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Indiana University College of Arts & Sciences Alumni Association

HOOSIER GEOLOGIC RECORD

Alumni Newsletter of the Department of Geological Sciences



Winter 1997

HOOSIER GEOLOGIC RECORD

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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 yours.

Chair's greeting

John Hayes, Distinguished Professor of chemistry and geological sciences and chair of the Department of Geological Sciences (1994-96), left IU in July 1996 to become director of a new national research laboratory facility and faculty member at the Woods Hole Oceanographic Institution. All of us in the department shall forever be indebted to John for his many contributions over the years in terms of outstanding research, teaching, and service. We wish him the very best in his new, exciting, and prestigious endeavors.

Much has happened since the last edition of the *Hoosier Geologic Record*. The pace of change in our faculty complexion continues to accelerate. The activity of the department's advisory board is the highest in its 35-year history, and we have formulated a vision and comprehensive academic plan that will guide the department into the next millennium. A key element of the plan is a major revision of our graduate course curriculum.

Faculty news first. As you have noted above, **John Hayes** resigned his position at Indiana University in July and accepted a joint appointment at the Woods Hole Oceanographic Institution and at Harvard University. John's scientific shoes are huge ones to fill, but he has left us with an analytical infrastructure that is as good as any in the nation. The budget situation in the College is such that we cannot fill the position during this academic year, but we intend to advertise for a junior-level person to replace John during the following year. Meanwhile, I have agreed to serve the remainder of John's term wearing a different hat from the one I don in the afternoons when I occupy the associate dean's office in Kirkwood Hall. The good news out of all of this is the daily 20 minutes of exercise I get walking back and forth between offices!

Claudia Johnson is no longer just a visiting faculty member. Our search for a new sedimentary geologist started in the office of **Bob Dodd**, chair of the search committee on the west end of the fifth floor, and extended out to universities across the country before concluding at the east end of the fifth floor in Claudia's office with her appointment as assistant professor. Joining her in her permanent move to Bloomington this past summer was her spouse, **Erle Kauffman**, formerly professor of geology at the University of Colorado at Boulder. Someone

Chair's farewell

Hayes ends two years as chair

Very probably, you don't know me personally. My connections with the department were rather distant during my first 14.5 years in Bloomington, from January 1970 until summer 1984. You do, however, know the department, the university, and the town of Bloomington. That's enough. You'll be able to imagine many of the feelings that are crowding in on me as I pull up stakes to move to Woods Hole Oceanographic Institution on Cape Cod in Massachusetts. Scientifically, I am eager to gain the new experience and, as a person whose research interests have been migrating upward from the sediments into the water column, to enjoy the challenge and benefits of an environment crowded with experts in marine science.

Unfortunately, that also involves leaving this department, the university, and Bloomington. Colleagues

who first tolerated me and then nurtured me as I made the transition from the physical to the natural sciences (my first appointment in Bloomington was in chemistry and practically all of my formal scientific education was in that field) eventually elected me as chair of the department. It has been a privilege to serve. Not always fun, but I've never had to ask myself whether the job was important, and I've never had the feeling that I was even coming close to repaying my debts to my colleagues and the institution. In the process, I have never encountered anything but support and best wishes from my colleagues and our alumni.

Many alumni have told me that they can never repay the university and the department. I now join them.

With heartfelt thanks and very best wishes to all,

— *John Hayes*

suggested, not totally in jest, that Erle provides the last critical mass needed for establishment of a Friends of the Cretaceous chapter in Bloomington — **Don Hattin** would be the logical president emeritus of the chapter — and Erle, Claudia, **Lisa Pratt**, and I could be charter members. We would have to establish a collective goal to locate a single outcrop of Cretaceous rocks within the state of Indiana as partial justification for so many Cretaceous groupies at Indiana University.

At its annual meeting in September, the department's advisory board officially announced and kicked off the largest endowment campaign in the history of the department — in fact, probably the largest in the history of *any* department on campus. The campaign, *Geological Sciences at the Forefront: "\$5 million in 5 years,"* has already passed the 20 percent mark, thanks to more than \$500,000 in initial pledges from board members and a match of this amount by President **Myles Brand**, if we are able to meet the campaign goal. You will be reading and hearing far more about this extraordinary development activity via mailings, receptions, and personal contacts by faculty and board members.

In the last five years, we have seen a 400 percent increase in the number of

individual donations to the department. In spite of the fact that we are a mid-sized department, we lead the 38 departments in the College of Arts and Sciences in the percentage of annual individual contributions. We are grateful to our alumni for this incredibly strong support, but, at the same time, we hope that we can count on moving to an even higher level. This will be essential if we are to meet the \$5 million goal.

Our vision for the next decade is defined: *We will be at the forefront in meeting selected needs of our university, our state, and our professional community, and what we do we will do better than anyone else.*

Through an intense process of self-examination over the last six months, the faculty, with help from the advisory board has articulated its objectives, its strengths and its priorities. A committee of world-class scholars will be visiting us later this academic year to assist us in honing our strategic plan. The endowment campaign will provide critical resources needed to implement the plan and give us a competitive edge. All of this permits us to look to the future of the department with excitement, enthusiasm, and exhilaration. I hope you share these special feelings.

— *Lee Suttner*

Departmental news

The undergraduate program continues to experience a steady, if modest enrollment. During 1995, the department awarded 10 BS and seven BA degrees. We currently have 40 undergraduate majors. The total number of hours taught in elementary geology courses (100-level) has shown a large increase, mostly due to the recent introduction of several new 100-level courses for nonmajors.

Among the new courses is G116 Earth and Environmental Systems, designed and taught by **Jeremy Dunning** and **Gary Pavlis**. This represents the department's initial foray into the world of high tech computer-oriented instruction. The course is centered around Jeremy's new interactive CD-ROM textbook and is taught entirely with computer technology. Two new 100-level courses are in the College Topics Curriculum and include E105/G121 Meteorites and Planets, taught by **Abhijit Basu**, and E105/G141 Earthquakes and Volcanoes, taught by **Michael Hamburger** and **Jim Brophy**. Other 100-level topics courses include G131 Oceanography, taught by **Simon Brassell**, and G171 Environmental Geology, taught by **Larry Onesti**. A new course being designed by **Greg Olyphant** is G351 Elements of Hydrology, intended to serve both our own majors as well as those students in the new environmental science degree program.

Graduate enrollment is 66, with 32 PhD students and 32 MS students. We have 17 research assistants, seven graduate fellows, and 20 associate instructors.

The **Geology Library** Web home page provides direct connections to several professional societies and governmental agencies. In addition, this home page also links to IUCAT, the interlibrary loan office, and provides listings of current acquisitions, as well as our theses file. The library's CD-ROM LAN continues to provide access from any IUB library to the major indexing services needed (such

as GeoRef, Science Citation Index, Selected Water Resources Abstracts). We are expecting to obtain the equipment upgrade that will allow IU students and faculty members to access GeoRef from their offices.

We are pleased to announce that **Claudia Johnson** who, as reported in this newsletter last year, was a visiting assistant professor in geobiology and paleontology during 1995-96, has now been appointed as a full-time, tenure track faculty member. We are equally excited that her husband, **Erle Kauffman**, also has joined our faculty. Erle comes to us from the University of Colorado at Boulder, where he was professor of geology, having served as chair of its Department of Geological Sciences from 1980 to 1984. He received the PhD degree from the University of Michigan in 1961 and joined the Smithsonian Institution, Department of Paleobiology, where he served until 1980, conducting extensive research in paleobiology and marine biology. In addition to holding the position of curator at the Smithsonian, Erle was adjunct professor from 1966 to 1980 at George Washington University. After moving to the University of Colorado as department chair in 1980, he was elected president of the Paleontological Society (1982) and later vice president of the International Paleontological Association. In addition, he has served on the National Research Council. Erle has published more than 225 professional papers and abstracts on subjects such as evolutionary theory; methods and concepts of biostratigraphy and high-resolution chronostratigraphy; research methodology and evolution in ecological/paleoecological units; physical stratigraphy and environmental interpretation; sequence stratigraphy; sedimentation and basin analysis; functional morphology and molluscan ecology; global sea level history; origin and early fossil records of Metazoa; geologic expression of climate

Kauffman recovering

In late September, Erle Kauffman suffered a mild heart attack. While in the early stages of recovery, he subsequently suffered a stroke. After periods in intensive and critical care, he has made substantial progress and is now facing a period of rehabilitation and therapy. All of us here in Bloomington, as well as his friends and colleagues from across the United States and around the world, wish him a successful recovery.

cycles; and mass extinction survival and recovery theory. Kauffman received the honorary doctorate from the Universität Göttingen, Germany, in 1987 and the Raymond C. Moore Medal in 1990 from the Society for Sedimentary Geology for his contributions to paleontology. He is extremely active in lecturing and writing about the modern biodiversity crisis and global change.

Two emeriti professors were recently honored by the university. The School of Continuing Studies honored Professor Emeritus **N. Gary Lane** in October 1995 with a Teaching Excellence Award in recognition of more than 10 years of geological field trips for the Bloomington Division of the School. Coordinator for the noncredit program **Jean Cook** noted that his field trips "are probably among the most popular programs the division has done because Lane shows what can be done to make science enjoyable for the adult learner." Gary has also taught for the Mini University, a week-long summer program sponsored by the Bloomington division and the IU Alumni Association. Professor Emeritus **Donald Hattin** was awarded a Distinguished Teaching Award by the University Graduate School. **George E. Walker**, vice president for research and dean of the University Graduate School presented the award to Don at a special dinner sponsored by the department and held on Feb. 2, 1996, at the University Club of the Indiana Memorial Union.

The most recent recipient of the department's **Richard Owen Award** is **Michael C. Mound**, MA'61, PhD'63, who received this distinction on Aug. 31,

Come visit our World Wide Web pages

Department of Geological Sciences: <http://www.geology.indiana.edu>
Geologic Field Station: http://www.geology.indiana.edu/field_station.html
Laboratories: <http://www.geology.indiana.edu/labs.html>
Geology Library: <http://www.indiana.edu/~libgeol/index.html>
Mailboxes and home pages: <http://www.geology.indiana.edu/folks.html>
Indiana Geological Survey: <http://www.indiana.edu/~igs/>

Geological Sciences at the Forefront: Department sets its strategic plan for future

Highlights of the Department of Geological Sciences' strategic plan, titled Geological Sciences at the Forefront, include a commitment to concentrate resources along five programmatic pathways to the forefront:

- *chemical, physical, and biological stratigraphy as a means of understanding the evolution of depositional basins*
- *physics, structure, and dynamics of the continental lithosphere,*
- *environmental geoscience,*
- *strategic and applied mineralogy,* and
- *teaching of geosciences in field settings.*

Collaborative research linkages designed to cut across traditional disciplinary boundaries will be promoted with other academic units, industry, and state and federal government agencies.

Major fundamental changes in both the undergraduate and graduate educational programs are planned. Separate

tracks in geophysics and applied environmental geoscience will be introduced into the baccalaureate degrees. The new BS degree in environmental science, a multidisciplinary degree jointly offered by the College of Arts and Sciences and the School of Public and Environmental Affairs, will draw heavily from our undergraduate curriculum.

In response to the increasingly interdisciplinary nature of our field, we are committed to reforming our approach to graduate education. We envision a graduate program with a multi-tiered design, reflecting progressive specialization and sophistication of problem-solving skills.

Tier I courses will be interdisciplinary and stress the link between diverse fields in the earth sciences. Critical issues will be addressed. One course will consider tectonics and the deep Earth. The second will cover sediment, ocean, and atmo-

sphere. In addition, there will be a laboratory-based quantitative skills course for all new graduate students.

