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Indiana University College of Arts & Sciences Alumni Association

HOOSIER GEOLOGIC RECORD

Alumni Newsmagazine of the Department of Geological Sciences



Spring 2004

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Editor's note: We urge alumni and friends to send us prints, photos, or slides that would interest our readers. Please be sure to provide a complete caption and label the material with your name and address so that it can be returned. We can't promise to include all submissions, but we can promise to return them.

HOOSIER GEOLOGIC RECORD

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THE COLLEGE

Punctuated equilibrium marks department's evolution

Our department, like our science and our society, is evolving. Punctuated equilibrium is the norm for all evolution in university settings. Here change happens in steps with long pauses. Ours is no exception. We are, however, in the middle of climbing a giant step; we are not in stasis. With four new faculty members (David Bish, Mark Person, Juergen Schieber, and Chen Zhu), two simultaneous retirements (Lee Suttner and Noel Krothe in summer '03), one loss to raiding (Chris Maples in fall '03), and the search for two or three new tenure-track faculty to hire within a year, we are surely in an unprecedented state of evolutionary bloom.

Alumni and other gifts in response to our endowment campaign are now producing enough interest income, despite a low market, to make a huge difference in our program. Chris Maples, our immediate past chair, made very wise spending decisions to encourage research productivity, visibility of students' paper presentations at various national and international meetings, and field experience for students. Chris also patiently waited to fill new positions with utmost care and to recommend appointments only for the best in the discipline. We owe a lot to Chris's leadership.

It is my privilege to share some of our activities of the past year. Our research continues to be field- and sample-based. Some are modeling field and sample data to understand the physical, chemical, and biological processes that shape earth materials and earth features. The models range from chemical reactions or physical responses to computer-assisted simulations. Lisa Pratt has teamed up with chemists to model the effects of ^{34}S in the hydrolysis of sulfate esters, common in biological matter. David Bish has worked out a chemical equilibrium model to conclude that hydrated minerals can exist in the ambience of the Martian atmosphere. This has far-reaching consequences for life outside the earth, as well as on planetary evolution. At the other extreme, modeling of field data has led Greg Olyphant to predict when the abundance of *E. coli* would increase in the shore waters of Lake Michigan such that we do not utilize the beach in the wrong way at the wrong time. This model will go a long way — no pun intended — for example, in application to the two coasts of America.

Other faculty research is equally exciting, and diverse. Stress-induced neomineralization, including dolomitization, continues to interest Robert Wintsch and Enrique



Abhijit Basu

Merino. Climatic effects on geologic material and the inverse problem of inferring past climate from analytical work and theoretical reduction stimulate the collaborative research of Arndt Schimmelmann, David Finkelstein, and Simon Brassell. Sulfur isotopic investigations are helping Erika Elswick, Chusi Li, and Edward Ripley to understand processes of ore generation, as are experiments done by James Brophy to determine the solubility of copper in basaltic melts. Gary Pavlis, Michael Hamburger, and Al Rudman are setting up seismic arrays and deciphering below-ground "layering" and theoretical aspects of P-S wave propagation and conversion. Whereas James Brophy is conducting experimental research for better understanding magmatic processes in volcanism, Michael Hamburger is using GPS measurements to assess the movements of magmatic and hydrothermal systems in volcanoes. Claudia Johnson is applying biological principles to trace the ecosystems of reefs throughout the Phanerozoic and especially the Cretaceous. Tectonic control of sedimentation even in small basins and watersheds interests Bruce Douglas, who is also reviving his longstanding research in mantle xenoliths vis-à-vis subduction tectonics. Watershed research and dynamic modeling of groundwater flow is now well established in our department by Mark Person and his newly formed research group.

Shale research, which we predict to dominate sedimentary geology in the near

future, has been pioneered by Jürgen Schieber, whose studies range from regional distribution of black/gray shale through nanobacterial entities. Greg Olyphant's inverse modeling of multiple field observation of soil creep and David Bish's mastery of clay mineralogy are seemingly distant but obvious partners in shale research. Christine Shriner's interest in archeology has excited James Brophy and Arndt Schimmelmann with different approaches and tools to revive our reputation, which Charles and Dorothy Vitaliano had fostered.

Geographically, our research spans the globe and beyond. Neotectonics of the Wabash Valley or water pollution in Indiana is of local economic interest. Our faculty are traveling to the Philippines and Italy, Taiwan and Greece, South Africa and Canada for fieldwork, sampling, and analysis. Mars and the moon are very much a part of our existence now.

Our students, working in close partnership with the faculty and postdoctoral fellows, are making research presentations at regional, national, and international meetings. Largely with the help of alumni gifts, we support travel to such meetings (and fieldwork, of course) far and wide. Presentations at GSA, AGU, and AAPG/SEPM meetings are common, and those at specialized meetings, for example in Poland or Canada, are not rare. This is a great incentive for students to be productive in research and to get to know what is happening in the outside world.

It is not necessary to repeat how field-based learning has been, is, and will continue to be a staple for our department. In another article in this *HGR*, James Brophy and Bruce Douglas will update you on activities at our beloved field station in Montana. Field trips associated with regular courses continue.

Something else is happening on campus! Robert Wintsch has designed and is teaching a course, nominally using the old G111 course number, on physical geology and rudiments of field mapping during fall semester. The course is meant for intended science majors, preferably those looking into geology. Robert Wintsch, a great teacher in the field with Socratic gifts, also runs short field trips for undergraduate and graduate students to distant places. This fall, he was invited by a number of colleges and universities in New England to run a field trip for their students. And he is not alone in designing field-based learning. We are truly excited about the quality of the

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Goodwill links faculty, staff, students with alumni, friends

In 1991, when I followed Bob Dodd as department chair (not to be confused with the title “department stool,” bestowed on me by our late alumnus Harold Kaska after Chris Maples replaced me), I gained insight into how the coaches who followed the Lombardies, Woodens, and Knights of the sports world must have felt. Little did I realize then that these same feelings would be rekindled after my retirement when I would be asked to follow both Bob Dodd (again) and Dave Towell as editor of the *Hoosier Geologic Record*. Dave certainly elevated this publication to a new high in quality, and Bob maintained the same standards. Because of their efforts, many feel that our alumni magazine may very well be among the top two or three in the university. As editor, I have already failed in meeting one of their standards — timely publication. I apologize to all for my tardiness. I also harbor fear that my rookie year as editor will be reflected in my inability to match several other standards set by Dave and Bob. Please bear with me as I learn from my mistakes.

Functional, healthy, and happy academic departments are characterized by the good-

will generated through the positive interaction of their students, staff, faculty, friends, and alumni. An important link connecting our friends and alumni with the on-campus members of our departmental family and generating goodwill is the *Hoosier Geologic Record*. The importance of goodwill with and among our alumni and friends cannot be overestimated. Those with good feelings toward the department assist in recruiting good students and providing timely and seasoned advice, as well as a valuable and different perspective. Moreover, the generous financial support of our alumni and friends permits us to compete in an environment where success, even for publicly funded universities, cannot be achieved solely with traditional forms of revenue — tuition, state subsidy, and research grant overhead.

We sincerely hope that this issue of the *Hoosier Geologic Record* will magnify the good feelings toward the department that we know many of you possess. But regardless of how you feel, do stay in touch with us in the same way that we use this publication to stay in touch with you. We encourage you to write with your advice, your

observations about how and where the department appears to be evolving, and, certainly, news of your own professional and personal lives.

Many thanks to all who have assisted in finally making this issue of the *HGR* a reality. First, I express my gratitude to Bob Dodd, who has played a variety of news-gathering, authoring, and editing roles, in addition to being a veritable fountain of ideas and advice on content. Kim Schulte took valuable time from her incredibly busy schedule to catalog important data on our alumni gifts, external grants, and other faculty and student activities. I am also indebted to many of our faculty and graduate students who contributed articles and information, and to Dick Gibson who graciously allowed us to use news he collected for the department’s Web site. The cooperation I received from Barb Hill in handling all aspects of photos and figures was truly commendable and well above and beyond the norm. Last but not least, Tricia Miles, here in the department, and Julie Dales in the Alumni Association office collected tens of attachments to e-mails

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Aloha from the former chair

New challenges lure Maples to Desert Research Institute

Ever since learning that the Hawaiian word “aloha” means both “hello” and “goodbye,” I’ve thought that having such a word was a really good idea. Some of you reading this issue of the *Hoosier Geologic Record* will be surprised to learn that I am leaving Indiana University after nearly five years as department chair to accept a position as vice president of research at the Desert Research Institute in Nevada. Yes, this is the same DRI with campuses in Las Vegas and Reno for which our alumnus Steve Wells serves as president. This was an extremely difficult decision for me to make. I like Bloomington and IU, as does my wife, Sara. I love the department with a passion that only alumni who have had wonderful experiences with their mentors can. And even though I put teaching and research, two other passions of mine, aside during my term as chair, I was looking forward to getting back to both on a more regular basis.

So why leave IU? The answer is simultaneously simple and complex. Simply put, I

believe that everyone loves to be challenged at some level by something. For me, that challenge is facilitating the work of others, spreading goodwill, and elevating the reputation of the institution for which I work. Five years ago, the faculty in geological sciences at IU took a chance on me to perform these tasks. The passage of time and the perspective that retrospect brings will be the best measures of success or failure in those capacities. But for now, serving the faculty, staff, and students of geological sciences has been tremendously rewarding and just plain fun! Certainly this is a very different looking department from what it was in December 1998! For that, and for so much more, I owe a great deal of thanks to everyone — from alumni to emeriti, from students to faculty, from staff to administration.

Although I cannot thank everyone by name — because that would be an injustice to someone I may miss and because space will not allow — please permit me a very personal thanks and a personal opinion

about why we (as a department) are where we are today: our advisory board and our former department chair, Lee Suttner. Without their collective vision, drive, and success in the department’s historic endowment campaign, we would not have had the opportunity to hire the faculty we have hired, nor would we have received the support from the IU administration that we have received. Our faculty, staff, and students have prospered from the success of that campaign, and for that we all owe you, our alumni and friends, more thanks than can be expressed adequately in these pages. Therefore, it is my hope that you will look through these pages, read the updates, and take pride in what you have helped bring about in geological sciences at IU. It is also my hope that all of you will continue your support for the department and its new chair, Abhijit Basu — I certainly will! As many of you know, Basu also is an alumnus of this department, which, in my mostly unbiased opinion, provides a wonderful

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Around the Department

David L. Bish joins faculty

David Bish joined the faculty in August 2003 as the first occupant of the Haydn Murray Chair in Industrial Minerals. We have asked him to tell us in this essay a bit about his background and interests.

As a youngster, I was fascinated by rocks and minerals, especially the prehnite that I collected from the cobbles of diabase in our driveway in northern Virginia. I have been interested in clay mineralogy since my graduate student days, when I received my PhD from Penn State in 1977 with Professor George Brindley, one of the renowned clay mineralogists of the 20th century. I fondly recall receiving a letter from Dr. Brindley (no one ever called him George, except his wife and a few old friends) after I had applied to Penn State for graduate school. He told me about his ongoing research program in clay mineralogy and asked if I would like to join him. Of course, I was thrilled. After I accepted, I learned just how high his expectations were of his students. He requested that I join him immediately after receiving my BS degree, without a summer vacation! I told him that I was going to attend geology field camp and could join him later in the summer. Being a laboratory scientist who, according to him, did his field work in museums, he felt that I didn't need field camp. Fortunately, I held my ground, and we arrived at a compromise that left me with about two weeks of vacation after field camp before starting my PhD program on Aug. 1, 1974. I quickly realized the gift I had been given when I had one month of research under my belt and my fellow students began arriving around Sept. 1. Penn State was a stimulating place to be in those days, and I had a wonderful time working on a variety of projects, from studies of nanometer-sized clay minerals to single-crystal diffraction and spectroscopic experiments on olivine. I remember that perusing the course catalog was like reading the menu in a high-class restaurant: I couldn't decide what offering to try next!

After three great years with Dr. Brindley, I took off for Cambridge, Mass., to be a postdoctoral fellow at Harvard University with Charlie Burnham, a crystallographer. There I continued my mineralogical research, delving into some computational modeling studies of clay mineral stabilities and doing some more single-crystal X-ray

diffraction and transmission electron microscopy studies on minerals. This was quite an exciting time, and I was fortunate to be able to mingle at lunch with the likes of J.B. Thompson, C. Hurlbut, Cliff Frondel, Marland Billings, and Steve Gould. Perhaps most thrilling was sharing an office for a year with Martin Buerger, one of the fathers of modern X-ray crystallography.

Around Thanksgiving 1980, I drove my old 1967 Buick Special out to New Mexico to take a staff scientist position at the Los Alamos National Laboratory (then the Los Alamos Scientific Laboratory), in Los Alamos, N.M. I was drawn to Los Alamos by the scientific breadth of the institution, the intellectual freedom that existed then, and, of course, by New Mexico. When most of us hear the words "New Mexico," we think of hot, dry desert country. Los Alamos and northern New Mexico in general are far from a hot, dry desert. This area of the state is mostly above Denver in elevation (Los Alamos is at ~7,400-foot elevation) and is dotted with ponderosa and piñon pine trees. The area has mild summers (temperatures usually below 90), with rain July to September, and mostly sunny cold winters with an average of six feet of snow. Los Alamos even has its own ski area, about 20 minutes from my old office. It's an almost ideal climate (but don't tell anyone).

The first few years at Los Alamos were pretty unusual, and I had the chance to work on the fledgling Yucca Mountain Project. At that time, we all thought the project would go on for perhaps four or five years. Little did I know that the project would outlive my career at Los Alamos. I also had the opportunity to work on what was known as the Containment Program, which was responsible for ensuring that no radioactivity was released during underground nuclear tests. Empirical observations suggested that previous leaks were associated with the presence of clay miner-



New faculty member David Bish displays one of his many prized juke boxes. He owns about 11 of the old-fashioned music makers.

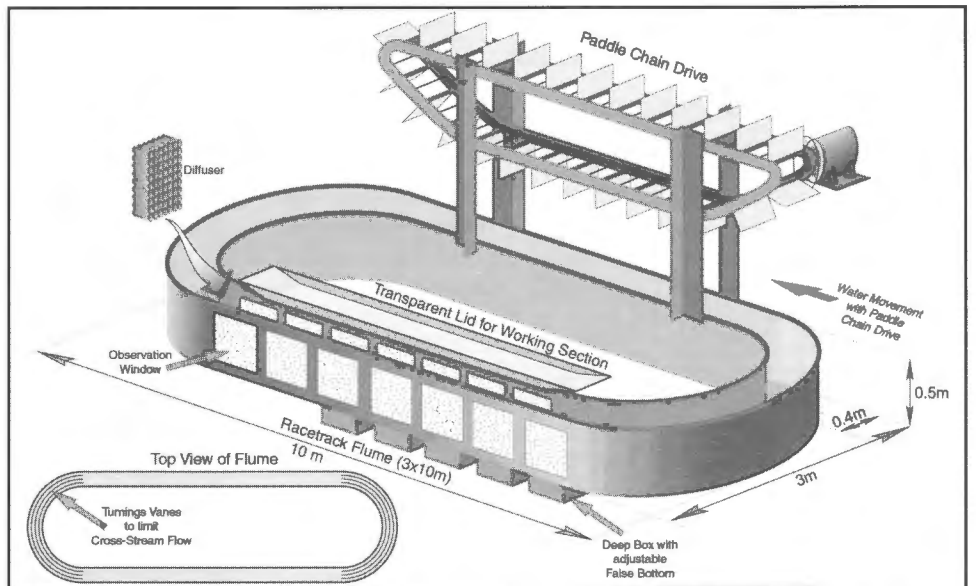
als near the "device," and it was my job to identify and quantify clay minerals in drill core from the Nevada Test Site. Apparently the water in clay minerals, mostly smectites, rapidly evolved when heated during a test, opening pathways to the surface. In the testing years, the Nevada Test Site, or NTS, was like a small city, complete with a movie theater (without doors), swimming pool, bowling alley, cafeteria, dorms, and a steak house. Yes, in those days you could go to a nice steak house at the NTS and have "surf and turf" for \$4.95. There was a carnival atmosphere the night before a test, and the steak house always offered free desserts. In the cafeteria, we used to try to spend \$1 for breakfast, something that was hard to do unless you had a huge appetite. In the evenings, you could buy a few beers and walk over to the movie house for a free movie after a hard day in the field.

Over the years, Los Alamos changed, through the end of the cold war and underground testing, through the Tiger Team (safety team), and the recent hard drive, espionage, and property scandals. Throughout my 23-year career at Los Alamos, I worked on a variety of applied projects involving both clay minerals and zeolites. The underpinning of much of my research was the importance of these minerals in environmental applications. Although Los Alamos is an applied research institution, I was given the freedom, indeed the encouragement, to investigate a variety of fundamental research questions, which I did with

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NSF funds new racetrack flume for sedimentary geology

NSF is funding the construction and operation of a large racetrack flume for experimental work on the sedimentology of mudstones. The dimensions of the flume are approximately 35x10 feet, with water movement accomplished by a motor-driven paddle belt. The flume will have five to six sediment boxes with adjustable bottoms for experiments on freshly deposited (and thus self-compacting) muds. The flume's design and the upcoming experimental work represent collaboration by Juergen Schieber (IU) and John Southard (MIT). Because the details of mudstone sedimentology are pretty much "terra incognita" at this time, results from this research will have important implications for our understanding of mudstones, their depositional dynamics during sea level fluctuations, and the interpretation of their depositional environments.



Conceptual view of the flume that is currently in the finishing stages of construction in the basement of the Geology Building. It was built in segments because of the size limitations of the PVC sheets used to manufacture the channel.

Chair's greeting

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learning experience of our students.

We are determined to work collectively to maintain a new momentum and make a department that is superior to the mere integral. Toward this end, for example, a few faculty members are joining forces to create a hydrogeology field school at Indiana University. They will advertise this camp nationally and seek support from NSF to obtain state-of-the-art hydrologic equipment. A newly funded flume lab and a low-vacuum SEM will assist in launching

experimental sedimentology on campus. Our multidisciplinary faculty expertise extends into facets of physics, chemistry, biology, mathematical modeling, high-powered computing, and applied aspects of petroleum exploration, water resources, and environmental law. We are resolved to engage in discourse across these disparate fields, to launch collaborative projects within the department, the College (e.g., with astronomy and biology to establish an IU Center for Astrobiology), other schools (e.g., Education, SPEA, Informatics) and other institutions (e.g., U.S. Geological Survey for Geochronology and Tectonics).

We are active in developing a nationally recognized effort in science outreach (e.g., U.S. Educational Seismology Network, NASA's E&O program). The quality of our classroom teaching, mentoring of research students, and the rigorous education we provide at the Judson Mead Geological Field Station assist such endeavors.

The crowning glory came to us on Oct. 12 when the U.S. National Academy of Science inducted Haydn Murray as a fellow in its Institute of Engineering. He is the only IU faculty in this institute.

— Abhijit Basu

From the editor

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from me, miscellaneous clippings of news from other sources, and a variety of other forms of information exchange and skillfully crafted them into a professionally done final product. Quite frankly, I am not sure how they managed to do so well, given the shortcomings of their inexperienced editor. Tricia always reacted to my gravest concerns with a can-do smile on her face and Julie with a can-do tone in her voice on the phone. The efforts of Kim, Barb, Tricia, and Julie vigorously reinforced feelings I developed during my time as department chair about how lucky we are to have such a wonderful staff.

— Lee Suttner

Aloha

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background for the work of the chair's office. Change is good and because Basu has such strong faculty support, he and the rest of the department certainly will be able to accomplish many things that were not even contemplated before our endowment campaign began.

The written contributions from me over the past several years have been about us (the department) and you (our alumni and friends). That has not changed and will not change now. Like you, I will look forward to receiving my copy of the *Hoosier Geologic Record* in the mail and reading about the comings and goings of faculty, staff, stu-

dents, alumni, and friends from Bloomington and nearly every continent of the globe. Like you, I will maintain my ties to the department and contribute in whatever ways possible to its collective success. And like you, I will take joy in the successes that IU enjoys. IU alumni really are everywhere, which means you never really leave IU — you simply experience it from a distance and revel in it with friends and family. I look forward to beginning a new chapter in my life at the Desert Research Institute, but, like you, I'm not really leaving IU or the department. For me, this really is aloha, not goodbye.

— Christopher Maples

2002 screwball campaign, annual holiday party

The 2002 holiday banquet and screwball campaign leading up to the event were among the more memorable events in recent departmental history. Once again, the students mounted fierce campaigns for the faculty members they felt were most “disserving” for this year’s Screwball Award. Campaigning began well before the event with a number of creative campaigns for many of the faculty.

The night of the banquet, the faculty and students enjoyed an evening of good food and good company. In addition to the normal happenings, three graduate students, Will Tackaberry, John Johnston, and Dave Lampe, put together two slide shows to complement the event. The first was a series of pictures from various field trips and department events set to the theme music from the movie *Chariots of Fire* by Vangelis. The second was a historical look back at the construction of the current building and the Indiana Geological Survey, along with images from the Field Station in Cardwell, Mont. The IGS archives kindly provided the images. This slide show was set to the music from *Robin Hood, Prince of Thieves* by John Williams.

After the two slide shows, the Screwball Award was presented to Noel Krothe, who gave warm and heartfelt thanks to the students for the award. Following Noel’s remarks, Bob Dodd and Don Hattin took center stage to tell stories and share some of their favorite memories from years past.

All in all, the evening was a great success! We look forward to continuing this tradition with another memorable screwball campaign and banquet this winter.

— Will Tackaberry



David Bish

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several close collaborators. Los Alamos is not a teaching institution, but I did have the opportunity to work with a variety of undergraduate and graduate students in my laboratory, and I mentored five postdoctoral fellows. Living in Los Alamos for so long was a unique experience. It’s a small town, and everyone knows everyone else. My wife, Karen, couldn’t go to the grocery store without stopping to chat with several people. Our daughter asked several times, “Mom, do you know *everyone* in town?”

Over the past 15 years, my wife and I have enjoyed collecting antiques and, in particular, jukeboxes. We now have something on the order of 11 jukeboxes (I’ve lost count). The younger of you are asking, what is a jukebox? Jukeboxes are those wonderful, light-up machines, first common in the 1930s, that were in bars and restaurants and played records. Originally, you could get a song for a nickel. Of course, records have gone the way of the mimeograph machine, and the slide rule too. But there’s nothing like listening to an old Glen Miller or even an Elvis tune on an original record, played by a beautiful glowing jukebox, the way they were meant to be heard. We are assembling a “diner” in our basement, complete with a few jukeboxes, coke machines, neon lights, foosball table, and a myriad of things we have collected over the years.

