hickman Kewpie.

A.G. Unklesbay continues as a retiree consultant member on the Board of the University Club. He suggests you try lunch or dinner at the Club whenever you are here on campus. He also serves as the dabster who receives the "what-is-it specimens" that reach us in increasing numbers. You would be pleased to see how many display specimens become gifts or on-loan to our department. When your personal collection gets too big, and you don't know what to do with your next "find," think of our display cases.

George Viele is writing this annual report in the third person so that it might sound with becoming modesty as though his mother had written it. George had an excellent year—nay, a *superlative* year. After returning from Argentina, regretfully, because a lovely señora had offered him tango lessons, he returned to the more mundane pleasures of re-arranging continents on the globe. Oh, for a book on the habits of gloriously ineffective people. Anyhow, he published an Oklahoma Geological Survey paper on the sacred Ouachitas. At the national GSA in New Orleans, he chaired a session on the Ouachitas and presented a paper on the closing of the Ouachita ocean. In Austin last spring, he gave another paper

on opening the Ouachita ocean, leaving it to the audience to reason which occurred first. George is being drawn, not unwillingly, into debates about how and when part of east Texas shipped out for Argentina. Doing this in retirement for no raise in pay? George concludes that his publishing of papers during the preceding thirty years was habit forming, and now—free of the pressure of continuous publishing—he can settle down to do some serious research. George and Kathleen spent most of the summer in Turkey and Greece, where he continued his studies on the tectonics of the Peleponnesus. This fall, he is sitting in, as is his wont, on courses in the College of Arts & Science. Be assured alumni, teaching is excellent at MU. Learning could be improved.

Carol Wicks had a busy year teaching, developing a new course, and simulating the real world on her computer. In addition to teaching Hydrogeology and Global Water Cycle, Carol offered a course in Karst Hydrogeology in the winter/spring semester. The Karst Hydrogeology course included three one-day field trips to the many karst features in Missouri. Carol also continues to develop the environmental geology component for our summer field course. This past summer Wyoming field projects were undertaken in the Dry Lake region, the Fremont County landfill facility, and at Camp Branson (see field camp section of this *Newsletter*). Carol's main research interests are in contaminant transport through karst aquifers. She involves herself and her students with both field-based studies and numerical modeling studies. The first project along this line of investigation was concluded when Todd Halihan completed his Masters thesis this past spring. Todd is continuing his graduate work at the University of Texas-Austin. Carol's other graduate students, Brian Bohm and Lee Florea, are continuing their projects on groundwater flow and contaminant transport. Carol and Doug Noltie (of our Department of Fisheries and Wildlife) wrote a proposal to the National Science Foundation seeking funding for a multi-disciplinary project on the effect of contaminants in a cave ecosystem. Tim Lyons and Carol received matching funds from our MU Research Council and purchased a much needed ion chromatograph. Peter Nabelek, Tim Lyons, and Carol are seeking matching funds for an inductively coupled plasma spectrometer.

Staff

Nathan Chao officially changed his name from Naiyu Zhao and became a naturalized citizen this past year. Prior to his resignation this fall, Nathan was working with Bill Johns in the Source Clay Repository and was a tremendous help in assembling our new X-ray fluorescence equipment that was donated last fall (see additional information elsewhere in this *Newsletter*). Nathan also maintained our departmental computers and supervised the X-ray Diffraction lab.

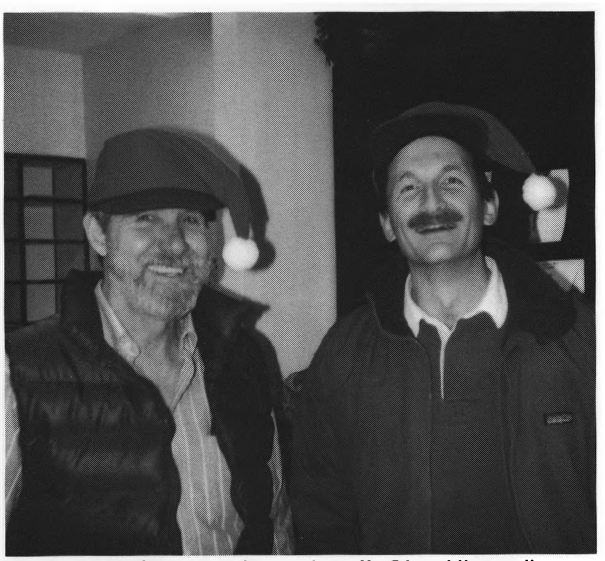
Linda Garrison has completed her fourth year in the department and reports an unusually busy year. She completed her two-year term as secretary on the Arts and Science Staff Network and hopes this will give her a little more free time this coming year. Because the department office has been kept so busy this past year, she found it hard to complete all the necessary work to be an officer as well as a member on several committees for the Network. Linda's youngest daughter, Julie, graduated from college at the University of Texas-Dallas and began working on her Master's degree this fall. Both Linda and husband David attended graduation (attendance was mandatory!) and experienced a truly proud moment in their lives. Linda's garden has been very productive this past year and she has spent a lot of time working on it. She has been canning a variety of vegetables, relishes, and jams. Linda thinks that the work in the garden is therapeutic after a hectic day in the office. The weeding and hard work helps relieve the tension of a long day! She enjoys the fruits of her hard labor in the winter time when the snow is flying. She reports that food tastes better when you grow it yourself and it's chemical-free.

Marsha Huckabey had a very busy year. In April she was elected to the Arts and Science Staff Network as vice chair for the upcoming year. She has been very busy working on our Field Camp reunion that will be held at Camp Branson in July, 1997 and hopes to see many of you there. She has also been working with Scott Raymond, our new development board chair, on upcoming Board activities. Marsha had been updating our alumni file, and hopes that many of you will send her your e-mail address (at geolmh@showme.missouri.edu). Also, please keep

her advised of address and phone corrections so that she can keep our alumni file up-to-date. On the homefront, oldest son Dustin broke his right arm shortly before school began, delaying his first football season as an LSE Hawk. Brandon began fourth grade and is enjoying playing flag football. Zachary is now almost three and loving life. He keeps Marsha and husband, Rodney, running!

Lou Ross was elected chair of the Arts and Science Staff Network for 1996–97. He also made a return trip to the National Center of Electron Microscopy at the Lawrence Berkeley National Laboratory in July to complete the fellowship that he was awarded last year. Lou is taking a break from teaching the SEM and the Electron Beam X-ray Microanalysis courses this academic year. During this time he will be revising both courses, enhancing the lab exercises, and adding an EDS x-ray component to the SEM course. He is also in the process of automating the service operation and improving some of the analytical software on the 1600 research SEM. Lou also wants to publish a new quantitative method to determine the major element chemistry of clay minerals by SEM/EDS. He has been working on this technique over the past several years with Eric Hathon, Nathan Chao, Bill Johns, and Mike Underwood. Lou's wife, Patti, is an exercise physiologist at the Cardiac Rehabilitation Lab, Wellaware, at Boone Hospital. Besides helping with exercise prescriptions, she is also coordinating the aerobics program and is still jogging and playing soccer. Jacci is beginning her freshman year at Truman State University in Kirksville, and Angie is in her junior year at Hickman High School. Jacci hung up her soccer shoes, but Angie is playing on two club teams, one of which is in St. Louis. Jeanna is in first grade at Ridgeway School, playing soccer during the fall and T-ball during the summer.

Stephen Stanton has been our librarian since January 1995. Stephen is an enthusiastic amateur geologist who would like to shed the amateur label. He is still quite able to help people find what they need in our library, and he does his best to keep our important collection well-tailored to research done at MU. He takes an interest in news relevant to geology and in the research conducted here. Stephen has long been a student of the history of science. He regularly attends colloquia and field trips, and still considers himself very fortunate to be here. He is also the new father of the best baby boy who ever was, and he also (modestly) makes the best barbecue anywhere in the former Western Interior Seaway.



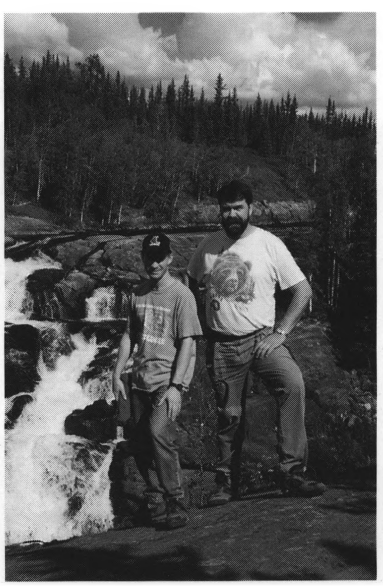
On behalf of the faculty and staff, Glen Himmelberg (left) and Kevin Shelton wish you a happy holiday.

Visiting scientists

In January **Dr. Susanne Gier** joined our faculty for the calendar year as a post-doctoral visiting assistant professor. Susanne recently became a member of the faculty of the Institute of Petrology, University of Vienna—the first woman faculty member of that renown institute. Also, she has become the premier clay mineralogist among Austrian academics. Susanne came to Columbia to conduct research with Bill Johns on the surface properties of micas and related clay minerals. They have been using the x-ray photoelectron spectrographic (XPS) facility at UM-Rolla on a cooperative agreement there. XPS is rapidly becoming a primary research tool for probing the surface properties of minerals and other crystalline substances. Susanne and Bill presented joint papers at the Clay Mineral Society meeting last June and at the Czech-Slovak Clay Meeting in Slovakia in late August. It is anticipated that their collaboration will continue after her return to Vienna in January of 1997.

Edmond van Hees is an easily recognizable new face in our department. At 6 feet 9 inches he towers over Kevin Shelton, with whom he is conducting research on the mechanisms of transportation and deposition of gold in hydrothermal ore systems.

Ed was born in the Netherlands and moved to Canada as a child. He received his BS from the University of Waterloo in 1975 and his MS from the University of Western Ontario in 1979. His PhD from the University of Michigan will be conferred soon. He has more than 15 years of research and practical experience in a variety of Canadian gold districts.



Ed first met Kevin on a joint MU-UMR-Michigan field trip to southeast Missouri's lead-zinc district. A year later, they met again in New Hampshire at a research conference on hydrothermal deposits. Ed and two of his PhD advisors, Stephen Kesler and James O'Neil, subsequently visited MU as seminar speakers, and Kevin was an invited speaker at Michigan.

As a result of their common research interests and developing collegiality, Kevin and Ed decided to pursue funding to bring Ed to MU at the completion of his Michigan studies. They were successful in securing funds from the University of Missouri's Research Board and from the Royal Oak Mining Company to support Ed for the next two years.

This past summer Ed (on right in photo), Kevin, and MS student Todd McMenamy (left) were in the field in Yellowknife, Northwest Territories studying Archean (Precambrian, 2.6–2.7 B.Y. old) greenstone-hosted gold deposits of the Giant gold mine. Although Archean deposits provide a large portion of the world's gold, several important questions regarding their genesis are yet to be answered: What is the source of gold, and how was it mobilized from the source region? How is gold transported in solution? How is gold deposited from solution? What causes mineralogically identical zones to be auriferous in some localities and barren in others? Ed's studies of the Giant gold mine, N.W.T., Canada will address these questions through combined application of a variety of geochemical techniques (e.g. fluid inclusion geothermometry and volatile analysis, stable isotope geochemistry, trace- and minor-element analysis) that will enable him to document the history of fluid-rock interaction in the Giant gold-bearing hydrothermal system.

Our research on ore deposits will be even more lively with Ed here.

Research grants

(Awarded last year)

A.G. Unklesbay Travel Award
Mian Liu $750

Assistant Professor Travel Award (College of Arts and Science)
Mian Liu $300

JOI-USSSP
Timothy Lyons $21,000
Michael Underwood $30,203

MU Research Council
Timothy Lyons and Carol Wicks $5,000

Royal Oak Mining Company
Kevin Shelton $20,000

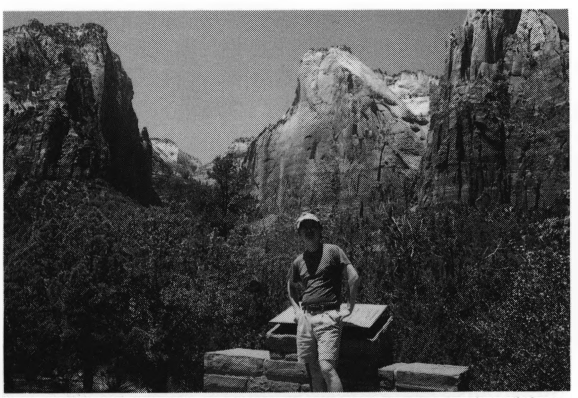
Texas A&M University
Timothy Lyons $19,981

UM Research Board
Bill Johns $33,000
Timothy Lyons $23,200
Kevin Shelton $22,164

Dr. Keller was congratulated by Dean Lee Saperstein and Dr. Robert Moore at his induction into the Academy.