Tier II courses will fall under five disciplinary groups in the department, namely, Solid-Earth Dynamics, Geobiological Concepts, Geochemical Processes, Environmental Geoscience, and Sedimentary Systems. Each of these five core tracks will offer three or four discipline-specific courses that will target topics or skills necessary for that particular professional discipline. Courses and seminars with specialized content will be restricted to Tier III. The ultimate intent of this approach is to foster and enhance interdisciplinary research and training among the various research groups, and to identify emerging areas of research and application. *Copies of the second draft of the department's strategic plan are available on request from the chair.*

1995. His Owen Award address to the Geology Colloquium on that date was titled "Minerals Exploitation and the Economics of Minerals Processing." Mound is director of marketing of automated process control and laboratory systems for cement and mineral process industries for FLS Automation, Copenhagen, Denmark. His range of experience extends beyond his work with industrial minerals; he has taught at three

universities and one college. He has held a variety of positions (including president and CEO) for companies in the minerals, mining, and cement technology industry and has worked for two oil companies. He currently serves on the department's advisory board.

An IU contingent of geobiologists participated in the annual Tri-Cities research meeting, along with the University of Cincinnati and Ohio State, at the

Cincinnati Natural History Museum. Several of our graduate students reported on their research and attended a field trip in the Cincinnati area.

Colin Harvey reports that the industrial minerals laboratory has a new particle size analyzer obtained through funds made available through the Grassman Trust. A state-of-the-art 6 Tesla capacity magnetic separator was purchased through the Grassman Trust and funds from an Electric Power Research Institute grant to study the removal of pyrite and clay (ash) from coal fines.

As noted in *Geotimes*, September 1996 (*Newsnotes*, p. 11-12), IU geophysicists have actively participated in the Princeton Earth Physics Program (PEPP). This project, funded by the National Science Foundation and IRIS (a consortium of universities dedicated to seismological research), links two objectives: to provide earth-science and physics high school students with hands-on training in seismology and to create a nationwide network of seismograph stations capable of providing useful data to researchers. Some 150 high schools across the country are participating and each PEPP workshop selects 20 high school science teachers from around the state. Indiana was the only state this year to host two PEPP workshops. These took place at IU and Purdue in June 1996. Although indepen-

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Science teacher Linda Stout (Berne, Ind.) puts together a liquefaction demo while teacher John Pokorney (Royal Center, Ind.) begins constructing his sheer wall model during the PEPP workshop held at IU in June 1996.

Departmental news

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dently operated, the workshops provided some materials and ideas that were shared between the two universities. At the IU workshop, geophysicists **Michael Hamburger** and **Gary Pavlis** and science education Professor **William Boone** employed a hands-on learning device developed by Purdue Professor **Larry Braile**. The participants also established a home page on the World Wide Web, which will be used for sharing information generated in the project. The address is <http://www.indiana.edu/~pepp/>. As reported by *Geotimes*, the IU workshop encouraged "shared teacher applicants" from the same high school. Hamburger noted that "one of the most exciting possibilities is creating links between physics classes and earth-science classes in high schools. Often earth-science students don't get much exposure to quantitative data analysis, and physics students don't get to apply their physics knowledge to real-world problems. This program helps address both needs." In addition to the seismometers that individual schools receive from PEPP, the teachers built less technical laboratory equipment to take back to their classrooms including a demonstration seismometer, electronics for data recording, and equipment that demonstrates how buildings shake during earthquakes. Hamburger noted that many of the universities plan follow-up activities to the workshops. "We want to encourage high-school teachers and students to get involved with real research," he says, "to use the data they collect. Early on, we want these students to start thinking like real researchers." The IU PEPP workshop was also supported in part by the Indiana Geological Survey, the IU Science Liaison Office, and IU Computing Services.



Biogeochemistry Laboratories faculty, staff, and students celebrate publication of a letter in Nature, v. 376, 6 July 1995: "Terminal Proterozoic reorganization of biogeochemical cycles." From left, front: John Hayes, Julie Primack, Ana Carmo, Cara Davis, Steve Studley; from left, back: Andrew McTaggart, Margaret Ricci, Kristen Leckrone, Lisa Pratt, Simon Brassell, Ruth Droppo, Susumu Sakata, Jon Fong, Mary Peckham, Volker Bruchert.

IU geophysicists continue their work on a major research project in the Tien Shan mountains of central Asia, including a major collaborative project with MIT, UC San Diego, and several other U.S., Russian, and central Asian research institutes. The project involves the use of global positioning survey (GPS) methods to study crustal deformation in the Tien Shan, geological and seismological studies of a major earthquake that struck the Tien Shan in 1992, and work with a broad band digital seismic network in the region. A new project on crustal deformation in the Philippines includes the Philippine Institute of Volcanology and Seismology and **Emmanuel Ramos**, PhD'95. With graduate student **Michiru Tomida**, a field experiment in the Philippines was conducted using GPS methods to study deformation associated with two active volcanoes, Pinatubo and Taal, as well as two major fault zones in Luzon.

Another major project that the geophysics group has undertaken involves a seismic monitoring project in the Wabash Valley of southern Indiana and Illinois. This project, supported by the USGS National Earthquake Hazards Reduction Program, has involved three IU faculty (**Michael Hamburger**, **Gary Pavlis**, and **Al Rudman**), a former postdoc (**Haydar**

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Help Make a Difference

Hoosiers for Higher Education (H.H.E.) is a state-wide organization of Indiana citizens wanting to raise public awareness about the importance of higher education for Indiana's future. We need your nonmonetary support. Please call (800) 824-3044 for more information.

Hoosier Geologic Record

This newsletter is published annually by the Indiana University Alumni Association, in cooperation with the Department of Geological Sciences and the College of Arts and Science Alumni Association, to encourage alumni interest in and support for Indiana University. For membership or activities information, call (800) 824-3044 or e-mail ialumni@indiana.edu.

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THE
COLLEGE

Look who's talking: 1995-96 Colloquium Series

- Aug. 28, **Michael Savarese**, Indiana University: "Practical and Philosophical Approaches to Functional Morphology: Good Science or Elaborate Story Telling?"
- Aug. 31, **Michael Mound**, FLS Automation, Denmark: "Minerals Exploitation and the Economics of Minerals Processing" (Owen Award Address)
- Sept. 11, **Craig Hatfield**, University of Toledo: "U.S. and Global Long-Term Fuel supply Problems"
- Sept. 18, **Alan Horowitz**, Indiana University: "100 Years of Bryozoan Studies in the Department of Geological Sciences" (Owen Award Address)
- Sept. 25, **Alan Kehew**, Western Michigan University: "Water Quality and Isotopic Indicators of Groundwater-Wetland Interaction"
- Oct. 2, **Robert Hall**, IUPUI, Indianapolis: "Geomorphology and Soils of the Wind River Basin, Wyoming"
- Oct. 9, **Claudia Johnson**, Indiana University: "Testing Biogeographic, Paleooceanographic, and Plate Tectonic Models with Cretaceous Caribbean Biota"
- Oct. 16, **Robert Reilinger**, Massachusetts Institute of Technology: "Space Geodetic Evidence for Plate Motion and Intraplate Deformation in the Eastern Mediterranean Region"
- Oct. 23, **Susan Kidwell**, University of Chicago: "Phanerozoic Trends in Bioclastic Facies: Biological versus Geological Explanations"
- Oct. 30, **Joe Meert**, Indiana State University: "Assembling Gondwana: An African Perspective"
- Nov. 13, **Lloyd Furer**, Indiana Geological Survey: "Basement Tectonics in the Illinois Basin and Its Effect on Paleozoic Sedimentation"
- Nov. 20, **R.V. Krishnamurthy**, Western Michigan University: "Isotopic Investigation of Direct Atmospheric Precipitation"
- Nov. 27, **Nelson Shaffer**, Indiana Geological Survey: "Biological Inclusions in Minerals"
- Dec. 4, **Jeremy Dunning**, Indiana University: "Teaching with Technology"
- Dec. 11, **Kathleen Campbell**, NASA: "Dynamic Development of Ancient Cold-Seeps, Convergent Margin of Western North America"
- Jan. 11, **J. Daniel Bryant**, Princeton University: "Biological and Climatological Signals in the Chemistry of Tooth Enamel"
- Jan. 15, **Michal Kowalewski**, University of Arizona: "Quantifying the Quality of the Fossil Record: Taphonomic Megabias in the Lingulide Brachiopods"
- Jan. 22, **Claudia Johnson**, Indiana University: "Middle Cretaceous Reef Collapse Linked to Ocean Heat Transport"
- Feb. 5, **James Brophy**, Indiana University: "Mineral Zonation Studies as a Key to Deciphering Magmatic Differentiation Processes: An Example from Medicine Lake Volcano, California"
- Feb. 12, **Christopher Chalokwu**, Auburn University: "Magma Dynamics in a Lower Mush Zone of the Partridge River Intrusion, Duluth Complex, Minnesota"
- Feb. 20, **Timothy Fisher**, Indiana University Northwest: "The New Northwest Outlet of Glacial Lake Agassiz: The Associated Catastrophic Flood and Possible Climatic Influences in the Arctic Basin"
- Mar. 4, **James Ellis**, Chevron Oil Co.: "Geological and Environmental Remote Sensing for International Petroleum Operations"
- Mar. 6, **Odin Christensen**, Newmont Gold Co.: "Sedimentary Rock-Hosted Gold Deposits of the Carlin Trend, Nevada" (Thayer Lindsley Lecture)
- Mar. 19, **Wayne Wendland**, Illinois Water Survey: "What is Normal Weather/Climate?"
- Mar. 25, **Michael Zaleha**, Indiana University: "Intra- and Extra-Basinal Processes Affecting Fluvial Deposition Within the Miocene Indo-Gangetic Foreland, Northern Pakistan"
- April 1, **Gabriel Filippelli**, IUPUI, Indianapolis: "Global Nutrient Cycling: A Glacial- Interglacial Perspective"
- April 8, **Erle Kauffman**, University of Colorado: "Global Biodiversity Crisis Through Time: Predictions for the Future"
- April 15, **D. Kirk Nordstrom**, U.S. Geological Survey: "Negative pH Ultra Acidic Mine Water and the Challenge of Environmental Restoration at the Iron Mountain Mines Superfund Anomaly" (Birdsall Lecture)
- April 22, **John McBride**, U.S. Geological Survey: "The Origin of Dipping Reflector Structures in the Crust and Upper Mantle Beneath the Scottish Caledonides"
- May 16, **Peter Vail**, Rice University: "Success and Future Direction for Sequence Stratigraphy" ■

Departmental news

(continued from page 4)

Al-Shukri, now at Southeast Missouri State University), several graduate students (including **Glenn Bear** and **Brian Pope**), and a technician (**Terri Stigall**). This has been a big field effort in our own backyard.

Four new computers have been added to the geophysics laboratories, three Sun and one Silicon Graphics workstations. Through a grant from the NSF Academic

Research Infrastructure Program, five state-of-the-art Trimble GPS receivers have been acquired. These instruments permit millimeter precision measurements to be made over distances of hundreds of kilometers and will be used for geodynamic projects in central Asia, the Philippines, and the central U.S. The instruments also include a remarkable new system called RTK (real-time kinematic) GPS, which provides centimeter precision surveying in real time.

Randie Mackie is also adding new

geophysical equipment including ground-penetrating radar (GPR). Delivery will be taken of a Sensors and Software Ground Penetrating Radar system called Pulse Ekko IV. This will include three different antennas, a 50 MHz, 100 MHz, and 200 MHz. The system is used for shallow geophysical exploration and has been used in a wide variety of environmental applications. Typical exploration depths are on the order of several meters to perhaps 10s of meters under optimal conditions. ■

Other seminars, brownbag talks, special presentations

• Sept. 8, **Jean Virieux**, University of Nice, France: "Application of Empirical Green's Function to Moderate-Sized Earthquakes: Illustration for an Event in the Patras Area (Greece) and for an Event in the Cote d'Azur (France)"

• Sept. 22, **Lou Derry**, Cornell University: "Geochemical Record of Himalayan Erosion in the Bengal Fan"

• Sept. 22, **Erle Kauffman**, University of Colorado: "Are There Oceanic Anoxic Events?"