Having been in northern New Mexico for 23 years, you might wonder why we decided to come to Bloomington. Karen and I both liked Bloomington from our

first trip, and we have enjoyed the town and the surrounding area already. We took in the Indiana State Fair this past summer and especially enjoyed the vegetable and animal displays and the antique tractors (I tried a deep-fried Twinkie and Snickers bar, just to say I’d had one of each). I returned from the fair with the urge to buy an old Farmall tractor, but my neighbors probably wouldn’t like seeing it in the driveway everyday (wait, what am I thinking, my wife’s car could come outside and the tractor could take its place). I was attracted to the department by the congenial faculty and by the opportunity to work with students on a daily basis. Of course, the Murray Chair was my primary attraction to the department. I have known and admired Professor Murray for a number of years through our mutual association in the Clay Minerals Society. This is the first chair of its kind in the country, if not the world. I believe that establishment of this professorship was an important moment in clay mineralogy, and I am proud to be the first occupant. Over the next few years I plan to assemble new laboratories for X-ray powder diffraction and thermal analysis. The X-ray diffraction laboratory, presently undergoing renovation, will include two state-of-the-art powder diffraction instruments, one for studies under ambient conditions, and one tailored for studies under nonambient conditions, such as elevated temperatures or controlled relative humidity. Gone are the days of strip-chart recorders and leaky X-ray machines. The new instruments are completely shielded and interlocked, and some of the latest diffractometers can collect a good powder pattern in just a few minutes

instead of an hour. In addition to using the X-ray diffractometers for clay mineral analysis, I plan to use the instruments to study how clays and zeolites respond to changing temperature and relative humidity. The new fast detectors will allow us to perform kinetic (time-dependent) studies that we couldn’t even imagine 25 years ago. The thermal analysis laboratory will include instruments that allow us to determine how clays and other hydrous minerals, such as zeolites, interact with water and organic liquids. Proper interpretation of the data can actually provide information on the thermodynamics of water in these minerals, something that I have been applying lately in an attempt to understand water in minerals on the surface of Mars. I have been studying whether hydrous minerals such as clays and zeolites can account for the water observed on Mars’s equatorial regions. My other laboratory studies are focused on gaining a fundamental understanding of the surface properties of fine-grained minerals such as clays — for example, what controls how clay minerals osmotically swell into a gel? I plan to pursue this research, perhaps mixing fundamental studies on clay mineral surfaces with applications of clays. Indeed, Professor Murray and I have also discussed several upgrades to his existing clay-property laboratory, and I look forward to blending our research interests in the coming years. I am excited about working with others in the department in the coming years and creating a vibrant program in applied mineralogy. And my wife and I look forward to an enjoyable and productive time in this lovely state.

— Dave Bish

Noel Krothe, friends celebrate his retirement in high style

More than 200 family, friends, colleagues, and former students joined Noel Krothe in the Big Red Room of IU's Memorial Stadium to celebrate his retirement after 27 years on the faculty of the IU Department of Geological Sciences. Even a brief power outage in the windowless room less than an hour before the party did not dampen the festivities.

The program following the reception and meal included brief talks, presentations, and some light-hearted "roasting" by some of Krothe's former students and colleagues. Perhaps the highlight of the evening came when Krothe was named a Sagamore of the Wabash, Indiana's answer to the Kentucky Colonel. The award is given to select individuals who have made significant contributions to the state of Indiana. Krothe's many years of research on groundwater resources and pollution problems in the

state certainly qualify him for this recognition. The award was presented by Rep. Matt Pierce. Gary Pavlis was master of ceremonies for the proceedings.

Krothe's wife, Joyce, and their three children, Kara, Joseph, and Jason, and his sister, Donna Goobic, were part of the celebration. Among the out-of-town colleagues who journeyed to Bloomington for the celebration were John Brahana, from the University of Arkansas, Jack Crelling, from Southern Illinois University, and Tom Hendrix, retired from Grand Valley College.

Twenty-seven of Krothe's many former graduate students were also in attendance: Kenny Arroyo, MS'01, Steven Baedke, MS'90, PhD'98, Mark Basch, MS'93, Mark Buehler, BS'96, Mary Prada Dombrowski, MS'91, John Edkins, MA'81, Yuming Fei, MS'99, Eric Fry, MS'94, Roy Funkhouser, MA'83, Billy Giles, MS'87, Brant Howard, BA'77, MA'82, Colin Hudson, Mohammed Iqbal, PhD'94, Robert Johnson, In-Sung

Lee, PhD'94, Robert Libra, MA'81, Steven Loheide, MS'01, Barbara Lakey McTaggart, MA'84, Bryan Motzel, MS'01, Matthew Noriega, MS'97, Jennifer Overvoorde, William Robinson, BS'81, MS'86, Jennifer Ryan, James Thomas, MA'80, Neill Vaughan, Scott Warner, MS'86, Hai (George) Choa Yu, PhD'99, and Francesca Zucco.



Noel Krothe's son, Joseph, addresses the gathering.

The department has established the new Krothe Hydrogeology Fund in honor of Noel Krothe on his retirement. Interest from the endowment fund will be used to aid hydrogeology students who are traveling to national or international meetings to present results of their research. To date, more than \$7,000 has been contributed to the fund. If you would like to contribute, send a check to the Department of Geological Sciences, Indiana University, Bloomington, IN 47405.



On behalf of Gov. Kernan, Rep. Matt Pierce, right, presents the Sagamore of the Wabash Award to Krothe.



Krothe revisits the past with former students, from left, Eung-Seok Lee, Yuming Fei, Mohammad Iqbal, and George (Hai-chao) Yu, pictured in the framed photograph.

Hattin sings professor's praises in Krothe retirement encomium

This encomium was written on the occasion of Professor Noel C. Krothe's retirement in 2003.

Full of 1968 marked the arrival in Bloomington of Noel C. Krothe, who had enrolled in the recently established National Science Foundation's master of arts for teachers program, sponsored jointly by the departments of Geology and Geography. At that time, no one could have guessed that this event portended profound change in the direction and success of the IU hydrogeology program. Greatly inspired by his MAT professors, Noel recast his professional goals and left the public school arena to pursue graduate studies in geology at Pennsylvania State University. On completing his doctorate, Noel accepted a position in the IU Department of Geology, where he became principal architect of our present dynamic hydrogeology program. His outstanding qualities as teacher and researcher attracted large numbers of graduate students, yielded an impressive array of publications, and brought him national and international acclaim.

Born on May 22, 1938, Noel was raised in Shickshinny, Pa., and attended nearby Bloomsburg State College, where he earned a BS in science education in 1961. During a six-year stint in public schools, Noel learned of the MAT program at IU, and, upon earning that degree in 1969, embarked on the course that led to his exceptionally productive career in geology. While at Penn State, Noel served as coordinator of geological sciences (1970–72) and as a professional research assistant (1972–76) and was employed during the summers of 1974 through 1976 by the Water Resources Division, U.S. Geological Survey, in Denver, Colo. He received an MS degree in 1973 and a doctorate in 1976.

As a member of the IU geology faculty, Noel served as assistant professor (1976–81), associate professor (1981–98), and professor (1998–2003), retiring on Aug. 10, 2003, after 27 years of exemplary service to the department and to the hydrogeology profession. Noel taught a variety of courses at both undergraduate and graduate levels, but G-451 Principles of Hydrogeology brought him special distinction because this course was consistently populated by large numbers of students, many of whom progressed to highly successful careers in that field.

In his research endeavors, Noel excelled, having carried out hydrogeologic investigations across much of the United States, including the Appalachian Mountains, Eastern Interior, Great Plains, Rocky Mountains, and Alaska. His interests are



Noel Krothe and his wife, Joyce, along with their three children, from left, Joseph, Jason, and Kara, enjoy Don Hattin's remarks about Noel.

diverse, with special attention to the Central High Plains Aquifer, hydrogeology of karstic terrains in southern Indiana, groundwater flow patterns as determined by stable isotopic chemistry, and toxic water contamination of surface water and groundwater. Noel's expertise, versatility, and enthusiasm drew numerous students into his laboratory, and resulted in co-authorship of many landmark studies, which brought widespread recognition to his program. Altogether, Noel is author or co-author of more than 160 abstracts and published articles and is co-editor of a book resulting from presentations made at the 30th International Geological Congress (Beijing, 1997). Under Noel's demanding tutelage, 58 graduate students, including recipients of 48 master's degrees and 10 doctorates, carried out research on problems of Indiana hydrogeology and work that he supervised in Alaska, Washington, Montana, Colorado, Kansas, Oklahoma, Wisconsin, Illinois, Massachusetts, the Bahamas, Italy, and New Zealand. Grant support for Noel and his students came from diverse state and federal agencies and from several corporations. These include the U.S. Department of the Interior, U.S. Army, U.S. Navy, and Westinghouse Corp., to name but a few. Noel has been extraordinarily successful in attracting extramural funding, with financing from 56 grants totaling more than \$1.8 million. Additionally, grants involving cooperating partners, such as the Indiana Geological Survey and SPEA, as well as grants for student support, have brought the total to an enviable \$2.9 million! These numbers speak volumes about the quality, social relevance, and impact of research in which Noel, his legion of students, and his other collaborators have been engaged.

Noel's service to the geological profession has been as impressive as his research

activity. He has taught short courses on groundwater chemistry, groundwater pollution, and hydrogeology field methods in Indiana, New York, New Hampshire, and Illinois, and he has chaired technical sessions at numerous conventions at regional, national, and international levels. In our flagship organization, the Geological Society of America, Noel has served as chair on the History of Hydrogeology Committee; as a member of the Meinzer Award Committee; as a member of the Student Research Grants Committee; and as associate editor of the prestigious *G.S.A. Bulletin* (1989–92). He has served also on the advisory board of the Water Resources Research Center at Purdue University; on the Groundwater and Vadose Zone Investigations Committee of American Standard Testing Materials; and with the Technical Association of the Pulp and Paper Industry.

Noel's far-reaching reputation in the field of hydrogeology is evinced by honors that have been bestowed upon him regionally, nationally, and internationally. In 1983, he was vice president of the Indiana Water Resources Association and in 1984 served that organization as president. Noel has been an invited speaker in numerous symposia of the Geological Society of America; at meetings of the International Association of Hydrogeologists, including that in Sukumi, U.S.S.R. (1981); and at the Western Pacific Geophysical Meeting of the American Geophysical Union in Kanazawa, Japan (1990). In 1992, he undertook an invited lecture tour in China, making presentations at institutions in Beijing, Xian, and Shijiazhuang. Lecture topics embraced highlights of his research career — "High Plains Regional Aquifer," "Karst Hydrogeology in Southern Indiana," "Delineation of Groundwater Flow and Origin Using

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Johnson awarded tenure, her students noted for success

Claudia Johnson was awarded tenure by Indiana University in 2003, and once this joyous news trickled from the chambers of the board of trustees to her office in geological sciences, Johnson celebrated heartily with colleagues, friends, and family.

One new PhD student, **Liming Zhu** (MS, Nanjing University) joined Johnson's research team on Cretaceous reef investigations in the '03 fall semester. Zhu is initiating her work on coral taxonomy in order to investigate rates and patterns of extinction across the Cretaceous-Tertiary boundary.

Jen Latimer (co-chair with Gabe Fillippelli, IUPUI) is completing her work on phosphorus geochemistry and terrigenous production in the southern hemisphere oceans. Latimer now holds a postdoctoral research position at the University of Michigan.

Leigh Fall completed her MS degree in '03 with a thesis titled "Quantification of Coiling in Rudist Bivalves and Assessment of Water-Energy Levels; Middle to Basal Upper Albian, Edwards Formation, Texas." Three more MS students are working toward the completion of their degrees.

Laurie Huff's project (co-chair with **Erle Kauffman**) focuses on the characteristics defining the dinosaur to bird transition.

Sonya Hernandez's work on Oligocene reefs centers on sedimentology and stratigraphy, and **Erica Barrows's** double major in geology and education has led her to investigate the teaching of evolution in public schools.

Johnson was a research mentor for **Selena Medrano** from the IU STARS Program for the last three-and-a-half years. Medrano finished her work on the recovery rates and patterns of modern coral genera from the south coast of Puerto Rico, a project carried out jointly with Wilson Ramirez of the University of Puerto Rico, Mayaguez.

Two undergraduate senior research projects were initiated this year. **Nick Leach** finished his work on the biogeography of ceratopsian dinosaurs, and **Morgan Hegewald's** BSES research on Oligocene coral reefs from Puerto Rico is continuing for another semester.

Johnson taught at the 100, 300, and graduate levels during the past year. GI14

Dinosaurs and Their Relatives had a respectable enrollment of 91 students, and lecture and laboratory sessions were updated and changed significantly. Laboratory topics that held the students' interest included analyses of dinosaur skeletons and taphonomy, feeding requirements of the herbivores and carnivores, investigations into the cold- versus warm-blooded nature of the group, and measurements of footprints leading to calculation of body size, walking, and running stride. G334 Principles of Sedimentology and Stratigraphy included several field opportunities for the students to measure, describe, and interpret depositional environments in sedimentary systems. **Erik Kvale** (IGS) shared his field expertise and led the students through a trip on tidal rhythmites. In the new graduate course, G690 Reefs and Global Change, students examined and integrated geologic sensors of environmental change and assessed the evolution and extinction history of icehouse and greenhouse reefs within the context of global change.

Johnson continues to engage in IU, professional society, and community service activities. At IU, she served as a panelist for an AAAS-sponsored workshop, titled "Interviewing Skills for Scientists," for university graduate students, and she is a member of the Planning and Implementation Committee for IU's Global Village Living and Learning Project. For the Geological Society of America, Johnson is serving her fourth and final year on the Student Research Grant Committee. Her Paleontological Society-sponsored Distinguished Lecture continues to be requested, and, this year, she will present the topic "Evolution in a Greenhouse World" to four additional institutions. The geobiology group helps the community by identifying fossils through the year. In 2003, Johnson and her students averaged approximately a dozen responses.

Johnson and her husband, IU Emeritus Professor Erle Kauffman, continue to enjoy the arts that the Bloomington community offers.

Hydrogeologist Zhu joins faculty

Chen Zhu joined the department as associate professor of hydrogeology in January.

Zhu received his BS in geology from Chengdu Institute of Geology, MS in economic geology/geochemistry from the University of Toronto, and PhD in aqueous geochemistry from Johns Hopkins University. He has four years of industry experience with OLI Systems Inc. and GeoTrans Inc., where he served as a geochemist. His academic experience includes two years on the faculty in ocean, earth, and atmospheric sciences at Old Dominion University and three years on the faculty in geology and planetary science at the University of Pittsburgh.

Zhu's research involves modeling,

field work, and laboratory experiments. He uses isotopes and groundwater chemistry to deduce groundwater flow, chemical reactions, and reaction kinetic rates in groundwater aquifers.

He is the author or co-author of more than 14 refereed publications and one book. His research is funded by the National Science Foundation, the U.S. Nuclear Regulatory Commission, the Department of Energy, and the U.S. Environmental Protection Agency, among other funding sources. Zhu has taught courses in introductory and advanced hydrogeology, mineralogy, aqueous geochemistry, geochemical and hydrological modeling, and freshman field camps.

Krothe encomium

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Stable Isotopes," and "Agricultural Byproducts Transport Through Karst Aquifers." At the time of Noel's retirement, former Gov. Frank O'Bannon conferred on him the title "Sagamore of the Wabash" in recognition of his outstanding service to the state.

Throughout his career, Noel has been the driving force in a program that has earned him the esteem of the hydrogeology profession. Aside from qualities that have raised him to the forefront of his field, Noel is at once a jovial, personable, warm, and caring human being who is admired by his associates and loved deeply by his wife, Joyce, and their three children, Kara, Joseph, and Jason. Such a man is worth knowing and

worth having as a friend. It is to be our good fortune that Noel will continue his association with the department and will continue to contribute to the field in which he has accomplished so much. We wish him a happy, productive, and prosperous retirement.

— Donald E. Hattin

Friends, family, former students celebrate Suttner's retirement

An afternoon symposium, a festive evening dinner in the Tudor Room, and a Saturday golf tournament and luncheon for the golfers and spouses — hosted by Ahbjit and Illora Basu — highlighted the late-April weekend celebration of Lee Suttner's retirement in 2003. Lee had been on the faculty since fall 1966. Retirement functions for Suttner's wife, Ginny, former principal of St. Charles School in Bloomington, also took place on that weekend so that friends and family could celebrate both retirements.

Peter DeCelles from the University of Arizona and Stephen Graham from Stanford University gave the keynote lectures in the afternoon symposium. Both are former students of Suttner. DeCelles's talk was titled "Tectonic Implications of Foreland Basin Evolution in the Central Andes, Bolivia." Graham spoke on the "Sedimentary Record of Transition from Contractile to Extensional Tectonics, Mesozoic Central Eastern Asia."

More than 150 guests entered the Tudor Room for the evening dinner accompanied by the delightful sounds of jazz and, later, a selection of Baroque music provided by trios from the School of Music. Dan Sullivan, the master of ceremonies for the

after-dinner roasting of Suttner, kept the audience thoroughly entertained and laughing throughout. After remarks by Haydn Murray and David Towell on behalf of the department, and Janet Suttner, Lee's sister, representatives of six different generations of Suttner's PhD students (Robert Schwartz, Steve Young, Greg Mack, Peter DeCelles, Suzanne Kairo, and Nate Way) took their turns telling stories about their mentor. The microphone was then opened for the audience to participate, and former students Humberto Guzman, Harlan Gerrish, and Jim Meyers continued the roasting of Lee. Through the combined remarks of Gerrish and Suttner, the audience finally learned the true and unabridged version of the infamous Showalter Fountain incident both had participated in more than 30 years ago.

Other former students present for the celebration included Stan Anderson, Ahbjit Basu, Prodig Dutta, Richard



Lee and Ginny Suttner enjoy the celebration of Lee's retirement.

Gibson, Lindsay Hood-Keeling, W. Calvin James, John Mackey, Michael May, Elise Porter, Craig Rankin, Ken Ridgeway, Albert Schultz, Todd Thompson, and Michael Zaleha. Former colleagues of Suttner in teaching and research who attended from out of town included Garry Anderson (St. Cloud University), Peter Dahl (Kent State University), Paul Doss (Southern Indiana University), Robert Hall (IUPUI), Thomas Hendrix (Grand Valley State University), Ray Ingersoll (UCLA), Robert Cassie (SUNY-Brockport), and Thomas Straw (Western Michigan University).

Hattin's encomium lauds Suttner's contributions to geology

This encomium was written on the occasion of Lee J. Suttner's retirement in 2003.

At the end of June 2003, Lee J. Suttner retired from Indiana University after 37 years of exceptional service to the Department of Geological Sciences and to the geologic profession. Lee is a gifted, creative, award-winning teacher, demanding mentor, cutting-edge researcher, and able administrator at the local, regional, and national levels. His inspired leadership in many arenas has been hallmarked by great professional responsibility in high offices to which he has been elected and by his outstanding success as a fund-raiser for the department and for the Geological Society of America.

Heavy demands on his time have detracted little from Lee's accessibility to students or his devotion to family, from the radiant warmth of his friendship, or from his passion for basketball, golf, music, and reading, especially for daily newspapers. His attraction to newspapers was kindled by his father, who was the editor of a weekly newspaper. Lee spent many after-school hours in the print shop

dreaming about someday exploring in the West. These thoughts, combined with his love for science, led to a career in geology. Fortunately for his colleagues, Lee will continue his energetic work in departmental development, which has resulted in truly excellent rapport between geology faculty and our many loyal alumni.

Lee is a native of Hilbert, Wis., where he received his early education and developed through participation an enduring love for basketball. He attended the University of Notre Dame, where he earned a BS degree in geology in 1961, and continued his studies at the University of Wisconsin, where he earned a master's in 1963 and a doctorate in 1966. In 1963, he met Virginia Schafer, whom he tried to help during another AP's makeup exam. She declined his offer, but two years later accepted his offer of marriage!

Despite two summers of work in the petroleum industry, Lee focused on a career in teaching and research and joined the IU Department of Geology as an assistant professor in 1966. Promoted to associate professor in 1969, he rose to the rank of professor in 1978. His teaching accomplishments include development of rigorous

courses in sedimentology at the graduate level and a 30-plus-year involvement in an ever-popular 100-level course, Evolution of the Earth, for which he received the President's Award for Distinguished Teaching in 1989. Lee had previously been the recipient of the Neil Miner Award, presented by the National Association of Geology Teachers for outstanding teaching. Lee's teaching excellence has also been recognized by the Eastern Section of the American Association of Petroleum Geologists, which presented him with its Outstanding Educator Award in 1994.

Lee has contributed several articles to the *Journal of Geological Education*, has authored two laboratory manuals for 100-level courses, and has served as editor and co-author of *Manual for Field Study of Geology of the Northern Rocky Mountains*. The last of these signals his long service at the Indiana University Geologic Field Station in Montana, where Lee was associate director from 1968 to 1981 and director from 1981 through 1995.

From 1966 to the present, Lee has capably steered a rigorous, nationally recognized sedimentology research program that has

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Highest alumnus award

2003 Richard Owen Award presented to Robert Cuffey

Roger Cuffey, BA'61, MA'65, PhD'66, is the 2003 recipient of the Richard Owen Award, the department's highest award for an alumnus. Each year, the award is given to an outstanding alumnus for contributions to the understanding and advancement of geological sciences in the pursuit of his or her career. Cuffey, on the faculty at Pennsylvania State University, is the 25th recipient of the award.

The award is named in honor of Richard Owen, who taught courses in geology, natural history, botany, and geography at IU from 1864 to 1879. He was the first IU professor to publish papers concerning geology. The Owen Award was established in 1985 in celebration of the 100-year anniversary of the founding of the department.



Chair Abhijit Basu presents the 2003 Owen Award to Roger Cuffey.

NSF supports purchase of new stable isotope mass-spectrometer

A proposal, primarily written by Peter Sauer with assistance from Arndt Schimmelmann, was funded by the NSF for acquisition of a "ThermoFinnigan Delta Plus XP" mass spectrometer. Indiana University provided 100 percent matching funds. It was installed in September 2003.

The new mass spectrometer enables determination of stable isotope ratios of hydrogen, carbon, nitrogen, and oxygen in carbonates, waters, and organic matter (solids, liquids, and gases) — all in online mode, whereby samples are directly fed into analytical interfaces that are directly con-

nected to the mass-spectrometer.

Productivity will be much enhanced because the online mode reduces the labor-intensive sample preparation on vacuum lines. Also, online analyses typically require much smaller sample sizes.

Suttner encomium

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been focused primarily on sands and sandstones. Foremost among specific areas of his research leadership are his studies of sediment provenance, interpretation of paleoclimates on the basis of mineral suites in sandstone, fluvial depositional systems, and effects of intrabasinal tectonics on the nature and distribution of sediments. Under his dynamic tutelage this research program has yielded 33 master's degrees and 12 doctorates and has garnered two coveted best-paper awards — the first for a paper in the prestigious *Journal of Sedimentary Petrology* (1986), co-authored with P.V. Dutta, and the second for one in the *Mountain Geologist* (1992), co-authored with A. Malone.