First A.G. Unklesbay Travel Award granted

As "Unk" traveled to sites of geologic interest throughout his career, he often reflected on how his teaching could have been enhanced had these travel opportunities been available to him while he was a young teacher. With that in mind, he established an endowment to defray expenses for young assistant professors to travel to classic geologic sites that would provide them with first-hand knowledge of geologic processes. The first award from this endowment was granted to Mian Liu, who traveled last summer to Death Valley, California, and to The Grand Canyon, Arizona, for experiences that enhance his teaching of our Surficial Processes course.

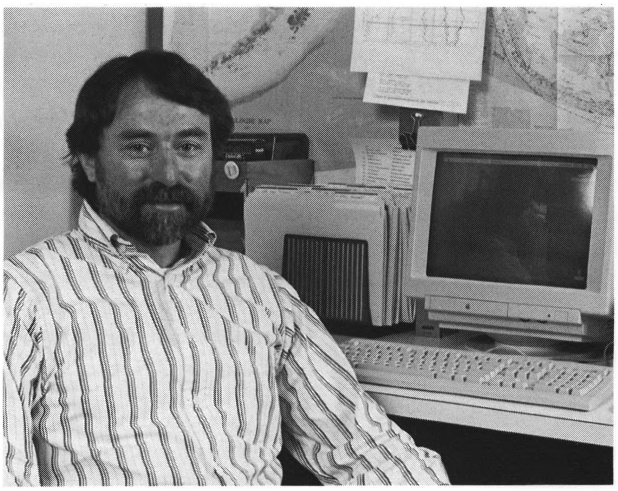


Mian Liu paused at Zion National Park during his studies of surficial processes sponsored by the A.G. Unklesbay Travel Award.

Dr. Keller inducted into Academy of the School of Mines and Metallurgy

Walter Keller continues to be reconized for his contributions to the sciences. In April of this year he was elected to the Academy of the University of Missouri-Rolla School of Mines and Metallurgy. The Academy, which was established in 1995, includes as its members "outstanding alumni of UMR who are successful in their professions and who epitomize industrial and civic leadership skills of the highest repute."

Mike Underwood receives prestigious research award



Mike Underwood was the 1996 recipient of the *Chancellor's Award for Outstanding Research and Creative Activity* in the physical and mathematical sciences. This award was established in 1979 to acknowledge outstanding accomplishments by mid-career faculty members. Mike, who was nominated by our department Chair, Glen Himmelberg, is the first faculty member in our department to receive this prestigous award. Mike's accomplishments honor our department, the college, and the university.

The fundamental purpose of Mike's research is to improve our understanding of how convergent plate boundaries behave and evolve. This is clearly a global-scale, "big-picture" theme, and it requires interdisciplinary co-operation among many different topical experts. Mike has always enjoyed working as a member of an interdisciplinary team, and his research program at the University of Missouri has benefited from close interactions with numerous individuals both inside and outside of our department. Many of his individual contributions have focused on three-dimensional sedimentary-facies architecture, a parameter that reflects structural development of plate boundaries as strata become partitioned into zones of frontal offscraping, underplating, and deep subduction. In addition, Mike is interested in how sedimentary architecture controls the distribution of high-permeability pathways for fluid flow, as well as sources and reservoirs of pore water and hydrocarbons. Mike and his co-workers also have illuminated the thermal evolution of convergent plate boundaries by documenting a wide variety of fluid-rock interactions, with pressure-temperature conditions ranging from near-seafloor to blueschist-facies metamorphism and hydrothermal systems above 300°C. A truly holistic view of these diverse topics obviously requires examination of active submarine systems and their ancient analogues. Mike's study areas, therefore, have included both mountain belts (the Franciscan Complex of California, the Kandik Basin and the Brooks Range of Alaska, and the Shimanto Belt of Japan) and modern deep-sea environments (the Aleutian Trench, the Nankai Trough, the Barbados Ridge, and the Cascadia Basin). Mike has attained international prominence within the Ocean Drilling Program as shipboard scientist and as a member of one a JOIDES advisory panel (see related story in this *Newsletter*). In his acceptance speech for the Chancellor's Award, Mike stressed that one of his most important sources of motivation is the pure adventure of field work. He feels truly fortunate to have participated in numerous cruises on conventional research vessels, three drilling legs on the *JOIDES Resolution*, two dives on the submersible ALVIN, and several helicopter-supported excursions into arctic Alaska.

Tom Freeman gets "hat trick" in teaching

In the sport of ice hockey a "hat trick" refers to a player's making *three* goals in a single game. This year Tom Freeman earned a "hat trick" for his long history of activities as a teacher. During 1996 Tom received:

(1) The University of Missouri's *Presidential Award for Outstanding Teaching* (nominated by our department Chair, Glen Himmelberg).

(2) The National Association of Geoscience Teachers' *Neil Miner Award* (nominated by Professor Emeritus Walter Keller).

(3) A University of Missouri *Curators' Distinguished Teaching Professorship* (nominated by the MU College of Arts & Science Awards Committee).

The Presidential Award for Outstanding Teaching, which includes a $15,000 stipend, each year recognizes a single teacher among the faculties of the University of Missouri's four campuses. This year marks the first time in the six-year history of this prestigious award that it goes to a member of our Columbia faculty—Tom Freeman.

The Neil Miner Award is presented each year at the annual meeting of the Geological Society of America meeting to an individual "for exceptional contributions to the stimulation of interest in the earth sciences." The award commemorates the late Neil Miner's concern for personal excellence and effective teaching. With this award, Tom joins other recipients of the Neil Miner Award whom he is quick to credit "for their example and inspiration," most notably the late Bob Heller (1965), Walter Keller (1967), Bob Boyer (1980), Bill Furnish (1985), and Bob Folk (1989).

The Curators' Distinguished Teaching Professorship is not awarded every year. Prior to this year, only two other professors have been so recognized at MU since the award was instituted in 1992. A recipient must have an "outstanding, established reputation in teaching." This most coveted of all University of Missouri teaching awards carries with it the title Curators' Distinguished Teaching Professor, an $8,000 increase in annual salary, and a continuing yearly stipend of $4,000 in support of the recipient's activities.

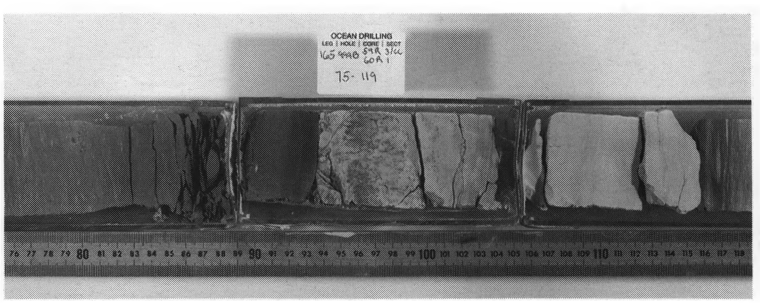
Tom Freeman received the University of Missouri's Presidential Award for Outstanding Teaching at the UM Board of Curators' dinner last May. With Tom were his wife, Peggy, and son Rob with his wife, Nancy.

Faculty participate in ocean drilling program

The Ocean Drilling Program (ODP) is the world's largest and most successful multi-national research organization in the earth sciences, with an annual budget of approximately $44 million and 19 participating countries. The current drill ship, *JOIDES Resolution*, can suspend up to 9,150 m of pipe and recover core samples from as deep as 2,000 m below the seafloor. Individual drilling legs usually last two months, and each focuses on a specific set of thematic objectives. The ODP community is interested in the dynamic behavior of Earth's near-surface environment, as well as its interior. Current priorities include: the history and causes of global climate change; causes and effects of sea-level fluctuations; sediments, fluids, and bacteria as agents of geologic change; transfer of heat and materials to and from the Earth's interior; deformation of the lithosphere; and earthquake processes. During the next five years, ODP scientists will embark on an innovative pilot project to explore the nature and extent of the sub-seafloor biosphere, and they will push the technological frontiers of *in situ* monitoring of geologic processes such as fluid flow and earthquakes.

Two of our professors have been recent participants in ODP drilling legs, and their activities have fostered challenging research opportunities for several of our graduate students. Last winter, **Tim Lyons** was a shipboard geochemist during Leg 165. Five sites were drilled in the Caribbean Sea, and some of their most exciting recoveries include: strata spanning the K/T boundary that contain ballistic and aerosol fallout from the Chicxulub meteor-impact site; dramatic evidence for multiple episodes and sources of unusually vigorous explosive volcanism during the Eocene and Miocene; evidence for sharply reduced deposition of pelagic carbonates across the entire Caribbean from about 12.5–10.5 Ma (the so-called "carbonate crash"); and a detailed record of sedimentation within the anoxic Cariaco Basin at the seaward margin of Venezuela. Tim's shore-based studies of Cariaco cores will be especially significant because they should yield information about late Quaternary climate variability within the tropics. With time-scales ranging from tens to thousands of years, Tim's data will be comparable in their resolution to that of ice-core records collected from high latitudes.

Mike Underwood has been an active member of the ODP community for many years. He was a shipboard sedimentologist during Leg 131 (Nankai subduction zone, offshore Japan) and Leg 156 (Barbados Ridge subduction zone). Both of those drilling legs were designed to study the physical and chemical behavior of fluids within active plate-boundary faults. Innovative strategies during Leg 156 included the installation of thermistor strings, pressure transducers, osmotic water samplers, and borehole seals (CORKs) to monitor *in situ* fluid properties within a highly overpressured fault zone. Leg 156 also pioneered the academic application of 3-D seismic data coupled with coring and logging-while-drilling (LWD) technology. LWD resulted in the first successful recoveries of reliable logs from any accretionary prism. This past summer, Mike returned to the *JOIDES Resolution* for Leg 168. Ten sites were drilled along a transect of the eastern flank of the Juan de Fuca Ridge (offshore Vancouver, BC). The central theme of Leg 168 is



One of several nearly complete sections of the Cretaceous-Tertiary boundary recovered during Leg 165 of the Ocean Drilling Program.

to document how physical processes and geochemical products of heat transfer and fluid circulation within young oceanic crust are affected by basement relief and patterns of sediment accumulation above the basement. Because of its proximity to the continental margin, this particular mid-ocean ridge system is being buried rapidly by turbidites. Mike's primary shore-based responsibility will be to reconstruct the history of turbidite sedimentation through analyses of detrital provenance, seismic stratigraphy, and physical stratigraphy.

In addition to his research contributions, Mike has served the JOIDES advisory structure in an important way, as a member of the Sedimentary and Geochemical Processes Panel and as SGPP liaison to the Tectonics Panel. These thematic panels are responsible for the scientific reviews and rankings of all drilling proposals, articulation of scientific and technological priorities, and long-range planning. As a byproduct, Mike has been able to share with our department a more global perception of where the scientific community in marine geology is headed.

JOIDES Resolution, which is officially registered as Sedco/BP471, is one of the top-rated drill ships in the world.

Degrees

Bachelor of Science *Summa Cum Laude* with Honors in Geological Sciences

Mark T. Clementz

Bachelor of Science *Cum Laude*

Todd A. McMenamy

Bachelor of Arts

Monica M. Fell
Cheri L. Hall

Bachelor of Science

Saba H. Al-Harazi
Ryan T. Arrowood
Pamela A. Holley
Brian D. Manz
Barry R. Marquart
Melanie A. Mayes
Michael J. Morris
Robert A. Schafer
Michelle M. Schubert

Master of Science

Todd Halihan
The Role of Constrictions in a Karst Basin: Devil's Icebox Cave System, Boone County, MO.
Co-Advisors: Carol Wicks and Joseph Engeln

Timothy J. Keller
Fluid-Rock Interactions and Fluid Migration in the Reelfoot Rift System, Midcontinent U.S.A.
Advisor: Kevin L. Shelton

Xudong Xin
Models of the Stress Field Near Ridge-Transform Systems.
Advisor: Joseph Engeln

Undergraduate scholarships

Mr. and Mrs. Richard Boyd Scholars

Brandon Gomer
April Welch
Kaplan Yalcin

James G. Mitchell Scholar

Jill Murray

Mabel Patterson Scholars

Jennifer Berger
Ken Tomlin

Pearl Todd Sando Scholars

Cassandra Gaddy
Kevin Koch
Matthew Schuchard
Christy Thomas

Fred Strothmann Scholars

Jessica Goin
Jeff Jurgensmeyer
Sarah Simpson
Jennifer Surber

Hugh & Tillie Looney Scholar

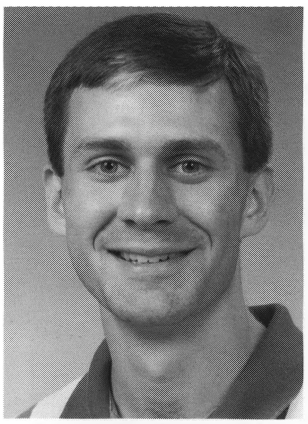
Kristen Short

Senior Theses

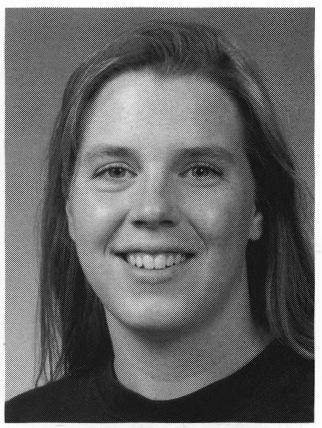
The following students are authors of a senior thesis either in progress or completed.