• Sept. 27, **John Hayes**, Indiana University: "¹³C in Lipids from Marine Particulates"

• Sept. 28, **Carl Rexroad**, Indiana Geological Survey: "Out in the Outback: An Australian Experience"

• Oct. 4, **Michael Hamburger**, Indiana University: "What's Moving in the Tien Shan?"

• Oct. 13, **Erle Kauffman**, University of Colorado: "Tepee Buttes, Cretaceous Submarine Springs, and the Evolution of Submarine Spring Biota"

• Oct. 17, **Robert Reilinger**, Massachusetts Institute of Technology: "GPS Constraints on Fault Slip Rates in Southern California and Northern Baja, Mexico"

• Oct. 18, **Dick Gibson**, Gibson Consulting: "Subsurface Geology of the Pantex Nuclear Weapons Plant, Texas: An Integrated Approach to Characterizing a Contaminated Perched Aquifer"

• Oct. 24, **Susan Kidwell**, University of Chicago: "Some Good News on Death Assemblages"

• Oct. 24, **Terry Carius**, Exxon: "An Overview of Exxon"

• Oct. 24, **Glenn Hieshima**, Exxon: "Geologic Presentation"

• Oct. 25, **Barbara Rassman**, Exxon: "Plate Tectonics Controls on Play Element Distribution in the North Caspian Basin, Kazakhstan"

• Oct. 31, **Matthew Mikulich**, Chevron Corp.: "The Use of 3D Seismic Data to Determine Proved Reserves"

• Nov. 15, **Arndt Schimmelmann**, Indiana University: "As the Wind Blows: Responses to Climatically Sensitive Sedimentary Records"

• Nov. 28, **Mitsuhiro Toriumi**, University of Tokyo: "Geospeedometry of Mantle Plumes"

• Nov. 29, **Haydn Murray**, Indiana University: "Amazonian Kaolins and Bauxites"

• Dec. 12, **Kathleen Campbell**, NASA: "Evolution of a Paleocological Model: Brachiopods and Bivalves in Ancient Vent-Seep Environments"

• Jan. 12, **J. Daniel Bryant**, Princeton University: "Testing Tectonic Uplift Scenarios and Paleocological Models with Fossil Tooth Enamel Chemistry"

• Jan. 16, **Michal Kowalewski**, University of Arizona: "Trace Fossils and Paleocology: Case Studies in Quantitative Ichnology"

• Jan. 18, **Roger Turpening**, Massachusetts Institute of Technology: "Cross Well Study Inside a Hanford Tank"

• Jan. 23, **Claudia Johnson**, Indiana University: "The Rise and Fall of Cretaceous Reef Ecosystems"

• Jan. 25, **Don Eggert**, Indiana Geological Survey: "Newcastle, New South Wales, Australia, December 28, 1989, ML 5.6 Earthquake, A Lesson for the Midwest"

• Jan. 31, **Enrique Merino**, Indiana University: "Rupture, Creep, or Replacement, All Produced by Crystal Growth in Rocks"

• Feb. 7, **N. Gary Lane**, Indiana University: "Cultural Artifacts in the Charles Deam Wilderness"

• Feb. 21, **Michael Zaleha**, Indiana University: "Local and Regional Controls on the Formation of Siwalik Paleosols (Miocene), Northern Pakistan"

• Feb. 28, **Eugenio Santos**, Indiana University: "Use of the Hydrogen and Carbon Stable Isotopes in the Characterization of Oils from the Potiguar Basin, Brazil"

• Mar. 6, **Michael Mound**, FLS Automation, Denmark: "South American Gold Deposits"

• Mar. 6, **Odin Christensen**, Newmont Gold Co.: "Gold Exploration"

• Mar. 20, **Susumu Sakata**, Indiana University: "Carbon Isotopic Fractionation Associated with Lipid Biosynthesis by a Cyanobacterium"

• Mar. 26, **Olaf Podlaha**, Indiana University: "High-Resolution Isotope Stratigraphy of the Middle Devonian and Jurassic/Lower Cretaceous: Theory, Application, and Limitations"

• Apr. 8, **Mary Droser**, University of California, Riverside: "Metazoan Radiations in the Ichnological Record"

• Apr. 16, **Carole Rock**, Chevron USA Production Co.: "Earth Scientists Plus Technology Equals Dollars, or the Role of Earth Scientists and Technology in the Generation of Wells"

• Apr. 17, **Nathan Way**, Indiana University: "A Simple Recipe for Complex Stratigraphy: 1) Add sediment to basin. 2) Gently *fold-in* local deformation. Serve (or preserve) rivers, lakes, and hills of the Early Cretaceous Lakota Formation."

• Apr. 23, **Olaf Podlaha**, Indiana University: "Modelling the Neoproterozoic/ Phanerozoic Sr Isotope Record of Seawater: Characterization of the Isotope System"

• Apr. 24, **Matt Warner**, Indiana University: "Organic Geochemistry of the Black Shale- Hosted Zinc-Lead Deposit at Red Dog Mine, Northwest Alaska"

• Apr. 30, **Kristen Hagstrom**, Indiana University: "Effects of Compaction and Wear- Induced Forces on the Preservation and Macroevolutionary Perception of Naticid Predator-Prey Interactions"

• May 8, **Donna Surge**, Indiana University: "Geochemical and Petrologic Evidence for Minimal Diagenesis in Lower Cambrian Carbonates, South Australia: Implications for Depth-Related Variations in Primary Production"

• May 9, **Pat Munson** and **Cheryl Munson**, Indiana University: "Aboriginal Mining Activities in Caves in the Eastern U.S."

• July 19, **Jack Rynn**, Brisbane, Australia: "The 1989 Newcastle, N.S.W., Earthquake and Post-Disaster Seismic Zonation: Lessons Learned from One's Own Earthquake That Might Help the Central United States" ■



Geologic Field Station update

The past year has seen several important changes at the Geologic Field Station. First and foremost is a change in the administrative structure. After 15 years as the field station director, **Lee Suttner** has decided to step down and pass the duties to **Jim Brophy**. Fortunately for the field station, Lee still plans on being involved in many of its programs.

As part of the administrative restructuring, **Bruce Douglas** will take on the duties of associate director of environmental field programs. This new position is crucial to the successful development of several new environmentally-oriented field programs. Bruce has been intimately involved in the environmental initiatives from their inception and is therefore the ideal person for the job. Bruce will continue as a full teaching faculty member in Option II, but is also looking forward to the challenges that the associate directorship will pose.

Dave Towell will continue in his capacity as associate director of geologic field programs.

Grant Estey, who joined the field station as resident manager in 1995, was part owner of a general contracting and construction company that specialized in the construction of log homes. Given this background, Grant brings to the field station an incredible range of both practical and administrative skills. Grant's wife, Lisa Estey, is as big a catch as Grant, for she tirelessly devotes her time and energy to keeping things running smoothly at the station. The field station community is fortunate to have the Esteys join us, and we all look forward to a long and successful relationship.

On the academic side of things, the big news is the continued success of the new environmental option G429. Two summers ago, 13 students were selected from Option II to participate in the pilot program. This past summer, the enrollment increased to 26 students. We fully anticipate that these numbers will continue to grow in the years to come. The ultimate goal is to have Option II become the "environmental" option, G429e, while Option I remains the "geologic" option, G429. We hope to meet this goal by summer 1998.

Yet another field station course is in the planning stages. Titled G329 Introductory Field Experience in Environmental Science, the course will integrate



Some participants in the Geology Alumni College stayed overnight at Sailor Lake. While elk steaks, onions, and mushrooms roast over the campfire Woody Woodson, from left, Andrew Estey (Grant's son), Ron and Carol Edge, Gary Lane, and Elsa Harik enjoy a cool August evening at 8,400 feet above sea level.

basic aspects of ecology, environmental chemistry, geology, hydrology, and meteorology. **Greg Olyphant** will be responsible for much of the course development. G329 will be required of all students enrolled in IU's new interdisciplinary bachelor of science degree in environmental sciences. Consequently, we are looking forward to the positive impact this will have on our overall enrollment picture.

After three consecutive years of increasing numbers, the field station has witnessed a two-year enrollment decline. In 1994, Options I and II of G429 had a combined enrollment of 128. In 1995, the combined enrollment dropped to 108. This past year, it dropped to 91. Obviously, the decreased enrollments are troubling, and we hope that it does not signal another enrollment slide like that experienced in the late 1980s. The silver lining to all of this is the burgeoning interest in the Option II environmental program. We are confident that this program will help us turn the corner and start seeing an enrollment increase once again.

The Alumni College at the field station met in late August for the sixth year. This is a week-long outdoor experience for friends and alumni of IU. Most of the participants do not have a science or geological background. Ages have ranged from 18 to 78. This year there were 15 participants. Several folks spent an overnight at Sailor Lake with **Gary Lane** and **Grant Estey**, rather than at Lost Cabin

Lake, where we have gone in previous years. Others spent an overnight in Yellowstone with **Tom Straw**. The weather was terrific, and we had a new cook, who prepared outstanding meals. If any recipients of the newsletter are interested in attending next year, please contact **Kim Schulte** in the department.

There are several ongoing or planned renovations to the field station physical plant. During all of this, we intend to use Grant Estey's construction skills to the utmost! In the short term, one half of the rock preparation and storage building on the lower campus will be converted into a modern computing facility to accommodate the computing needs of the two new environmental courses, G429e and G329. In addition, the interiors of the two large dormitories for men have been partitioned into smaller, more private rooms. Finally, all of the student dormitories have been insulated and heated with electric base-board heating (yes, the times they are a-changing). In the long term, we have plans to convert the field station into a four-season facility and make it available to outside groups for use during our off-season. The additional revenue that this will bring to the station will be used for several purposes, including further upgrades to the physical plant, the purchase of necessary equipment for the new environmental courses, and reduction of the large financial subsidy that the field station receives from the College of Arts and Sciences. ■

Indiana Geological Survey update

The full-time staff of the IGS has organized itself into a communication assembly that allows each member an opportunity to contribute to important decisions made at the IGS. Assembly officers are **Walt Hasenmueller**, chair, **Jay Arnold**, vice chair, and **Kerry McGarry**, secretary. Several committees have been formed to study and make recommendations on such important issues as strategic directions for the IGS and procedures for reviewing job performance.

The IGS World Wide Web site is getting better all the time. Point your web browser to <http://www.indiana.edu/~igs/> to see for yourself. Future plans for the site include interactive instruction for K-12 and for professionals; publication ordering capability, including credit card payment; and access to information contained in IGS databases.

Work continues on many projects throughout the state that contribute to the resolution of problems encountered by Hoosiers as they interact with the geologic environment.

Several of the survey's projects are concerned with protection of ground water resources, including one that has produced maps to be used by the Office of the State Chemist to assess relative sensitivity of groundwater to contamination by agricultural chemicals, and another that has produced computer maps of groundwater resources in Marion County to be used by government officials in planning for future development. Other continuing related efforts include assessment of the level of risk from seismic activity in several regions of the state and evaluation of techniques used to restore land that has been mined for coal.

Among the many projects being conducted in the area of energy and mineral resources is one in which the IGS, with support from the Indiana Department of Commerce and Solar Sources Inc., has located deposits of clean-burning, low-sulfur coal in southwestern Indiana. Another project has resulted in construction of a large data base on the mineral resources of Putnam County that was used with other computer programs to create maps and graphs that may be used with geographic information system software to show the resources in relation to other areas or objects of interest.