Because of his role in forefront investigations of sandstone depositional history, Lee has been convener of several research symposia on the regional, national, and international scenes. His research program has been supported by numerous grants from the American Chemical Society and the National Science Foundation and has resulted in an enviable record of publications, including numerous articles and abstracts, several field conference guidebooks, and a

major co-authored monograph, titled *Alluvial Fans and Fan Deltas*.

While his accomplishments in teaching and research would suffice to mark a highly successful career, Lee's service to the profession adds impressively to a lifetime of noteworthy achievements. Early in his career, he developed strong ties to the Society of Sedimentary Geology, serving the Great Lakes Section as secretary (1972), vice president (1974), and president (1977). He has also served the society at the national level on numerous committees and in the exceedingly demanding role of associate editor (1980–87). In 1980, Lee served as vice president of the National Association of Geology Teachers and was elected president for 1981–82.

At this point in his career, Lee became heavily engaged in administrative service to our flagship organization, the Geological Society of America. Among his many important roles were those of elected councilor, from 1984 to 1986, and chair of the Second Century Endowment Campaign, from 1994 to 1996. The latter of these entailed the difficult duty of fund raising, a task at which Lee has become a true master. Rising to ever more demanding positions within the society, Lee became a member of

its foundation's board of trustees in 1997, was next elected president of the Geological Society of America Foundation, and is currently chair of the foundation's board.

The burden of professional society activities notwithstanding, Lee took on the chair of the Department of Geological Sciences from 1990 to 1994 and from 1996 to 1998. Additionally, he served as associate dean of the College of Arts & Sciences from 1994 to 1997, and he amazed all of us by spearheading a recent departmental fund-raising campaign that garnered \$7.5 million in just five years!

Nationally recognized as a leader in his field, Lee has had a strong impact on the manner in which two major societies serve the profession and has influenced the critical thinking of nearly two generations of grateful students. In recognition of these accomplishments, the department bestowed due honor by naming him Robert R. Shrock Professor of Sedimentary Geology in 2001.

On this joyous occasion, the geology faculty and staff extend profound thanks to this extraordinary man of science, together with best wishes to him and his loving family for many happy retirement years.

— Donald E. Hattin

Lectures and Presentations

Colloquium Series 2003–04

• Sept. 22, **Xian-Huan Wen**, Chevron Texaco, “Geostatistical Simulation of Flow and Transport in Heterogeneous Media: Upscale and Integration of Dynamic Data”

• Sept. 24, **S.K. Acharyya**, Jadavpur University, “Arsenic Poisoning of Groundwater in India, Bangladesh, and Vietnam”

• Sept. 29, **Julie Bartley**, University of West Georgia, “The Carbon Cycle Before Skeletons: Carbon Cycle Linkages and the Marine Carbon Reservoir”

• Oct. 13, **Thomas Algeo**, University of Cincinnati, “Middle and Late Devonian Global Events: The Role of Land-Plant Evolution and Intensified Pedogenesis”

• Oct. 20, **Roger Cuffey**, Penn State University, “Battle Wreckage, Bryozoans, and Artificial Reefs”

• Nov. 24, **Yemane Asmerom**, University of New Mexico, “Discovering the Recent Past: New Horizons in High-Precision Chronology of Rapid Geological Change”

• Dec. 8, **Howard R. Feldman**, ExxonMobil Upstream Research, “Estuarine Facies Models from the Cretaceous Clearwater Formation at Cold Lake, Alberta, Canada”

• Jan. 16, **Barbara Bekins**, U.S. Geological Survey, “Hydrogeology and the Weak Nature of Plate Boundary Faults”

• Jan. 26, **Lauren Browning**, Center for Nuclear Waste Regulatory Analyses, “Yucca Mountain, Nevada: A Potential Geologic Repository for High-Level Nuclear Waste”

• Jan. 27, **Curt White**, National Energy Technology Laboratory, “Separation and Capture of CO₂ from Large Stationary Sources and Sequestration in Geological Formations — Coalbeds and Saline Aquifers”

• Feb. 2, **Dennis Hubbard**, Oberlin College, “Coral Reef Decline: Past, Present, and Future”

• Feb. 9, **Enrique Merino**, Indiana University, “Insights into Dolomitization and Other Metasomatic Reactions”

• Feb. 23, **Richard Goldfarb**, U.S. Geological Survey, “Gold in Space and Time”

• Mar. 8, **Linda Bonnell**, University of Texas/Geocosm “Sealed, Bridged, or Open — A New Theory of Quartz Cementation in Fractures”

• Mar. 31, **Fred Hilterman**, University of Houston, “Estimation of Pore-Fluid Content from Seismic Amplitude”

• Apr. 12, **Harrison Schmitt**, NASA, “Implications of Lunar Evolution for That of Mars and the Earth”

Other presentations

• Sept. 23, **Xian-Huan Wen**, Chevron Texaco, “Geostatistical Simulation of Flow and Transport in Heterogeneous Media: Upscale and Integration of Dynamic Data”

• Sept. 30, **Julie Bartley**, University of West Georgia, “Life at High [DIC] — Carbonate Platforms, Taphonomy, and Carbon Cycling”

• Oct. 10, **Peter Heaney**, Penn State University, “Diamonds from Heaven or Hades? The Carbonado Conundrum”

• Oct. 14, **Thomas Algeo**, University of Cincinnati, “Redox Facies and Sequence Stratigraphy of Upper Pennsylvanian Cyclothemic Core Shales from the Mid-Continent Region”

• Oct. 21, **Roger Cuffey**, Penn State University, “The World’s Earliest-Known Bryozoan Reefs: Early and Mid-Ordovician China and Vermont”

• Nov. 25, **Yemane Asmerom**, University of New Mexico, “Who Killed Woolly?”

• Jan. 27, **Lauren Browning**, Center for Nuclear Waste Regulatory Analyses, “Reactive Transport Modeling of the Unsaturated Zone Hydrogeochemical System at Yucca Mountain, Nevada”

• Feb. 16, **Kathy Licht**, IUPUI, “The Ross Sea’s Contribution to Eustatic Sea Level During Meltwater Pulse 1A”

• Feb. 23, **Lisa M. Pratt** and **David L. Bish**, Indiana University, “i-Mars — Technology and Space Exploration”

• Feb. 24, **Richard Goldfarb**, U.S. Geological

Learn about lectures in advance — via e-mail!

Would you like to learn about colloquia and other lectures before they happen rather than a year later in the *Hoosier Geologic Record*?



Perhaps you live in or near Bloomington and would like to attend our lectures on occasion. Send your e-mail address to tpmiles@indiana.edu, and tell us that you would like to be put on our “This Week in Geological Sciences” mailing list.

Survey, “Metallogenic and Tectonic Evolution of Alaska”

• Apr. 15, **Bob Dodd**, Indiana University, “Guatemala and Costa Rica: A Geologic Travelog”

Faculty, student presentations at GSA meeting in Seattle

• Isotopic Characterization of Sulfur Cycling in Basalt-Hosted Alkaline Lakes, South-Central Oregon: **Arango, Irene, Finkelstein, David, and Pratt, Lisa M.**

• Geostatistical Characterization of Apparent Hydraulic Conductivity Distributions Within Three Highly Heterogeneous Glacial Terrains of Indiana: **Lampe, David C.**

• Development of a Method to Assess Riparian Vegetated Buffer Zones Using GIS and Remote Sensing in Young’s Creek Watershed, Johnson County, Indiana: **Letsinger, Sally L.**

• The Influence of Sedimentary Processes on Element Distribution in the Devonian New Albany Shale of the Illinois Basin: **Lazar, Ovidiu Remus**

• Aqueous Dissolution-Precipitation as a Link Between Microstructure, Petrology, and Rheology: **Wintsch, Robert P., Attenoukon, Miriam B., Whitmeyer, Steven J., Aleinikoff, John N., Kunk, Michael J., and Simpson, Carol**

• Replacement of Magmatic Sulfides by Hydrous Silicates and Carbonates in the

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GSA presentations

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Bushveld and Other Layered Intrusions: Evidence for Sulfur and Metal Redistribution: **Li, Chusi, and Ripley, Edward M.**

- Modeling of Variations Accompanying Mineral Reactions in Pelitic Xenoliths at the Voisey's Bay Ni-Cu-Co Deposit, Labrador, Canada: **Mariga, Jeffrey, Ripley, Edward M., and Li, Chusi**

- Preserving Geoscience Data: Lessons Learned in Inventorying an Institution: **Steinmetz, John C., Hill, Richard T., and Like, Karen K.**

- Sorption Behavior of Helium and Nitrogen in Uncrushed Coal Cores Under Controlled Pressure and Temperature: **Solano-Acosta, Wilfrido, Hawkes, Laurence, Mastalerz, Maria, Schimmelmänn, Arndt, Fong, Jon, Walker, Rachel, and Burruss, Robert C.**

- Evaluation of Ground-Water Chemistry and Age in Aquifer Systems in Lagrange County, Indiana: **Hasenmueller, Nancy R. and Branam, Tracy D.**

- Exploring Views of the Global Hydrologic Cycle through Student Interviews and Drawings: **Beilfuss, Meredith L.**

- Cladid Crinoid (Echinodermata) Anal Conditions and a Terminology Problem: **Webster, G.D., and Maples, C.G.**

- Shale Microfacies and Origin of the Middle Proterozoic Rampur Shale of the Rohtas Formation, Vindhyan Basin, India: **Sur, Sohini, Schieber, Juergen, and**

Banerjee, Santanu

- Paleoproterozoic Condensed Zone Sediments in the Kajarahat Formation, Vindhyan Supergroup, Central India: **Banerjee, Santanu, and Schieber, Juergen**

- Evaluating SEM-Cl Textures in Quartz Grains for Provenance Studies of Mudstones and Shales: **Krinsley, David, Schieber, Juergen, and Tennison, Evelyn**

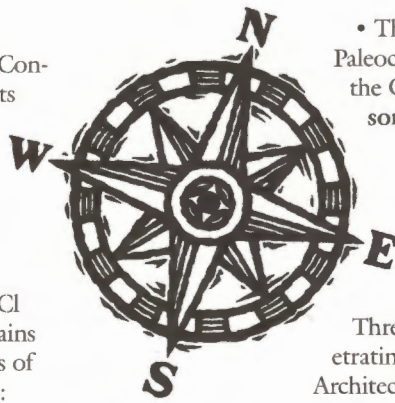
- Hydrologic and Geochemical Controls on Soluble Benzene Migration within the Uinta Basin: **Person, Mark Austin, Zhang, Ye, Merino, Enrique, and Szpakiewicz, Michael**

- The Role of Tectonics and Faulting in Brine Flushing within the Papuan Fold Belt: **Konfal, Paula**

- Isolated Ideas: Crinoid Literature of the 16th Century: **Lane, N. Gary**

- Disturbed Beds in Lower Frasnian Black Shales of Tennessee and Kentucky: Their Possible Connection to Impacts: **Schieber, Juergen**

- Assessment of the Influence of Climate on the Water Balance of Lake Superior During the Late Holocene as Inferred from Stable Isotope Ratios in Swale Sequences: **Sharma, Shikha, Zanazzi, Alessandro, Mora, German, Johnston, John W., Thompson, Todd A., and Baedke, Steve J.**



- The Role of Aquifers in Paleoclimatic Reconstructions of the Crow: **Prasenjit, Roy, Person, Mark Austin, Zabielski, Victor, Ito, Emi, Dahlstrom, David, Winter, Tom, Rosenberry, Don, Cohen, Denis, and Gutowski, William**

- Two-Dimensional and Three-Dimensional Ground Penetrating Radar Study of Bedform Architecture of an Ancient Carbonate Shoal: **Tackaberry, William J.**

- Sulfide Mineral Solution and Redeposition at the Jinchuan Cu-Ni Deposit: Constraints from Stable Isotopic Studies: **Ripley, Edward M., Li, Chusi, and Sarkar, Arindam**

- Re-Os Isotopic Characteristics of Pge Mineralization in the Birch Lake Area, South Kawishiwi Intrusion, Duluth Complex, Minn.: **Shafer, Paula, Ripley, Edward M., Li, Chusi, and Hauck, Steven**

- Mineralogic and Isotopic Studies of Chromite-Bearing Rocks of The Sukinda Ultramafic Complex, Orissa, India: **Sarkar, Arindam, Mondal, Sisir K., Ripley, Edward M., and Li, Chusi**

- Late Middle Ordovician Kukersites: Negative D¹⁵n Excursion Coincides with Positive D¹³c Excursion: **Lis, Grzegorz, Schimmelmänn, Arndt, Mastalerz, Maria, and Hatch, Joseph**

- Optically Stimulated Luminescence Dating of Late Holocene Raised Strandline Sequences Adjacent to Lakes Superior and Michigan, U.S.A.: **Argyilan, Erin, Booth, Robert K., Forman, Steven, and Johnston, John W.**

- A Short-Term Monitoring of a Karst System in the Mitchell Plain, Indiana: Identification of Water Mixing Sources During a Storm Event Using Stable Isotopes and Major Ions: **Zucco, Francesca, and Krothe, Noel C.**

- Influence of Wildfire Emissions on Terrestrial Cycling of Carbon Isotopes during the Late Cretaceous: **Finkelstein, David B., and Pratt, Lisa M.**

- The Separation of Lake Superior from Lake Michigan/Huron: **Johnston, John W., Thompson, Todd A, Baedke, Steve J., Argyilan, Erin, Forman, Steven, and Wilcox, Douglas A.**

- An Investigation of the Granites and Rhyolites of the Wichita Mountains Igneous Province, Southwestern Oklahoma Using SEM-Cl: Textural Features of Quartz Crystals Reflect Crystallization Histories: **Tennison, Evelyn, and Schieber, Juergen**

- Clay and Zeolite Records of Natural

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Department of Geological Sciences faculty, staff

Professors: Abhijit Basu (chair), David Bish, Simon Brassell, James Brophy, Michael Hamburger, Claudia Johnson, Christopher Maples, Enrique Merino, Greg Olyphant, Mark Person, Gary Pavlis, Lisa Pratt, Ed Ripley, Juergen Schieber, Robert Wintsch, Chen Zhu

Part-Time Professors: Henk Haitjema (SPEA), Brian Keith (Survey), Peter Ortoleva (Chemistry), Carl Rexroad (Survey), Jeff White (SPEA)

Research Scientists: Bruce Douglas, Erika Elswick, Chusi Li, Peter Sauer, Arndt Schimmelmänn

Visiting Research & Postdoctoral Associates: David Finkelstein, Yongli Gao

Emeriti Faculty: Robert Blakely, J. Robert Dodd, John Droste, Donald Hattin, Norman Hester, Erle Kauffman, Noel Krothe, N. Gary Lane, Judson Mead, Hady H. Murray, Al Rudman, Lee J. Suttner, David Towell

Staff: Patty Byrum, administrative secretary, chair's office; Dave Dahlstrom, computer support, geofluid computational lab; Ken DeHart, computer systems manager; Ruth Droppo, senior office services assistant, third floor; Cindy Hale, administrative secretary, Geological Field Station; Mary Iverson, student records; Tricia P. Miles, grant monitor/administrative support, fifth floor; DeAnn Reinhart, grant monitor/administrative support, fourth floor; Kim Schulte, administrative assistant, chair's office; Terry Stigall, geophysics electronics technician; Steve Studley, manager, mass spectrometry lab

Library: Linda Zellmer, librarian; Linda Stewart, circulation/reserves; Barbara Cox, technical services

GSA presentations

(continued from page 12)

Geochemical Processes at Yucca Mountain, Nevada: **Vaniman, David, Chipera, Steve, and Bish, David**

• Genesis of Replacive Burial Dolomite and Of Displacive Zebra and Breccia Veins Via the Induced Stress: A Paradigm for Metasomatism: **Merino, Enrique, Canals, Àngels, and Fletcher, Raymond C.**

• An Alternative Way to Produce Black Shale Rhythmites: The Significance of Depositional Processes: **Schieber, Juergen**

• Biomarkers Confirm Cyanobacteria as a Major Source of Planktonic Organic Matter During the Early Aptian: **Dumitrescu, Mirela, and Brassell, Simon C.**

• Isotopic Evidence for Microbial Sulfate Reduction and Methanotrophy During the Late Archean, Witwatersrand Basin, South Africa: **Boice, A. Erik, Tipple, Brett J., and Pratt, Lisa M.**

• An Impractical Idealist's Journey into

Teaching Freshman Non-Science Majors and The Theory Of Earth: **Basu, Abhijit**

• Paleo-Fe Inputs to the Southern Ocean on Glacial/Interglacial Time Scales: **Latimer, Jennifer C., and Filippelli, Gabriel M.**

• Dynamic Mapping and Analysis of Geological, Geophysical and Environmental Data with Spatial Data Engines and Internet Map Server Applications: **Carr, Timothy R., Bartley, Jeremy D., Look, Kurt, Nelson, Kenneth, Adkins-Heljeson, Dana, Korose, Christopher P., Nuttall, Brandon C., Radhakrishnan, Premkrishnan, and Riley, Ronald A.**

• A Spectroscopy and Isotope Study of Sediments from the Antarctic Dry Valleys as Analogs for Potential Paleolakes on Mars: **Bishop, Janice L., Edwards, Howell G.M., Anglen, Brandy L., Pratt, Lisa M., Doran, Peter T., and Des Marais, David J.,**

• Effect of Arsenic Substitution on Pyrite Oxidation in Bituminous Coal Samples:

Experiments and Spectroscopic Monitors: **Kolker, Allan, Huggins, Frank E., Khalid, Syed, Fedorko, Nick, Mastalerz, Maria, and Carroll, Richard E.**

• D/H Relationship of Kerogens, Oils, and Hydrocarbon Biomarkers Released During 5-Year Hydrous Heating Experiments: **Sauer, Peter E., and Schimmelmann, Arndt**

• H/D Ratios in Australian Petroleum Systems: **Schimmelmann, Arndt, Sessions, Alex L., Boreham, Christopher J., Edwards, Dianne S., Logan, Graham A., and Summons, Roger E.**

• Application of the Stable Isotopes of C, N, S to Evaluate the Development of Reducing Conditions and Organic Matter Sequestration Following Brackish Marsh Creation: **Struck, Scott, Craft, Chris, Elswick, Erika R., and Schimmelmann, Arndt**

• High-Frequency Oceanographic and Climatic Fluctuations in a Subequatorial Mid-Cretaceous Basin, Northeastern Brazil: **Johnson, Claudia C., Pratt, Lisa M., Kauffman, Erle G., Mora, German, and Carmo, Ana M.**

• Taphonomy of *Mopalia Muscosa* and *Katharina Tunicata* (Phylum Mollusca, Class Polyplacophora) from Cattle Point and False Bay, San Juan Island, Washington, U.S.A.: **Puchalski, Stephaney S.**

• Iterative Pelmatozoan Community Reorganization: The Key to Blastoid Success?: **Waters, Johnny A., and Maples, Christopher G.**

• Open-Ended Surveys in the Geoscience Classroom: Effect of Discussion Groups Targeting Student's Prior Knowledge: **Brassell, Simon Christopher, Beilfuss, Meredith, and Boice, Erik**

• Conodont Geochemical Records of Late Paleozoic Paleoenvironmental Variability in Midcontinent North America: **Bates, Steven M., Lyons, Timothy W., Brown, Lewis M., Rexroad, Carl B., and Bright, Camomilia A.**

• Application of a Three-Dimensional Saturated-Unsaturated Transient Groundwater Flow Model to a Wetland Restoration Site in Northwest Indiana: **Boswell, James S., and Olyphant, Greg A.**

• Reaction Localization Leads to Strain Localization and Softening in Reactivated Mylonitic Rocks: **Whitmeyer, Steven J., Wintsch, Robert P., and Simpson, Carol**

• The Role of Faults in the Plumbing of the Great Basin Geothermal Systems and Gold Mineralization: **Gao, Yongli, Person, Mark Austin, Dahlstrom, David, Hofstra, Albert, Sweetkind, Don, Howard, Keith, John, David A., Prudic, David, and Wallace, Alan**

INDIANA UNIVERSITY ALUMNI ASSOCIATION



It started with a fire. The Indiana University Alumni Association began in 1854, after a midnight blaze reduced to rubble a struggling young frontier college. That fire galvanized a group of visionary graduates of Indiana University, inspiring them to create an association that would not only rebuild their beloved campus, but that would also help to build the future of a world-class university.

Today, the Indiana University Alumni Association serves more than 450,000 living graduates around the globe. Along with providing programs that raise tens of thousands of dollars annually for scholarships, creating commencement ceremonies that make lifelong memories, and welcoming alumni back through Homecoming and a variety of other special events, the IUAA connects alumni to each other, and to their alma mater, through clubs, travel, learning experiences, and many other rewarding opportunities.

Just as important, the IUAA continues to serve IU and its internationally respected missions of education, research, and service, building IU's reputation for excellence every day, and in every way possible.

The IUAA started with a fire — and, today, it's burning brighter than ever.

150 years of Connecting Alumni. Serving IU.
(800) 824-3044 www.alumni.indiana.edu

Geologic Field Station Update

Field Station reports exciting changes, expectations

The summer of 2003 was a good one for the Judson Mead Geologic Field Station of Indiana University.

Welcome to our new field station resident manager, **Glenna Roessler**, who just happens to be the field station cook as well! Roessler and her husband, Vern, arrived in early May and immediately went to work getting the station in shape.

Lee Suttner was the first IU person out there. He was helping out with a group of about 20 high school students from Atlanta, Ga., who used the station for a few days. The students were participating in a course that was being run by Suttner's brother-in-law, **John Schafer**, who took G429 in 1972, and **Skip Pyle**, who also took G429.

On the academic front, there have been no significant changes from last year in any of the courses that we offered (G429, G429e, and G329). G329 was offered during June and early July (in the old G429 Option I time slot) with faculty members **Clara Cotton**, **Erika Elswick**, **Andrew Olyphant**, and **Sally Letsinger**. Some may

recall that Letsinger conducted her PhD research in the Willow Creek Demonstration Watershed, where much of G329 is taught, so we were able to make good use of her expertise. Unfortunately, the enrollment in G329 continues to decline, and we had only eight students this past summer. As a result, we have spent much of the fall semester redesigning the course so as to make more efficient use of faculty time. G429 and G429e had a solid combined enrollment of 42 students. The faculty were the same as last year (**Bruce Douglas**, **Ed Ripley**, **Sue McDonald**, **Tom Howald**, and **Paul Jewell**). The only rough spot in the entire course occurred in Glacier Park, where, because of several intense forest fires, Going-to-the-Sun Highway was closed at Logan Pass. The caravan went up to the pass to give the students some much needed "R&R" and then back-tracked out of the park, went over Marias Pass to the south, and eventually made it to Kalispell, our destination for the night.