Mark Clementz
Gretchen Degler
Jim Luepke
Melanie Mayes
Robert Schafer
Ken Tomlin

Graduate scholarships

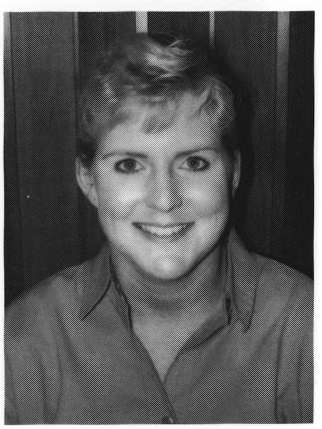


Todd McMenamy
Chevron USA Inc. Fellow
W.A. Tarr Scholar



Cindy Bartlett
W.A. Tarr Scholar

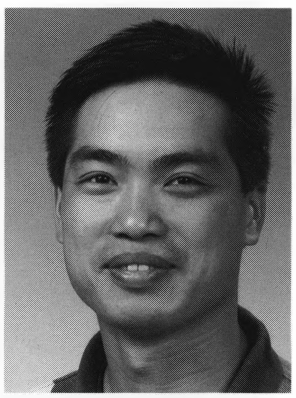
Mona-Liza Sirbescu
W.A. Tarr Scholar



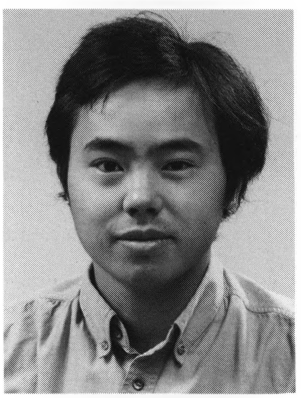
Terri Baker
Maurice G. Mehl Scholar

Walter D. Keller Graduate Scholars

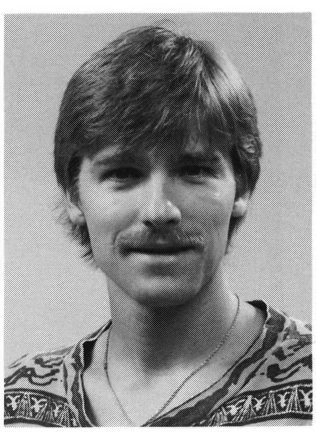
Todd Byrd
Greg Chludzinski
Mark Clementz
John Hoke
Matthew Hurtgen
James Kocher
Patrick Perfetta
Kimberly Saettler
Mona-Liza Sirbescu
Terri Zeman



Yunqing Shen
Dan E. McMillen
Memorial Scholar



Xinhua Deng
Huggins Fellow



Timothy Keller
Superior Graduate
Achievement Award

Diane Boyer
Donald K. Anderson
Graduate Teaching Award

Raymond E. Peck Graduate Scholars

Carey Costello

Lee Florea

Camp Branson scholarships

Scholarship recipients: (Left to right) Angie Cook (Purdue University), Tim Wineland (NW Missouri State University), Lisa Head (St. Louis University), Sarah Simpson (MU), Jennifer Elder (Bucknell University), Brent Norum (California State Polytechnic University), Elisa Sims (University of South Florida). Not shown: Mike Singleton and Jennifer Dougherty (both from Southern Methodist University).

Clayton H. Johnson Field Camp Scholars

Angie Cook
Jennifer Dougherty
Lisa Head
Sarah Simpson
Tim Wineland

Raymond E. Peck Field Camp Scholars

Jennifer Elder
Brent Norum
Elisa Sims
Michael Singleton

Student publications and abstracts

Bergfeld, D., Nabelek, P.I., and Labotka, T.C., 1996. Carbon isotope exchange during regional polymentamorphism in the Panamint Mountains, California: Journal of Metamorphic Geology, v. 14, p. 199–212.

Cruse, A.M., Lyons, T.W., and Glascock, M.D., 1996. Paleoceanographic controls on metal partitioning in Pennsylvanian cyclothemic black shales, midcontinent North America: Geological Society of America, Abstracts with Programs, v. 28, p. 34.

Cruse, A.M., Lyons, T.W., and Glascock, M.D., 1996. Transition metal concentrations in midcontinent Pennsylvanian cyclothemic shales: A geochemical record of dynamic anoxia: Geological Society of America, Abstracts with Programs, v. 28, p. 34.

Glascock, M.D., **Cruse, A.M.**, and Coveney, R.M., Jr., 1996. Analysis of metalliferous, organic-rich shales of Pennsylvanian age in the midcontinent: Transactions of the American Nuclear Society, v. 74, p. 120–122.

Deng, Xinhua, and others, 1996. Illite/smectite diagenesis in Nanxiang Basin, Yitong Basin, and North China Permo-Carboniferous Basin: Application to petroleum exploration in China: Bulletin of the American Association of Petroleum Geologists, v. 76, p. 145–165.

Deng, Xinhua, and Underwood, M.B., 1996. Influence of clay mineralogy on the location of basal decollement zone, Barbados accretionary complex: Geological Society of America Annual Meeting, Abstracts with Programs, v. 28.

Deng, Xinhua, and Underwood, M.B., 1996. Clay mineralogy and diagenesis at abnormal low temperature at Barbados accretionary complex: Clay Mineral Society Annual Meeting, Abstracts with Programs, v. 33, p. 65.

Bauer, R.L., **Gresham, D.A.**, and **Edson, J.D.**, 1996. Multiphase Early Proterozoic ductile reworking of Archean basement in the central Laramie Mountains, SE Wyoming: Geological Society of America, Abstracts with Programs, v. 28, p. 1–2.

Halihan, T., Wicks, C.M., and Engeln, J., 1995. Physical response of a karst drainage basin to flood pulses: Geological Society of America, Abstracts with Programs, v. 27, no. 6, p. 181.

Luepke, J.J., 1996. Geochemical assessment of paleoenvironments within the Belt Supergroup of northern Montana: Geological Society of America North-Central Section Annual Meeting, Abstracts with Programs, v. 28, p. 14.

Luepke, J.J., and Lyons, T.W., 1996. Geochemical trends within fine-grained sediments of the lower Belt Supergroup, Northwestern U.S.: Paleoenvironmental implications: Geological Society of America Annual Meeting, Abstracts with Programs, v. 28.

Liu, M., and **Shen, Y.**, 1996. Core complex formation and the basin-range extension: Geological Society of America Annual Meeting, Abstracts with Programs, v. 28.

Shen, Y., and Liu, M., 1996. Ductile extension of continental lithosphere driven by excessive potential energy: Geological Society of America Annual Meeting, Abstracts with Programs, v. 28.

Liu, M., and **Shen, Y.**, 1995. Effects of rheological stratification on Tertiary extension in the North American Cordillera: IUGG XXI General Assembly Abstract, p. B335.

Nabelek, P.I., and **Ternes, K.**, 1996. Fluid inclusions in the Harney Peak Granite, Black Hills, South Dakota, USA: Implications for solubility and evolution of magmatic volatiles and crystallization of leucogranite magmas: Geochem. Cosmochim. Acta, in press.

Nabelek, P.I., and **Ternes, K.**, 1996. Fluid inclusion evidence for the evolution and solubility of fluids in the Harney Peak leucogranite magma, Black Hills, South Dakota: PACROFI VI, p. 95-96.

Ternes, K., and Nabelek, P.I., 1995. Fluid inclusion evidence for the evolution of magmatic fluids in the Harney Peak leucogranite, Black Hills, South

Dakota: III Hutton Symposium, U.S. Geological Survey Circular, v. 1129, p. 144–145.

Valentine, R.B., Jones, C.E., Lyons, T.W., and Holmes, A.E., 1996. Constraints on age and deposition of the Jurassic Gypsum Spring Formation, Wyoming, using strontium and sulfur isotope geochemistry: Geological Society of America Annual Meeting, Abstracts with Programs, v. 28.

Xin, X., Engeln, J., and Liu, M., 1995. Stress field near ridge-transform systems: EOS (Transactions of the American Geophysical Union), v. 76, p. 276.

Anna Cruse captures SEPM's Best Student Paper Award

Anna Cruse
SEPM Best Student Paper Award—Geological Society of America North-Central Section Meeting, May 2-3, 1996.
Title: *Transition metal concentrations in midcontinent Pennsylvanian cyclothemic shales: A geochemical record of dynamic anoxia.*

Science and Engineering Research Semester appointees

Brian Manz–Lawrence Livermore Lab
Melanie Mayes–Oak Ridge Lab

Student research grants and awards

Anna Cruse
Graduate Professional Council Student Travel Grant to attend and present at the North-Central Section meeting of the Geological Society of America held in Ames, Iowa, May 2–3, 1996: $200

Trans World Airlines Environmental Scholar 1995–1996 $6,000

Chevron Fellow 1995–1996 $8,000

Xinhua Deng
The Clay Minerals Society
Title: Illite/Smectite Reactions at Abnormally Low Temperature, Barbados Accretionary Prisms. $2,400

Jim Luepke
UMC School of Arts and Science Student Senate Undergraduate Research Grant $300

Robby Valentine
American Association of Petroleum Geologists Grant-in-aid $1,962

Geological Society of America Research Board Grant $1,725

Graduate students and faculty socialized at the fall departmental reception.

Geology Club news

The Geology Club remains a strong, proactive group in our department. Major objectives are to provide professional and social interaction among students, faculty, and staff and, through outreach activities, to educate the public about geological sciences and their potential impact on their lives.

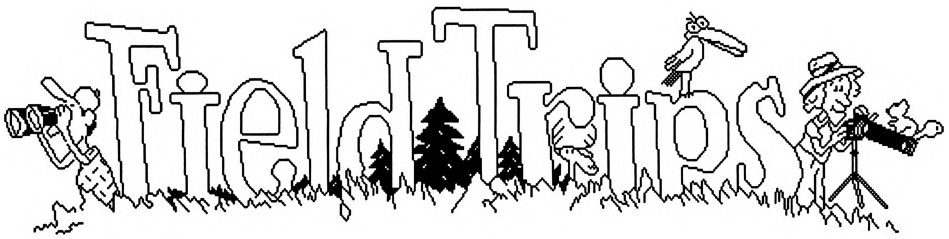
To accomplish their goals members of the Geology Club raised funds through the traditional selling of rock-and-mineral sets to students in introductory geology classes. This year the club also sold rock hammers and hand lenses to students preparing to attend the summer field course at Camp Branson. These funds helped finance several field trips that were recreational as well as educational. Trips were taken to the Pine Ridge area of Mark Twain National Forest, to Onadagga Cave, to a meteor impact crater in southeastern Missouri, and to other local geologic sites.

Outreach activities included the ongoing help to Cub Scouts and Boy Scouts in earning rock identification merit badges. This year, the Geology Club also participated in the Earth Day festival held in Peace Park where they had a booth designed to educate those interested in the dynamics of the earth and its impact on humans.

After a two-year hiatus the Geology Club again sponsored the traditional spring banquet, which was held at the Pasta Factory in downtown Columbia. Following the dinner, graduate student members presented tasteful "awards" to select faculty members, which served to promote and enhance student-faculty relationships.

The geology club would welcome suggestions from alumni for both local and spring-break field trips.

Geology Club members were exhuberant after assembling rock and mineral sets for sale to introductory geology students.



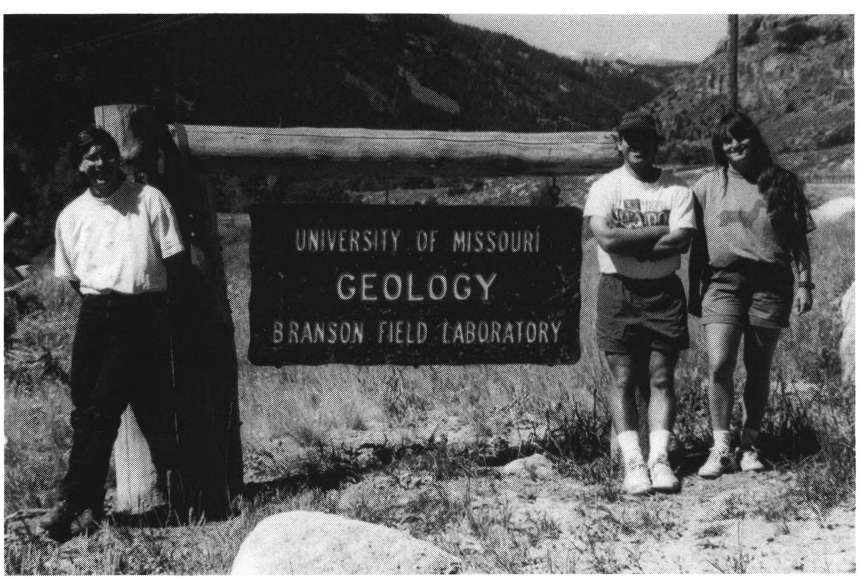
Sedimentology students studied exposures of the Caseyville Formation (above) and the Ste. Genevieve Limestone (below) during their trip to southern Illinois.