The IGS recently developed a full-color corebook illustrating and describing common rock types from the Pennsylvanian of the Illinois Basin. This project, which is the largest and probably most complex publication project ever undertaken by the survey, involved many people, especially in the Technology Transfer and Photography sections of the IGS. The authors of the corebook are **Mark Barnhill**, now with Eastern American Energy Corp., and former IU geol-



ogy student **Huitang Zhou**, now with ITC Inc. The authors' version of the corebook was extensively revised with the incorporation of a unique four-digit coding system that can be used to describe most sedimentary rocks regardless of age or locality. The revision was done under the guidance of corebook editors **Brian Keith** and **Todd Thompson**, with input from **Maria Mastalerz**, **Erik Kvale**, **Clayton Millard**, and **Norm Hester**. The corebook was published in fall 1996. The survey has received funding from the Indiana Coal Council to match an award from the Industrial Research Liaison Program at Indiana University to develop a curriculum and offer a series of workshops to the coal industry on the hands-on application of the corebook to the description of coal-bearing rock sequences.

Maria Mastalerz expanded her involvement in cooperative efforts with the mining industry and utilities in Indiana as she continued her research on coal and kerogen. She presented a paper at the

V.M. Goldschmidt Conference, an International Conference for the Advancement of Geochemistry at Penn State University in May 1995. In late August, she attended the Carboniferous-Permian Congress in Krakow, Poland, presenting two papers. Her trip to Poland also presented an opportunity to visit her parents, family, and friends, whom she had not seen for at least three years. The year 1995 ended with Maria's participation in the International Chemical Congress of Pacific Basin Societies in Honolulu, Hawaii, where she delivered two papers. Maria has also been invited to join the editorial board of the *International Journal of Coal Geology* for a term of three years.

Carl Rexroad attended some exciting meetings in Australia during summer 1995 and visited with **Bob Nicoll**, who received his bachelor's and master's (1967) degrees at IU. Bob led a pre-meeting Pander Society field trip in Western Australia, which went into the outback from Derby. In spite of the spinifex (sharp pointed grass) and getting well stuck while bush-bashing (four-wheeling cross country), they saw a lot of good geology. Next came the well-attended meetings at McQuarie University in Sydney, which in turn were followed by a camping trip in the outback of eastern Australia. Again they enjoyed good geology and good campsites, plus kangaroos and wallabies, which they missed to the west. The final field trip was spending four days at the research station on Heron Island on the Great Barrier Reef. Most amazing to Carl were the number and variety of sea cucumbers (holothurians to the uninitiated) to be found among the corals. Carl enjoyed the final week with a visit with Bob Nicoll at his home in Canberra City and tours of the Australian capital.

Rea and **Bill Kersey** became the parents of their first child, William Ross, on March 8, 1996. According to Rea, Will is "the most adorable kid in the world."

Jay Arnold and his wife also became parents on April 6, 1996, with the birth of their son, Justin. Jay also won the primary election for the Owen County Council. **Kari Lancaster** has created an impressively detailed original drawing of an alligator and is now selling signed and numbered 44"x15" prints from a limited edition. ■

Faculty news

Allen F. Agnew, emeritus faculty (1963–69), and his wife, **Francis**, are now living in Corvallis, Ore. Allen, the first director of the IU Water Resources Research Center, left Bloomington in 1969 and spent the next four years at Washington State University and the University of Washington working in the water resources policy area. Following this, he spent the rest of his full-time professional career (1974–81) doing policy analysis for the U.S. Congress as senior specialist in environmental policy with the Congressional Research Service, where his responsibilities included not only groundwater, but also geologic hazards related to mineral resources and mining.

Abhijit Basu is continuing with his lunar regolith research as always. He is worried that NASA grants will soon be as dry as the moon, so he has taken up a new pilot project on the distribution of toxic metals in the Venice (Italy) Lagoon. He says, "Venice is a fine place that Basu cannot afford and sampling the organic muck all day long makes him stink until the next shower." He is enjoying the opportunity to teach G111–G112 in the

mountains of Montana and is "excited to have students with IQs far above his." He will teach in the Honors Division for a three-year stint. He also notes, "Basu must be getting old and not able to inspire graduate student symposia for Thursday night libations."

On the side, Basu continues to be an associate editor for *JSR* and has become the science editor for GSA books (memoirs and special papers). He continues as a foreign correspondent for the Indian Society of Earth Sciences and the Indian Association of Sedimentologists. Finally, Basu may participate in setting up a "PhD school in planetary geology" in Italy, which will be funded by the European Union.

Bob Dodd was on sabbatical leave in New Zealand during the 1996 fall semester. He received a grant from the IU Office of Research and the University Graduate School to support his research there, which involves comparison of tropical Paleozoic limestones (such as those found in southern Indiana) with cool water Cenozoic limestones (such as those found in New Zealand). Cenozoic and modern cool water limestones are much

more like tropical Paleozoic limestone than are Cenozoic and modern tropical limestones, which are normally used for comparison.

Bob's student, **Audrey Aronowsky** is doing an MS thesis involving a study of the factors controlling thickness of the shells of several species of mollusks. Preliminary evidence suggests that temperature is a major factor. If this turns out to be so, ancient temperatures can be estimated from shell thickness. She collected modern pelecypods and gastropods along the Pacific coast this summer. Isn't it nice to be doing a thesis in which you do your field work by beach combing!

Bob reports that he saw several former geobiology students at San Diego at the AAPG meetings. **Patty Merkley**, MS'91, is still with Exxon in Midland, Texas, where she is being given increasing responsibility for projects in the Midland Basin. **Neal Immega**, MA'72, PhD'76, and **Inda Immega**, MA'73, PhD'76, remain with Shell Oil in Houston. **John Holbrook**, PhD, now a faculty member at Southeast Missouri State University, presented a poster paper. Bob also saw **Mike Hahn**, MA'75, PhD'76, at the AAPG meetings.

Jeremy Dunning is currently working on two CD-ROM projects on environmental geology that will be successors to his interactive text, *In Terra Active*. The extended studies course he designed around *In Terra Active* won the 1996 National University Continuing Education Association's Distinguished Course Award (i.e., its "national course of the year"). He also has been named the first director of the IU Research Park, a key operation in the new IU Advanced Research and Technology Institute (ARTI). On a personal note, Jeremy, a collegiate place-kicker at Colgate, is donating some of his spare time to serve as an assistant football coach at Bloomington North High School, where he works on their kicking game.

Michael Hamburger has reported on the busy activity and changes in the geophysics program. Graduate student research includes the work of **Sujoy Ghose**, a doctoral student, who is working on seismotectonics of the Kyrgyz Tien Shan. Sujoy has a paper in press on the 1992 Suusamy earthquake and is currently working on a seismic tomography study of the Tien Shan in collaboration with

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When faculty imitate students...

Throughout this section, you'll find photos from 1979, when the geology faculty turned the tables by costuming themselves as their students. After all, imitation is the sincerest form of flattery!



Don Hattin, left, and Enrique Merino

Faculty news

(continued from page 9)

French seismologist Jean Virieux. **Alex Krueger** is completing a masters project on analysis of earthquake focal mechanisms in the Garm (Tadjikistan) region and will be starting work in the Energy Resources Section of the Indiana Geological Survey. **Michiru Tomida** is beginning work on a seismotectonic study of the Philippine island arc, and he spent a month working in a field GPS study in the Philippines this past spring. **Emmanuel Ramos**, PhD'95, is serving as deputy director of the Philippine Institute of Volcanology and Seismology. He has a lot of the day-to-day responsibilities for running the operations of a major, 180-person institute that is responsible for monitoring earthquakes, volcanoes, and other geological hazards throughout the Philippines. **Rob Mellors**, PhD'95, is a postdoc at the Institute for Geophysics and Planetary Physics at the University of California, San Diego. He's continuing to work on Central Asia research projects, and has developed a major new field program in Saudi Arabia.

Colin Harvey reports that current research activities with graduate students include work on Chinese palygorskite clays with **Huitang Zhou**; investigations of crystalline silica with **Jean Hemzacek Laukant**; X-ray diffraction and high gradient magnetic separator studies of beryllium ores from Utah with **Tim Johnson**; and differentiation of floodplain deposits from terrace materials along the Ohio River with **Elizabeth Russell**. Colin has supervised comparative studies of electrophoresis and rheological measurements on fault gouge materials and silica in cooperation with **Jeremy Dunning** and graduate student **Richard Stotts**. Colin hosted a visiting scientist from Thailand, **Pitak Wittunochai**, during spring 1996.

Tang Dahzen, a postdoctoral fellow from China, is joining Harvey for a study (funded by the Electric Power Research Institute, EPRI) of the removal of pyrite and clay (ash) from coal fines. **Noel Krothe**, funded by a consortium of the Tennessee Valley Authority (TVA), Southern Indiana Gas and Electric Company (SIGECO), the state of Indiana, and EPRI, will investigate the feasibility of re-mining coal slurry ponds in southern Indiana for power generation. Two graduate research assistants, **Nelson Daniel** and **Burpee Franz**, are supported on this grant. Colin has been working with **Arndt Schimmelmenn** on the use of clay min-

eral compositions in varved sediments as indicators of paleoclimate and flood events in the Santa Barbara Basin. This study, plus a beryllium study with **Ed Ripley**, formed the basis for an NSF grant proposal in June 1996.

During summer 1996, Colin traveled to New Zealand for a series of lectures on clay mineralogy at the University of Auckland. He returned through northern Australia to join his son, who is a dive master on a charter vessel along the barrier reef. He then spent several days in Thailand with a major industrial clay producer and stopped in Amsterdam to meet with Elsevier in regard to his role as a managing editor of the *Applied Clay Science Journal*. Colin notes that at the June 1996 Clay Minerals Society meeting there were 17 former or current IU alumni and students in attendance.

Don Hattin remains active in retirement with continued research and travel. In September 1995, the department hosted a retirement dinner and program to honor Don. Everyone enjoyed the party at Terry's Conference Center in Westbury Village.

Alan Horowitz, also now retired, has found no lack of projects, old and new, on which to work. He co-authored two poster sessions for the North American Paleontological Convention, held in June in Washington, D.C., in conjunction with the 150th anniversary of the Smithsonian Institution. Two papers based on long-term work on compilations of bryozoans were published this year and several more papers are in preparation. Alan continues to work with **John Droste** on some subsurface Pennsylvanian limestone deposits in the Illinois Basin, especially in the southwestern corner of Indiana. They have published several abstracts on this work and two manuscripts have been submitted. Alan still does some curation of the departmental paleontological collections and handles loans from our standards collections. The principal work has been data entry into an electronic database for easier handling of summary statistics concerning the collections.

Gary Lane, though retired, continues each spring to teach an honors class on the natural history of southern Indiana. His written history of the geology department has now reached about 150 pages in length. The text is mostly complete except for some small additions and corrections. The next step will be to select and prepare the photographs to illustrate the history. In addition, Gary continues to do research on crinoids from northwestern China and from the type Devonian of England. He attended the Inter-



Noel Krothe

national Geological Congress in Beijing, China, in early August and gave a talk on his and his colleagues' research on Chinese fossils from northwestern Xinjiang-Uygur Autonomous Region. His wife, **Mary**, accompanied Gary to China, and they spent two nights in Hong Kong on their return. A short time later, they left Bloomington and headed for Montana, where Gary joined **Tom Straw** for the sixth consecutive year in teaching/hosting the annual Alumni College at the Geologic Field Station.