On the facilities front, there have been

some very exciting things happening. A cost-sharing agreement with the university resulted in close to \$30,000 worth of renovation in the lower and upper campus washhouses. The renovation included new copper piping, water faucets, showers, and toilets. The interior walls were painted white and the floors gray. The exposed asbestos board in the shower rooms was covered with bright white "glass board" giving a much more open feeling all around. It must be mentioned that our half of the project cost was made possible by the generosity and continued support of all the donors to the field station. Special mention goes to **Melody Holm**, who got the renovation project going in the first place, and **Rocky Orgil**, who made a particularly large contribution, significantly earmarked for capital improvements. *Thank you all.*

Even as the spring semester began in Bloomington, we were starting to gear up for the 2004 season in Montana — with full hope and expectation that it will be as successful as the 2003 season was.

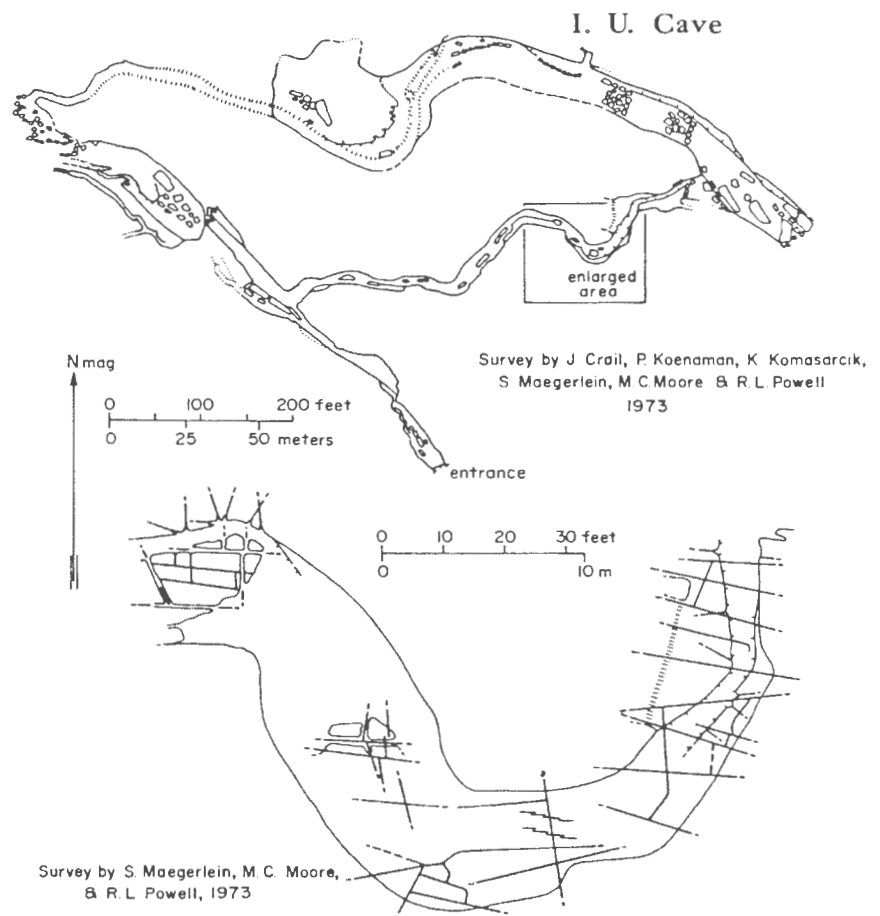
IU Cave still interests local geologists

IU Cave is situated about five miles west of Bloomington. It is also known as Truitt's or Truett's Cave. **W.S. Blatchley** described the cave in 1896. He said that the cave "is a favorite resort for students from the State University, who wish to get a glimpse of underground life." He went on to say that the "only life in the cave are bats, insects, and spiders."

During the early days of Sigma Gamma Epsilon, the students used the cave for initiation of new members into the earth science fraternity. This was in the days when it was a men's organization. Women were not permitted officially to belong.

The accompanying map of the cave is taken from **Richard Powell's** doctoral dissertation on the relationship between joint sets and cavern formation. Powell, BA'53, MA'61, did his doctorate at Purdue University.

This map of IU Cave, Monroe County, shows the trend of passages and joints mapped in a passage segment.



It happened yesteryear



Several years ago, during a basement clean up, several bound volumes of old faculty meeting minutes were uncovered. The minutes cover the later years of **Charles Deiss's** years as chair and the first years of **John Patton's** tenure in this role. Here's what we gleaned:

Sept. 14, 1959

- Faculty: **Beck, Droste, Esarey, Hattin, Hendrix, Lowell, Mead, Perry, Thornbury, Vitaliano, and Patton**, acting chair. **Deiss** had recently died.

- Professor **Perry** advised that other departments are getting much more publicity than the geology department, pointing out that only three press releases had been submitted by the faculty the past year. The faculty agreed to keep **Perry** informed of contributions they made at meetings or of other appropriate items.

April 22, 1959

- Mr. **Kiltz** invited the faculty to visit the deep well being drilled on the Leesville anticline on the Mount Carmel fault.

- Professor **Lowell** brought up the possibility of a National Science Institute for teachers at small colleges at the Montana Field Station for the summer of 1960.

Sept. 24, 1958

- A proposal was received to sponsor a National Science Foundation institute in astronomy and geology at the Montana Field Station. The faculty agreed that such an institute must not interfere with the teaching of G429.

May 28, 1958

- Professor **Droste** expressed a desire to teach a new seminar course in sedimentary petrography.

- A memo from the College dean was read. It indicated that funds were available from a Lilly Foundation grant to pay high school science students to carry on research in departmental laboratories.

- Graduate assistantships were awarded to seven students with stipends ranging from \$700 for one semester and from \$1,400 to \$1,800 for the academic year.

- Research assistantships and fellowships were awarded to seven students, with stipends from \$1,400 to \$1,600.

- Three industrial fellowships were offered: Shell, \$1,800; Arktex, \$1,700; and Standard of Texas, \$1,500.

Historical note on parking lot walnut tree

Shortly after the department moved from Owen Hall to the new Geology Building in the early 1960s, bulldozers excavated the eastern and western arms of our parking lot. In the process, the roots of our large walnut tree were either exposed, damaged, or cut off. Almost immediately, the leaves wilted as the root system lost its ability to furnish sufficient water and nutrients to keep the tree alive. In an attempt to save the tree, **Don Hattin** collected 50 cents from each faculty member (well, at least some of them) and purchased two packages of

soluble fertilizer cartridges for use in his Ross Root Feeder. Leonard Roberston, our incredibly conscientious custodian, furnished a hose and shifted the position of the feeder after each cartridge had been dissolved. Application was in a circular pattern, and the whole job was completed in little more than a day. Almost at once, the tree perked up, and eventually made a complete recovery. Today, the tree is at least twice as large as it was in 1962, and most years produces a bountiful crop of delicious nuts!

Digging in the archives

What was happening in the department 10, 25, and 50 years ago? One way to find out is to shine a light into the archives of old issues of the *Hoosier Geologic Record* and its predecessors. We hope these excerpts will bring back memories of your time in the department (if you were around that long ago!).



10 years ago (1994)

- John Hayes** had just assumed the chairship and written his first chair's greetings. One of the highlights of the issue was a long article describing events that led to the deportation of **Gary Pavlis** from Kazakhstan, newly independent after the fall of the Soviet Union. Gary was in Kazakhstan to conduct research, but, apparently, he could not convince the officials that was his only purpose.

- In 1994, the winners of the Senior Faculty Award were **Jennifer Klug, BS'94**, and **Dana Strength, BS'94**. **Christopher Carlson, MS'91, PhD'00**, received the Estwing Award. Outstanding AIs for nonmajor courses were **Matthew Noriega, MS'97**, and **Patrick O'Malley, MS'93**. **Chris Gellasch, MS'94**, won the award for courses for majors. The Cumings Award went to **Victoria Ferguson, MS'92**. **John Guthrie, PhD'94**, received the Graduate Achievement Award.

- "Undergraduate enrollments in the 100-level courses were up 15 percent over one year ago."

- "On April 22, 1994, more than 220 family members, geology faculty members, business associates, alumni, and friends assembled for a banquet to honor **Haydn H. Murray** upon his retirement from Indiana University."

- "**Dave Towell** was elected secretary of the Bloomington Faculty Council for 1994-95."

- "**Charles Miller** retired from his official duties in the department on Jan. 15, 1994. Charles has provided more than 40 years of service to the department and the Indiana Geological Survey." [Note: He still attends special events in the department and survey.]

25 years ago (1979)

- The 1979 *Geology Newsletter* noted that **Jeremy Dunning** had joined the faculty. **Jud Mead** had received the national Neil Miner Award from the National Association of Geology Teachers in recognition of his excellence in teaching.

- That year's winners of the Faculty Scholarship Award were **Bruce Smith, BS'79**, and **Ronald Cohen, BS'79**.

- The Underclassman Award was given to **Anthony Withnell, BS'81**, the Cumings Award to **William Ausich, MA'76, PhD'78**, and the Grassman Fellow was **Colin Harvey, PhD'80**. [Note: Colin's son Mark Harvey is currently a graduate student in the department.]

- "On July 3, 1979, **Ellen Freeman**, longtime librarian in the Department of Geology, died unexpectedly after a brief illness. Ellen had been the geology librarian at Indiana University since 1958."

- "**Maynard Collier**, the department's chemist, retired in May 1979 after completing more than 30 years of faithful service to the department and university."

- "On Aug. 26, 1978, the alumni of the Academic Year Institute (AYI) of 1968 held a 10-year reunion in Bloomington. Several of the original 18 graduate students who received their MAT degrees that year attended the get-together." Attendees included **Harvey**

(continued on page 16)

News bytes from the past

(continued from page 15)

Field trips of yore



1935 field trip to the Ozarks:

1. "Pushrod" Elrod (bus driver)
- 2.-6 . unidentified
7. Jim Reeves
- 8.-10. unidentified
11. Hugh Latimer
12. Richard Schweers
13. Gordon Fix
14. Marion Fidlar
15. Ralph Esarey
16. John Harris
17. unidentified
18. Kenny Payne
19. Mary Payne



All photos courtesy of
Hugh Latimer



1935 field trip to
Perry County:

1. Norbert Parker (?)
2. Jim Reeves
3. Tom Dawson
4. Gordon Fix
5. unidentified
6. unidentified
7. William Von Osinski
8. Hugh Latimer
9. Marion Fidlar
10. Louis Thompson (?)



In 1935, field trips were not taken in vans rented to the department by the motor pool. Instead, the athletic department lent us their bus for transporting the basketball team. (Perhaps today the team's airplane might be used in the same way?) This photo was taken near the Einstein Silver Mine on a 1935 field trip to the Ozark Mountains.



This scene near
Salt Shaker Rock
was taken on a
1935 field trip to
Perry County.

Digging in the archives

(continued from page 15)

Barrett, David Burd, Dave Clarkson, Bruno Goldschmidt, Wallace Helber, Walter Jackson, and Mike Kelleher.

50 years ago (1954)

The 1954 *Geology Newsletter* announced the addition of two new laboratories to the department. One was designed by Haydn Murray for graduate courses in sedimentation and sedimentary petrography. The other was a quonset hut on Forest Lane for use by J.J. Galloway, who was

professor emeritus, having retired in 1953. [Note: Not only the quonset hut but Forest Lane as well are long gone from the campus.]

- "Professor **Heinrich Neuman** of the University of Oslo, Norway, taught mineralogy and optical mineralogy as an interim replacement for **Brian H. Mason**, who left Indiana in June 1953."

- "**Carl W. Beck** of the University of New Mexico will join our staff as professor of mineralogy in September 1954."

- "The geology department has been awarded a graduate fellowship by the California Co. The stipend for the fellowship is

\$1,250. In addition the company will pay for tuition, fees, books, related research expenses, and field expenses up to a maximum of \$500. **Jack Harrison**, BA'54, MA'55, PhD'58, has been designated the first California Fellow."

- "A new seismograph has been installed at IU under the able direction of **Judson Mead**. ... Mead becomes ecstatic when he sees the pen going through its paroxysms and thus indicating that an earthquake is in progress."

[Note: Former editor **Bob Dodd** took his first geology course at IU this year, a fact that was not noted in the newsletter!]

Indiana Geological Survey Update

U.S. Department of Energy

IGS scientists to study alternate methods of reducing greenhouse gas

The Indiana Geological Survey will join more than 40 other state agencies, universities, and private companies to determine whether carbon dioxide, an important greenhouse gas, can be removed from the atmosphere by trapping it underground in oil and gas fields, coal seams, and brine-filled aquifers.

The IGS will be a part of two U.S. Department of Energy research consortia, the Midwest Regional Carbon Sequestration Partnership and the Midwest Geologic Sequestration Consortium. Both consortia will investigate possible ways carbon dioxide can be prevented from entering the atmosphere and be trapped within geological systems. Along with five other regional partnerships covering most other states, the two consortia are key parts of the Bush administration's Global Climate Change Initiative, whose stated goal is to reduce

manmade greenhouse gas emissions in the United States by 2012.

"We are very pleased to have been selected to be a part of these exclusive teams addressing the critical issues of fossil fuel usage and climate change," says project director **John A. Rupp**, who will oversee IGS's contributions to the consortia. "Each regional partnership comprises a diverse team well suited to using their different strengths and technological abilities to evaluate different methods of managing carbon dioxide."

Members of the Midwest Regional Carbon Sequestration Partnership will be funded over two years by \$2.4 million from a combination of DOE, state, and private sources. Members of the Midwest Geological Sequestration Consortium will receive \$3.2 million over two years from DOE, public, and private sources.

Director to lead AASG

John Steinmetz, state geologist and director of the Indiana Geological Survey, was elected to the presidency of the Association of American State Geologists. He also serves on the board of trustees of the Paleontological Research Institution, on the board of advisers of the Micropaleontology Press, and on the GeoRef Advisory Board of the American Geological Institute. He is also chair of the board of licensure for Indiana Professional Geologists.

The AASG works to advance the science and practical application of geology. It also serves to coordinate the efforts of state geological surveys and to expand the areas in which state surveys work cooperatively with federal entities. One project of particular importance that AASG played a key role in is the National Cooperative Geologic Mapping Program. Today, by working closely with the U.S. Geological Survey and others who are interested in geologic mapping, the program has grown into a successful partnership among state surveys, the federal government, and universities.

Survey creates displays for state parks

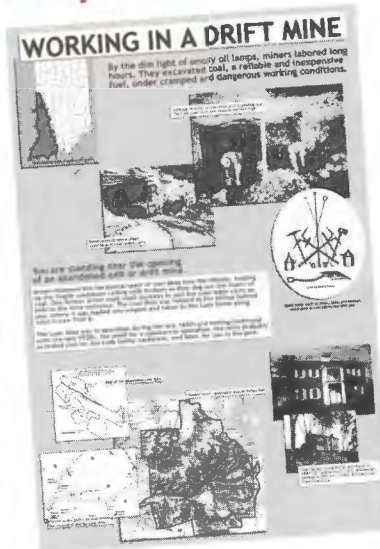
A new outdoor display for Turkey Run State Park explains the entire process of how coal was formed, the techniques used to mine it, and the mine's eventual transformation into a bat habitat. Working with the Indiana Department of Natural Resources, Division of Reclamation, IGS staff members **Barbara Hill**, **Kim Sowder**, and **Licia Weber** designed the three permanent display panels for the park.

Another set of nine panels is now being designed for a display at Weber Lake, a reclaimed strip mine in Lincoln State Park in Spencer County. A coal strip mine operation ceased to function on the site in the late 1950s, but the refuse pile created by the

mining operations rendered the lake too acidic to support normal aquatic life. The Division of Reclamation is in the process of reversing the acidity problem and making the lake part of a nature trail.

The educational panels will describe the

reclamation process, the mining of coal in Indiana, the health of the lake and development of the wetlands, and the effects on wildlife. The panels should be completed this year.



Turkey Run posters

IGS Kudos

This overview of the activities of the Indiana Geological Survey highlights just a few of the many projects and programs taking place in "the other side of the building." Visit the IGS Web site at <http://igs.indiana.edu> for more information or to contact staff members.

Awards

Charly Zuppann was awarded the George V. Cohee Public Service Award at the AAPG Eastern Section Meeting in Pittsburgh, and **Agnieszka Drobnik** received the Vincent E. Nelson Memorial Award for a best poster presentation.

Maria Mastalerz's graduate student **Rachel Walker** received the Award for Outstanding Technical Poster during the 20th annual International Pittsburgh Coal Conference for "Insights into the Coking Behavior of Southern Indiana Coals: Bulk and Individual Maceral Chemistries." She also received Best Graduate Research Poster, Annual Student Research Day (D.O.G.S. Daze), IU Department of Geological Sciences, and Best Graduate Poster, Women in Science Program Research Day.

John Johnston was awarded an International Association of Great Lakes Research Scholarship at the 46th annual meeting of the International Association of Great Lakes Research. His Research Day talk, "The Key to Interpreting Changes in Water Level, Vertical Ground Movement, Shoreline Development/Preservation, and Climate During the Late Holocene," received the best graduate research presentation award.

Leadership

During 2003, many other IGS staff members undertook leadership roles in various state, national, and international geological organizations.

Tracy Branam presided over the 24th annual Indiana Water Resources Association Conference and Field Trip. The conference convened in Richmond, and the field trip featured the geology, history, and water resources of the Whitewater River Basin. As IWRA president, Branam was responsible for planning the conference and leading the annual field trip.

During 2003, **Nancy Hasenmueller**, head of the IGS Environmental Section, held the office of president of Professional Geologists of Indiana.

John Hill, IGS associate director, is serving on the Indiana State Museum Advisory Committee.

John Johnston, Web manager for the Limnogeology Division of the Geological

Society of America, received the group's 2003 Distinguished Service Award in recognition of his valuable contributions.

Erik Kvale is associate editor for the *Journal of Sedimentary Research*, an international journal of the Society for Sedimentary Geology.

Maria Mastalerz was 2003 president of the Society for Organic Petrology, an international organization for organic petrologists and geochemists. She also sits on the editorial board of the *International Journal of Coal Geology*.

John Rupp, head of the Subsurface Geology Section, is treasurer and board member of the Indiana Society of Mining and Reclamation and Indiana membership coordinator for the American Association of Petroleum Geologists.

Nelson Shaffer, PhD'96, head of the IGS Coal and Industrial Minerals Section, is serving his third term as executive director of the Indiana Academy of Science. He has been honored as a fellow of the academy. He is also a founding member and current president of the Midwest Chapter of the Friends of Mineralogy and serves on their national board of directors. Shaffer is the general chair of the 40th Forum on the Geology of Industrial Minerals, which he and the IGS will be hosting in May.

Charles Zuppann serves as the editor of both the *PGI Geology Standard*, the newsletter of the Professional Geologists of Indiana, and the Indiana-Kentucky Geological Society's *IKGS Newsletter*.

Milestones

Marilyn DeWees retired after more than 15 years of service as secretary to several sections of the Indiana Geological Survey.

Ed Hartke retired from his position as head of the Environmental Section. He continues his research on water quality issues as an IGS research affiliate.

Carl Rexroad, paleontologist with the Indiana Geological Survey for more than 42 years, retired and was recognized at a reception in his honor in the Indiana Memorial Union. He continues his work on conodonts as a research affiliate of the survey.

Rebecca Meyer joined the Coal and Industrial Minerals Section as a GIS/database analyst working on

the Coal Mine Information System.

Premkrishnan Radhakrishnan joined the IGS as a GIS analyst/researcher in the Subsurface Geology Section. Radhakrishnan comes to the IGS from Southern Illinois University, where he received his master's degree in geography.

Leigh Fall, a graduate student in the Department of Geological Sciences, has been working with **John Steinmetz** on a field guide to the fossils of Indiana, which will be published by the IGS.

Amy Foster is the new secretary for both the Geochemistry and Coal and Industrial Minerals sections.

Ana Karina Scomazzon completed her mentorship under **Carl Rexroad's** direction and returned home to Brazil, where she will continue her studies toward a doctorate in geology with an emphasis in micropaleontology.

The Geological Survey hosted a farewell reception for departing chair **Chris Maples** of the Department of Geological Sciences. Maples is the new vice president of research for the Desert Research Institute in Las Vegas. During his administration, the IGS and the department enjoyed a mutually supportive and collegial relationship.

IGS Grants

The U.S. Department of Energy has awarded a grant to **Arndt Schimmelmann** and **Maria Mastalerz** for a proposal titled "Significance of Isotopically Labile Organic Hydrogen in the Thermal Maturation of Source Rocks."

Nelson Shaffer and **Terry West**, professor of engineering geology at Purdue University, received a grant from the Indiana



Carl Rexroad

Department of Transportation to study the petrology of aggregates in concrete test specimens that fail one engineering test.

The U.S. Geological Survey funded the IGS's continued participation in the state map component of the National Cooperative Geologic Mapping Program. The grant will fund new bedrock mapping in the Wabash 30x60 minute quadrangle and new glacial geology mapping in western Hancock County. Participants include **Steve Brown, Ned Bleuer, Jennifer Olejnik, Marni Lynn Dickson, Robin Rupp, Ray René, Walter Hasenmueller, and Christina James.**

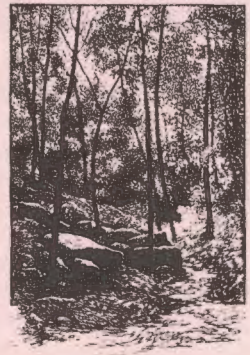
John Rupp, head of the IGS Subsurface Geology Section, along with colleagues at the Illinois State and Kentucky Geological Surveys, has been awarded a preliminary contract for research to evaluate the potential of coals in Indiana as a source of natural gas. The three-year project will result in a series of deep core holes drilled in collaboration with Black Beauty Coal Co.

The Central Great Lakes Geologic Mapping Coalition has funded the glacial geology group to continue to develop geologic map products of the greater Indianapolis area, the Lake Michigan Rim, and the greater Fort Wayne area and has funded the IGS's Center for Geospatial Data Analysis to produce 3-D groundwater flow models of Berrien County, Mich. **Steve Brown** and **Ned Bleuer** are leading this effort.

A grant to evaluate the storage and

IGS hosts Palestinian limestone producers

This past fall, **Brian Keith** and **Todd Thompson** introduced a dozen commercial Palestinian limestone producers to Indiana's dimension limestone industry by way of lectures and field trips. The IGS received a note of appreciation from the U.S. State Department stating that "... it was a very interesting and enjoyable experience. We were welcomed warmly by the group and were able to learn from them about their stone industry, as well as talk to them about ours. I was impressed with how successful [the Palestinian] industry appears to be despite the difficult political environment in which they have to operate. I appreciate having had the opportunity to be a part of their positive experience here."



movement of potential contaminants in soils at a confined animal feeding operation in Daviess County was approved by the Indiana Department of Environmental Management. Project activities will determine whether high nitrate levels in the groundwater at the water table are from fertilizer and animal waste that are flushed rapidly through the vadose zone by rainfall events. **Greg Olyphant** is the project director, and **Sally Letsinger, Tracy Branam, John Comer, Peg Ennis, and Ron Smith** are contributing scientists.