Summer at Camp Branson

The 1996 Field Camp session at Camp Branson was a great recovery from last year's difficult weather and high water levels in camp. We made some exciting changes in our curriculum, and had an opportunity to complete several major maintenance projects to upgrade camp facilities in preparation for next summer's field camp reunion. We were also pleased to have a great group of students from a wide variety of schools and locations. In addition to 18 students from Missouri, we had 19 students from 14 states across the country and one student from South Africa. For the first time in our camp's history we had more women students (21) than men (17). Several of the students (see photo, page 19) came to camp with excellent academic records and were awarded scholarships from funds donated by the many department alumni who have attended our camp.

A major part of our curriculum expansion this summer involved introducing students to new technologies. Wes McCall (MS '87), who now works for Geoprobe Systems Inc., arranged for us to use a Geoprobe unit for part of the summer. The Geoprobe is a hydraulically driven, mechanically operated soil-auger system that is mounted in the rear of a panel truck. Carol Wicks and Wes used the Geoprobe to install several shallow water wells in camp for instructing the students, and Wes demonstrated its use and applications for the students.

We were also able to expose the students to state-of-the-art electronic surveying capabilities. Dallas Rhodes (BS '69), of Whittier College, who had run projects at our camp in surficial mapping and stream gauging over the past several years, uses a Total Station in his geomorphic research and was willing to demonstrate it and instruct our students in its use. The Total Station is an electronic theodolite and distance meter capable of an accuracy of millimeters per kilometer. The project using the Total Station obtained horizontal and vertical (elevation) position coordinates at several hundred stations across camp. The final product included precise water well elevation data for our recently installed wells and a computer-generated contour map of the camp.



Camp Branson Teaching Assistants: Todd Byrd, Dave Curtis, and Melissa Pratt.

STUDENTS

CAMP BRANSON

The Geoprobe and Total Station instruction was part of three days of projects on field aspects of "environmental geology." Three different projects were run concurrently, and student project teams were divided into three groups that rotated through the projects and completed a different project each day. Don Zenger guided students through a project on the hydrogeology and origin Dry Lake, south of Lander. Bob Bauer ran a project on the geology and hydrologic monitoring of the Lander sanitary landfill. Carol Wicks, Drew Diefendorf (MA '73) of Oak Ridge, and Dallas Rhodes ran projects in camp that included stream gauging in the Popo Agie (Carol), measurement of hydraulic conductivity (Drew), and use of the Total Station (Dallas). Carol organized and coordinated the projects and worked hard with Wes and the Geoprobe to install four shallow wells in camp. Students measured water levels in the wells and calculated hydraulic gradients using these data and topographic information from the Total Station.

Many of this summer's projects continued in past tradition. Don Zenger (Pomona College) and Ann Holmes (MU) ran projects in stratigraphy and sedimentation. Bob Bauer and Don continued to supervise mapping projects on Dallas and Derby Domes. Drew Diefendorf again talked to students about mine reclamation and assisted with the guided tour of the Luck Mc uranium mine reclamation project in the Gas Hills. Bob Bauer was again assisted by Peter Nabelek and Joe Engeln on the hardrock mapping and structural analysis projects in the South Pass area. Joe also ran projects that introduced students to shallow seismic and magnetic analysis and to the use of several new GPS (geographic positioning system) receivers purchased for the camp.

Mark Anders, of Columbia University, taught at camp this year for the first time. Mark has done extensive work on the Snake River Plain, its seismicity, and its relationship to the Yellowstone Hot Spot. He helped Bob on the four-day tour of northwestern Wyoming and extended the trip into eastern Idaho for a day of stops on the Snake River Plain. Mark also conducted a project dealing with fracture analysis.

All projects benefited from the able teaching assistance of Todd Byrd, Dave Curtis, and Melissa Pratt. Todd is currently an MU graduate student working with Bob Bauer. Dave and Melissa are recent graduates of California Polytech at Pomona. All three teaching assistants completed our field course at Camp Branson in 1995.

After a difficult maintenance season in 1995, this past summer proved to be time for some major camp improvements. Jim Luepke served again as the camp caretaker, but he was also assisted at times by Todd Byrd, who has worked as an electrician, and by Dave Curtis and Melissa Pratt, who have worked as carpenters. One of the first projects was the completion of a raised path across the marshy path between the men's dorm and the shower house. This became officially known as Luepke Way. Other projects included major repairs of screens and doors, including a new screened-in porch for the cook's quarters; electrical work to improve both inside and outside lighting in camp; and new roofs on several cabins.

Frances and David Hicks again served as cook and cook's helper, keeping students and staff alike well nourished for the long days in the field. David, who is a notorious horseshoe pitcher, again teamed up with Don Zenger to capture first place in the Camp Branson horseshoe tournament. This year, we are pleased to report that official trophies acknowledge the horseshoe champs. Dave and Don earned the "Golden Ringer Award" and the first two name plates on the Golden Ringer plaque. (Last year's win earned the first name plate.)

Faculty and staff worked hard last summer to provide a first-rate field experience for our students. We look forward to becoming reacquainted with many of our past students at next summer's reunion. The camp may look a bit different, but the rocks and beautiful scenery of the Wind River Range haven't changed much. See you next summer!

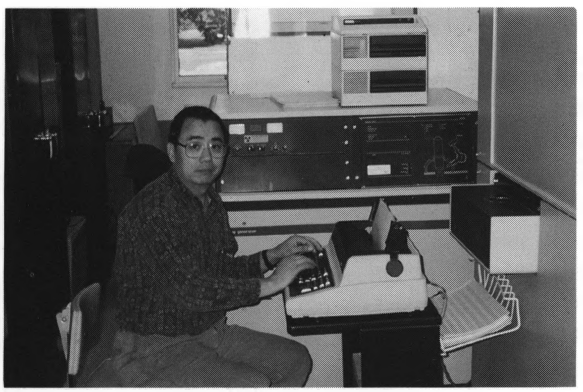
P.S. Discover additional information about Camp Branson on our camp's World Wide Web site at: www.missouri.edu/~geoscrlb/fchome.htm

CAMP BRANSON–GEOPROBE PARTNERSHIP

Wes McCall (MS '87) of Geoprobe Systems, Inc. demonstrates Geoprobe to students at Camp Branson (above). Working with Carol Wicks, Wes used Geoprobe to establish four monitoring wells in the boulder-rich glacial till at the camp and one well at Dry Lake near Derby Dome (below).

Research facility

X-Ray Diffraction and X-Ray Fluorescence Laboratories



Nathan Chao, prior to his resignation, operated and maintained the XRF and XRD laboratories.

X-ray diffraction and x-ray fluorescent spectroscopy have become the two most basic tools for mineralogical and chemical characterization of minerals, rocks, and a host of other crystalline substances. Our department has the good fortune to be able to provide faculty and student researchers with both state-of-the-art XRD and XRF facilities.

Our x-ray diffraction facility was established in 1988 by acquisition of a Scintag PAD V automated, microprocessor controlled x-ray powder diffractometer. This was acquired at that time through National Science Foundation funding with matching funds from the University and the Geology Development Fund. The University contribution was forthcoming, because it was realized that this facility should be an important asset to the entire University scientific community. Indeed this has been the case, as this laboratory has become part of our departmental materials characterization laboratory, used by researchers from the Physics, Chemistry, and various Engineering departments on and off of campus. We are now just as likely to see research on thin diamond films, new transistor phases, and new organic and inorganic compounds taking place here, as we are to observe mineralogical and geochemical research taking place in this laboratory. The XRD lab is and has been used extensively by most members of our faculty. Procedures for clay mineral analysis and characterization have received some emphasis as expected, since Bill Johns has prime responsibility for the x-ray lab. The day-to-day operation has been provided by Nathan Chao, who has been responsible for maintaining the lab, through continuous upgrading, as a first-rate facility.

This year, through the generosity of the Lafarge Cement Company of Kansas City, we were given their used, but operational, Phillips 1600/10 x-ray fluorescence spectrometer (XRF). Inasmuch as it is in perfect operating condition, it is a valuable addition to the University and to our department as a research and graduate-teaching instrument. Funding from our University Research Council and the from our Dean of Arts & Science provided funds necessary to disassemble, transport, and reassemble the XRF spectrometer into a refurbished laboratory facility in the basement of our Geology Building. This instrument uses characteristic atomic x-ray emission spectra to nondestructively chemically analyze mineral and rock specimens. It is used for major elemental analysis, and our Phillips instrument is configured to analyze simultaneously 11 major elements (Na, Mg, Al, Si, P, S, K, Ca, Ti, Fe, Sr). It is, and will continue to be, used as the prime source for rock and mineral analysis by faculty and students of this department, but it is anticipated that usage on campus, within the university system, and outside will continue to grow. Nathan Chao has been responsible for the installation, operation, and maintenance of this XRF facility in addition to his other activities. Costs for maintenance and operation of both the XRD and XRF facilities derive largely from service fees charged against research grants held by individual users. Both faculty and students benefit from the availability of these state-of-the-art facilities.

Visiting speakers

A rich and varied program of visiting speakers continues to be funded by our Williamson Family Endowment Fund. Last year's speakers included:

Peter Dahl, Kent State University
New $^{40}Ar/^{39}Ar$ Age Constraints on Proterozoic Tectonothermal Evolution of the Black Hills Segment of the Trans-Hudson Orogen, South Dakota.

Robert Criss, Washington University
Hydrothermal Systems Associated with Stratovolcanoes, with Particular Reference to the Comstock Lode.

G.L. (Wendy) McPherson, University of Kansas
Overview (Underview?) of the Hydrogeology of Thin Limestones at the Konza Prairie LTER Site, Kansas.

John Y. Chen, Oregon State University
The Genesis of Oceanic Crust: Observations and Theory.

David Clark, University of Wisconsin at Madison
History of the Arctic Ocean.

Ray Thomasson, Thomasson Partner Associates
Geology of the Mid-Continental Rift *and* Opportunities for Geologists and Geophysicists in Petroleum Exploration.

Richard L. Stanton, University of New England
Volcanic Processes and Massive Sulphide Formation.

Barbara Bekins, U.S. Geological Survey (Menlo Park, CA)
Episodic and Constant Flow Models for the Origin of Low-Chloride Waters in the Barbados Accretion ary Complex.

Terry Plank, University of Kansas
The ins and outs of arc volcanoes: sediment recycling at subduction zones.

Judith Chester, St. Louis University
Mechanisms of Crustal Block Rotation in Strike-Slip Regimes.

Mark Anders, Lamont-Doherty Earth Observatory
Tale of a Tail: Tracking the Yellowstone Hotspot *and* Low-Angle Normal Faults: Are They All They're Cracked-up To Be?

Jim Palmer, Missouri Division Geology & Land Survey
Late Quaternary Faulting in SE Missouri.

William D. Carlson, University of Texas-Austin
Metamorphic rocks from the inside-out: computed X-ray tomography as a new petrologic tool *and* The Cheshire cat's grin: How metamorphic minerals record the tectonic evolution of the Llano Uplift, Texas.

Geoff Abers, University of Kansas
Seismic evidence for the nature of subducting slabs —Alaska and the world.

Michael Glascock, MU Research Reactor
Archaeology and Geochemistry: A Database for Obsidian Glasses in the Western Hemisphere.

Kirk Nordstrom, U.S. Geological Survey (Boulder, CO) 1996 Geological Society of America, Hydrogeology Division Birdsall-Dreiss Lecture
Negative pH, ultra-acidic mine waters, and the challenge of environmental restoration at the Iron Mountain Superfund anomaly.

Kent Nielsen, University of Texas at Dallas
Geometry, kinematics, and timing of the Grenville Orogen, West Texas.

Emiliano Mutti, Istituto di Geologica, University di Parma, Italy), International Association of Sedimentologists 1996 Special Lecturer
Facies Analysis of Turbidite Systems *and* Flood-generated Sandstone Facies in Ancient Fluvio-deltaic Systems.

CONTRIBUTIONS

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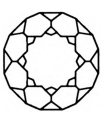
...a society of alumni and friends who promote the recognition, welfare, and progress of the Department of Geological Sciences and the University of Missouri. Donors whose cumulative giving to MU, including corporate matching gifts, totals $10,000 or more are also recognized through the University of Missouri-Columbia Jefferson Club. Effective January 1, 1995, the total required for Jefferson Club membership was increased to $25,000 cash/pledge or $50,000 deferred.