Enrique Merino gave papers during 1995-96 at the American Geophysical Union meeting in San Francisco and at the University of Arizona in Tucson, where he was impressed by the outstanding tectonic research of **Peter DeCelles**, MA'84, PhD'84. Pete took Enrique to see rocks, shears, and saguaros in the Saguaro National Park. Enrique presented a paper at the North-Central Section GSA meeting at Ames, Iowa, where our "senior **Melissa Buciak** debunked Bob Ruhe and Carolyn Olson's 'sedimentary' theory of the origin of the local terra rossa (Ruhe had himself previously debunked Thornbury's 'residual' theory, so he is even)." Merino presented a paper at the U.S. Geological Survey in Menlo Park and another (with **Daniel Nahon**) at the fourth Geochemistry of the Earth's Surface meeting held at Ilkley, U.K. Here Enrique enjoyed side excursions to the

beautiful towns of Cambridge, Lincoln, York, Durham, and of course, London. "Don Hattin would have loved the Railway Museum at York." One of Enrique's former students, **Yifeng Wang**, PhD'93, now at Sandia National Laboratories, Albuquerque, was in Bloomington this past August for a week to continue joint research with Enrique and Richard Murray of Boston University on the origin of bedded cherts and banded iron formations.

Enrique notes that he has been teaching Mineralogy G221, which he loves and which continues to have modest numbers of students (which, in turn, means a modest number of new majors for the next few years), and also Historical Geology G112, a first for him, made easier by help from **Bob Dodd**, **Abhijit Basu**, and **Mike Savarese**.

Haydn Murray reports that funding for the Murray Endowed Professorship in Applied Clay Mineralogy is making significant progress. He and the IU Foundation are working on raising the remaining funding by the end of 1997. As of May 1996, more than half of the \$600,000 goal had been attained. Haydn notes that retirement in May 1994 hasn't made much difference in his activities except for classroom teaching. This past year, he has been to Brazil twice, working on a large kaolin deposit on the Rio Capim; to Argentina, where he gave a three-week short course on industrial minerals at the Universidad Nacional del Sur at Bahia Blanca; to China, investigating kaolins and attapulgite; and to Leuven, Belgium, where he presided at an AIPE Council meeting at the Euroclay '95 conference. Haydn is president of AIPEA the international clay minerals association. His term ends in June 1997 after the next International Clay Conference.

Haydn notes that four of his doctoral students finished their dissertations by December 1996 (**Karan Keith**, **Jean Hemzacek Laukant**, **Nelson Shaffer**, and **Huitang Zhou**). Other former graduate students of Haydn are located around the country. **William Moll**, MA'58, and **David Burke**, BS'75, MS'85, are with Oil-Dri Corp. of America. Bill is at the R&D center near Chicago, and David is at the clay operations in Ochlocknee, Ga. **Tim Salter**, BS'78, PhD'88, is heading a research group at Chemical Lime Company in Fort Worth, Texas. Tim and his wife, Becky, have two daughters. **Tom Dombrowski**, MA'82, PhD'92, is with Engelhard Corp. at their R&D center in Gordon, Ga. Tom and his wife, Mary, have two sons. **Robert Pruett**, MS'88, PhD'93, and **Jun Yuan**,

PhD'95, are with English China Clays at their R&D facilities in Sandersville, Ga. Bob and his wife have three sons; Jun and his wife, **Xiujia Weng**, MS'95, who is with Evans Clay Co. in McIntyre, Ga., have two sons. **Jason McCuistion**, BS'93, MS'96, who has been employed as the geologist for the Spinks Clay Co. in Paris, Tenn., was married in February 1996. **Tom Toth**, BS'86, MS'89, recently received his PhD degree from Purdue University, where he was voted this past year's outstanding graduate student in the Department of Geosciences. Congratulations, Tom! **Franz Reisch**, MS'91, is working at the R&D laboratories of American Colloid Co. in Skokie, Ill.

Haydn notes that three of his former students, **Wayne Bundy**, BA'50, MA'54, **Jack Harrison**, BS'54, MA'55, and **Ken Vance**, BS'52, MA'53, have all retired and moved to Bloomington, where they are enjoying living in a university town with all of its activities, especially the basketball. As for Haydn and **Juanita**, they have purchased a condominium in Bonita Springs, Fla., and spent a good deal of time there during last winter (which was a good time to be away from Indiana).

Larry Onesti was recently inducted into the Northwestern University Ath-

letic Hall of Fame. Onesti, an All-American and co-captain of the Wildcats in 1961, played middle-linebacker and center during those one-platoon days. He also was named an Academic All-American that year. After playing four seasons with the AFL Houston Oilers, Larry embarked on his graduate study at Michigan State, where he also served as a graduate assistant to Duffy Daugherty (being on the sidelines during the famous 10-10 tie with Notre Dame and the No. 1 national ranking at stake). During his spare time, Larry is serving as an assistant football coach for Bloomington North High School.

Peter Ortoleva was honored at the 1996 IU Founders Day ceremonies by being named a Distinguished Professor. A pioneering leader in the modeling of geochemical processes, Ortoleva has engaged in groundbreaking research on geochemical systems, demonstrating that many repetitive and other patterns observed in the Earth's crust could have risen spontaneously without the need for an externally-imposed template. He has promoted the coordination of work among different research centers and his laboratory attracts researchers from around the world.

Ed Ripley reports that his current graduate students and their projects are **Megan McCoy** (mineralogy and geochemistry of oxide waste piles at the Golden Sunlight Mine, Mont.); **Young-Rok Park** (oxygen and hydrogen isotopic studies of hydrothermal flow systems above and below the Duluth Complex, Minn.); **Iskandar Taib** (genesis of oxide and incompatible-element-enriched gabros at the Babbitt Cu-Ni deposit, Duluth Complex, Minn.); and **Tim Johnson** (mineralogic and isotopic studies of Bemineralization at the Spor Mountain deposit, Utah). His recent postdoc, **Cheon-Young Park**, Chosun University, South Korea, has completed his studies on metal contamination associated with mining activities in Korea.

Ed notes IU involvement with a project on the Voisey's Bay Cu-Ni deposit. This is a giant deposit located in Labrador, discovered by Diamond Field resources. Both Falconbridge and Inco have bid for the deposit. Falconbridge bid \$4 billion, but Inco bettered that price to protect its No. 1 spot with 30 percent market share of world nickel. Reserves at Voisey's Bay are estimated at 63 million tons grading at 2.83 percent nickel, 1.68 percent copper, and 0.12 percent cobalt. Ed traveled to South Korea in November 1995 to tour the Korea Basic Science Institute.

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Abhijit Basu

Faculty news

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He presented lectures at the Institute and at Seoul National University on future directions in isotopic geochemistry.

Al Rudman continues to spend the summers in Hawaii with an appointment as visiting researcher with S.O.E.S.T., working with Neil Frazer on velocity and amplitude variations from thin-bedded sedimentary sequences. He also spends summer time in Boulder, Colo., where he is a research associate with C.I.R.E.S.. When there, he also gets to visit with son David and his three grandchildren. At IU, Al continues to work with **Gary Pavlis** and **Michael Hamburger** on the U.S.G.S-N.E.H.R.P. study of the Wabash Valley seismic zone. In August 1996, all 20 seismic stations were removed and shipped back to I.R.I.S. There now remains the task of analyzing 100 gigabytes of data.



John Droste

Mike Savarese will be on a leave of absence this coming year. He has accepted a research position with the state of Florida at the Rookery Bay Marine Center near Naples. Among his graduate students, **Donna Surge** finished her MS thesis during summer 1996. She studied archaeocyaths (primitive Early Cambrian sponges) from South Australia. She also studied the petrography and geochemistry of the limestones containing the fossils. Donna obtained isotopic evidence confirming a differential rate of photosynthesis with depth in the early Cambrian seas. Another Savarese student, **Kristin Hagstrom**, completed her MS thesis during spring 1996. She studied the effect of snail borings on the strength of pelecypod shells. The weakened shells are preferentially destroyed by surf action causing a bias in the apparent relative abundance of the clams. **Katrina Nell** did field work this past summer in Nevada, collecting archaeocyaths. Her

Faculty research grants 1995-1996

• **A. BASU** (NASA), "Petrologic evolution of lunar and meteorite parent body regolith."

• **S. BRASSELL** (UNOCAL), "Organic Geochemistry."

• **S. BRASSELL** (NSF), "Temporal variations in molecular records of sea surface temperatures and plankton productivity: assessment of high resolution signals in sediment trap particulates from the Gulf of California."

• **S. BRASSELL** (National Leading Laboratories of China), "Biogeochemical evidence of environmental and climatic change in the sedimentary record of Lake Gucheng Hu, Nanjing, China."

• **S. BRASSELL** (NOAA), "Development and calibration of paleoclimate proxies: a sediment trap study in Santa Barbara Basin."

• **S. BRASSELL** (NSF), "Modernization of Biogeochemical Laboratories."

• **S. BRASSELL** (Petrobrás), "Cooperative agreement for research in biogeochemistry and petroleum geochemistry."

• **S. BRASSELL** (Research Faculty Fund), "Semi-automated facility for Biogeochemical sample processing."

• **B. DOUGLAS** (USGS), "Geologic Field Mapping of Cenozoic Deposits in the Willow Creek Watershed."

• **B. DOUGLAS** (NSF), "Curriculum Development for Interdisciplinary Field Courses in Environmental Geo-

sciences."

• **M. HAMBURGER** (USGS), "Multidisciplinary Study of Geodynamics in an Active Collisional Orogen, Soviet Central Asia."

• **M. HAMBURGER** (NSF), "Analysis of Seismic Data from Pinatubo Volcano, Philippines."

• **M. HAMBURGER** (NASA), "Application of Global Positioning System Measurements to Continental Collision in the Pamit-Tien Shan Region, Soviet Central Asia."

• **M. HAMBURGER** (NSF), "Application of Global Positioning System Measurements to Continental Collision in the Pamit-Tien Shan Region, Soviet Central Asia."

• **M. HAMBURGER** (IRIS), "Seismic Array Studies in Eurasia."

• **M. HAMBURGER** (USGS), "A comprehensive Geophysical Investigation to assess seismic hazards in the Wabash Valley Seismic Zone: A case Study of the New Harmony Fault."

• **M. HAMBURGER** (IRIS), "Teacher-Training Workshop conducted in support of the Princeton Earth Physics Project."

• **C. HARVEY** (SIGECO), "Assessment of Low Cost Slurry Fuels for Power Generation in southern Indiana."

• **C. HARVEY** (EPRI), "High Gradient Magnetic Separation of Sulfur and Clay from Coal Fines."

• **J. HAYES** (Petrobrás), "Cooperative Agreement for Research in Biogeochemistry and Petroleum Geochemistry."

• **J. HAYES** (NASA), "Training Grant, Fellowship for Graduate Student Training - Kristen Leckrone."

• **J. HAYES** (DOE), "Isotopic Investigation into the fate of terrestrially derived dissolved organic matter in estuaries and coastal waters."

• **J. HAYES** (Petrobrás), "Tuition and fee support for Eugenio Santos Neto."

• **J. HAYES** (NSF), "Modernization of Biogeochemical Laboratories."

• **J. HAYES** (NSF), "Factors controlling the abundance of ^{13}C in algal and sedimentary biomarkers from the Amundsen and Bellinghausen Seas, Antarctica."

• **C. JOHNSON** (NSF), "Testing the hypothesis of a Cretaceous Supertethyan climate zone in the Caribbean Province: Do climate simulations and observational data support to concept of tropical stability?"

• **N. KROTHER** (Westinghouse), "Hydrochemical Field Research and Isotopic Studies."