Denver Harper received a grant from IDEM to assist in the development of agricultural best management practices to

remediate nitrate contamination in a major outwash aquifer in Jackson County.

Chemical analysis of pore water from a coal-processing waste pile at the abandoned Chinook coal mine located in Clay County was completed in December 2003. Data will be used to evaluate the effects of a synthetic soil on the quality and hydrology of water in the vadose zone of coal waste. The synthetic soil is a blend containing fluidized-bed combustion ash from Purdue University's power generation plant and bacterial fermentation byproduct from Eli Lilly and Co. The project is funded through the Surface Mine and Reclamation Technology Grant Program sponsored by the IDNR Division of Reclamation. **Tracy Branam** is the project director, and **Peg Ennis, Ron Smith, John Comer, Greg Olyphant, and Denver Harper** are contributing scientists.

Maria Mastalerz, John Rupp, and Nelson Shaffer have received a grant from the Center for Coal Technology Research at Purdue University to write a white paper characterizing Indiana's coal resources. They will compile information on the availability, quality, and utilization of Indiana's coal.

Nelson Shaffer and **Licia Weber** have received a grant from the IDNR Division of Reclamation to continue enhancements to the IGS Coal Mine Information System.

Maria Mastalerz and **Arndt Schimmelmann** received a grant from the USGS for their study "Prediction of CO₂ sorption in coal seams using uncrushed coal cores under realistic P, T, and moisture conditions."

John Rupp and **Maria Mastalerz** have been awarded a grant from the U.S. Department of Energy, administered through the University of Kentucky, as part of an Illinois Basin Consortium collective effort. The project, "Resource assessment and production testing for coal-bed methane

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Pore water from a coal-processing waste pile at an abandoned Chinook coal mine in Clay County is collected for chemical analysis. **Tracy Branam** directs the project.

Faculty Notes

Abhijit Basu, professor of geological sciences, has been named the next Class of 1948 Herman B Wells Endowed Professor. The unanimous decision of the committee for this award came because of Basu's exemplary commitment to undergraduate education, reflecting the spirit of the late Chancellor Wells. Basu will receive a grant each year for five years or until retirement, and he will be asked to consult on enrichment of the undergraduate experience on the Bloomington campus. He is the second recipient of this award.

Simon Brassell was successful in obtaining funding for an automated device to extract solvent-soluble organic compounds from sediments and a new Agilent gas chromatograph for analysis of biomarkers. Both instruments were purchased and installed in 2003. They are being used, together with the isotopic mass spectrometers in the biogeochemical laboratories, to explore molecular and isotopic evidence for the depositional history of early Aptian organic-rich sediments. This project is the basis of the doctoral research of Brassell's PhD student Mirela Dumitrescu, who was successful this past year in her applications to both GSA and AAPG for research funds. Brassell gave research presentations at conferences and colloquia in France, Canada, Poland, the Netherlands, and Germany during 2003. He also serves on the IU Bloomington Scholarship of Teaching and Learning Steering Committee, is a member of the IU Bloomington SOTL Academy, and the Bloomington Faculty Council.

Bob Dodd continues to enjoy his retirement from the editorship of the *HGR*, as well as from employment by Indiana University. But he has not completely disappeared from the department. Last February, he taught a three-week short course for graduate students on carbonate petrology.

He also helps Abhijit Basu, Don Hattin, and Erle Kaufman organize the weekly faculty coffee sessions in the Owen Room. Last August, Dodd had a pleasant visit with former PhD student Steve Benham.

Benham has been teaching for many years at Pacific Lutheran University in Tacoma, Wash. He especially enjoys leading field trips and for several years has conducted January field trips to the Big Island of Hawaii — not too hard to take!

Dodd enjoys a number of hobbies, including growing roses, bicycling, running, birding, photography, reading, and doing volunteer work for the Red Cross and his church. For the past three years, Dodd has served as secretary for the IU Annuitants Association. He and his wife, Joann, travel extensively. Last winter, they made their third trip to New Zealand. They spent this past Thanksgiving and early December on a trip to Guatemala and Costa Rica.

Jeremy Dunning received the 2003 Sloan Consortium Effective Practices Award for Learning Effectiveness. The Selection Committee commended the Indiana University Bloomington Repurposeable Learning Objects: the TALON Learning Object System as a "definite move toward the next generation of learning objects, adaptable to teaching styles. This practice is quite elegant in its simplicity and potential for multiple uses."

Claudia Johnson was featured in an article in the April 2003 *National Geographic Magazine*. She was interviewed as part of an article focusing on the extinction event at the end of the Cretaceous and the subsequent rise of mammals. (See page 8.)

Erle Kauffman has been active in documenting Mosasaur and fish predation of Ammonites and, just recently, on Nautiloids. This all began with the discovery with Bob Kesling in 1961, of an Ammonite that

had numerous bite marks attributable to a Mosasaur (*Platycarpus* or *Mosasaurus*). The research continued until 1990 (Kauffman, *Mosasaur Predation on Ammonites During the Cretaceous — An Evolutionary History*) and is still active today with evidence of giant fish tooth marks, as well as those of Mosasaurs on Pacific Coast Upper Cretaceous strata. Kauffman is currently working on two books. One is *The Geology, Stratigraphy, and Paleontology of South-Central Colorado*, to be published by the Paleontological Research Institution. The other, a coffee table book, is *Geology and Ecology of the Rocky Mountains*, in which he presents 100 slides that show something special about both topics — perhaps an interesting outcrop in the Rocky Mountains characterized by rocks, the nature of the soil, and flowering plants. He is also involved in several professional papers on the subjects of stratigraphy, ecology, and paleobiology.

Kauffman continues to work actively with students. He is currently co-chair of Lori Huff's thesis on "The Dinosaur-Bird Transition in the Mesozoic."

Gary Lane, **Chris Maples**, and IU D.O.G.S. alumni **Bill Ausich**, **Tom Kammer**, and **Johnny Waters** were featured in an article titled "Those Crazy Crinoids" — which no doubt refers to the fossils, not the faculty and alumni — in the July/August 2003 *Indiana Alumni Magazine*.

Chusi Li was cited by advisory board president Derek Fullerton for the remarkable accomplishment of co-authoring four of the total of eight papers in a special issue of the *Journal of the Geological Society of South Africa* on platinum-group elements. In addition, Li has been named a fellow of the Society of Economic Geologists.

Haydn Murray continues to be active and productive in the field of industrial

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Survey

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development in the Illinois Basin," will compile fundamental information on methane content, permeability, and well-completion data for Illinois Basin coal beds and associated organic-rich shales. **Wilredo Solano-Acosta** will also be working on this project.

Todd Thompson received funding from the USGS to investigate Late Holocene lake levels in the Great Lakes.

Sally Letsinger received a grant from the Association of American State Geologists to support an undergraduate student on the AASG Field Mentoring Experience Program.

John Comer was awarded a grant-in-aid of research for a proposal titled "Locating Natural Gas Reservoirs Using Model-Automated Informatics." Funding will be used to prepare and present results of a comprehensive 3-D computer model that simulates the evolution of fractured natural gas reservoirs in Harrison County.

Indiana GIS Conference

More than 300 people attended the Indiana Geographic Information Systems Conference, co-hosted by the IGS and held in Indianapolis on Feb. 27–28, 2003. Paul Irwin sat on the conference committee and organized IGS efforts in planning the meeting. Numerous IGS staff members contributed to the success of the conference.

Faculty notes

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minerals. He attended and presented papers at the SME annual meeting in Cincinnati, the Clay Minerals Society annual meeting at the University of Georgia, and the Euroclay 2003 meeting in Modena, Italy. He also continues to serve as associate editor of the journal *Applied Clay Science*. A highlight of this past year was his election to the Petroleum, Mining, and Geological Engineering Section of the National Academy of Engineering, the first and only member of this department ever to be elected to a National Academy. (Murray's undergraduate minor was in the field of mining engineering).

Working with Murray in his laboratory is Wanda Allo (PhD from the Universidad Nacional del Sur in Bahia Blanca, Argentina), on a two-year postdoctoral fellowship from Conicet. Together they already have three articles in press. These are in addition to four papers Murray authored or co-authored in the *Proceedings of the 12th International Clay Conference*, held in Bahia Blanca, Argentina, and two other papers. (See sidebar.)

Greg Olyphant, who works at the interface between the Indiana Geological Survey and the department, received a special commendation from the Science Coalition, which (as a letter to Olyphant from former IU President Myles Brand notes) featured his "pioneering efforts in developing a faster and more accurate system for predicting *E. coli* blooms" in the Great Lakes.

Gary Pavlis has three major, ongoing research projects. The first is part of a large interdisciplinary project to study the unusual plate margin between the Caribbean Plate and South America. The overall project is funded under NSF's Continental Dynamics Program and is headed by Rice University. IU and Scripps Institute of Oceanography share responsibility for a passive seismic array experiment deployed to study the relationship between surface tectonic features and the mantle. IU has primary responsibility for the 60-station land deployment, and Scripps has primary responsibility for a 15-station Ocean Bottom Seismometer component of the experiment.

At the time of this writing, Pavlis and student Tammy Baldwin were in the field gathering data from portable digitizers installed in December 2003. The data from this experiment will be analyzed by a suite of conventional passive seismology tools (seismic tomography, shear-wave splitting, and seismicity studies of local earthquakes) to understand the geometric relationship of the large-scale, 3-D structure defined by the termination of the Antilles Arc in northern Venezuela, and the processes that have

Murray elected to National Academy of Engineering

Haydn Murray, professor emeritus of geology, has been elected to the National Academy of Engineering for pioneering work on the mineralogy and industrial applications of clays. Election to the National Academy of Engineering is among the highest professional distinctions accorded scientists and engineers. Academy membership honors those who have made "important contributions to engineering theory and practice, including significant contributions to the literature of engineering theory and practice," and those who have demonstrated accomplishment in "the pioneering of new fields of engineering, making major advancements in traditional fields of engineering, or developing/implementing innovative approaches to engineering education." The academy now counts a total membership of only 2,303 scientists and engineers worldwide.

shaped the northern margin of South America. In addition, they plan to use new technology for direct wavefield imaging developed by two recent PhD students, Scott Neal and Christian Poppeliers, in collaboration with Pavlis.

The second major project Pavlis is involved with is the continuation of recent work on wavefield imaging with passive array data. He has had support from NSF for the past five years to work in this area. He recently received a new four-year grant from the NSF's Collaborative Mathematics and Geosciences Program to continue this work. The newest project is being done as a formal collaboration with Art Weglein at the University of Houston. Weglein was one of the pioneers in the use of the Inverse Scattering Series in seismic processing. The focus of Weglein's previous work was to use the Inverse Scattering Series to provide the mathematical machinery for a general tool for removing multiples from seismic reflection data. In the new project, they have proposed to study how inverse scattering concepts might be applied to modern, passive array data like that being collected in Venezuela or the new national scale seismic experiment called the USArray (www.earthscope.org).

Finally, Pavlis has a collaborative program with Michael Hamburger to study earth-

quake hazards in Indiana. This project, which is a two-year effort supported by the U.S. Geological Survey's National Earthquake Hazard's Reduction Program, is designed to use all the seismicity data we currently have to provide a better appraisal of earthquake risk in Indiana. The main new data the project will bring to bear on the problem is that recorded by the network of school seismographs (Princeton Earth Physics Program in Southern Indiana). Several years of continuous data have now been recorded by this network, and they are in the process of analyzing these data to discriminate between earthquakes and mining explosions. The end result will be an earthquake catalog and estimates of detection capabilities that will help quantify earthquake risk in the state. In addition to the earthquake hazards element, Jeidi Wu is utilizing seismic tomography methods to produce the first-ever, high-resolution image of the lower crust and upper mantle for this region. Finally, they are also planning on additional analysis of data from the 1995-96 Wabash Valley experiment. Earthquakes recorded in that experiment will be combined with data from the larger-scale PEPPSI network to improve knowledge on seismicity rates.

Pavlis recently returned from a successful sabbatical at Scripps Institute of Oceanography in LaJolla, Calif., where he spent the last year as a Green Scholar. He never learned to surf, but the beaches were hard to leave behind. He also continues his successful collaboration with Michael Hamburger of the past several years in their Seismographs in Schools Program. Last September, he and Hamburger were part of a committee that held a workshop on educational seismology in Baltimore, Md., with support from the National Science Foundation. Finally, Pavlis recently rotated off a four-year term in service to the Incorporated Research Institutions for Seismology's Executive Committee.

This past year, **Mark Person** and postdoctoral student Yongli Gao traveled to Nevada for fieldwork related to a USGS project on gold mineralization. They visited several open-pit mines and one underground mine along the Carlin Trend during their trip. In January, Person and Professor Emeritus Noel Krothe were awarded a grant from the National Science Foundation that focuses on reconstructing the Pleistocene hydrology of the Atlantic continental shelf in New England using 3-D mathematical models of groundwater flow and solute transport. The models are being constructed to explain the anomalous occurrence of freshwater more than 100 kilometers out along the continental shelf off

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A Professor of Conscience: Abhijit Basu

It would not be unusual for Professor Abhijit Basu to commence a geology class by asking what headline topic is in the news. After all, this socially astute man believes "an educator's responsibility is to bring up social issues." Abhijit Basu ardently believes that an educator has an obligation to bring more into a student's awareness than offering academic specialization. For Basu, his position in life has the responsibility to foster social justice in young minds so that they will know how to apply academic knowledge with integrity. This is not the pie-in-the-sky philosophy of a dilettante; it is the refined belief of an intellectual — a geologist by profession — bred from generations of Indian intelligentsia and social activists.

Basu was one of 196 gifted young scholars who were selected to pursue academic excellence as a Bengali youth in the premiere college of Calcutta, India. He made the most of his opportunities to become a distinguished geologist, honored by many, and working with NASA scientists. This is

not surprising when you examine the academic tradition from which he came. His father was a portrait artist and a principal of the premiere art college in all of Bengal while his mother earned her master's in philosophy. His father's father was a headmaster and, upon early retirement, started a school for young girls at a time when there were no schools for girls beyond third grade. His mother's father was a true Renaissance man, who wrote extensively and was held in high esteem as a scholar. His mother's grandmother wrote the first feminist Bengali novel — totally out of the mainstream at that time — with the foreword written by Tagore, a Nobel laureate friend of the family.

Abhijit Basu's identity, however, is not restricted to his chosen profession or nationality — it is rooted in his humanity and in the characteristics he shares with all people, whether they are rural farmers from Wyoming or African refugees.

He professes to rarely think of himself as merely a student, faculty, or colleague and is

oblivious to how he looks, especially in relation to the color of his skin. He jokes about how short he is, and, when caught in error, he says that he is unable to blush, and even if he did, you'd never be able to tell. He does admit that he feels his identity most fully when he reads literary magazines, air mailed to him from India. It is not surprising when you consider that India is a land of 15 official languages (with different scripts) and more than 300 dialects — a sea of intricate relationships and bonds that distinguish both secure familiarities and the expansive potential of transcendence.

The sign above Basu's lab door at IU, written in nine languages, seem to describe the meaning and value he has cultured during his lifetime. The sign reads: "Abode of Meta-national Geologists," representing the transcendence of boundaries of nations. This is Abhijit Basu, a world citizen and a human being first and foremost.

— Michael E. Jones,
PhD student, Education Policy Program

Faculty notes

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Long Island. This fall, they will travel to New Jersey, Long Island, and Nantucket Island to collect water samples for geochemical and isotopic analysis.

This spring will see the graduation of two of Person's master's students, Paula Konfal and Prasenjit Roy. Konfal, who is also receiving a law degree, will be joining an energy law firm in Houston. Roy heads to Oklahoma to join a software company developing petroleum related software. Person's three doctoral students, Linda Zhang, Dave Dahlstrom, and Mohamad Al-Khadhrawi, are making good progress on their doctoral research. Two of these students are developing high-performance simulation models on IU's massively parallel supercomputer (AVIDD).

Lisa M. Pratt has been awarded the College of Arts & Sciences Alumni Association Distinguished Faculty Award for 2003. The Distinguished Faculty Award is based on research, teaching, and service. The Selection Committee sought faculty whose research has made a difference to their field and brought recognition and prominence to Indiana University. For teaching, the committee looked for high-quality mentorship and documented successes at both the

undergraduate and graduate level. Finally, the committee wanted faculty who have given time and expertise back to the university and the state. Pratt certainly has distinguished herself in all three areas. Congratulations!

Pratt also was one of three collaborators (with Donald Burke in chemistry and Carl Bauer in biology) who received a five-year, \$1 million award from the David and Lucille Packard Foundation's Interdisciplinary Science Program. They will study how microbes and the molecules of life evolve when water is scarce. This is the first Packard Grant that Indiana University has ever received.

Ed Ripley has had a particularly successful year attracting research and grant support from NSF and NASA. He has had proposals funded that were co-authored with Chusi Li to study Voisey's Bay Cu-Ni-Co deposit in Labrador, Canada, and the giant Jinchuan Ni-Cu sulfide deposit in China, and with Mike Leshner to investigate Fe-Ti-V oxide deposits associated with Permian Emeishan flood basaltic magmatism in southwest China. Ripley also co-authored (with Juergen Schieber, Dave Bish, and Bob Wintsch) the successfully funded proposal for the new ESEM, which arrived on campus for installation earlier this year.

Currently, Ripley is supervising three PhD and two MS students. He also continues to serve on the Geochemistry and Petrology Panel of the NSF.

Arndt Schimmelmann has a patent pending through the Indiana University Advanced Research and Technology Institute for his invention of a "Safety Glass Break-Seal." Jon Fong provided essential support in the development of the invention and thus holds 25 percent of the applied patent.

A paper by Bill Elliott (now at Southern Oregon University), Lee Suttner, and Bruce Douglas won the Rocky Mountain Association of Geologists 2003 award for best paper in the *Mountain Geologist*. Based on Elliott's master's work, the title of the paper is "Structural Control on Quaternary and Tertiary Sedimentation in the Harrison Basin, Madison County, Montana."

Robert Wintsch led five students on a field trip to New England. They emphasized the Mesozoic in the Hartford Basin and in the crystalline rocks. Wintsch is teaching G111 with almost weekly field trips. The final project will be a bedrock geologic map of the Bloomington quad.

Earth to Mars



IS THERE LIFE ON MARS? When NASA wanted to research the likelihood of life on the Red Planet, it turned to a team headed by Lisa Pratt, professor of geological sciences at Indiana University. Pratt was already researching microbial action deep in mines in South Africa, and the findings from that study may identify the best approach for unmanned probes seeking life on Mars. Her selection to lead the Indiana-Princeton-Tennessee Astrobiology Institute came with a five-year, \$5 million renewable commitment from NASA.

Pratt, who earned her PhD in geology from Princeton, is well equipped to lead the cross-disciplinary team that will relate the deep-mine findings to Mars exploration: She has both an undergraduate degree and one of her two master's degrees in botany. "I grew up out of doors, exploring the natural habitat with my father," Pratt relates. "My father had planned to be a biologist, but then went into medicine and became a surgeon at the Mayo Clinic." Pratt and her father regularly collected plant and animal specimens in areas near their home in southern Minnesota; she also remembers with fondness "Baltimore" the tree toad, brought back home by her father after a visit to the city of that name. "It lived in our home for years, and my father and I would regularly go out and dig worms to feed Baltimore," she recalls.

Pratt loved science, but when she became a teenager, studying science presented difficulties. "In the later years of high school, I became the only girl in science courses. It was terrible," she says. "It's a sensitive age; the boys in class were mean to me, and I finally gave up on it." She went to college as a Spanish major at the University of North Carolina at Chapel Hill. "I tried that for a while, but eventually the sciences were irresistible," she recalls. "I just couldn't stay away from them." She switched her major to botany, and again found joy in her studies.

But how did a botany major get into geological sciences? "I didn't know the type of geology I was interested in even existed until my junior year," Pratt says. "I took a course from John Dennison, a charismatic lecturer, about historical geology. I was hooked." Pratt delayed her switch to geology long enough to gain, at the urging of her academic adviser, a master's in botany. "It's fortunate, because I was able to learn the language of molecular fossils by studying biochemistry," says Pratt. Her specialty is now the study of the history of molecular signatures: the evidence fossils leave of

chemical activity at the molecular level.

"Dr. Pratt is a process-oriented geochemist who uses bio-geochemistry to address questions of 'how' and 'why' rather than leaving off at just 'what,'" says Christopher Maples, until recently chair of the Department of Geological Sciences at IU, about his colleague. Pratt's research has produced more than 50 articles on subjects relating to sedimentation deposits; on oceanographic conditions that allow organic matter to be preserved in fine-grained sediments that become black shale; and on the interplay between organisms and inorganic matter.

Yet, excellence in research is but one area of achievement for this scholar and educator. Winner of the Teaching Excellence Award from the College of Arts and Sciences in both 1996 and 1999 and named outstanding educator by the Association of Women Geoscientists in 1997, Pratt has a reputation as a superb mentor to her students. Considered by Jeffrey R. White, associate dean of the School of Public and Environmental Affairs, as "one of the most effective research advisers that I have known in my 24 years in academic research," Pratt has won the undying loyalty and affection of the graduate students she advises. Brandy Anglen, a doctoral student in the department, says, "Lisa is an amazing adviser. The process of working on a PhD is not an easy one, and her enthusiasm can really help you work through any frustrations, disappointments, or minor setbacks."

Pratt is also a leader in service to her field and to the university. She was co-chair of the federal Earth and Atmospheric Sciences Panel from 1998 to 2002 and served in 2000 on the National Science Foundation's panel for Multi-User Equipment and Instrumentation Resources for Biological Science. She was associate editor of the *Geological Society of America Bulletin* from 1996 to 1998, and she currently serves on the editorial board of the journal of *Geobiology*.

For the university, Pratt served as associate dean for research in the College of Arts and Sciences from 1999 to 2001 and chaired the Steering Committee that oversaw the lengthy planning of the Multidisciplinary Science Building, for which the groundbreaking ceremony will soon take place on the Bloomington campus. Juggling the competing claims of IU's scientific discipline communities for space and facilities in the new building has required leadership, fairness, and determination. White characterizes her role in the process as "visionary." Pratt is now chair of the Steering Committee for a second multidisci-

plinary science building that eventually will go up on the north side of the Bloomington campus.

And what about that question — is there life on Mars? "I will be genuinely surprised if brines beneath the Martian permafrost do not contain living microbes," Pratt says. "The chief ingredient for life — water — seems to be there." Pratt's research in South African diamond mines, where conditions seem inhospitable to life (sunless, with temperatures above 90 degrees Fahrenheit and 100 percent humidity), examines sulfur-like carbons used by many life forms. A change from sulfur to sulfide is a signature of biological activity taking place deep under the surface, and this signature might determine bioactivity in material taken from Mars in a future probe.