GeoGem Diamonds and Jefferson Club Members



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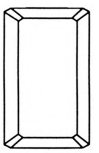

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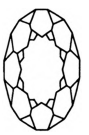

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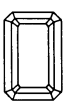

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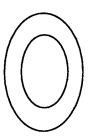

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FROM OUR BOARD CHAIRMAN

From our Geology Development Board Chairman...

Dear Alumni and Friends:

One of the concepts in vogue in business today is embracing change. Your Geology Development Board spent the last year doing exactly that. Within the Board, on the faculty, and at the highest levels of the University, changes occurred throughout the year. Our Board first added a new chairman and a new vice-chairman. We were saddened by the passing of one of our Board's dearest members, Norm Smith (BA '51), last June. Conversely, we were very pleased to welcome Don Garvin (MA '51) back to our Board. The faculty reduced its staff by one, when Ann Holmes departed in July. After these changes, the University changed Chancellors, saying goodbye to Chancellor Kiesler. And, if those changes aren't enough, drop by the Geology building and see the remarkable upgrades made to Keller Auditorium.

One thing that hasn't changed over this time period, however, is the dedication and commitment of our Geology Development Board members. They have put their minds, hearts, and backs into assisting both the Department of Geological Sciences faculty and the College of Arts & Sciences in their fund-raising and educational pursuits. A heartfelt "thank you" goes out to all who helped by contributing time and/or money to these efforts.

The past year saw emphasis placed on raising money for the Geology Department to use in an unrestricted manner. While gains were made, we must still pursue increasing this type of financial help from department alumni. A strong effort will also be made to provide longer-term support by initiating a planned giving program. Bequeaths from alumni estates is the course we intend to follow. We will also entertain increasing the size of the Board, by finding two or three cogent, energetic, and creative alumni with diverse geological work histories. Another area of possibly significant support is the involvement of the Geology Department in research consortia, with corporate sponsorship of specific research programs planned or underway by the faculty. Of course, we will plan to help the Department with student placement assistance, curriculum input, and scholarship support.

Our long-awaited Camp Branson reunion is now less than one year away (July 11–13, 1997). This will be a perfect opportunity to renew old acquaintances, see the improvements made over the years at one of the top field camps in the country, and have fun with friends and family. About 100 alums have indicated interest so far. I expect this number to grow, and I hope to see you there.

Sincerely,

Scott Raymond
Chairman, Geology Development Board

Mrs. Lola Howe accepted the Jefferson Club Plate from Glen Himmelberg in recognition of her gift to establish the Wallace B. Howe Fellowship in Geological Sciences.

Ernie Knirk showed a sense of relief after passing the development board chairman's gavel to Scott Raymond.

Development board members and spouses at the April board meeting dinner.

A profile of commitment– John H. Marshall, Jr.

By Nancy Moen

Editor's note: This interview was conducted on the occasion of John Marshall's receiving the 1996 Arts & Science Distinguished Service Award.

John Marshall, Jr. , who calls himself a poor swamp boy from "swampeast," Missouri, returned to campus February 16 to receive the 1996 Distinguished Service Award from the College of Arts & Science.

In thanking the College for the honor, John (of Dallas, Texas) told the assembled crowd of faculty, students, and guests that his Mizzou education had made it possible for him to match wits with any of his peers.

"I was fortunate to have professors who were so good that you would run to their classes," John says. "You would sit with your mouth open in class. I hated for class to end. Dr. (Raymond) Peck was fascinating, Dr. Keller astounding, and Unk (A.G. Unklesbay) could charm you with his intellectual base. Dr. (Maurice) Mehl was an actor, and Professor Willard Phelps really cared for his students. He once gave me a pair of dress shoes because I didn't have any."

For 32 years John Marshall worked for Mobil Oil Corporation, serving in almost every geological position from field and well-site geologist to chief geologist worldwide in New York City. About his work, he said he couldn't believe people would pay him for doing something he enjoyed so much. In 1982 he retired from Mobil in the position of general manager of exploration, western hemisphere and formed a worldwide consulting and producing company, Marshall Energetics, Inc. (MEI) in Dallas. "I wanted to go on my own to see how well I could do," John says. "I still had that passion, so I took retirement at age 58 and formed my own company."

Concurrent with his work at Marshall Energetics, he served as director of exploration and development for the Anschutz Corporation. Currently, he is president both of Madera Production Company and of Summit Oil and Gas Worldwide. He has no plans for retirement. "I want to be on the exploding end to see what's out there," he says. "This universe fascinates me."

John has experience in most of the major oil and gas producing basins of the world. He is an active member of 12 professional societies, including Sigma Xi, the American Association of Petroleum Geologists, the New York Academy of Sciences and the Association of Christian Geologists.

John was a founding member of the Geology Development Board in 1982 and served as president of the board from 1984 to 1986. He spearheaded and contributed to the department's major fund-raising drives to establish two professorships, construct new dining facilities at Camp Branson, and establish the Geology Endowment Fund.

"I owe this university. I'm paying that off now," John says. He and his wife, Betty, have announced the establishment of the *John and Betty Marshall Opportunities for Excellence Endowment in Geological Sciences*, an endowment that will provide financial support to the department—with emphasis on undergraduate education.

John Marshall, the son of a school teacher, was raised in humble surroundings in Missouri's bootheel. As a student he couldn't afford the price of a movie, and upon seeing a copy of *Life* magazine at a friend's house, he felt if he could ever afford a subscription to that magazine he would be a wealthy man.

During high school John worked at an auto store and saved $500 toward college. His life as a Mizzou student was interrupted after the first semester by the Second World War, when he served as a tank commander and participated in three major European campaigns. On his return to

campus, he completed work on his bachelor's degree in 1949 and earned his master's degree in 1950.

The GI Bill paid his tuition while at Mizzou, but he worked part-time to support himself, his wife, and baby. He cleaned slides, worked as an assistant lab technician, served as a cadet colonel in the ROTC, delivered gas, and worked in the printing office in Jesse Hall.

John earned his bus fare to Camp Branson by driving the school bus that transported students to Wyoming, and he earned his board by arising daily at 5 a.m. to prepare sack lunches for the group. "I was so lucky," he says of the experience. "I ended up $80 ahead that summer."

One of his funniest memories of the camp occurred on a campout in Yellowstone with some student geologists from the School of Mines. Among their group was a burly member of that school's football team who heard noises outside his tent one night and suspected other students were 'messing with him.' From inside the tent, he lunged at the source of the scuffling sounds, only to find he had grabbed an armful of live bear.

John considers Camp Branson an essential part of educating geologists. With its exposed rocks, the camp, he says, allows students to see in three-dimension and teaches them to depend on people while developing an esprit de corps. "They have a huge exposure," he says. "Nothing equals this on-the-job training."

Dean Larry Clark praised John Marshall's enduring interest in our University: "John is a true wildcatter at heart," he said. "That sense of daring and adventure underlies everything he does. He likes to make things happen, and he sweeps others along with him on a steady stream of enthusiasm for old Mizzou."

Dean Clark recently named John president of the College of Arts and Science Leaders Development Council. The Leaders Development Council is composed of alumni and friends from various departments within the College of Arts and Science who share John's love for the University and are working to ensure its future financial stability and growth. In addition to providing leadership for this group, John will represent the College of Arts and Science on the university-wide development council.

John Marshall related career experiences to students and faculty at a reception in his honor as recipient of the 1996 Arts & Science Distinguished Service Award.

Alumni honors

Richard S. Bishop (MA '69) is a nominee for President-Elect of AAPG.

John H. Marshall Jr. (BA '49, MA '50) received the 1996 Arts and Science Distinguished Service Award from the University of Missouri-Columbia.

Jesse O. Snowden (MA '61, PhD '66) to Dean, College of Science and Engineering Technology, University of Arkansas at Little Rock. Previously Dean, College of Science and Technology, Southeast Misouri State University, Cape Girardeau, Mo.

M. Ray Thomasson (BA '52, MA '53) was selected as one of four new members of the AAPG Foundation Trustee Associates.

James F. Wescott (BA '41, MA '47) received the Hal Williams Hardinge Award from the Society of Mining, Metallurgy and Exploration. He was cited "for outstanding achievements in exploration, mining, and processing of industrial minerals, in particulary refractory clays, kaolins and bauxites".

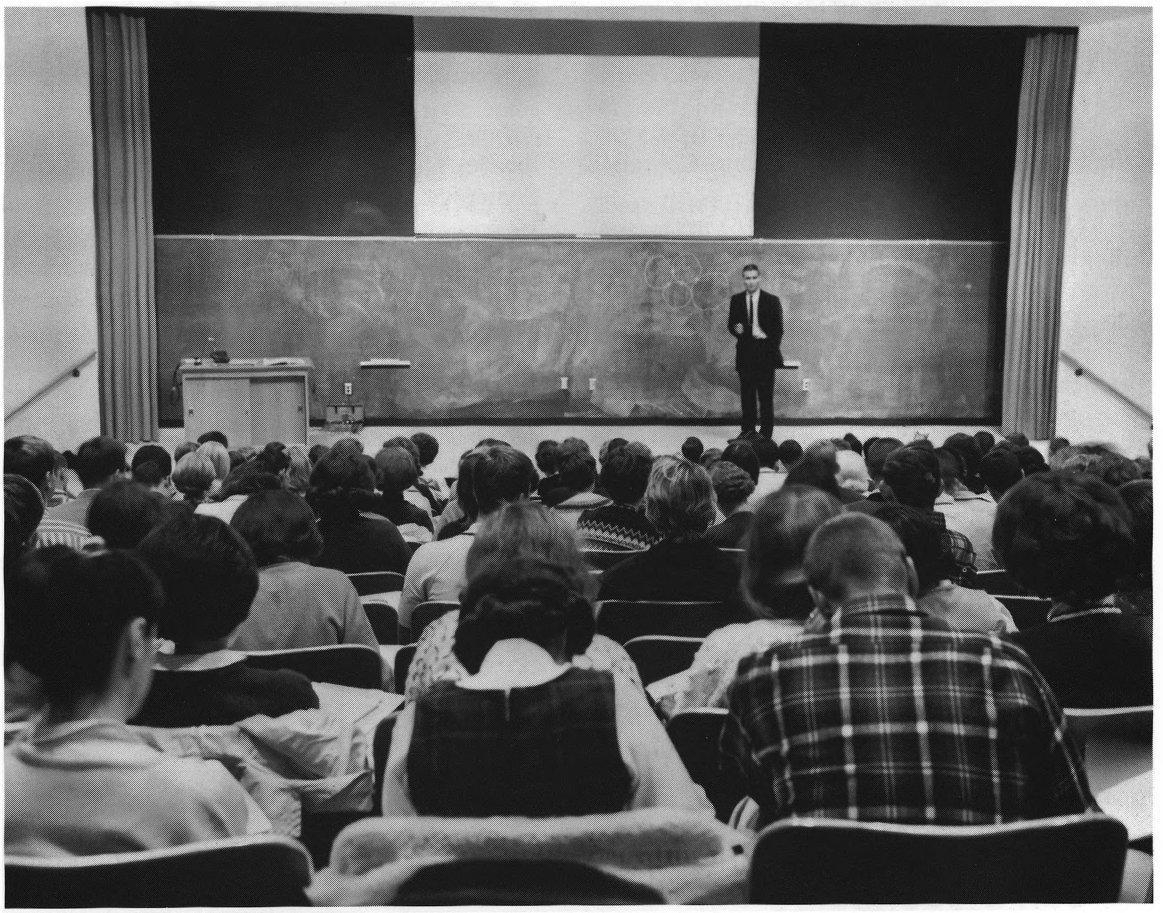
Alumni receptions

As has been tradition, alumni and friends of our department have met at annual meetings to renew acquaintances. During this past year two receptions were held, one at the Geological Society of America meeting in New Orleans, and one at the American Association of Petroleum Geologists meeting in San Diego. We invite and encourage each and every one of you to attend future receptions if you are in the area—whether or not you are attending the meetings.

AAPG annual meeting
San Diego, California

Romaine Kupfer, Don Kupfer, and Hugh Looney reminisced about their time at MU.

Stephanie Houseknecht, Dave Steyaert, and Jack Gallagher listened to Ray Ethington relate current events at MU.



Fall of 1964. In the new Geology Auditorium, Tom Freeman had not yet invented his now-famous prepared overhead transparencies. Here Tom is diagramming for his Principles of Geology class dissolution at points of contact among quartz grains in the production of metaquartzite.