• **N. KROTHER** (US Army Corps of Engineers), "A Hydrochemical Study to Determine the Groundwater Flow and Chemical Transport in the Big Clifty/Beech Creek Aquifer Beneath the Ammunition Burning Grounds, Naval Weap-

project is to investigate the nature of the interaction between the sponges when they grow together and when they encounter other groups of organisms, this being important in understanding the growth of primitive early Cambrian reefs.

Bob Shaver has been doing a bit of consulting on Silurian reef geology pertinent to hydrocarbon production in the Illinois Basin. He says that this increases his federal and state income taxes and allows him to increase significantly his catalog shopping. Although we reported last year on Bob's teaching an Elder Hostel course at Clifty Falls State Park, he still reminisces about this highly rewarding experience.

Bob has completed his two book-size genealogical manuscripts on the maternal branches of his family. He notes that "who else can say that they had a relative, a murderer escaping justice, who years after the deed got his comeuppance by going down with the *Titanic*? The fur-



Lee Suttner

ther point to be made is on how singular their distant cousin is, to think that God would have to devise such an incident in the cause of justice!" In 1995, Bob and his wife, Sue, took another exhilarating summer cruise on the *Crown Odyssey* under the auspices of the IU Alumni Association. They sailed in and out of the Norwegian fjords and around the top of Europe into the Arctic Ocean. The product of this trip is Bob's latest published travel book, *Geology Failed Us in Norway, But the Trolls Were Convincing* (98 pages, 128 color illustrations). Bob attended the 125th anniversary celebration of his home town, North Henderson, Ill., in June 1996. Since the booklet he wrote for his 50-year college reunion two years ago was such a success, he says, "I may write a Peyton Place type of book on North Henderson. I'm not sure that another kind would be very truthful. There is no scandal today because anything

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Faculty research grants 1995-1996

ons Support Center, Crane, Indiana."

- **N. KROTHER** (SIGECO), "Assessment of Low Cost Slurry Fuels for Power Generation in southern Indiana."

- **N. KROTHER** (EPRI), "High Gradient Magnetic Separation of Sulfur and Clay from Coal Fines."

- **N.G. LANE** (NSF), "Collaborative Research: Paleobiogeography of Late Devonian and Carboniferous Echinoderms from the People's Republic of China."

- **N.G. LANE** (NSF), "Echinoderm Rebound and Diversification after the Late Devonian Extinction: Evidence from Asian Echinoderm Faunas."

- **R. MACKIE** (NSF), "Upper Mantle Electrical Conductivity Variations beneath North America and Adjacent Oceans: A Collaborative Study."

- **R. MACKIE** (NSF), "Collaborative Research: Crustal Reworking During Orogeny: An Active System Himalayan Perspective."

- **E. MERINO** (IU, Office of Information Technology), "Computing system to devise spatial exercises in mineralogy and geochemistry."

- **E. MERINO** (IU, RUGS), "Replacement, creep, and earthquakes: alternative consequences of crystal growth in rocks."

- **G. OLYPHANT** (IDEM/EPA), "Chemistry and Movement of Septic Tank Absorption Field Effluent in the Dunes

Area, Lake and Porter Counties, Indiana."

- **G. OLYPHANT** (National Park Service), "Hydrologic Monitoring Associated with Pilot Restoration of the Great Marsh, Indiana Dunes National Lakeshore."

- **G. OLYPHANT** (EPA), "Great Marsh Wetland Habitat Restoration."

- **G. OLYPHANT** (IDNR, Div. of Reclamation), "Evaluation of the Hydrologic and Chemical Effects of Reclaiming a Coarse-refuse Deposit with Ash Fill and a Poz-o-tec Cap."

- **G. OLYPHANT** (IDEM/EPA/State Chemists Office), "Development of a Statistically Valid Program of Monitoring Pesticides in Ground Water in the State of Indiana."

- **G. OLYPHANT** (IU, RUGS), "Development of a Demonstration Watershed in the Willow Cr. Drainage adjacent to the IU Geologic Field Station in Montana."

- **L. ONESTI** (US Fish and Wildlife Service), "Augusta Lake Anoxic Limestone Drain and Wetlands Project."

- **L. ONESTI** (IDNR, Dept. of Water), "Field Locate Water Well Records and Determine UTM Coordinates to Enhance IDNR-DOW Computer Database."

- **G. PAVLIS** (AFOSR), "Broad-band signal enhancement of seismic array data: application to long-period surface

waves and high-frequency wavefields."

- **G. PAVLIS** (IRIS), "Seismic Array Studies in Eurasia."

- **G. PAVLIS** (USGS), "Collaborative research (SE Missouri State Univ., Indiana University, Indiana Geological Survey): A comprehensive geophysical investigation to assess seismic hazards in the Wabash Valley Seismic Zone: A case study of the New Harmony Fault."

- **G. PAVLIS** (AFOSR-ASSERT), "Innovative seismic array analysis for studies of wave propagation in the earth."

- **L. PRATT** (Mobil Research and Development Company), "Award for Research."

- **L. PRATT** (Exxon Education Foundation), "Student Travel and Fieldwork."

- **L. PRATT** (Cominco, Alaska Inc.), "Organic geochemistry of lead-zinc ore and black shale host rock at Red Dog Mine, Alaska."

- **L. PRATT** (NSF), "Molecular and isotopic composition of lipids in bivalve shells: records of biosynthetic origins and paleoenvironmental change."

- **L. PRATT** (NSF), "Modernization of Biogeochemical Laboratories."

- **L. PRATT** (NSF), "A stratigraphic and geochemical transect across northern South America for assessment of paleoceanographic events in the Caribbean gateway during the middle Cretaceous."

(continued on page 14)

Faculty news

(continued from page 13)

goes, but back then scandal was rife!"

Dave Towell has added Introductory Physical Geology to his teaching and is currently handling three sections per year of G103. He finds it especially nice to lecture to about 100 students per section in the new technology classroom/auditorium (Room 126), which was made possible largely by donations from alumni. Dave also was recently elected by the Bloomington Faculty Council to a six-year term on the University Athletics Committee. As an ex-jock and long-term fan, he's eager to serve, though the volume of work is substantial. For bedtime reading, he can always break out his personal copies of the current 600-page NCAA manual or the 200-page Big Ten handbook. Dave and his wife, Lindsay, spent a wonderful week last winter break on the volcanic islands of Guadeloupe

and Les Saintes, F.W.I. Highlights included climbing to near the summit of the 5,000-foot volcano, Soufriere, amidst substantial hydrothermal activity, and later a snorkeling trip to Pigeon Island off the black sand beach on the west coast of Basse-Terre.

Bob Wintsch has taken a one- or two-year position at the National Science Foundation as the program director in the tectonics division. He's also now collaborating with Arndt Schimmelmann on a PRF project to study the exchange of hydrogen and nitrogen in different types of kerogen. Bob has just completed, with the help of graduate student Chris Amato, a USGS-funded geologic map of the Rockville quadrangle in Connecticut. Bob also notes that he caught the dreaded Lyme disease for the second year in a row, but now finds it fun living in the D.C. area, though he is so busy that it's hard to take full advantage of the city. ■

Faculty grants

(continued from page 13)

• E. RIPLEY (NSF), "Metal sources and mechanisms of enrichment for Cu-Ni-PGE mineralization in Fe-Ti-rich gabbroic rocks, Duluth Complex, Minnesota."

• E. RIPLEY (IU Faculty Fellowship), "Experimental studies of copper solubility in mafic magmas."

• E. RIPLEY (NSF), "Isotopic studies of the North Shore Volcanic Group and related hypabyssal rocks, Midcontinent Rift System, Minnesota."

• E. RIPLEY (Golden Sunlight Mine), "Mineralogical and geochemical characterization of oxide waste stockpiles, Golden Sunlight Mine, Whitehall, Montana."

• E. RIPLEY (Natural Sciences and Engineering Research Council of Canada), "Petrological, mineralogical, geochemical, and isotopic studies of the Ni-Cu-Co deposit at Voisey's Bay, Labrador."

• E. RIPLEY (Mississippi Valley Archaeology Center), "Isotopic analyses of lithic fragments, Chally-Turbenson site, Minnesota."

• A. RUDMAN (Chevron), "Earth Sciences Cash Gift."

• A. RUDMAN (USGS/NEHRP), "Assessment of Seismic Hazards in Wabash Valley."

• A. RUDMAN (VASTAR), "Seismic and Potential Field Studies in Midcontinent."

• M. SAVARESE (American Chemical Society), "Paleobiological and Paleoenvironmental context of corallomorph-bearing Lower Cambrian reefs, South Australia."

• A. SCHIMMELMANN (Univ. of CA., San Diego), "Abrupt Climate Changes During the Late Quaternary monitored with Annual to Biennial Resolution in Santa Barbara Basin."

• L. SUTTNER (IU, RUGS), "Development of a Demonstration Watershed in the Willow Cr. Drainage adjacent to the IU Geologic Field Station in Montana."

• R. WINTSCH (NSF), "History of Terrane Assembly, Eastern New England."

• R. WINTSCH (State of CT), "Bedrock geology mapping of Rockville 7.5 'minute' quadrangle, Connecticut." ■

Department of Geological Sciences faculty & staff

Professors: Abhijit Basu, Simon Brassell, James Brophy, J. Robert Dodd, Jeremy Dunning, Michael Hamburger, Norman Hester, Claudia Johnson, Erle Kauffman, Noel Krothe, Randy Mackie, Enrique Merino, Greg Olyphant, Lawrence Onesti, Gary Pavlis, Lisa Pratt, Edward Ripley, Albert Rudman, Michael Savarese (on leave for 1996-97 to Rookery Bay Marine Center, Fla.), Lee Suttner (chair), David Towell, and Robert Wintsch (on leave as visiting scientist at National Science Foundation in Arlington, Va.)

Part-Time Professors: Donald Carr (survey), Gordon Fraser (survey), Henk Haitjema (SPEA), Brian Keith (survey), Peter Ortoleva (chemistry), Carl Rexroad (survey), Jeff White (SPEA)

Professors Emeriti: Robert Blakely, John Droste, Donald Hattin, Alan Horowitz, N. Gary Lane, Judson Mead, Haydn Murray, Robert Shaver, Charles Vitaliano

Research Scientists: Michael Dorais, Bruce Douglas, Colin Harvey, Andrew McTaggart, Arndt Schimmelmann

Postdoctoral Fellows: Takashi Hasegawa, Michael Zaleha

Librarian: Lois Heiser

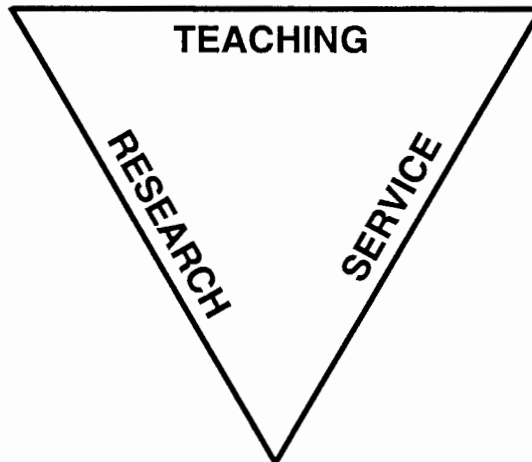
Library Staff: Dennis Scoville (technical assistant); Linda Stewart (circulation/reserves)

Staff: Sarah Burton (financial/administrative assistant), Patty Byrum (administrative secretary, chair's office), Lorie Canada (faculty secretary, fourth floor), John Day (photographic specialist/survey), Ruth Droppo (research secretary, biogeochemistry), Grant Estey (resident manager, Geologic Field Station), Candace Franz (research and administrative services secretary), Jon Fong (technician, biogeochemical labs), Mark Gilstrap (chemist, analytical chemical labs and computer systems support provider), Mary Iverson (administrative secretary, student records), Kari Lancaster (cartographic specialist/survey), Anne Leinenbach, (faculty secretary, fifth floor), Julie Primack (technician, biogeochemical labs), Gillion Gibson (secretary, business office), Kim Schulte (administrative secretary, Geologic Field Station), Brian Snow (computer systems manager), Kim Sowder (cartographic specialist/survey), Steve Studley (manager, mass spec lab)