While the basis of Pratt's research is looking at microbial signatures deep under the earth's surface and related analysis of biogeology on the beds of shallow salt lakes in Oregon, NASA has tasked her group with more pragmatic work as well. "Our team will spend time designing flight-capable instruments for space travel," says Pratt. "All the instruments we use here are human-operated, but for the Mars probe, they have to be robotic. It'll be a whole new area for us, thinking about instrumentation in a totally different way."

Pratt is a successful woman in a science that traditionally has been led by men. Perhaps because of her own struggles in her formative years, Pratt believes strongly in the importance of mentoring. "I had wonderful people who opened doors for me, who believed in me before I believed in myself," she says. She cites John Dennison, at University of North Carolina at Chapel Hill, and Al Fischer, at Princeton, as two teachers who helped her immeasurably.

Pratt is grateful not just to her early mentors, but also for the support she receives from her husband, Bruce Douglas, an assistant scientist in the Department of Geological Sciences at IU. "It's difficult to raise a family, teach, and do successful research without help," she says. "The women I know in my field who are successful have, like me, the support of husbands who are also scientists. When I go off for weeks to do research in mines in South Africa, my husband can explain to my daughters why it is important, why I'm doing what I do. And when he goes off in the summer to do field work in Montana, I can step in to be there for my daughters."

Director of the university's Science Outreach Program from 1998 to 2000, Pratt also was on the advisory board of the Women in Science Program from 2000 to 2003. Students readily talk about the deep

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Faculty Research Grants, 2002–03

- BASU, A. (NASA) — “Petrologic Evolution of Lunar and Meteorite Parent Body Regolith”
- BROPHY, J. (NASA) — “An Experimental Investigation of the Immiscibility of Iron Metal Globules in Melts of Lunar Soil Composition”
- HAMBURGER, M. (Purdue University) — “Analysis of Seismic Hazard Assessments for Indiana”
- HAMBURGER, M. (NSF) — Collaborative Research: “GPS Measurement of Tectonic and Volcanic Deformation in an Active Island Arc, Luzon, Philippines”
- HAMBURGER, M. (NSF) — Collaborative Research: “Trans-Tibetan Strain: Testing Models with Surface Observations”
- HAMBURGER, M. (DOI-USGS) — Characterizing Seismogenic Faults and Evaluating Seismic Potential in the Wabash Valley Seismic Zone: Collaborative Research with Columbia University, Indiana University, and Purdue University”
- HAMBURGER, M. (Inc. Res. Inst. Seismol.) — USESN Program Center
- JOHNSON, C. (ExxonMobil) — “The Influence of Paleoclimate on Source Rock and Reservoir Development”
- KROTHER, N. (Sci. App. Intl. Corp.) — “Groundwater Investigation at the Ammunition Burning Ground, Crane Division Naval Warfare Center”
- LI, C. (NSF) — “An Experimental Study of the Effect of Sulfur on Nickel Partitioning Between Olivine and Silicate Melt”
- LI, C. (NSF) — “Olivine Geochemistry and Stable Isotope Studies of the Giant Jinchuan Ni-Cu Sulfide Deposit, Western China: Investigation of Ore Genesis in a Magma Conduit”
- MAPLES, C. (Shell Oil Co. Fdn.) — Shell Fellowship
- MAPLES, C. (NSF) — Workshop: “Preservation of Geoscience Research Cores and Collections: The View from Academic Researchers”
- MERINO, E. (Am. Chemical Soc.) — “Putting Replacement and Displacement Textures in Reaction-Transport Modeling of Dolomitization”
- OLYPHANT, G. (Ind. State Dept. Hlth.) — “Field Evaluation of On-Site Sewage Disposal System Impacts on Shallow Groundwater in Morgan County, Indiana”
- OLYPHANT, G. (IDEM) — “Aquifer Characteristics and Groundwater Flow Paths in the Surficial Aquifers of the Little Calumet Watershed, Northwest Indiana”
- PAVLIS, G. (NSF) — Collaborative Research: “Upper Mantle Structure of Gulf of California Rupture”
- PAVLIS, G. (Univ. Calif. San Diego) — Collaborative Research: “Seismic Catalogue Completeness and Accuracy”
- PAVLIS, G. (NSF) — Collaborative Research: “Imaging Earth Structure with Elastic Waves by Application of the Inverse Scattering Series”
- PAVLIS, G. (NSF) — “Crust-Mantle Interactions During Continental Growth and High-Pressure Rock Exhumation at an Oblique Arc-Continent Collision Zone”
- PERSON, M. (Los Alamos Natl. Lab.) — “Determination of Effective Hydrogeological Parameters Using Jurassic Tank Experimental Stratigraphy”
- PERSON, M. (DOI-USGS) — “Hypothermal Fluid Flow and Ore Formation in Great Basin, Nevada”
- PERSON, M. (NSF) — “Laboratory and Quantitative Models of Fault Permeability”
- PERSON, M. (NSF) — Collaborative Research: “Pleistocene Hydrogeology of the Atlantic Continental Shelf”
- PRATT, L. (NASA) — IU Subcontract to NASA: “Technology Development for Identification of Aqueous Processes on Mars”
- PRATT, L. (NASA) — “IPTAI Proposal for Detection of Biosustainable Energy and Nutrient Cycling in the Deep Subsurface of Earth and Mars”
- RIPLEY, E. (NSF) — “Stable Isotopic Studies of the Voisey’s Bay Cu-Ni-Co Deposit, Labrador, Canada: The Role of Externally-Derived Sulfur in Ore Genesis”
- RIPLEY, E. (Univ. of Minnesota) — “Isotopic Analyses for the Minnesota Natural Resources Research Institute”
- RIPLEY, E. (NSF) — “Petrogenesis of Gabbroic-breccia-hosted PGE Deposition in the Nuasahi Complex, Orissa, India”
- RIPLEY, E. (NSF) — “Mineralogic and Isotopic Studies of Cu-Ni Sulfide Mineralization Associated with the Duke Island Ultramafic Complex, Southeastern Alaska”
- SCHIEBER, J. (Chevron-Texaco) — “A Study of Petrophysical Properties of Shales in a Sequence Stratigraphic Context”
- SCHIEBER, J. (NSF) — “Experimental Mudstone Sedimentology: An Attempt at Reverse Engineering of Natural Processes”
- SCHIEBER, J. (NSF) — “Can Scanned Cathodoluminescence (SEM-CL) of Quartz Silt Be Applied to Provenance Studies of Mudstones? A Feasibility Study”
- SCHIEBER, J. (NSF) — “Acquisition of a New Environmental SEM (ESEM) Optimized for Advanced Microcharacterization of Samples (EDS, EBSD, CL)”
- SCHIMMELMANN, A. (CRDF) — “Isotope Geochemistry of Inert Components (He, Ar, N₂) Carbon and Hydrogen from Mud Volcanoes: Significance for Oil and Gas Exploration”
- SCHIMMELMANN, A. (Am. Chemical Soc.) — “Stable Isotopes Ratios in Indiana Coalbed Methane: Geographic and Time Variance, and Isotopic Fractionation”
- SHRINER, C. (Inst. Aegean Prehistory) — “The Application of the Integrated Petrologic Approach to the Study of Aeginetan Ware Technology Production and Exchange”
- SHRINER, C. (NSF) — “A Quantitative Assessment of Established Criteria for Emergent Complexity at Proto-Urban Settlements of the Southern Aegean”
- WINTSCH, R. (NSF) — “An Evaluation of the Role of Pressure Solution Creep in Crustal Deformation”

Earth to Mars

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impact Pratt has made on their lives.

“Lisa Pratt as a teacher and mentor has changed my life and afforded me opportunities that I wouldn’t have dreamed possible five years ago,” relates Eric Boice, a doctoral student in Pratt’s department. Boice came to graduate school later than most, with a poor record in his undergraduate years and the belief that, because of this record, he would not get a chance to do

research at an advanced level. But one person saw his potential and had faith. “Lisa saw something in me and believed in me — and I’m not the only one,” he says. Pratt looks out for students, Boice says, who may have lost their confidence or need a second chance, helping them to shine for the world.

“This is her gift,” he affirms.

— This article by William Rozycki appeared in the winter 2003–04 (Vol. 27, No. 1) issue of *The College* and is reprinted with permission.

IU professor studying proposed radioactive waste site

Geological properties of Yucca Mountain critical in decision to license repository

Starting next year, federal regulators will be making decisions about whether to license the nation's first repository for high-level radioactive waste at Yucca Mountain, Nev.

When they do, they should consider the geological properties of the site in designing a facility that will contain waste for thousands of years, said an Indiana University geology professor.

"There's been a tendency over the last five years to emphasize the man-made part of the repository," said the geologist, **David Bish**, who has studied the site for more than 20 years. "I firmly believe, in order to do the best job at Yucca Mountain, we need to consider both the engineered system and the geological system."

Bish led a team that conducted the most comprehensive study to date of the mineralogy of the site. It was published in the November-December issue of *American Mineralogist*.

The paper identified the location at Yucca Mountain of high concentrations of zeolites, a family of clay-like minerals with the capacity to absorb certain radioactive materials. It presents conclusions about the role the minerals can play in keeping radioactive waste from reaching the water table, where contamination would have a higher risk of spreading.

Bish came to IU this fall after working at Los Alamos National Laboratory in New Mexico, where his work included studying Yucca Mountain. He holds the Haydn Murray Chair in Applied Clay Mineralogy at IU. His collaborators on the paper work at Los Alamos.

Yucca Mountain is about 100 miles northwest of Las Vegas, near the edge of

Nevada Test Site, where nuclear weapons tests take place. Authorities started looking at it in 1978 as a possible site for containment of nuclear power plant and military waste.

Among its attractions, Bish said, are an extraordinarily deep water table — more than 1,500 feet underground. Another positive feature is the presence of zeolites that were formed ages ago by the movement of groundwater through thick volcanic deposits.

The study that Bish led included analysis of more than 2,000 core samples from holes drilled at Yucca Mountain to depths of between 20 and 1,800 meters.

The researchers confirmed that zeolites called clinoptilolite and mordenite are present in high concentrations between where the waste would be stored and the groundwater — that is, where they could filter any wastes that escape from man-made containers.

But Bish said the wastes that would be most effectively blocked by the zeolites, including radioactive cesium, barium, and strontium, aren't the materials that cause long-term concern at Yucca Mountain. That's because they have relatively short half-lives: Half their radioactivity would be gone in about 30 years.

Only a negligible amount of the materials would remain after 10 times the half-life, or 300 years, Bish said. Experts believe the stainless steel canisters in which the waste will be stored will easily last that long.

"All the predictions are the waste would not be going anywhere for 300 years," he said.

But that doesn't mean the zeolites aren't important. Bish said the minerals also have

the capability to act like a sponge, absorbing and giving off water. The sponge-like quality, he said, could help protect the Yucca Mountain area from developing cracks as the area is warmed by the addition of radioactive waste that continues to generate heat. Fewer cracks means fewer opportunities for the waste to leave the site.

Bish's paper is likely to serve as a resource as regulators weigh license applications and decide what conditions to impose on the waste-storage process.

Last year, Congress voted to move forward with a Yucca Mountain repository for 70,000 metric tons of high-level radioactive waste, despite opposition from environmentalists and Nevada officials. The U.S. Department of Energy is expected to apply to the Nuclear Regulatory Commission for licenses to build, operate, and seal the facility. It could start accepting waste by 2010.

Bish said there are pros and cons to the plan.

"I don't think any site is perfect," he said. "Yucca Mountain has a lot of things going for it and some things that, in a perfect world, we would change."

But he believes the time has come to face up to the issue of disposing of radioactive waste, which has been accumulating for decades in temporary storage at power plants and other locations.

"As long as we have nuclear power in our country, we're going to have waste we need to deal with," he said. "Doing nothing is not an option with this."

— *This article by Steve Hinnefeld appeared in the Nov. 14, 2003, Herald-Times and is reprinted with permission.*

IU becomes 'lead team' with NASA Astrobiology Institute project

Indiana University Bloomington will soon be the headquarters of one of the National Aeronautics and Space Administration's new Astrobiology Institute "lead teams," which are research institutes working on projects related to the search for life beyond Earth.

Based at IU and involving 18 scientists from eight research institutions, the new Indiana-Princeton-Tennessee Astrobiology Institute will be directed by IU Bloomington biogeochemist **Lisa Pratt**. Other IU members are geologist **Edward Ripley**, artist Ruth Droppo, and digital media services managers Douglas Pearson and

Michael Jasiak of University Information Technology Services.

NASA will provide IPTAI with \$5 million in funding over five years, and the institute will be able to apply for a renewal of funding in 2008. IPTAI is one of 16 lead teams selected this year. The importance of this award is reflected in the fact that it was announced in Washington, D.C., by Indiana Sen. Evan Bayh.

IPTAI's project, titled "Detection of Biosustainable Energy and Nutrient Cycles in the Deep Subsurface of Earth and Mars," will employ a series of field and laboratory experiments, as well as biological samples

taken from deep inside mines to figure out the best of way of detecting life on the two planets. As yet, no life has been detected on or under the surface of Earth's chilly neighbor, Mars, where the daily temperature usually tops out around 30 degrees Fahrenheit.

Scientists from Princeton University, the University of Tennessee at Knoxville, Pacific Northwest National Laboratory, Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, the University of Toronto, and the Universities Space Research Association's Lunar Planetary Insti-

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Geophysicists, faculty and students alike, have busy year

It's been an active year for the geophysics group. We bade farewells to several members of our group this year.

Postdoctoral research associate **Qizhi Chen** returned to his family in California, where he's initiated a collaborative research project with Stanford geophysicist Paul Segall on tectonics of the U.S. mid-continent. Graduate student **Xiujun Yang** completed her master's project on seismic tomography in the Tien Shan Mountains, and left us for greener (well, browner) pastures at Texas A&M, joining **Neelambari Save**, BS'02, in the geophysics program there.

At the same time, we welcome two new graduate students into our group. **Tammy Baldwin** joins us from the University of Arizona, where she completed her MS last spring. Baldwin will be working with Gary Pavlis on an exciting new field-based research project in Venezuela. She has already completed two field trips there and will be involved in an oceanographic cruise later this spring. **Kevin Eagar** joins us from Youngstown State University in Ohio. Eagar will be working with Gary Pavlis and Michael Hamburger on a USGS-funded project examining seismicity in the Wabash Valley region. **Jiedi Wu** is developing her master's research on a related project: a tomographic study of the structure of the crust and upper mantle beneath southern Indiana. And **Gerald Galgana** returned to IU after a semester's leave, which allowed him to return to the Manila Observatory and extend his work on remote sensing and active tectonics of the Philippine archipelago.

Michael Hamburger continues his collaborative work with the Philippine Institute of Volcanology and Seismology (PHIVOLCS), led by **Emmanuel Ramos**, PhD'95. **Gary Pavlis**, along with graduate student **Chengliang Fan**, has developed a collaborative project with University of Houston geophysicist Art Weglein on a new NSF-funded theoretical seismology project, with important applications to both earthquake and exploration seismology.

Astrobiology Institute

(continued from page 25)

tute comprise the rest of the IPTAI team.

The NASA Astrobiology Institute is an international research consortium with central offices located at NASA's Ames Research Center in Mountain View, Calif., the agency's lead center for astrobiology. Astrobiology is the search for the origin, evolution, distribution, and future of life in the universe.

Graduate student **Winston Anyanwu** is pursuing an environmental geophysics project, using seismic methods to study salt-water intrusion beneath Nantucket Island in Massachusetts.

Michael Hamburger and **Gary Pavlis**, along with technician

Terry Stigall, have continued their high-profile science outreach project, the IU PEPP Earthquake Science Program (www.indiana.edu/~pepp), which brings research-quality seismographs to some 25 schools in the Indiana region and provides Indiana with its first state-of-the-art digital seismograph network. The program has received support from the National Science Foundation, the Indiana Commission for Higher Education, the IRIS Consortium, and the Indiana Department of Transportation. This year, the geophysics group has hosted three outreach workshops, including a summer teacher-training workshop, and fall and spring teacher-student research symposia. The success of the PEPP program has led to the development of a new national outreach initiative, the U.S. Educational Seismology Network (www.indiana.edu/~usen), which provides resources to teachers and students nationwide.

Hamburger and Pavlis have both become key players in a major new, high-profile geophysical research initiative. The EarthScope Project is a \$250-million project sponsored by the National Science Foundation, which promises to develop a new, continental-scale seismic and geodetic "observatory" to study structure and dynamics of the North American continent. The IU group has been involved in much of the planning effort that has led to this successful new initiative. Hamburger led workshops on interdisciplinary study of magmatic systems and on education and outreach; Pavlis has been involved in an EarthScope workshop on seismic array deployment and imaging technologies. And Hamburger received one of the first science



Terry Stigall, left, and Michael Hamburger, right, encourage students to make the Earth quake at the annual science open house, co-hosted by the departments of Physics and Geological Sciences.

and education grants from the NSF: "A Map Tool for EarthScope Research and Education." The project is an outgrowth of a collaboration with the UNAVCO consortium and has resulted in a powerful new geodynamic mapping tool, the "Jules Verne Voyager." Check out the new map tool at <http://jules.unavco.org/VoyagerJr/Earth>.

Hamburger, along with IGS geologist **John Rupp** and graduate student **Brandy Anglen**, has begun an exciting new field-based geology class for first-time geology students. The class brings about 15 entry-level undergraduates to one of the world's most spectacular sites to study volcanic and tectonic processes, the Long Valley Caldera of eastern California. The course, developed in collaboration with the Collins Living-Learning Center, introduces students to volcanic, geologic, and environmental processes on the eastern flank of the Sierra Nevada. The course brings a group of Midwestern students into some of the most exotic terrain of the western United States: Death Valley, Yosemite Park, Mono Lake, and the Owens River gorge. It has proven to be a successful new part of the introductory geology curriculum and has enticed a few new students into our major!

And, last, but certainly not least, Hamburger and Pavlis, together with **Ed Ripley**, are heavily involved in recruitment of a new faculty member in geophysics. Thus far, we've received applications from more than 40 highly qualified candidates. Depending on the qualifications of our finalists, we hope to welcome a new colleague to our group, either as the Judson Mead Professor in Applied Geophysics or as a tenure-track assistant professor in geophysics.

Student News

Students go to the D.O.G.S., take a bow — wow!

Have you ever wondered about the nature and scope of graduate student research in the department? If so, there is an annual event called the Department of Geological Sciences (D.O.G.S.) Research Day, run by students in the IU chapter of Sigma Gamma Epsilon, the earth science honor society. Undergraduate and graduate students present their research proposals, data, or results in an oral or poster form conveniently located in the Department of Geological Sciences. The popular event attracts people from industry, the public, faculty, and fellow students in geosciences and other fields.

The third annual D.O.G.S. Research Day, held on March 7, 2003, was a huge success. This one-day event had 10 oral and 16 poster presentations, more than double the participation of the previous year. Presentations were submitted from every geoscience discipline (geophysics, geobiology, sedimentary geology, hydrology, mineralogy, and geochemistry) and discussed research being conducted or compared throughout the world. **Brandy Anglen**, a doctoral student, gave an intriguing talk titled "Sulfur Isotopic Record of the Antarctic Water Budget from Sediments, Lake Hoare, McMurdo Dry Valleys, Antarctica." **Will Tackaberry**, a master's student, presented a fascinating poster titled "Bedform Architecture of the Salem Limestone Revealed by 2-D Ground Penetrating Radar Signatures," and **Laurie Hawkes**, an undergraduate student, presented an interesting poster titled "Prediction of CO₂ Sorption in Coal Seams Using Uncrushed Coal Cores Under Realistic Pressure, Temperature, and Moisture Conditions."

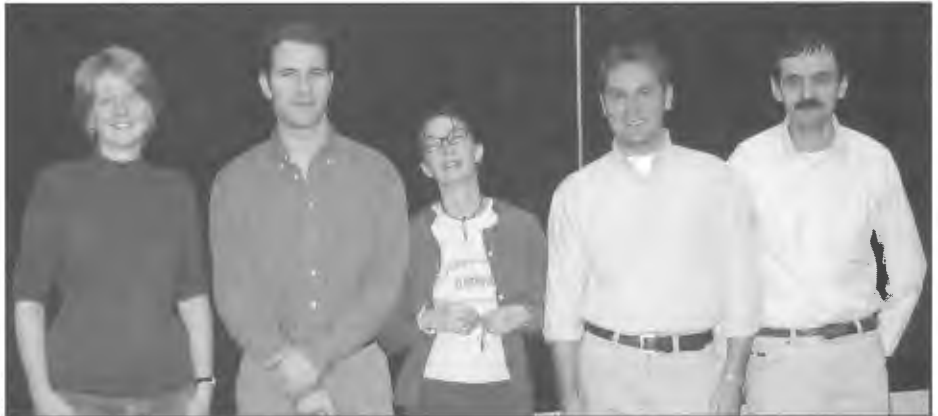
Undergraduate and graduate students are strongly encouraged to participate in order to gain valuable experience in preparing, presenting, and displaying their research. Whether students are undergraduates or graduates, just beginning or almost finishing their degrees, all are encouraged to participate. It allows them to exchange ideas, practice answering questions or defending their work, and gain ideas or new directions for further work. The format follows that seen at several conferences, such as the Geological Society of America's regional and national meetings, so the students gain valuable experience.

The 2003 D.O.G.S. Student Research Day award winners were **Francesca Zucco**

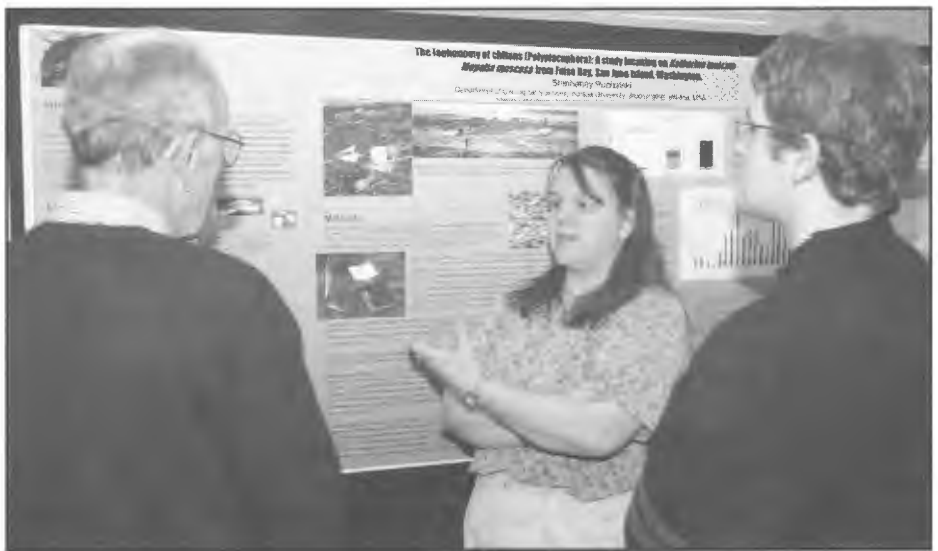
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Students and faculty view displays at the 2003 D.O.G.S. Research Day poster session.