Keller auditorium renovated

The history of our geology auditorium goes back to 1964 and the construction of our present building, the design of which was ably guided by Professor Emeritus A.G. Unklesbay. As readers of our *Newsletter* might remember, sixteen and one-half years later, on April 24, 1981, our geology auditorium was given the name *Keller Auditorium* in honor of Professor Emeritus Walter D. Keller, recognizing his many years of exemplary teaching at all levels. In the beginning, our geology auditorium was fitted with newfangled floor-length plaster chalkboards that proved to be less than satisfactory, but we were soon able to replace them with blackboards of the old-fashioned (i.e. slate) variety. Now, modern technology has begged additional changes to Keller Auditorium—changes that provide for the projection of video programs and computer images. Moreover, the recent Americans With Disabilities Act has required certain structural modifications to accommodate handicapped instructors and students, for example the lowering of the stage so that wheelchairs can have

Winter of 1996. (The main projection screen is raised so as to reveal cascading chalkboards.) Tom Freeman continues with his course, Principles of Geology. Notice: (a) Lighted auxiliary chalkboard (to the right); (b) console with touch-control panel, VCR, and laser disk and CD player (to the left); and (c) new and improved hi-fi speakers.

access to the lectern. Additional new features include cascading chalkboards (favored by math instructors), an auxiliary chalkboard (for making a spontaneous point while the main projection screen is in the down position), and an auxiliary projection screen (for showing paired Kodachrome slides). Hardware and software now allow for the projection of animated clips from either Macintosh or MS DOS computers, so that, for example, the evolution of a superimposed stream can—for the first time—be understood by all. (Well...almost all). The ceiling was lowered to create a more intimate environment, walls were treated with acoustical fabric, new seats were installed, and sound and lightening were enhanced and automated. (The idea of a fault with ten inches of offset running the length of the ceiling—a feature envisioned by the architectural firm—was eventually scrapped in the interest of economy.) Design and construction personnel did a terrific job! We urge you to drop by when you can to have a look at the "New Keller Auditorium." (Now if we can only keep some of its use for ourselves!)

Alumni news

Hank Allen (BA '48, MA '49) writes, "For the past 13 years I have called the edge of the Ozarks my home. A son and son-in-law graduated from the University of Missouri-Rolla in mining engineering in the early 80s. My dear wife Lillian passed away three years ago."

Ryan Arrowood (FC '95, BS '95) currently works for Ecotechnology, a company that specializes in environmental services and environmental contracting. Ryan reports that they do a great deal of underground storage tank removal and remediation of contaminated soil.

Arthur C. Banet (MA '76) writes, "From all indications, I am still making myself ever (un)popular(er) trying to get bureaucratic higher-ups to realize there is some rhyme and reason (of geotechnical and legal varieties) to open up the Arctic Wildlife Refuge for exploration to see what, if anything is there. Not too terribly career enhancing in the teeth of this administration's anti-development zealots who call all the shots! But, I'm not complaining as I can still see five mountain ranges from here and I'll be returning to those igneous-metamorphic regimes of the Fortymile country real soon."

Perry Beason (FC '84, BS '84) writes, "I got married! My wife's name is Mary Jo Wenzinger. She's a graduate of Purdue and Penn State Universities, and is currently employed as an audiologist at Cardinal Glennon Children's Hospital in St. Louis."

Joseph F. Born, Jr. (Grad. Student '69-'70) is presently consulting in Lafayette, Louisiana, and reports that things are relatively slow but will hopefully pick up soon.

Robert L. Brenner (PhD '73) writes, "After several years of trying, I, along with my 'research team' landed a NSF grant to study the mid-Cretaceous on the eastern margin of the Western Interior Basin. For the next three years we will be busy doing field work from Kansas to Manitoba, collecting samples for biostratigraphy and geochemistry. Aaron is a senior at Wisconsin; Mike is a freshman at Kansas."

William C. Bridges (FC '55, BA '56, MA '58) is still doing some consulting and waiting for the oil business to come back. Bill resides in Dallas, Texas.

Steven K. Broberg (MS '85) is a senior geologist with Universal Resources Corporation in Oklahoma City.

John F. Burst (FC '47, PhD '50) is the 1996 president of the Society of Mining Engineers.

Robert E. Busch, Jr. (FC '66, BS '67) writes, "I'm happy to report I actually have an e-mail address now; I'm finally caught up to the current wave of computer advancement (for today, anyway). Children (11 and 13) still are growing, and my business has done well this year. Golf handicap is still at 10, despite painful knees. Work on my book, CSZ, continues. Hi to all!"

Joseph Butera (FC '68, MA '71) is currently residing in Sugar Land, Texas.

Wayne F. Canis (MA '63, PhD '67) is keeping busy visiting fossil sites in New York State, Missouri, Nebraska, South Dakota, and Wyoming. Wayne spends his summers at SeaLab on Dauphin Island teaching Marine Geology.

George T. Cardwell (BA '49) writes, "After 35 years with the USGS Water Resources Division and 10 years as Director of the Capital Area Ground Water Consolidated District in Baton Rouge, Louisiana, I'm now 80–90% retired. Still put in about two afternoons a week when not occupied with higher priorities, such as checking on activities of grandchildren."

Ann D. Clapp (FC '37, BA '37) is residing in a nursing home in Walpole, Massachusetts, following a stroke.

Joseph M. Clark (BA '25, MA '26) writes, "For my 93rd birthday I received, from one of my sons, a cast of the head of the saber tooth tiger from the La Brea tar pits of California. I wish I could attend the 1997 reunion at Camp Branson in memory of the camp in 1924, 72 years ago."

Robert J. Cordell (FC '46, PhD '49) writes, "Have been putting finishing touches on my autobiography, a collection of essays and narratives describing my foreign tours. Also spend quite a bit of time keeping up with geological, petroleum, and related literature. For relaxation, my wife, Fran, and I continue to enjoy bridge, symphony concerts, plays, etc."

James W. Danser (FC '49, MA '50) reports that visiting dinosaur digs and museums in 1994 inspired his wife, Alice, to read *Hunting Dinosaurs* and give a thirty-minute report to her Chautauqua group in 1995. Jim reports that she has become his best student.

Christopher J. Daus (FC '82, BS '83) is a partner in the St. Louis law firm of Greensfelder, Hemker, and Gale, where he specializes in representing contractors and design professionals. Chris and his wife, Cheryl, are the parents of a new son, Matthew.

George H. Davis (FC '86, MS '89) writes, "I work in the same office as does Mark Dietiker (MS '86) and interact frequently with Ken Markwell and Rob Lauer, both MHTD employees and MU geology alumni. Some of the bridges, walls, and culverts we planned three years ago are now built or under construction, and it's immensely satisfying to see concrete results (pardon the pun) of our work."

Stanley N. Davis (Former Faculty '67–'72) writes, "I have continued my research into the use of halogens in hydrology with a primary interest in bromide and the radionuclide, chlorine-36. I was pleased to have been elected as a fellow in the American Geophysical Union in 1996."

Dana V. Downs (MS '86) writes, "Doing 'the best of Basin and Range' as Geologist for White Sands Missile Range. Land of crunchy groundwater and exposed geology! Purchased a home on the side of the mountain and spend much time touring the area via hiking and biking. Miss Missouri???? Miss Mizzou!!!!"

Richard De Camara (FC '65, BS '66, MA '69) is a senior consulting geologist with Amerada Hess Corporation in Houston, Texas.

Ebion Delima (FC '82, BA '82) is living in Columbia, Missouri, where he is retired from the University of Missouri.

Mark Dietiker (FC '85, BS '86) writes, "Traveling the byways and helping to build the highways of our beautiful state. Hope to see other '85 field campers at the reunion next year."

John G. Elliott (FC '74) reports a big year for hydrologic events in the west. He writes, "We had record and near-record snowmelt floods in Colorado, and I witnessed a major debris flow at Lava Falls Rapid in the Grand Canyon in March. Hello to my old friends and faculty."

Burnett Ellis (BA '44, MA '48) and **Jessie B. Ellis** (PhD '59) celebrated their 50th anniversary this past year. They enjoyed part of the winter in California and part of the summer in Wyoming.

Samuel P. Ellison, Jr. (FC '37, MA '38, PhD '40) reports that he completed *Geology of Texas* in 1996. Sam's oldest son, David, is an engineer for CH2M Hill in Denver, Colorado. His middle son teaches genetics at Texas A & M in College Station, and his youngest son, Stephen, is an engineer working with Travis County and living in Austin.

Celeste G. Engel (BA '44) resides in Victor, Montana.

Brad Esslinger (FC '80, BS '81, MA '83) reports that he is still living in Oakland, California, where he is enjoying the weather and the wine. Brad is a Senior Project Geologist for Woodward-Clyde Consultants.

Stanley C. Fagerlin (PhD '80) writes, "I'm pleased to report that I was finally promoted to associate professor this past year. It would not have been possible without the kind reference letters from Drs. Ethington and Freeman. I was also brought into the computer age with a new computer last November. Next year, e-mail!"

Craig D. Faris (FC '78, BS '79) is a senior strategic advisor working with Amoco E & P in Chicago.

Thomas J. Focht (MA '81) writes, "All is well in Kuala Lumpur except working on Saturdays! I recently transferred to Petronas Caragali, the national oil company of Malaysia (check out their home-page). I am on loan from ESSO for a couple of years. The family and I continue to enjoy living in this part of the world. Drop me a line via the Internet—focht@pop.jaring.my."

Richard D. Foxworth (FC '57, MA '58) is an attorney with Foxworth, Shepard, and Berry, P.A. in Columbia, Mississippi.

James R. Frank (FC '75, BS '76, MA '79) is still living in Walnut Creek, California, where he is working for Chevron Overseas Petroleum. Jim reports that he is still playing golf as much as work allows.

Alice C. Fuerst (MA '80) writes, "Nothing has changed here. I am continuing my environmental work through the Missouri Well Installation Board and the Blue Springs Solid Waste Management Commission."

John 'Jack' Gallagher (FC '63, MA '65) writes, "My principal SG & T international client is Pemex. Due to worsening and severe eye problems, I started to earn money outside of geology doing things that do not require vision. I market long distance service and recruit independent representatives to do the same. It works! I have good but limited vision in my left eye so I expect to be able to do geology for a few more years."

Jack W. Gardner (MA '35) writes, "My geology training served me well with Gulf Oil, in Naval Photo Intelligence in WWII, and in V-2 and satellite photo intelligence with CIA 1953–1972. Take a look sometime in the library at the book *Eyeball to Eyeball* by Dino Brucioni, published by Random House."

Donald S. Garvin (FC '50, BA '50, MA '51) is the owner of Braxton Oil and Gas Corporation in Oklahoma City.

Martha George (FC '76, BS '76) is a senior marketing representative for Western Geophysical in Midland, Texas.

Craig L. Glassinger (FC '69, BS '70, MA '72) is the vice-president of Stone Energy Corporation in Lafayette, Louisiana.

Barry A. Goldstein (MA '77) writes, "Bridge Oil bought by Parker and Parsley in late 1994. Left BOL/P & P in late 1995 (joined Santos). Santos bought most of BOL/P&P properties in Australia-Indonesia in April, 1996. Got all my files back! Olav Malvik and I collaborated in getting Phillips/P & P into Zone of Cooperation between Australian and Indonesia (Bayu field). We're both waiting for our bonus checks. Jenny and I turned into empty-nesters on this move. Cassi (now 22) and Becky (now 19) elected to stay in the outskirts of Sydney—on the New South Wales Central Coast. Have corresponded with Dr. Davies this year (after the passing of roughly two decades). All the best regards to all."

Mariano Haensel (FC '82, BS '82, MS '88) and wife Angela visited Camp Branson in September, 1995 and reports that Lander has grown a lot. Mariano writes that they will be hiking in central Mexico and around Inca ruins in the Peruvian Andes during September. He writes, "Lou, Reader, Delima, and Sheehan are always invited to come along."

Richard Hamilton (FC '53, MA '55) retired in June, 1995 from the Mt. Greylock Regional School District in Williamstown, Massachusetts.

Stanley E. Harris, Jr. (Visiting Professor '49) reports sad news: "Jane died last August suddenly and peacefully after a lovely afternoon picnic. Family hard hit, but we support one another. I am O.K. Spent January and February in Florida; now it is flower walks, gardening, and visits. My year-and-a-half at MU was a great start for 34 years at SIU."

George M. Haselton (FC instructor '81–'82) is currently retired in the small village of Westmoreland, New Hampshire, in the Connecticut River Valley.

Robert J. Heller (FC '77, BS '79) is still in Malaysia working for Core Lab. Bob writes, "Travel takes me often to Vietnam, China, Cambodia, and Japan. Family is doing well with Alex (3) and Nicolas (1) keeping Agnes and myself quite busy. Business is good, and Asia is still a great place to live."

Hank Hilliard (FC '66, BS '67, MA '70) writes, "Enjoying work these days! Norway, United Kingdom, and France...life is tough."

Troy L. Holcombe (FC '62, MA '64) reports, "Staying busy. Working on Coastal and Great Lakes geomorphology and surviving in the Federal Government. Two children in college; must stay active!"

William C. Hood (FC '58, BA '59) is retired from Amoco and living in Grand Junction, Colorado. Bill writes that the scenery is quite a change from Houston, and he is delighted to be able to see rocks again.