**GEOLOGICAL SCIENCES
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THE DEPARTMENT OF GEOLOGICAL SCIENCES

INDIANA UNIVERSITY, BLOOMINGTON

Employment

Students who were hired by various companies and organizations this past year included **Julie Boyd**, MS'95, Kingwood, Texas, who is employed full time with Phillips Petroleum in Bartlesville, Okla. **Megan McCoy**, MS expected '96, was employed by the Golden Sunlight Mines at Whitehall, Mont., but has recently moved to Elko, Nev., and accepted a job with Placer Dome at Cortez. **Jennifer Ayers** (graduate student), Claudville, Va., has received summer internships with both Phillips, Bartlesville, and Chevron, New Orleans. **Craig Rankin** (graduate student), Avella, Pa., was a summer intern with Exxon, New Orleans, and **Nathan Way**, MS'95, Bloomington, served an internship with Amoco, Denver. Appointed to a summer internship with Amoco in Houston was **Dmitriy Repin**, MS'96, Moscow, Russia. **Glenn Bear**, MS'93, Fostoria, Ohio, and **Lorie Bear**, MS'92, St. Louis, Mo., served internships with Exxon Production Research in Houston. **Volker Bruchert** (graduate student), Munich, Germany, was on appointment with the Marine Biological Laboratory, Woods Hole Mass., and **Tim Johnson**, MS'94, Auburn, Ala., was employed by Brush-Wellman, Delta, Utah. **Matthew Warner** (graduate student), Columbus, Ohio, was employed by the Red Dog Mine, Alaska, and **David C. Wilson**, BS'95 (graduate student), Losantville, Ind., received an internship with Exxon, Houston.

Lorie Bear, Glenn, and their year-old son, **Robbie**, were featured in an article in the spring 1996 issue of the College of Arts and Sciences magazine, *The College*. Lorie points out that "I had planned to go to college for four years, find a job in my field, settle down, and then get married and start a family. Instead, I completed two degrees in mathematics in six years, married, switched departments to work on a PhD, studying earthquakes, and had a baby." She met her future husband, Glenn, in differential equations class during her senior year ("such a romantic setting!"). Glenn had come to IU from Bowling Green State University to study geophysics. During Lorie's master's study in mathematics, she took two courses in geophysics (seismology and signal analysis). On completing her

MS degree in mathematics, she switched to geological sciences and joined Glenn in our PhD program in geophysics. Glenn is studying the tectonic history and earthquake risk in the Wabash Valley of southern Indiana. Lorie is doing a more theoretical project that involves developing a method that produces multiple estimates for direction and velocity, and statistical information on the variability of seismic waves with the aim to provide more stable location values and estimates of earthquake locations. Their research has been funded by Graduate School and Chevron fellowships, the Indiana and U.S. Geological Surveys, and the U.S. Air Force. In addition to graduate teaching appointments, Glenn and Lorie have received several summer internships in the petroleum industry. As for young Robbie, he typically goes to work with them and loves all of the attention he gets. Lorie says, "We both do most of our work in the geophysics computer lab, and our colleagues in the geophysics group have been very supportive of our decision to keep Robbie with us during the day. We were able to set up a baby station in the geophysics library/reading room, and we share the baby duties according to who is less involved in a project at the moment. Robbie has even participated in Glenn's field work in the Wabash Valley." After receiving their doctorates, Lorie and Glenn are considering faculty positions, perhaps even sharing one, or maybe taking advantage of opportunities in the petroleum industry.

Energy companies that sent representatives to recruit both full-time employees and interns during 1995-96 included:

- Amoco Exploration & Production, Houston, Texas (Paul Singer and Edith Wilson)
- Chevron, San Francisco, Calif. and Lafayette, La. (Matthew Mikulich and Carole Rock)
- Exxon Computing & Information Technology, Houston, Texas (Terry Carius)
- Exxon Exploration Co. & Exxon Co., USA, Houston, Texas (Barbara Rassmann)
- Exxon Production Research Co., Houston, Texas (Glenn Hieshima)
- Phillips Petroleum Co., Bartlesville, Okla. (Tom Moore)

Awards & grants

Undergraduate

- Senior Faculty Award
Mimi Tzeng, Bloomington
- N. Gary Lane Award (beginning major)
Sue Ellen Riegsecker, Noblesville
- Chevron Geophysics Scholarship
Terry Arcuri, Bloomington
- Junior Professional Development Award
Karen Cyr, Fort Wayne
- William Tarr Award (Sigma Gamma Epsilon)
Mimi Tzeng, Bloomington
- Field Station Scholarships (IU)
Karen Cyr (Charles Deiss Award), Fort Wayne; Michal Umbanhowar-Zidek, Bloomington; Ji-hun Ryu, Seoul, Korea; Mimi Tzeng, Bloomington; Julie Ciasto, Greenwood; Mark Buehler, Bloomington; Terry Arcuri, Bloomington

Graduate

- Estwing Award and Outstanding Academic Achievement
Steven Baedke, Estherville, Iowa
- Department of Geological Sciences Award for Academic Achievement
Volker Bruchert, Munich, Germany
- Outstanding Associate Instructor
Kristen Hagstrom, Southington, Conn.
- Geochemistry Fellowship
Jennifer Villinski, Albuquerque, N.M.
- Shell Oil Company Fellowship
William Elliott, Latrobe, Pa.
- Chevron Fellowship in Geophysics
David Wilson, Losantville, Ind.
- Grassman Fellowship
Huitang Zhou, Beijing, China
- Federal Government of Brazil Scholarship
Ana Carmo, Bahia, Brazil
- Federal Government of Columbia Scholarship
German Mora, Bogota, Columbia
- Petrobras Fellowship
Eugenio Santosneto, Rio de Janeiro,
- Cumings Award
Lindsey Leighton, Worcester, Mass.
- Golden Sunlight Mines Grant-in-Aid
Megan McCoy, Spokane, Wash.
- USGS National Cooperative Geologic Mapping Program
William Elliott, Latrobe, Pa.

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Advisory board update

The advisory board of the department met in Bloomington on Feb. 2-3, 1996, with **George Nevers** (Garnet Resources Corp., retired) as president and **Malcolm Boyce** (Chevron Overseas Petroleum Inc., retired) as vice president.

New members of the board are **Thomas L. Dobecki** (president, Dobecki Earth Sciences Inc.), **Ferol F. Fish** (Gas Research Institute, retired), **Derek G. Fullerton** (president, Exmin Corp.), **Glenn Hieshima** (senior research geologist, Exxon Production Research Co.), and **Michael C. Mound** (director of marketing, QCX Systems, Denmark).

Continuing members of the board are **Stanley Anderson** (Houston Exploration Co.), **Robert Blakely** (Indiana Geological Survey, retired), **Michael T. Cowen** (petroleum geologist), **Marcia Engle** (consulting geologist), **Richard Gibson** (Gibson Consulting), **Michael Graham** (U.S. Water), **Stephan Graham** (Stanford University), **Helen M. McCammon** (U.S. Department of Energy, retired), **Richard McCammon** (research geologist, U.S. Geological Survey), **Judson Mead** (Indiana University, retired), **Ana Marie Petricca** (geologist, ERM, New England Inc.), **Frank Pruett** (consulting geologist, Indiana Geo-

sciences Institute), **Thomas Straw** (Western Michigan University), **Daniel Sullivan** (Indiana Geological Survey, retired), **Glenn M. Thompson** (president, Tracer Research Corp.), **Jerome Thornburg** (geophysicist, Conoco Inc.), **Dan Tudor** (Chevron Exploration & Production Services Co., retired), **Kenneth R. Vance** (Anadarko Petroleum Corp., retired), and **Steven Young** (geological associate, Exxon Exploration Co.).

John Hayes presented the chair's report to the board. The B.S. in environmental science degree program proposed by the College and the department has

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Student news

(continued from page 16)

- Illinois Geological Society Scholarship
Nadeem Ahmad, Multan, Pakistan
- Best Oral Paper by a Student, Northeastern Section AAPG 1995 Meeting
Nadeem Ahmad, Multan, Pakistan (Margaret Hawn Mirabile Memorial Award)
- American Federation of Mineralogical Societies Scholarship Foundation Award
Jennifer M. Ayers, Claudville, Va.
- Lerner-Gray Award (American Museum of National History Grant)
Donna Surge, Deer Park, N.Y.
- Paleontological Society Grant
Donna Surge, Deer Park, N.Y.
- Geological Society of America Grants-in-Aid of Research
Audrey Aronowsky, San Francisco
Volker Bruchert, Munich, Germany
Katrina Nell, Bronx, N.Y.
Richard Stotts, New York, N.Y.
- Sigma Xi Grant-in-Aid of Research
Donna Surge, Deer Park, N.Y.
- North-Central Section GSA Travel Grant Awards
Donna Surge, Deer Park, N.Y.

Degrees awarded

Bachelor of Arts — 1995

Lamping, Brent P.; Batesville
Niemi, Shawn E.; Chagrin Falls, Ohio
Osburn, Christopher; Santa Claus
Peake, Monte S.; Holland
Portnoy, Eli M.; Morganville, N.J.

Ress, Alexander B.; Kailua, Hawaii

Bachelor of Science — 1995

Buciak, Melissa A.; Palos Heights, Ill.
Carson, Daniel M.; Fort Wayne
Clayton, Frederick G.; Carmel
Johns, Candice A.; Carmel
Pickett, Amber L.; Fischers
Wilson, David C.; Losantville

Master of Science — 1995

- Cohn, Matthew E.; Chicago (1995), "Electrical Resistivity, Characteristics of the Indiana Karst: Field and Model Studies"
- Hagstrom, Kristen M.; Southington, Conn. (1996), "Effects of Compaction and Wave-Induced Forces on the Preservation and Macroevolutionary Perception of Naticid Predator - Prey Interactions"
- Hudson, M. Colin; Indianapolis (1996), "A Hydrochemical and Isotopic Study of the Groundwater Basin at the Ammunition Burning Ground, Crane Naval Weapons Support Center, Crane, Indiana"
- Larabee, John H.; Plattsburg, N.Y. (1995), "Stratigraphy and Paleogeological Analysis of the Coralline Zone, Uppermost Part of Dillsboro/Lower Part of Saluda (Upper Ordovician), Southeastern Indiana and North-Central Kentucky"
- Leighton, Lindsey R.; Worcester, Mass. (1995), "Factors Influencing Morphological Variation in the Articulate Brachiopod *Rafenesquina Alternata*, Upper Ordovician (Richmondian), Southeastern Indiana"

- McCuiston, Jason T.; Monroe, La. (1996), "The Mineralogy and Physical Characteristics of the Ball Clays of Henry and Weakley Counties, Tennessee"
- Radzevicius, Stanley J.; Crosby, Minn. (1995), "Processing Shallow, High-Resolution Seismic Reflection Data in a Crystalline Rock Environment: Imaging of the Weathered Zone in Granodiorite at Pinyon Flat, California"
- Repin, Dmitriy G.; Moscow, Russia (1996), "Tomographic Inversion with and without Constraints: Analysis of Solution Errors from Simulations of Earthquake Data from the Garm Region, Tadzhikistan"
- Russell, Elizabeth M.; Bangor, Maine (1996), "Geoarchaeological Investigations of Ohio River Terrace Deposits near Bethlehem, Indiana"
- Suits, Neil S.; St. Louis, Mo. (1996), "Paleoceanographic Interpretation of a Sulphur Isotopic Excursion in Pyrite and Acid-Volatile Sulfides from the Hartland Shale and Bridge Creek Limestone Members of the Greenhorn Formation near Pueblo, Colorado"
- Whittington, Carla M.; Fort Wayne (1996), "The Petrogenesis of the Basalts of Round Head Volcano, Kanaga Island, Aleutians"

Doctorate — 1995

- Wang, Ruiliang; Beijing (1996), "Molecular and Isotopic Signals of Environmental/Climatic Changes in Modern and Ancient Hypersaline Sedimentary Records" ■

been finalized as a joint degree with the School of Public and Environmental Affairs. **Bruce Douglas** is serving as the coordinator for this program. A junior-level field course is being developed for offering at the Montana Field Station. John noted that the department continues to have the second largest graduate enrollment in the Big Ten and that we have climbed from sixth to fifth in the number of undergraduate majors. A problem, however, is that we have dropped from sixth to ninth in the size of the stipend offered to graduate teaching assistants even though the level of support increased slightly. In terms of extramural funding, we have improved slightly, moving from seventh place to sixth. John also noted that the department has been selected as a department to undergo an external review during 1996-97. We are taking this opportunity to review our curriculum and programs, as well as formulate an academic plan and mission statement for our future. These are very important components not only in our self-evaluation and

planning, but also in presenting a focus for our efforts with the advisory board in the recently announced endowment campaign.