Winners of Best Presentation Awards at the 2003 D.O.G.S. Research Day, are, from left, Rachel Walker, John Johnston, Francesca Zucco, Brett Tipple, and Remus Lazar.



Stephanie Puchalski successfully defends her research poster presentation.

Student honors

Annual awards were presented to geology students at a reception in the John B. Patton Room of the Geology Building on April 21, 2003.



Winifred Collier and her son, Don, present the inaugural Maynard and Winifred Collier Scholarship Award to Cory McWilliams. The late Maynard Collier was the department's analytical chemist for more than three decades. An endowment, established in memory of Collier by his family and friends, will support an annual \$500 scholarship for an outstanding undergraduate major. This is the second such endowment of an undergraduate scholarship to be established in the past two years. In 2001, Bill, MA'71, PhD'78, and Jan Cordua, BA'01, also made a very generous donation to endow an undergraduate scholarship. Friends of the Collers and Corduas are invited to contribute to these endowments. Checks should be made out to the IU Foundation and designated for the endowment of your choice.



2002–03 Graduate Student Award Winners are, from left, Remus Lazar, Francesco Zucco, David Lampe, Ye Zhang, and John Johnston.



2002–03 Undergraduate Student Award winners are, from left, Megan Hill, Antonio Buono, Erika Hinshaw, Susan Taylor, Aaron Wood, Anna Mahowski, Brett Tiple, and Cory McWilliams.



Simon Brassell presents a certificate to Jiedi Wu, the 2002–03 recipient of the Dan Tudor Fellowship in Geophysics at the April student awards function.

In other news

Ginger Korinek took a one-semester leave of absence to work with Richard Whitman (USGS–Biological Research Division) on evaluating sources and fate of *E. coli* bacteria in the swimming zone of Lake Michigan beach waters. Korinek returns to IU this spring to develop a dissertation proposal to study the accrual and entrainment of *E. coli* in the sediments of Dunes Creek Watershed. Dunes Creek discharges directly into Lake Michigan at the main swimming beach at Indiana Dunes State Park and is considered to be the main cause of water quality problems at that extremely popular swimming beach.

Aaron Satkowski (now a junior, doing undergraduate research with Robert Wintsch and with the Indiana Geological Survey) landed a USGS summer job as a field assistant this summer — a nice feather in his cap, because these don't grow on trees any more.

D.O.G.S.

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(best graduate poster, proposal), **Rachel Walker** (best graduate poster, results), **John Johnston** (best graduate talk, results), **Remus Lazar** (best graduate talk, proposal), and **Brett Tipple** (best undergraduate). Each winner received \$300. Special thanks go to the panel of judges: Mary Parke (ChevronTexaco), Sara Marcus (assistant editor, *Palaios*), Charlie Zuppan (Indiana Geological Survey), Dick Gibson (consulting geologist), and Erika Elswick (Indiana University).

A silent auction, held in conjunction with the event, was run by SGE to raise money to help in the recovery of a 26,000-foot core in the Belize rain forest. Money is needed to build core sheds, buy diesel fuel for transportation, and cover storage costs. About \$300 was raised from the silent auction for the Belize core recovery. Special thanks go to those who donated items: Kooters (binoculars, hand lenses, field pouches, and books), Yogi's (two gift certificates), Chris Maples and Dick Gibson (books), Sara Marcus, Don Hattin, and Richard and Louise Birge (rocks and minerals).

Alumni Notebook

Before 1960s

William J. Wayne, BA'43, MA'50, PhD'52, writes, "In November 2002, I was honored as a 'Socio Pionero' of the Argentine Geological Association. This is the term for those members who have reached 80 years of age that year. In 2003, I became a '50-year Fellow' of the Geological Society of America. In July 2003, I had a paper on the program of the VIII International Conference of the International Permafrost Association. The meeting was in Zurich, Switzerland, but because of the international situation in April, I decided not to attend this time. The paper was published in the proceedings volumes, though." The Lincoln, Neb., resident can be reached at wwayne3@unl.edu.

Phyllis Scudder Snow, BS'56, MA'58, joined the Glacier Orchestra in 1984 and still enjoys playing with them and other related groups. She lives in Kalispell, Mont.

William Dixon, BS'58, MA'66, is in his final term on the Illinois Board of Licensing for Professional Geologists. Since October 1997, he has represented Illinois at the semi-annual workshops of the National Association of State Boards of Geology to review the national licensing examinations. At the November 2003 meeting of the NASBG, he was elected secretary for 2004.

1960s

Richard J. Beckman, MA'61, retired to Pinhurst, N.C., and enjoys golf and travel. He writes, "My career as geologist with USG stretched from California to Alabama to New Mexico and included travel to all the states, Canada, and Mexico." IU field camp, he writes, is one of his cherished memories.

Dave Weinberg, BS'68, left the Idaho National Engineering

and Environmental Lab to join the Department of Homeland Security in Washington, D.C.

Robert Boyce, MA'69, is retiring from BP and beginning his own consulting service in Houston.

Mike Hamilton, BS'69, MA'75, retired from the U.S. Bureau of Mines in the 1990s, but has continued diverse geological activities from his home in Spokane, Wash. He is the first president of the new Columbia Basin Geological Society, and, in July 2003, he took a monthlong trip across the U.S., stopping for visits with various IU D.O.G.S. alumni.

Nicholas Noe, BA'69, is director of the Indiana Karst Conservancy, which seeks out unique karst features (e.g., Sullivan Cave, Orangeville Rise, Buddha Cave) and acquires them to assure their continued access for education, research, and recreation. The conservancy is presently seeking donations to support the purchase of the Wayne Cave Preserve in Bloomington.

1970s

Steve Henderson, BS'70, MA'74, professor at Oxford College of Emory University in Georgia, develops and leads field trips to dinosaur country, the Big Bend of Texas, and Scotland and has been involved in the research and publication of the role of geology in the Civil War.

Steve Koehler, BS'71, MA'73, won a prize for his short story "The Mysterious Fish of Owyhee River" in a contest sponsored by *Idaho Magazine*.

Richard Gibson, BS'71, is now living in Butte, Mont., giving daily talks on mining history and geology for the World Museum of Mining. In 2004, he will present lectures and day trips for tourists in southwestern Montana as the mining museum's educational

director. He was also a geological study leader for a nine-day Smithsonian tour through the National Parks of the Northern Rockies in September 2003 and continues to work as a volunteer editor for the Montana Bureau of Mines and Geology. He is generating funding for a book on geologic wonders of Montana while working on consulting projects that include oil exploration in Nevada and the former Soviet Union.

Nelson R. Shaffer, BA'72, PhD'96, updated and revised the latest edition of "Let's Look at Rocks," the first edition of which was written by **William J. Wayne**, BA'43, MA'50 [see column 1]. The 42-page booklet gives children a new way of looking at the history on their shelves.

Inda (Proske) Immega, MA'73, PhD'76, and her husband, **Neal Immega**, MA'72, PhD'76, retired from Shell Oil and now volunteer with the Houston Museum of Natural Science, Houston Geological Society, AAPG, and rock and mineral clubs. At the Clear Lake rock show, Neal held a class on petrified wood. At the museum, Inda is the main interpreter for Nobel and is reading for the Vatican, SuperCroc, Pearls, and the Human Genome exhibits. She teaches a basic crystallography class and aids in teacher in-service activities.

Cary Kuminecz, BS'73, MA'80, works for Seneca Resources in upstate New York.

Arlen Grove, BA'74, MA'81, is vice president of Prime Natural Resources, where he was formerly senior staff geologist. He works with stratigraphy and structure in a variety of geologic settings, and, in his spare time, he sails and builds hot rods.

Mark Leonard, BS'77, MA'80, is responsible for Shell's new business development in Russia and CIS in Moscow and is a new appointee to the department's advisory board.

Tom Kammer, MA'78,

PhD'82, and **Bill Ausich**, MA'76, PhD'78, conducted fieldwork on lower carboniferous crinoidal limestones in Ireland, Wales, England, and Belgium in summer 2003 as part of their NSF-sponsored research on generic longevity and evolutionary success in fossil marine invertebrates. On the faculty at Ohio State, Ausich was the 2001 winner of the Owen Award from the IU Department of Geological Sciences. Kammer is the Arts and Sciences Centennial Professor of Geology at West Virginia University, where he has been a faculty member since 1982. He is co-director of WVU's geology field camp and completed a six-year term as treasurer of the Paleontological Society.

Tim Salter, BS'78, PhD'88, and his family live in Fort Worth, Texas, where he is responsible for quality control at nine plants that produce chemical lime.

James W. Farnsworth, BS'79, was named vice president of BP's World-Wide Exploration in Houston and is on the advisory board of the University of Texas's geoscience department and the Texas Bureau of Economic Geology.

1980s

Colin Harvey, PhD'80, is section manager for geothermal, minerals, and groundwater at the Institute of Geological and Nuclear Sciences in Taupo, New Zealand. Harvey is a managing editor of *Applied Clay Science*.

Alan P. Laferriere, MA'81, PhD'87, is principal interpreter with BHP Billiton in Houston, Texas, and interprets seismic data from deepwater (>8000 ft.) sites in the Gulf of Mexico. He works with turtle structures, basins that have been connected to anticlines by salt removal, and some data are from depths as great as 30,000 ft.

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A tale told by a 'screwball': The Saga of the Blue Lake Rhino

Lee Suttner was at it again. One of the most renowned screwballs in the history of the department had been talking about science with Denver-area consulting geologist Bob Reynolds, when his interest was suddenly awakened by a tale that Bob began to spin. In 1997, Bob and his son made a pilgrimage to an obscure fossil locality, where a rhinoceros was trapped at the base of a lava flow (the Priest Rapids flow, a member of the Wanapum Basalt series) 14-and-a-half million years ago. The rhinoceros (a mature *Dicera-therium* bull) was preserved as a mold — large enough to accommodate an average-size adult person. As the story goes, geologists make this pilgrimage in order to commune with the Miocene by entering the rhino's body cavity from the rear, and in the darkness, toast its life and death with a glass of wine or a can of beer. Bob knew that he had sparked Lee's interest in visiting the site, but he kept its location a mystery, saying only that reaching the site would require finding one's way across a lake, then hiking up through talus and steep cliffs to reach the goal.

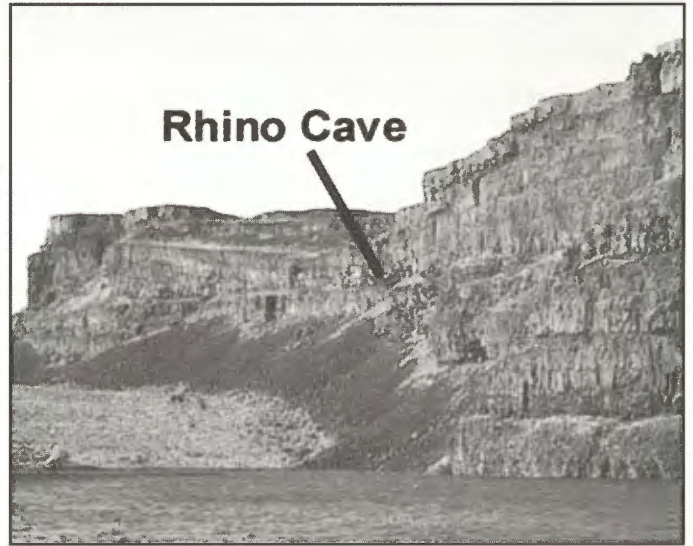
By the time Lee told me this story, the story had become a legend, and the pilgrimage a quest. Lee and his wife, Ginny, and my wife, Peggy, and I had been planning a golf trip to Portland, Ore., for June 2003, but the focal point of the trip soon shifted from pars and birdies to the rhino locality. Lee and I did some Web research on the location of the rhino mold and learned that it was at the northeast corner of Blue Lake, not far south of Grand Coulee. And so, on July 16, 2003, the four of us met in Moses Lake, Wash., eager to commune with the rhino the next day.

Early the next morning, we drove caravan-style to a campground and marina along the northwest side of Blue Lake. There were boats for rent, but Lee was not about to spend our precious resources on the fee. So he did what Lee does best: He hailed a boat that was returning to the

dock, formed a fast friendship with the mariner, and negotiated a free ride across the lake for the four of us. Lee also managed to borrow a flashlight and a walkie-talkie from the gentleman. Soon we were speeding across the lake, hair blowing in the wind, and anxious excitement building in the pit of our bellies.

We disembarked at the base of a steep talus cone, perhaps 300 feet in vertical relief. Scrambling up this cone would lead us to ledges along flow boundaries that had to be followed to the left and upward to the rhino cave. It didn't take us long to realize that Ginny and Peggy were unaccustomed to the rigorous hiking that Lee and I faced each day during our teaching at the IU Geologic Field Station. Footing was precarious, and every step upward required careful planning and lots of patience. When we finally reached the top of the scree, Lee was very relieved, and apologetic about dragging us all on this quest, at the risk of our very lives. But there was nothing else to do except, in the words of Lewis and Clark, to "proceed on."

Soon we were picking our way along a



Location of the Blue Lake fossil rhinoceros



Peggy Meyers, left, and Ginny and Lee Suttner show smiles of relief following their successful descent from the basalt cliffs.

ledge just below the cave's opening. But to our great dismay, and so close to our goal, the ledge was about 12 feet below the entrance to the mold, making our rear entry into the rhino's body cavity far too dangerous to attempt. It was a strange and surreal ending to our odyssey, which still required a cautious descent.

In the old days, Lee would probably have attempted the entry. But an older and much wiser Lee was willing to let go of his quest. He called for our boat to pick us up, and then we picked our way downward through the talus and were soon back to the campground, disappointed but at the same time exhilarated by nearly realizing our goal. And there we drank a toast to the Blue Lake rhino.

Now we are planning our next adventure. Who knows — perhaps we'll dine on woolly mammoth in Siberia.

— Jim Meyers, PhD'71

'Lost' alumni

We have lost contact with these alumni. If you have any information about their current location, please let us know. Send e-mail to inaarec@indiana.edu or call (800) 824-3044.

Seth Bretscher, APO, AE
Mark Brown, Deming, N.M.
David Burd, Tucson, Ariz.
David DeBarthe, Rio Rico, Ariz.
John Edkins, Ojai, Calif.
Bryan Eklund, Nederland, Colo.
Tom Fertal, Aurora, Colo.
Tark Hamilton, Wichita, Kan.
Janet Heiny, Arvada, Colo.
Morton Hill, Merced, Calif.

Eung Lee, Hilliard, Ohio
Hyong Lee, Salt Lake City, Utah
Steve Loheide, Stanford, Calif.
Mike McLane, Denver, Colo.
Amanda Reynolds, Tucson, Ariz.
Ji-Hun Ryu, Davis, Calif.
Ernesto Sirvas, Lomita, Calif.
John Walker, Boulder, Colo.
Myron Webb, Mexican Hat, Utah
Dave Weinberg, Idaho Falls, Idaho

Meet your advisory board

New members

Mark S. Leonard

Shell International Exploration and Production Inc., P. O. Box 4741, Houston, Texas 77210

Mark Leonard holds a BS degree in astrophysics and an MA degree in geology from Indiana University. He joined Shell Exploration and Production in September 1979 as a geophysicist in New Orleans and held a variety of positions in the United States in geophysical acquisition, processing, and interpretation. In 1993, he became chief geophysicist for the Gulf of Mexico and soon after was named prospect development manager overseeing Shell's Deepwater Gulf of Mexico Portfolio. In 1998, he moved to the international arena as vice president, Shell International Exploration and Production, responsible for new

business development worldwide. In early 2002, he was appointed director, Shell Deepwater Services, and also took over the role of board chair for Enventure, Shell's joint venture with Halliburton for expandable tubulars. Leonard assumed his current position of regional new business director for Russia and the CIS in July 2003.

Leonard is a recent member of the executive advisory boards of the Shell Asian Pacific Employee Network Group and Shell's Women's Network. He is also on the advisory boards of the University of Texas Geology Foundation and the Texas Bureau of Economic Geology.

Leonard recently moved to Moscow with his wife, Kim, son, Steven, and daughter, Kelli. He is an active participant with his son in the Cub Scouts and likes to share his passion for

astronomy, golf, and travel with his friends and family. He is currently taking Russian language lessons and is looking forward to learning to cross-country ski.

Kenneth D. Ridgway

Earth & Atmospheric Sciences, Purdue University, CIVL 3275, Phone: (765) 494-3269, E-mail: ridge@purdue.edu

Kenneth Ridgway has broad research interests in the field of sedimentary geology. Sedimentary deposits provide a wealth of data on past events that occurred at the Earth's surface. Because they form at the Earth's surface, sedimentary deposits are a product of the interaction between lithosphere, hydrosphere, atmosphere, cyosphere, and biosphere processes. The challenge to understand these complex relationships lends itself to interdisciplinary re-

search. Ridgway's research and the basin analysis group's research is geared toward collaborative research with paleobiologists, structural geologists, geochemists, petrologists, geochronologists, and geophysicists. This type of interaction makes for fun science and constant learning. For more information on sedimentary geology research at Purdue, see the basin analysis group home page.

Jayne L. Sieverding

ChevronTexaco North America E&P

Jayne Sieverding's career began in Denver, Colo., working on exploration plays in the Greater Green River Basin of Wyoming. She was assigned to several more Rocky Mountain projects, including one doing a detailed carbonate study of the giant gas field of Whitney Canyon-Carter
(continued on page 32)

Alumni notebook

(continued from page 29)

Andy Thomas, MA'81, is treasurer of the Clay Minerals Society and works for Chevron-Texaco in New Orleans.

Tom Dombrowski, MA'82, PhD'92, is in research and development for Specialty Minerals, Allentown, Pa., researching ground calcium carbonate and talc.

Howard Feldman, MA'84, PhD'87, taught introductory geology, sedimentology/stratigraphy, and paleontology at Clemson University after graduating from IU. From 1988 to 1995, he was based at the Kansas Geological Survey in Lawrence, where he worked on the taphonomy of lagerstätten, oolite depositional models for the Pennsylvanian cyclothems, and sequence stratigraphy of Pennsylvania-incised valley fills.

In 1995, Feldman joined Exxon, beginning in exploration and production research followed by two years in Calgary. He is now with Upstream Research Co. and has deciphered sequence stratigraphy of

shelf systems in numerous basins of the U.S. Western Interior, eastern coastal Canada, Niger Delta, and the North Sea. He has been teaching sequence stratigraphy schools, mainly in the field, in Utah, Colorado, and Spain. During fall 2003, he visited Nigeria to study Niger Delta cores. He returned to the department in December 2003 to present a colloquium.

Janell Janssen, MS'85, continues as a supervisor of drilling programs at the Savannah River Nuclear Facility near Aiken, S.C. She and her husband, also a geologist, have two children.

Scott Warner, MS'86, lives in Novato, Calif., with his wife, Susan, and daughters, Shayna and Sara. He is a vice president at Geomatrix Consultants and a practice leader in the firm's Oakland office. The co-editor for an American Chemical Society book on chlorinated solvent remediation says he enjoyed bringing a geology and music road show to elementary children in Novato, San Rafael, and Bolinas-Stinson Beach, Calif.

Signe Wurstner, BS'86,

MS'89, is senior research scientist in the hydrology group for Pacific Northwest National Laboratory. In April 2003, Wurstner was one of three staff members selected to receive the Pitzner/Eberhardt Award for Outstanding Contributions to Science and Engineering Education.

Robert C. Earle, BS'87, MS'91, writes, "I am currently the team leader of the Center for Subsurface Modeling Support. I am with the Robert S. Kerr Lab in Ada, Okla., doing groundwater modeling, GIS, and data management for groundwater research." He and his wife, Kris, live in Ada.

Jessica Elzea Kogel, MS'87, PhD'90, is immediate past president of the Clay Minerals Society and continues on SME's board of directors. She is a clay mineralogist for the Thiele Kaolin Co., Sandersville, Ga.

Cliff Ambers, MS'88, PhD'93, and his wife, Rebecca, now live in Monroe, Va. He cares for the farm and orchards, and she teaches at Sweetbriar College.

David Hirt, MS'88, JD'94,

writes, "I am a partner with the Aurora, Ohio, law firm of Christley Herington & Pierce. We are a general practice firm with an emphasis on municipal law and school law. The focus of my practice is on school law, including special education and student enrollment, tuition, and discipline, as well as on municipal law, including criminal and traffic prosecution, planning and zoning, and telecommunications and cable television law. Our two daughters, Emily, 3, and Sarah, 1, keep Lisa (BA'89, JD'93) and me busy."

Bob Pruett, MS'88, and **Jun Yuan**, PhD'93, are with the Imerys Pigments and Additives group in Sandersville, Ga. Pruett is leader of Minerals Technology, and Yuan is a research scientist analytical supervisor.

M. Ross Vandrey, BS'89, spent five years with Exxon in New Orleans after getting an MS from the University of Wisconsin in 1991. He joined a British independent company, Enterprise Oil, in 1997, and, in 2002, was transferred to Aber-
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Alumni notebook

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deen, Scotland. He is expecting to be transferred to Stavanger, Norway, this summer.

1990s

Alice Nightengale, BS'90, and Dave Luhan are the parents of Madeleine Nightengale-Luhan, born in June 2002. They live in Denver.

Franz Reisch, MS'91, is the principal geologist at American Colloid Co., Skokie, Ill., re-

sponsible for worldwide exploration for bentonite deposits.

Lisa Rhoades, MS'91, PhD'99, is a member of the Regional Geology Team of Chevron-Texaco, New Orleans. She is working on new deep-water stratigraphic interpretive tools in the Gulf of Mexico. She and Keith Goggin, also a geologist, were married on Sept. 13, 2003, in Mandeville, La.

Brian Towell, BS'91, works for Landmark Graphics, supporting, the GeoGraphix family of products and was named Support Employee of the Year

in spring 2002. He and his wife, LaDawn, live in the foothills above Golden, Colo.

Scott Wendorf, MS'92, is an intellectual property attorney with Halliburton Energy Services Inc. His work includes the patenting of new well completion and reservoir monitoring technologies. Wendorf and his wife, Andrea Hamilton, MA'92, live in Dallas with their children, Frances Anna and Henry.

Jane Hultberg, MS'93, is a librarian at the College of the Atlantic in Bar Harbor, Maine.

Jason McCuiston, BS'93,

MS'96, is a geologist for Ainks Clay Co., Paris, Tenn., where he is responsible for exploration, development, and mining of ball clay.