Frank Hooper (MA '59) writes, "I got bored at being semi-retired so I have agreed to help one more company get into international projects. This is the fourth and last one." Frank is working for Texas Petroleum Investment in Houston, Texas.

Kenneth L. Houser (MA '82) is the principal geologist for Geraghty and Miller in the Phoenix, Arizona, area.

Art Kasey (Student '65-'70) is beginning his 26th year teaching geoscience courses (Physical Geology, Historical Geology, and Advanced Earth Science) at Fox High School in Arnold, Missouri. Art says that he still loves the challenge of teaching about 180 teens each year.

Charles E. Keathley (BA '30) resides in Alhambra, California.

Robert M. Kick (FC '77, BS '78) reports that his work continues with the Forrester Group as an environmental management consultant. Robert has expanded his role in the past year by providing litigation support for several clients, in addition to his ongoing study of the geology and hydrogeology of southwest Missouri as part of a RCRA Facility investigation.

David T. King, Jr. (PhD '80) reports that he has become more interested in dinosaur research

and has established a dinosaur course at Auburn University. In January, David went to Belize, Central America, to study K/T boundary ejecta (a 30 m interval of diamictite). In August, he planned to go to Italy to assist with drilling at the K/T boundary there.

Donald L. Kling (FC '59, BA '60, MA '62) has been an independent geologist since 1971 in Corpus Christi, Texas. He reports, "Exploring for oil and gas in South Texas and the Texas Gulf Coast along with operations, production, and property management. Looking forward to 'better days' in the oil industry, especially in the natural gas sectors! Very optimistic about the future for everyone in oil and gas industry."

Ernie Knirk (FC '62, BS '65, MA '70) writes, "I have moved to Oklahoma City and am working with Louis Dreyfus Natural Gas. It's a great experience! Call if you can."

Romaine L. Kupfer (FC '48, MA '49) reports that she and husband Don enjoyed the May AAPG meetings in San Diego and hopes to be at the GSA meeting in Denver this fall.

Mark Kuhn (MA '81) and family have recently moved to Canada. He writes, "After 15 years in Houston, we were due a choice location. Beth and the three boys can't wait for the snow and all the winter fun that lasts until May! Now's the time to come see us. Y'all are welcome... ay!"

James D. Loch (PhD '92) has completed his third year at Central Missouri State University teaching Introductory Geology, Paleontology, and Historical Geology.

John Long (FC '73, BS '74) writes, "Married, two kids, living from well to well."

Olav Malvik (FC '76, MA '77) is working for Phillips Petroleum Company Niugini as the General Manager in Port Moresby, Papua, New Guinea.

William L. Mansker (FC '68, BS '68, MA '73) writes, "Still doing mineral exploration (diamonds, precious metals), environmental compliance and remediation, delving into subquantal reality, and writing some stuff. Regards to Frank. Where's Herman Jackson? Leanne Johnson?"

Melvin Marcher (FC '51, BA '53, MA '54) is still buying and selling rare and out-of-print books, mostly on natural history and western Americana. Melvin travels to book shows in Texas, Arkansas, Tennessee, and Colorado and all over the midwest to buy books.

Dave Martin (FC '87, BS '87) is CEO of ITIC, Inc., specializing in client/server application design and development and enterprise-wide networking (local and wide area networks). They currently have a staff of 10 people and are expecting to double in 1996.

Keith Scanlan Matlack (MS '86) is a Research Scientist at Catholic University of America, working on research and development in vitrification of nuclear, hazardous, and asbestos waste. Keith collects fossils in Calvert County, Maryland.

Earle F. McBride (FC '54, MA '56) writes, "Spent June in Spain looking at sandstones. Took a side trip to sample beach sands of the Bordeaux coast. People there seem to eat a lot of grapes. Get occasional letter from Doc Keller asking me to solve the origin of chert. Tough problem."

Kenneth McGee (FC '70, BS '70, MA '73) is still stationed at the Cascades Volcano Observatory working on volcanic gases. He managed to survive USGS downsizing last year and has recently worked at the Popocateptl volcano in Mexico and Kilaueau, Hawaii, and has an ongoing project at Mammoth Lakes, California. Ken sends his best to all!

Timothy McHargue (FC '70, BS '71, MA '74) reports that he been given the responsibility of leading a regional studies team to figure out the Australia's Carnarvon Basin and come up with new play types for oil and gas. Tim writes, "I'm anxious to see how we do. Geology used to be simpler. There has been a lot of deposition since the good old days at MU."

Peter McMahon (FC '80, BS '81) is in his 12th year as a hydrologist with the USGS in Denver, Colorado.

Jeff McManus (MA '70) writes, "Hi from Natchez. All is well in southern Mississippi. The kids are growing up, but my five-year-old does keep an old man on his toes. Looking forward to the next big oil boom (chuckle, chuckle). Our best."

Gary C. Mitchell (FC '67, BS '70, MA '71) writes, "Wow! What a year. A scottish wedding in Denver for my wonderful new wife, Jan, and me in May, followed by a two-week honeymoon in Scotland (Siccar Point is great!). Sold my house in May, moved in June, bought a new house in July, moved again in August in three

phases (storage, office, and storage, and Jan's house) and then maybe things will settle down. Everything is great. Hi to all."

Mary Mittelstaedt-Mann (FC '83, BS '83) writes, "I'm enjoying staying at home with our two daughters, and feel very lucky to be able to spend my days with them. I'm having fun teaching my 3-1/2-year-old about her environment and natural resources! (A junior geologist!)"

George E. Moore, Jr. (FC '35, BA '36, MA '38) writes that he is "enjoying retirement in Rhode Island, though the fishing has been only so-so. Our turn to visit daughter and family in Anchorage this summer. Enjoyed Xmas cards from a few MU geologists, but not many of the 1930 group left."

Thomas R. Moore (MA '81) writes, "Although I wasn't able to catch the alumni function, I saw a few folks at AAPG in San Diego and caught up with several of the faculty on a recruiting trip to Columbia last fall. Hope to do it again this year as we were able to hire two good geologists as a result. Working various aspects of sedimentary geology worldwide, from Algeria to Australia, Canada to Zimbabwe. Overworked and still underpaid."

João Alberto Pratini de Moraes (MA '69, PhD '71) is still working with surface and groundwater pollution control in the mining industry in Brazil. João writes, "Yes, drinking water is becoming more and more difficult to find (sure, we still have lots of water in developed regions, but its quality is questionable). I'm trying to get in touch with Van Brahana (Arkansas?) and Art Kasey (Fox High School, Arnold, Mo.?) Greetings from Brazil!!!"

Steven A. Morreale (MA '81) writes, "Hello to all. Life is good with Berlinda (30+), Helen (3), and Emma (1+). Still a federal bureaucrat (DOE) for pay and preaching for joy (New Life Foursquare Church in St. Anthony, Idaho). Stop by on your way to Yellowstone and hear the good news!"

Donald J. Muckerman (FC '78, BS '80) is a teacher in the Kirkwood R-7 School District.

Russell Murphy (MS '86) writes, "Things continue at a hectic pace at Exxon. Currently studying the sequence stratigraphy of the Miocene Ofkina Formation in Venezuela. Hello to the Sheltons, Wes McCall, John Rockhold."

Nader Nabulsi (FC '61, BA '61) writes that he misses everyone in Columbia and is doing fine in Syria. Nader is the Minister of Oil and Mineral Resources. He has four children: two boys and two girls.

Kerry L. Nikolaisen (BA '86) writes, "Our boys, Jason (7) and Alex (3), keep us busy with baseball and school functions. My wife, Kim, keeps things moving smoothly. I received my Missouri Geologist registration in January, 1996. If you're in St. Louis, stop by and see us!"

John L. Nold (FC '62, BA '63, MA '64) continues to teach at Central Missouri State University. John worked in the Proterozoic of Colorado and Wyoming for Cominco during the summer of 1995. He also rode his bicycle from Warrensburg to Ely, Minnesota. John and wife Judy have three grandchildren.

Jack Norman (FC '58, BS '60) writes, "Retiring this year. Sorry I never got the opportunity to put my degree to use. Still cherish memories of field camp. I have returned twice to visit Camp Branson. Would enjoy contacting 1960 geology classmates."

Donald M. Oliver (BA '34, MA '35) writes, "Sent to Midland, Texas by Phillips Petroleum Company in 1935. Transferred to Kerr-McGee until 1945. Independent Oil Producer until liquidated company in 1982. Now retired at Lakeway near Austin. No outstanding awards. Light producer of heavy crude."

Jack M. Oswald (FC '55, BA '56) writes, "Moved to Cedar Park from Houston on June 15, 1993. Spend my time traveling with my wife, Flo, playing with my three grandchildren and drowning minnows in nearby lakes. Stay somewhat current in Earth Sciences as a member of Geological and Engineering Research Committee at Texas A & M University."

Henry L. Ott (FC '52, BA '53, MA '58) retired from Chevron in November of 1992 with whom he had been working in Indonesia. He and his wife have now settled in the Denver area where they are likely to stay since two of their three children and five grandchildren live there. Hank writes, "Retirement hasn't presented any problems. Even tee times are easier to get during the week. Fishing is also great. Have been to Alaska twice already since retiring."

Robert J. Pauken, Jr. (FC '65, PhD '69) is presently working in Mobil's Exploration and Production Technology Center on projects related to international exploration. Bob writes, "It's nice to hear from former classmates periodically. Is Tom Freeman still skating?"

George R. Pinkley (FC '24, BA '26) writes, "Subsurface research in South Texas. Looking for more oil and gas. Assisting in promoting drilling operations. Still at the office half time. Health better than I deserve."

Michael W. Quearry (FC '72, BS '73, MA '75) continues to work for Texaco in Bellaire, Texas. Mike writes, "South America is calling me! Eva and I are active in our church and enjoy our nieces and nephews. We attended a family reunion in Hawaii last summer—stayed at Randy Travis' estate on Maui! We saw lava flowing into the Pacific! See you at Camp Branson."

Scott Raymond (FC '71, BS '72, MA '74) reports, "Life is good in Denver. Hello to all geology alums. If you're interested, call me about helping out your Geology Development Board. See you at Camp Branson in 1997."

John Repetski (FC '69, MA '73, PhD '75) writes, "Following the USGS reorganization, I'm now in the Eastern Geologic Mapping Team, but currently most of my work is in the Midwest (Ozark Scenic Waterways and SE Missouri bedrock mapping). So, Missouri co-op work is in progress with Prof. Ethington and alum Jim Loch, and I get to Mizzou more often. Also, still working with John Taylor on eastern projects as Survey work permits. I was Program Chair for the North American Paleontological Convention (a quadrennial paleontological Olympics) in Washington in June. It probably was the biggest paleo meeting ever, and it went pretty well, but I'll be glad to no have to plan another soon. On the home front, kids' activities continue to be added, but none ever seem to faze out, so time continues to be pinched; taller grass looks greener anyway. Donna get a minor break this fall, as our youngest, Trey, started kindergarten. All still hale and hearty in Virginia!"

Carl B. Rexroad (FC '48, BA '49, MA '50) reports, "Had a great time at meetings in Australia with camping field trips in the outback before and after; also a stay out on the Great Barrier Reef. Missed a planned trip to Poland because of wife's illness. Work continues as usual."

Dallas D. Rhodes (FC '68, BS '69) is starting his 20th year at Whitter College. In addition to teaching and chairing his department, his research on tectonic geomorphology of active strike-slip faults continues with good results. He also enjoys returning to Camp Branson each summer to work on environmental/ surficial teaching projects. Dallas says that he enjoys the annual chloresterol overdose at Svilars steakhouse in Hudson.

Harry B. Robinson (FC '35, MA '33) reports that he hasn't visited the Geology Building and Walter Keller, as often as usual because he is trying to complete the writing of his manuscript about Calamity Jane, who was born in his hometown of Princeton, Missouri. He hopes to finish the publication by the end of this year. (Harry lives here in Columbia.)

Sharon K. Rudolph (FC '76, BS '77) writes, "I am flying now. Opened my own mapping and GIS business in Anchorage, mid 1996. Contact me via e-mail: encompas@alaska.net. Hope all is well!"

William A. Ryan (FC '39, MA '40) reports, "Retired in 1979. Wife and I play with dance bands for jam sessions and other events. Are active in computer work (genealogy, music, etc.). Sons Edward and James live in Colorado and Michigan, respectively. Their wives, Joan and Lynne, are in education fields. Ed has an adopted daughter from Thailand. Jim has two sons."

Lisa L'Hote Schildt (FC '73, BS '80) writes, "Started 1996 to the sound of wedding bells. Married Ulrich Schildt in January. Spent a couple of weeks in Sweden in August looking at younger dryas glaciofluvial deposits. Biggest thrill of the year! Surviving mosquito attacks on forementioned trip. Berlin is still home base."

Dietmar Schumacher (PhD ' 72) reports that he will be leaving the Earth Sciences and Resources Institute of the University of Utah at year's end and will join GeoMicrobial Technologies, Inc., near Tulsa, Oklahoma.