Chris Gellasch, MS'94, writes, "I moved to Grafenwoehr, Germany, in June 2003 and took command of the 71st Medical Detachment. There is not a lot of geology involved with the position, but I get to command troops in a field unit. In September, I was promoted to major in the U.S. Army, and in 2004 I will have a paper

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Advisory board

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Creek in the Wyoming thrust belt area. She was transferred to Houston in 1988 and worked primarily on exploration projects in both Oklahoma and Wyoming. In 1992, she left the area of technical geology and moved into an exploration staff position, implementing various quality initiatives and facilitating project teams. In 1994, she was moved into an exploration economic evaluations training assignment. Her first supervisory position was in 1997 when she became the geology super-

visor for the Houston-based mid-continent production earth science staff.

In 1999, Sieverding was given an asset manager position in the Oklahoma and Texas Panhandle area that included overseeing all field operations and capital spending programs. In 2001, with the merger of Chevron and Texaco, she was appointed the South Texas Area manager for the MidContinent Business Unit of Chevron Texaco North America E&P.

Sieverding has a BS in earth science from St. Cloud State University and an MA in geology from IU. She was born in

St. Cloud, Minn., and is married to Peter Schipperijn. They have two children, Johanna, 10, and Eric, 7.

2003 members and affiliations

Robert F. Blakely, *geophysicist emeritus, Indiana Geological Survey (retired)*

John N. Bubb, *Exxon (retired)*

Michael T. Cowen, *Petroleum Geologist*

Derek G. Fullerton, *president, Exmin Corp.*

John W. Gibson Jr., *president, Halliburton Energy Services*

Richard I. Gibson, *consulting geologist*

Michael J. Graham, *manager, Environmental Restoration Program, Department of Energy INEEL Site*

Stephan A. Graham, *professor, Stanford University*

Glenn B. Hieshima, *geoscience supervisor, ExxonMobil Production Co., US West*

Robert G. Jones, *executive director, Indiana Mineral Aggregates Association*

Mark S. Leonard, *new business director, Russia and CIS, Shell International E&P*

Judson Mead, *professor emeritus, IU Department of Geological Sciences*

Michael C. Mound, *product manager, Global*

Frank D. Pruett, *director, Indiana Geosciences Institute*

Kenneth D. Ridgway, *associate professor, Purdue University*

Jayne L. Sieverding, *S. Texas area manager, MidContinent SBU*

John C. Steinmetz, *director and state geologist, Indiana Geological Survey*

Thomas Straw, *Western Michigan University (retired)*

Daniel M. Sullivan, *Indiana Geological Survey (retired)*

Kenneth R. Vance, *Anadarko Petroleum Corp. (retired)*

Johnny A. Waters, *professor, State University of West Georgia*

Stephen G. Wells, *president and research professor, Desert Research Institute*

Stanley W. Anderson, *Houston Exploration Corp. (retired)*

Malcolm W. Boyce, *Chevron Overseas Petroleum Inc. (retired)*

George M. Nevers, *Garnet Resources Corp. (retired)*



Attending the department's external advisory board 2003 fall meeting are, front row, from left: Abhijit Basu, Robert Blakely, Thomas Straw, Jayne Sieverding, Frank Pruett, and John Steinmetz; back row, from left: Kim Schulte, Thomas Herbert (College of Arts & Sciences), Robert Jones, John Bubb, John Gibson, Mark Leonard, Johnny Waters, Derek Fullerton, Judson Mead, and Kenneth Ridgway; not shown: Michael Graham.

Alumni notebook

(continued from page 32)

published on groundwater and military operations.”

Nate Way, MS'94, PhD'98, and **Cara Davis**, MS'95, PhD'98, are the parents of Jacob, born in December 2001. Way and Davis work for ExxonMobil in Houston.

Mark Monk, MS'95, a geochemist at the Stroud Water Research Center in Avondale, Pa., was married in June 2003.

Stan Radzevicius, MS'95, completed a PhD at Ohio State University in 2001 and is now working at Enco Inc. in Springfield, Va., in geophysical and engineering applications.

Huitang Zhou, PhD'96, is president of Mintech International, which is headquartered in Bloomington, but mines and processes attapulgite clay and muscovite mica in China. The company exports to the United States and several Asian countries. Zhou and his wife, Ping Sun, are building a new home in Bloomington and expect to move in this year.

Ana Carmo, PhD'97, participated in an Arctic research expedition in summer 2002 on the icebreaking U.S. Coast Guard cutter *Healy*. The research focused on sea-bottom coring to study paleoclimates.

In October 2003, **Richard Stotts**, MS'97, was featured on an MTV special, “A Social History of Hair.” Stotts was co-founder and lead guitarist for a punk band, the Plasmatics, and pioneered the mohawk hairdo in rock and roll.

Bill Elliott, MS'98, PhD'02, writes that he and his wife, Sarah, are the proud parents of Abigail Elizabeth, born Sept. 11, 2003. Elliott is on the faculty at Southern Oregon University.

William K. Fallowfield, BA'98, works in Superior, Wis., as an environmental geologist for Twin Ports Testing Inc.

Catherine Brownlee Talbot, BS'98, works for Indigo Pool as a data administrator. She and her husband, Robert Talbot, BS'96, MS'00, live in Sugarland, Texas, where they enjoy

spending time with their dogs and camping.

Martin Drury, BS'99, is an Internet programmer with ADSNetcurve, Louisville.

Mark Panning, BS'99, is at the Berkeley Seismological Laboratory of UC Berkeley.

George Yu, PhD'99, writes, “I have been living in Knoxville, Tenn., with my wife, Jing, and daughter, Miao, since 1994. We love Bloomington and try to visit IU as often as we can. We will make another trip to Bloomington in the summer to celebrate my adviser’s (Professor Noel Krothe) retirement [see page 7]. I am working for MACTEC Engineering and Consulting in west Knoxville as a principal project manager/scientist, engaging in chemical- and bio-remediation work. Let’s go, IU!”

2000s

Shawn Naylor, BS'01, is relocating to Salt Lake City.

Christian Poppeliers, PhD'01, writes, “I just got a postdoc appointment with the Rice University Center for Computational Geophysics. Lots of math, seismograms, inversions, and no rocks, which for me is a good thing.”

Shayne Wiesemann, MS'01, after graduating from IU, traveled to Central and South America for four months. He is a geologist with RMT Inc., an environmental and engineering consulting firm in Ann Arbor, Mich., where he conducts Phase II investigations for clients in Indiana, Ohio, and Michigan.

Dan Capps, MS'02, and his wife, Krista Brewer, MS'02, are in the Peace Corps in Cata-

camas, Honduras, involved in forestry and environmental education. They appeared on Honduran television, and Capps was asked to compile a geologic history of Honduras as part of his assignment. He gave a workshop for the Guides' Association for the Talgua Caves. They've also had expeditions sighting three-toed sloths and trees of toucans.

Neil Whitmer, BS'02, is a graduate student at the University of Tennessee, studying structural geology.

Ginger Korinek, MS'03, is working with Richard Whitman (USGS Biological Research Division) on evaluating the sources and fate of *E. coli* bacteria in Lake Michigan beach waters. Korinek will return to IU in the spring to develop a

(continued on page 34)

What's new?

The IU Alumni Association is charged with maintaining records for all IU alumni. Please print as much of the following information as you wish. Its purpose, in addition to providing us with your class note, is to keep IU's alumni records accurate and up to date. To verify and update your information online, visit our online alumni directory at www.alumni.indiana.edu/directory.

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Soc. Sec. # or Student ID # _____

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Please send information about IUAA programs, services, and communications.

Attach additional pages if necessary. Mail to address on back cover, or fax to (812) 855-8266.

Honor Roll of Donors (Sept. 1, 2001, to Aug. 30, 2002)

Many thanks to those who have contributed to the IU Department of Geological Sciences!

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Clebnik, Sherman
Cleveland, John & Elinor
Cody, Clyde & Elizabeth
Coller, David & B.L.
Coller, Donald & Patricia

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Alumni notebook

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dissertation proposal to study the accrual and entrainment of *E. coli* in the sediments of Dunes Creek Watershed.

In memoriam

James R. "Dick" Harris

(The following article is excerpted from the winter 2003 issue of the Indiana Board of Licensure for Professional Geologists newsletter. At the time of his death, Dick Harris served on the department's advisory board. His presence on the board will be greatly missed.)

The state of Indiana lost a consummate geologist and public servant with the passing of James R. "Dick" Harris, of Evansville, on Sept. 23, 2003. Dick died of complications from heart surgery at age 74.

A Boonville, Ind., native, Dick was a graduate of Indiana University, where he received a bachelor's degree in geology in 1951. During the Korean War, he served in the U.S. Navy as chief engineer aboard the *U.S.S. Rebooth*. As a young geologist, Dick worked in the Warrick County coal mines and as a petroleum explorationist in the Illinois Basin. Despite his successes in oil finding, he remained modest about them and was quick to share the credit.

In 1972, Dick was elected to the Indiana House of Representa-

tatives from 1973 to 1974. He served as the ranking majority member of the Standing Committee on Natural Resources, along with other committee assignments. He attended and participated in numerous energy conferences in other states, representing the speaker of the Indiana House of Representatives. Subsequent to his tenure in the House, he served two terms in the state Senate from 1974 to 1986.

His talents were recognized nationally during his second term in the Indiana Senate, when he was nominated by President Reagan and confirmed by the Senate to serve as director of the Office of Surface Mining Reclamation and Enforcement in the Department of Interior. He served until 1984 and is remembered for his efforts to promote safer mining conditions.

During his tenure in the Indiana State Assembly, Dick often represented the profession of geology. He worked diligently in establishing licensure of geologists. For that, he proudly carried Indiana License No. 1. In 1998, and again in 2002, then-Gov. Frank O'Bannon appointed Dick to the Board of Licensure for Geologists.

From his home in southern Indiana, Dick worked to improve the quality of life for its citizens. He lived for the challenge of "making life better for

everyone around him," said Kevin Harris, one of his four sons. "He never met a problem he didn't want to solve."

During his long and varied career, Dick was president and owner of the New Elberfeld Telephone Co. He built the first modern telephone network in Elberfeld and the neighboring town of Lynnville. He was elected president of the Warrick County School Corp. and was instrumental in building many of the Warrick County area schools. Additionally, he worked with area legislators to win independence for the University of Southern Indiana. He was also always a geologist, practicing his craft as owner of Dick Harris and Associates, his consulting firm in Evansville, and continuing to serve the profession of geology. He was a member of Indiana University's Department of Geological Sciences' advisory board, served on the Geological Mapping Advisory Committee of the Indiana Geological Survey, and was a member of the Indiana Board for the Licensure of Professional Geologists. In 1999, the Professional Geologists of Indiana recognized him with the PGI Lifetime Achievement Award.

Dick is remembered for his successes as a geologist, as a businessman, and most particularly as a public servant. Despite his very public professional life, those who knew Dick person-

ally will remember him as a private man. Jesslyn Harris, his wife of 50 years, said her husband never bragged about his success. "His lifelong effort was to see (his family) was well-provided for," she said. "He never talked about all the successes in his career. He was a very modest man."

We also have recently learned of the death of the following alumni (dates shown in parentheses):

Nick Baciu, BA'50 (3/16/00)
Thomas G. Beck, BA'51 (1/21/03)

Jerry P. Birge, BS'59 (10/21/01)

James Bush, MA'49 (4/03)

Michael Cowen, BS'57 (4/23/04)

Milissa J. Gibboney, MA'80 (4/16/96)

Edith M. Ginger, MA'69 (12/84)

S.R. Hollensbe, BS'50 (4/18/99)

Dennis R. Lucas, BS'50 (8/1/01)

James R. Mahorney, BS'52, MA'56 (1/17/02)

Bernard M. Parlock, BS'60 (9/4/97)

Robert E. Sargent, MA'53 (2/20/91)

George R. Wagner, MA'57 (4/11/89)

Steven L. Widdicombe, BA'76 (8/24/03)

Donors

(continued from page 34)

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Davis, Craig & Paula
Davis, R. Laurence
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Dean, Mildred & Lyndon
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Griest, Stewart
Griffiths, Scott A.
Griggs, John & Bessie
Grove, Arlen
Grover, Monty & Susie
Guerrettaz, John
Gutstadt, Allan & Lyndal
Guzman, Humberto & Joyce
Hagey, John
Hamburger, Michael & Jennifer
Bass
Hamilton, Stanley & Mary
Hanley, Thomas & Judith

Patton Visiting Professor for Industrial Minerals established

The department, in conjunction with the IU Foundation, has established an endowment for a visiting professor in industrial minerals in honor of John B. Patton. The late Professor Patton was head of the Industrial Minerals Section of the Indiana Geological Survey from 1949 to 1958, when he was appointed chair of the department and state geologist. He taught the graduate course in industrial minerals until 1978.

The endowment fund has been established at the IU Foundation, and support from industry and individuals is being solicited. Please send your contributions, payable to the IU Foundation, to the Department of Geological Sciences, Indiana University, 1001 East Tenth Street, Indiana University, Bloomington, IN 47405, Attn: Kim Schulte. Designate your contribution for the Patton Visiting Professorship.

Harper, Roxanne
Hasenmueller, Walter & Nancy
Hattin, Donald & Marjorie
Heisen, Gene
Heiser, Lois
Henderson, Gerald
Henderson, Stephen & Kathryn
Hendrix, Thomas & Mia
Hieshima, Glenn & Suzanne
Kairo
Hill, Richard & Barbara
Hinton, Richard & Maryellen
Hirsch, Stuart & Pamela
Hokanson, Neil
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Nelson, Jack & Eileen
Nelson, Priscilla
Noe, Nicholas & Carita
Nolan, Carrie
Ogle, Ronald
Oliver, Joseph
Olliver, David
Olsen, Larry & Maryanne
Olyphant, Greg & Cynthia
Orgill, James R.

(continued on page 36)

Ginkgo trees to be dedicated

Some of you may remember that when **Gary Lane** retired from the department, in honor of that event, we planted a ginkgo tree (a "living fossil") near the Arboretum across the street from the Geology Building. That tree is still growing and thriving (just like Gary). There are two other ginkgo trees nearby that have not been dedicated. We thought it would be a nice gesture to the memory of two other IU paleontologists, **Bob Shaver** and **Alan Horowitz**, to dedicate those two trees to them. (The Arboretum charges \$300 to dedicate a tree, which covers a plaque and care for the tree).

We are inviting our alumni and friends of the department who wish to contribute to the cost of dedicating those trees to do so. We would particularly encourage former students of Shaver and Horowitz to contribute toward this memorial. If you would like to make a contribution, please send your check (made out to the IU Foundation) to Department of Geological Sciences, 1001 East Tenth Street, Indiana University, Bloomington, IN 47405, Attn: Kim Schulte. Please indicate that your contribution is for the "Tree Fund."

If more money is contributed than is actually needed for the trees, we will use any excess to support student research in the paleontology-sedimentary geology area.

Donors

(continued from page 35)

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 Pickering, Ranard & Joyce
 Ploger, Sheila
 Plymate, Thomas & Lynda
 Pratt, Lisa & Bruce Douglas
 Proctor, Martha
 Pruett, Frank & Shirley
 Ramsey, John & Carol
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 Renzetti, Phyllis J.
 Retherford, Michael & Dana
 Revetta, Frank
 Rexroad, Carl
 Riddell, John
 Ridgely, Bradley
 Ripley, Edward & Kathleen
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 Rohr, Steven
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 Schilling, Richard J.
 Schimmelman, Arndt & Minh
 Schulte, Kim & David
 Serne, Dennis
 Sexton, John & Mary Ann
 Shaffer, Nelson & Kathryn
 Shaver, Sue
 Shirk, William
 Shorb, William & Lisa
 Shriner, Christine
 Siekierski, Jerome
 Sieverding, Jayne
 Smith, Charlotte & Howard
 Smith, James
 Sonntag, Mark & Jean
 Soreghan, Michael & Gerilyn
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Stafford, Rodney K. & Marie C.
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 Stewart, Michael & Carol
 Struhs, James
 Stump, Richard & Catherine
 Sukup, James & Mary
 Sullivan, Dan & Nora
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 Tarbuck, Edward
 Taylor, Lawrence
 Thomas, Andrew & Sarah
 Thomas, James
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 Thornburg, Janet
 Tipple, Brett
 Tipple, Gregory & Joyce
 Basciano
 Towell, Brian
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 Tudor, Janet
 Utgaard, John & Mary
 Utgard, Russell & Doris
 Vance, Kenneth
 VanCoutren, Lewis & Mary
 Viola, Dorothy
 Vitaliano, Dorothy B.
 Voss, Robert & Katherine

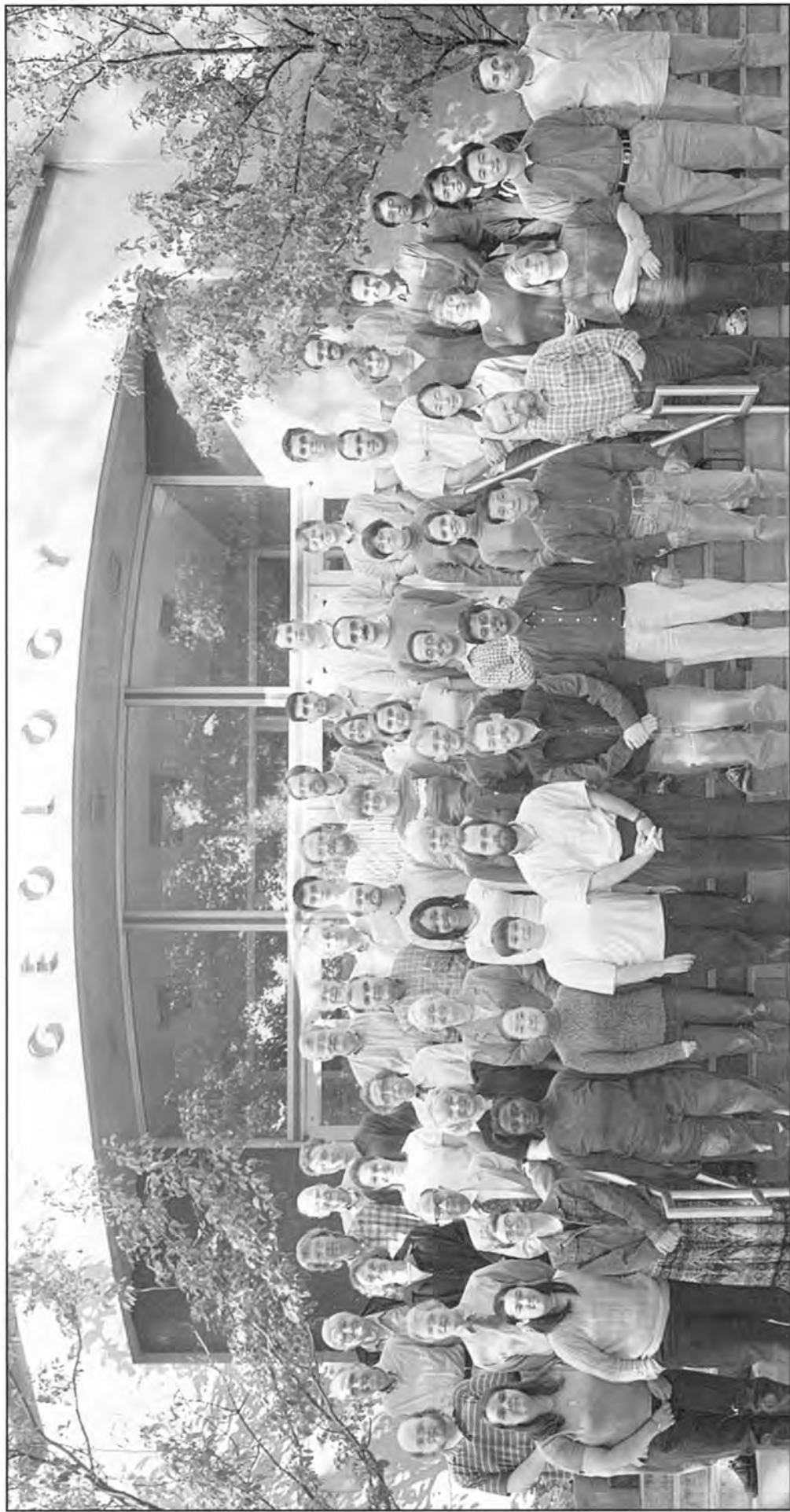
Vrahana, John V.
 Waddell, Courtney
 Wagner, Paul
 Walker, Jerome
 Wang, Margaret (Peggy)
 Warner, Scott D. & Susan
 Waterman, Arthur & Marcia
 Wayne, William & Naomi
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 Zucco, Francesca



A new display in the lobby of the Geology Building recognizes departmental donors making gifts under \$250, \$250-\$499, and over \$500. Names are changed annually to reflect giving in the previous calendar year. The inscription on the plaque at left reads: "Annual contributors add a major component to our financial strength. Their continued support ensures that the department will reach its highest academic and research potential. We thank these donors for their generosity." The plaque in the center, mounted on Indiana limestone donated by Indiana Stone Works Inc., recognizes the 1996 advisory board: "In 1996 the Advisory Board of the Department of Geological Sciences with the support of President Myles Brand initiated an endowment campaign designed to ensure excellence in our present and future academic and research missions. The overwhelming success of this endeavor has resulted from the vision, wisdom, generosity, and leadership of members of the Advisory Board, to whom we extend enduring gratitude." The plaque on the right reads: "Part of the endowment campaign centered on attracting 200 donors who would each contribute \$400 annually for at least five consecutive years. Special alumni and friends who have participated in this effort are commended for their loyalty to the department, and for their part in ensuring continued growth and success of our programs."

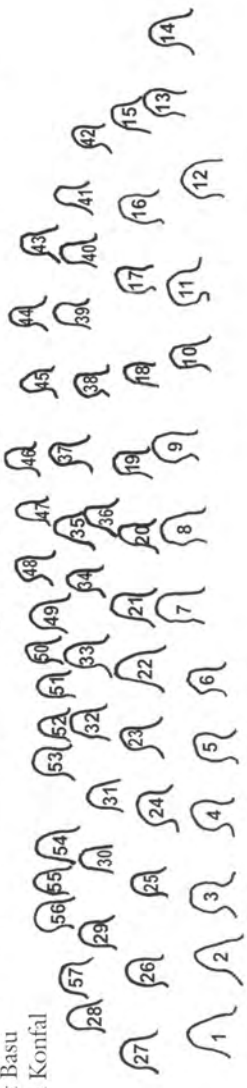
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Geological sciences seniors, graduate students, faculty, staff — October 2003

1. Stephanie Puchalski 2. Haley Abbott 3. Erika Hinshaw 4. Deborah Opokuah 5. Liming Zhu 6. Cindy Hale 7. Adam Davis 8. William Tackaberry 9. Joyashish Thakurta 10. Chusi Li
11. Juergen Schriber 12. Terry Stigall 13. Chengliang Fan 14. Erik Boice 15. Nabanita Gupta 16. DeAnn Reinhart 17. Ye Zhang 18. Irene Arango 19. Wilfrido Solano 20. Peter Sauer
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