Eugene 'Buddy' Schweig (FC '74, BS '76) is still with the USGS as Central U.S. Coordinator for their earthquake program. Buddy writes, "Been sneaking some research on the side. I've been to Panama twice this year, working

with the Panama Canal Commission on seismic hazards. Three kids, one wife, all well."

Kriston H. Scott (MA '81) is a computer scientist with the Air Intelligence Agency. Kriston writes, "I finally bought a house back in 1994. That, my job, and other activities keep me pretty busy. I wish the best of luck to all the other UMC grads!"

Larry Seright (FC '50, BA '51) writes, "Oil and gas exploration has been at a good pace here, especially with the current price structure. Have been doing work for Lario in west Texas and southeast New Mexico. Saw a few alums in San Diego (AAPG) and had a great time. Play golf and tennis every week—usually good weather for this all year. Enjoy the Newsletter!"

Trish Settles (MS '88) is an environmental organizer for the Dodley Street Neighborhood Initiative in Roxbury, Massachusetts.

John M. Sharp (Former Faculty) writes, "Great Newsletter. Daughter Katie is a geology major at Colorado State (junior). Son David enters U.T. in engineering this fall. I'm busy with projects on fractured rock hydrology, the Gulf Coast, and Trans-Pecos Texas. Carol and I enjoyed seeing George Viele at the GSA meeting in Austin."

Warner 'Bud' Sherman (FC '89, BS '89) is an environmental manager for the city of Springfield, Missouri.

Christopher J. Skiles (FC '94, BS '94) is employed by Levine-Fricke, Inc. in Chicago, Illinois. Chris is participating in and managing several CERCLA, RCRA, and FIFRA jobs. Chris reports that he spent his first year with Levine-Fricke as a field geologist but more and more has found himself in the office preparing reports and job proposals.

Scott Slagley (MS '84) is a Manager of Environmental Programs at RF&P Corporation in Richmond, Virginia.

Christopher J. Snider (FC '94, BS '94) works as a geologist for Geotechnology in St. Louis, Missouri.

Jesse O. (Joe) Snowden (FC '61, MA '61, PhD '66) reports that as of July 1 he became the Dean of the College of Science and Engineering Technology at the University of Arkansas at Little Rock. For the past six years, Joe had been the Dean of the College of Science and Technology at Southeast Missouri State University in Cape Girardeau. Joe writes, "I'm looking forward to seeing the MU folks at GSA in Denver. Give Dr. Keller my best, and say hi to Drs. Unklesbay and Viele."

David J. Steyaert (MA '80) writes, "My e-mail address is steyaert@IX.NETCOM.COM. Send me a note, drop me a line, and a warm welcome to all of you back at Mizzou. Jennie and I are enjoying our second child, Jen Clarice, born in November, 1994. Our son, age 11, now has me busy with Boy Scouts, 4-H, soccer, and baseball. If anyone is in the Albuquerque area come see us."

Ron Stoufer (MA '75) reports that he is working to build up the capacity of Nepali organizations to do rural development work on their own. Ron and his family live in eastern Nepal, which is a 3-day walk to the nearest motor road and four hours from an airstrip.

Joseph Swartz (BA '39) is enjoying retirement on Table Rock Lake and seeing the shows in Branson, Missouri.

Michael Sykes (FC '93) writes, "Just wanted to say 'hi' to the 'blue van crew' of summer, 1993."

John F. Taylor (FC '78, PhD '84) reports that he is "still enjoying life at IUP. Lots of fun with Adam (9) and Katie (1-1/2) at home (in the little time that I'm not away unraveling Cambro-Ordovician stratigraphy, sometimes with fellow alumni Brezinski and Repetski). Joanne and I would welcome a visit from any alumni from the '78-'84 era at MU."

Larry Tedesco (FC '77, PhD '81) is a geochemical coordinator for Chevron and is still doing exploration geochemistry for onshore U.S. Larry and Cindy visited London and Ireland this past summer and report that they had a wonderful time.

M. Ray Thomasson (FC '50, BA '52, MA '53) attended the International Geological Congress in Beijing, China in August as a convener at the session on *Basin Analysis - Genesis, Dynamic Process, Classification and Evolution of Sedimentary Basins*. Ray and wife, Merrill, enjoyed a three-week trip, part of which was spent sailing the southern coast of Turkey and studying the geology around Esphesus, Xanthus, and Kekova. Ray writes, "Thomasson Partner Associates has gotten on the map recently because of a field discovered on one of our projects in the Wind River Basin. It's called Cave Gulch. Barrett Re-

sources is the operator, and it's shaping up to be the biggest single field discovery in the Rockies in probably the last 15 or 20 years. Lastly, I would make an appeal to those graduates who came through Missouri in the early 50's to get in touch with us when they come through Denver. We love to renew old friendships."

Michael L. Trout (FC '67, BS '68, MA '74) reports that 1995 brought his return to the ranks of the employed. Mike is currently kept busy pursuing opportunities on Citation Oil and Gas Corporation's recent acquisition of Apache's Rocky Mountain properties. Mike writes, "See you at field camp next summer."

George Ulmo (MA '79) writes, "Still employed and prospecting for oil. Best regards to Russ B., Glen H., Doug F., B.B., and all the gang."

Jerry D. Vineyard (FC '57, BA '58, MA '63) reports that he became President of the Missouri Academy of Science, following in the footsteps of Clay Johnson and Wally Howe, who were Missouri Academy of Science presidents in earlier years.

Michael Vosbein (Student '69-'70) is now working for Halliburton Integrated Services in Kuala Lumpur, Malaysia, where he will be stationed for the next several years. Mike will be handling projects throughout southeast Asia and Australia.

John H. Wall (PhD '58) maintains affiliation with the Geological Survey of Canada at Calgary as an emeritus research scientist. At present, John is in the final stages of shepherding a multi-authored paper on Russia-Canada Arctic Jurassic correlations to the publication stage. John continues curating the microslide collection at the Geological Survey of Canada and provides service identifications to colleagues.

Tom Ware (FC '49, BA '50, MA '51) is showing a bronze sculpture in the Shidoui Gallery in Santa Fe.

Al Warneke (St. '81-'83) just published the second edition of *Color Country Sun-Fun Time Tour Guide*, a rather humorous advertiser-supported guide to Zion, Bryce, Grand Canyon, Arches, and Canyonlands parks.

Paul H. Weaverling (FC '79, MS '87) continues to work in the environmental consulting business. Paul writes, "Greetings to all and if life, business, or fun brings you through the Denver metro area, give us a call."

Randall W. Weber (FC '52, BA '53) retired in 1993 from A.P. Green Industries at age 62 after 27 years. He also spent 10 years in the U.S.A.F. following graduation in 1953. Randy reports that he never worked directly in geology, but always appreciated the fundamental base that he acquired from his geology courses.

Robert C. Weigel, Jr. (FC '56, BA '58) resides in Winchester, Virginia, where he is retired from E.I. DuPont.

Robert 'Bud' Weiser (FC '57, BA '58, MA '60) writes, "Still on Lake Norman, largest lake in North Carolina. Very busy with my consulting and training business. Family (two sons and two daughters) and two grandsons are all well. Will be at the July '97 Camp Branson reunion. Hope to see some 'old' buddies."

James White (MS '85) writes, "Looks like Linda and I will be staying on in New Zealand for a while longer. I've just changed to a tenure track position from the previous 3-year contract. Cheers."

James H. Williams (FC '50, BA '51, MA '52) writes, "The Missouri Division of Geology and Land Survey, through good and bad times for almost 140 years, has been involved with people—providing technical information and publications about geology, minerals, water resources, and surveys. We are still doing that. Stop in and see us."

Eddie A. Williamson (MA '73) is still living in Calgary with wife, Connie (former Geology librarian), and two teenage children. Eddie has moved back into Exploration from Production and is now vice president of exploration for Amoco Canada. Eddie writes, "Having a great time, but hope to be back 'down south' before too many more years pass."

M. Wes Winberry (FC '84, BS '85) is marking his eleventh year with ABC Laboratories, Inc. here in Columbia. Wes writes, "Best wishes to all my friends in geology."

David Woolery (FC '73, BA '73) is the owner of Cottman Transmission in Independence, Missouri.

Donald G. Woolverton (FC '71, BA '72, MA '75) writes, "We are still in Argentina and still enjoying it. If anyone gets this far south please look us up."

Mark A. Yanoski (FC '80, MA '83) writes, "Hope that 1996 is a great year for all of you.

The increased price of crude oil and natural gas shouldn't do any harm to those of us still left in the industry. Let's keep our fingers crossed. Ken Chapman, where are you these days?"

Jerry Yunker (FC '78, MA '79) is still working the Gulf of Mexico Basin in search of commercial hydrocarbons. Jerry reports that "Children, Anna (14) and Michael (12), are keeping us plenty busy. We keep in contact with Edith Roper, Bill Mills, Ken Jackson, Larry Tedesco, and Mark and Kathy Dando. It is nice to see a real rock occasionally, so we go backpacking in the southern Appalachians or Arkansas once or twice a year. Regards to all. Where are Kalish and Ulmo?"

In memoriam

James B. Rucker (BA '60, MA '61) passed away on April 4, 1996 of a sudden heart attack. Jim retired from NOAA in 1990 and moved to Mississippi, where he had been very active. Jim and Joe Snowden owned adjoining property there and worked together for several years on the geology of the Mississippi-Alabama barrier islands, which led to three publications.

Norman E. Smith (BA '51, FC '54) died on June 14, 1996 where he resided in Lafayette, Louisiana. Those who are currently in our department first came to know Norm in 1992 when he became a member of our Geology Development Board. Norm was immediately a contributor to our goals, through his hard work on our behalf and through his establishing the *Norman E. Smith Opportunities for Excellence Endowment in the Geological Sciences.* Norm is also remembered for his contributions to our development board dinners preceeding our meetings. On separate occasions he brought with him from Lafayette the most wonderful shrimp gumbo and gulf shrimp. Not only did Norm provide these culinary delights, but he would spend his time preparing and serving them to the other guests. Norm was also a benefactor of Southwestern Louisianna State University and of the community of Lafayette. These contributions are mentioned, not because of their intrinsic value, but because they illustrate that Norm was happiest when he was providing for others. All who knew Norm Smith will miss him.

Norm Smith (center) visited with M. Ray Thomasson and Kit Clark at our AAPG alumni reception in Houston in 1995.

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Bachelor of Science Degree Program

Department of Geological Sciences - University of Missouri-Columbia

Geological Sciences Core Curriculum (35 Credit Hours)

1. Introductory Option: Principles of Geology *or* Environmental Geology	4
2. Historical Geology (124) - writing intensive	3
3. Mineralogy (234)	5
4. Structural Geology (307)	4
5. Sedimentology (308)	3
6. Igneous/Metamorphic Petrology (326)	4
7. Geophysics Option: Plate Tectonics (304) *or* Applied Geophysics (303)	3
8. Water-Rock Option Hydrogeology (325) *or* Low-Temperature Geochemistry (342)	3
9. Field Geology (336)	6
10. Upper Level Electives: Three Geological Sciences elective courses 300+	9-12

Total in Geological Sciences Department = 44-47 Credit Hours

Collateral Science and Math Requirements (33-36 credit Hours)

1. General Chemistry (31, 32 *and* 33)	8
2. College Physics (21 and 22) *or* University Physics (175 and 176)	8-10
3. Analytic Geometry & Calculus (80) *and* Calculus II (175)	10
4. Computer science course (C. S 75 or 103, AG111, Geog147)	3
5. Introduction to Soils (100) *and* Laboratory (106) *or* Surficial Earth Processes and Products (227)	5 4

General Education Requirements (33 Credit Hours)

1. Foreign Language or Collateral Emphasis Area *Note*: Collateral Emphasis Area is an option individually tailored to student interests and could include advanced courses in math, engineering, biology, chemistry, physics, soil science, geography, etc.	12
2. English 20 Students must complete two additional writing intensive courses with one in their major field.	3
3. Social Science, Behavioral Science, Humanities and Fine Arts Should include one writing intensive and one constitution course . Students entering in Fall 1996 or later must complete a cluster.	18

Total Credit Hours Required = 120 or more for any B.S. degree in the College of Arts and Science.

Camp Branson Reunion

July 11–13, 1997

Over 200 participants expected

Renew acquaintances and meet new friends

Revisit Derby Dome and South Pass

Fish in the Popo Agie

Visit the Sinks

Hike to the Falls

Camp-out, lodge in one of the dorms, or sleep in a motel

Climb Wind River Peak

Photos and slides of your and others' years

Saturday night cookout with guitars, songs, and related activities

Informal, spontaneous events

Yarn-spinning and other tales.

The next mailing detailing activities, costs, motel listings, etc. will go only to those respondents who indicated an interest in attending our reunion. If you have not responded, but plan to attend, please write, phone, or e-mail immediately so we can include you in our plans.

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