The Educational Planning Committee, chaired by **Steve Young**, hosted a forum for students on "Maintaining a Career in the Geosciences." Presentations were made by **Tom Dobecki**, **Derek Fullerton**, and **Helen and Dick McCammon**. In this informal setting, board members passed on experiences and advice, while students asked questions concerning careers. In another matter, the committee envisions the department offering a one-credit course/seminar on the business side of the geosciences, perhaps by bringing in an outside expert. The committee also is considering innovative means of one-to-one student-industry contacts (i.e., a mentor relationship) between geoscience professionals and IU students. Another suggestion is to compile a directory of alumni in industry including their positions, skills, and company affiliations.

In addition to sponsoring several

alumni receptions, the Development Committee, chaired by **Stan Anderson**, held a number of meetings for discussion of the desirability, focus, and means of conducting an endowment campaign for the department. During 1996, this campaign was formulated and integrated into an academic plan for the department.

Glenn Thompson, chair of the Industrial Liaison Committee, reported information on internship programs at a number of universities.

As usual, the two-day session in February included the always-popular Friday evening potluck dinner with faculty, spouses, and friends.

New member profiles

Thomas L. Dobecki, BS'67, MA'69, PhD'72, received degrees from IU in physics, geology, and geophysics. He is currently president of Dobecki Earth Sciences Inc. He lives in Cassopolis, Mich. Tom works in the application of
(continued on page 19)

24 members attend the February 1996 meeting of the IU Department of Geological Sciences Advisory Board



1. Steven Young, 2. Thomas Dobecki, 3. Malcolm Boyce, 4. Frank Pruett, 5. Thomas Straw, 6. Stephan Graham, 7. Judson Mead, 8. Ferol Fish, 9. Lee Suttner, 10. Richard Gibson, 11. Daniel Tudor, 12. George Nevers, 13. Ann Marie Petricca, 14. Stanley Anderson, 15. John Hayes, 16. Glenn Thompson, 17. Daniel Sullivan, 18. Michael Mound, 19. Kenneth Vance, 20. Robert Blakely, 21. Michael Cowen, 22. Susan Green, 23. Sarah Burton, 24. Derek Fullerton

Alumni news

Kudos to Alan Pratt, MA'61, for identifying one of the unnamed persons in the photograph on page 19 of the last issue of *Hoosier Geologic Record* as Jim Crisman, BS'62. Second-hand information also leads me to believe that Jack Connelly correctly named this person, who is sixth from the left and standing between Roger Cuffey, BA'61, MA'65, and Jack. No one has yet identified the third person from the right in the photograph.

William I. Ausich, MS'76, PhD'78, began serving a four-year term as chair of the Department of Geological Sciences at the Ohio State University, Columbus, in July 1995. He reports that "this may be the most challenging position I have held. We have a wonderful new building and strong faculty and students, so it will be fun." Ausich's oldest daughter, Elizabeth, was a freshman in the Department of English at IU in 1995-96.

James W. Batchelor, BA'46, a professor at McNeese State University, Lake Charles, La., since 1960, received an honorary doctorate from Southern Christian University in June 1995. Batchelor



Visiting the Geology Field Station last August, Michael Cowen, BS'57, MA'58, center (between Don Cunningham and Lee Colby), returned to Montana for the Alumni College, revisiting sites remembered from his student days. A member of the department's advisory board, Mike is a retired petroleum geologist.

was the founder of the geology department at McNeese, where he is affectionately known as Mr. B. He is also the

founder of the 7-On, 7-Off Petroleum Technology Program, which has served
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Alumni board

(continued from page 18)

geophysics to geotechnical engineering, environmental, and archaeological projects, most commonly mapping utilities, piping, and underground hazards/contaminants. He has a close and special interest in the environmental curriculum and hopes that industry follows a similar development, utilizing the developing technology and expertise. His 1991 expedition to the Sphinx and other pyramids was the subject of a 1993 Emmy-winning NBC special. He went again in 1996. Tom enjoys lots of tennis, some golf, and "little or no rock and roll". He and his wife, Kaye Sandine, have four children, Daphne and Dylan Dobecki, and Mark and Bryan Richardson.

Ferol Fish, BS'55, MA'57, received a PhD degree in geophysics from Penn State University, before embarking on a career in research, including mining geophysics, planetary physics, and applied physics. Among his experiences are management of research contracts in geosciences, fluid flow and flow measure-

ment, plastic pipe technology, coal gasification fundamentals, thermophysics of fluids, gas-fired coolers, nondestructive evaluation of piping, location of plastic piping by ground-penetrating radar, and mathematical modeling of furnaces. Ferol retired in 1995 and moved from Arlington Heights, Ill., to Boise, Idaho, where he enjoys white water rafting, participation in five- and 10-kilometer "fun runs," genealogy, and gardening. He and his wife, Lois, have five children and six grandchildren.

Derek G. Fullerton, president of Exmin Corp., moved to the United States 15 years ago from Namibia. He established headquarters in Bloomington for Exmin Corp., a subsidiary of Sibeka, a Belgian diamond mining company with principal activities in Zaire, China, and Europe. Exmin is engaged in exploration activities throughout the United States. Derek is vice president of the Hoosier Trails Council of the Boy Scouts of America and also serves as a board member of the Monroe County Community School Corporation Foundation. His hobbies include thematic philately, pho-

tography, shipwrecks, and pre-1931 automobiles. He and his wife, Hilda, have three children, Gordon (a freshman at IU), Brian, and Leigh-Ann.

Michael C. Mound, MA'61, PhD'63, is director of marketing of automated process control and laboratory systems for cement and mineral process industries for FLS Automation, Copenhagen, Denmark. He also is a 1995 recipient of the department's Richard Owen Award. Mike has a wide range of experience in both industry and education. After receiving his PhD degree from IU, he obtained an MBA degree from Oklahoma City University. He has held a variety of positions (including president and CEO) for companies in the minerals, mining, and cement technology industry, has worked for two oil companies, and taught at three universities and one college. Mike is married to Betsy Greene Mound, and they have a son, Andrew, currently enrolled the MBA program at Indiana University, and a daughter, Molly Michelman, a graduate student at Penn State. ■

Alumni news

(continued from page 19)

the Louisiana oil industry by producing many outstanding petroleum technologists. Batchelor has one son, David, who recently received his PhD in chemistry from the University of Arkansas.

Bernard R. "Dick" Berry, MA'61, of Norcross, Ga., is retired. He worked with Chevron, New Orleans, from 1961 to 1964 as a development geologist. He joined the FBI as a special agent in 1964, serving in San Diego, Washington, and Atlanta. Although he retired in 1984, he kept busy as a security consultant from 1984-94. He retired again in 1994. Berry has three sons and one grandchild.

Seth Paul Bretscher, BS'83, is an assistant swim coach at the USAF Academy, Colorado Springs, Colo. Captain Bretscher's women's swim team won the NCAA Division II national championships earlier this year.

Brian K. Butler, MS'89, is a geologist and environmental scientist with ABB Environmental Services Inc., Portland, Maine. He has been assigned as the environmental lead in support of the U.S. Defense Nuclear Agency, ICBM Silo Dismantlement Project, country of Kazakhstan, in the Brown and Root/ABB SUSA joint venture. He has relocated to Almaty, Kazakhstan, for the project.

Ronald E. Cohen, BS'79, was the recipient of the Mineralogical Society of America Award for 1994. Cohen is on the staff of the Geophysical Laboratory, Carnegie Institution of Washington.

William Cordua, MA'71, PhD'78, professor at the University of Wisconsin, River Falls, was among five persons honored by the Wisconsin Board of Regents when their Department of Plant and Earth Sciences was selected as the outstanding academic department in the University of Wisconsin system for 1995.

Lyndon Lee Dean, BS'60, is chief geologist for Material Service Corp., Lyons, Ill., which operates eight stone quarries and three sand and gravel pits.

Thomas Michael Deputy, BS'64, is now a senior project manager with Louis Berger and Associates, an international environmental firm. He specializes in environmental construction and pollution prevention. He and his wife, Margaret Kelly Deputy, live in Dumfries, Va.

William G. Dixon, Jr., BS'58, MA'66, received presidential awards in 1995 from both the Association of Engineering Geologists and the American Institute of Professional Geologists for "effort in support of the passage of the Illinois Profes-

sional Geologist Licensing Act." In August of this year, he was appointed to the Illinois Board of Licensing for Professional Geologists. In his spare time, Dixon has been working part-time as senior environmental geologist for Practical Environmental Consultants in Roselle, Ill., on projects involving leaking underground storage tanks.

Howard R. Feldman, BA'84, PhD'87, is currently employed by Exxon Production Research, Houston. After seven years of pursuing a variety of research topics at the Kansas Geological Society, he decided to forsake paleontology and join Exxon Production as a senior research scientist.

In October 1995, **Richard Ingram Gibson**, BS'71, a consultant in Golden, Colo., conducted an oil industry short course in gravity and magnetics for the Department of Geological Sciences.

Samuel Huffman MA'66, MA'67, PhD'70, professor at the University of Wisconsin, River Falls, was among five

people honored by the Wisconsin Board of Regents when their Department of Plant and Earth Sciences was selected as the outstanding academic department in the University of Wisconsin system for 1995.

James Jontz, BA'73, is currently director of the Western Ancient Forest Campaign and an adviser to the conservation group Defenders of Wildlife.

Michael McLane, MA'68, PhD'72, continues his work with P.T. Geoservices Ltd., Jakarta and Bandung, Indonesia. He writes that he was caught up in watching the badminton world finals competition for the Uber Cup and Thomas Cup. The world's fastest game results in shuttles being clocked at 320 km/hr. McLane enjoys the ride from Jakarta to Bandung over a range of volcanic mountains, but says that the two-lane road handles a heavy traffic of slow-moving, overloaded trucks and fast-moving overloaded buses that tend to crash into trees, other buses, or various objects. Cars typically pass on curves and hills with their headlights flashing and horns blaring. Consequently, he prefers the three-hour train ride for safety reasons. Either way, he describes the countryside as "spectacular...vast tea plantations of the greenest green, and coffee and rubber and cassava; high on the slopes are forests of pine. The deep valleys are all elegantly terraced for rice. Here and there a stand of coconut or banana palms on the paddies, or mango and papaya. Splendid resorts for the tourists." Mike has been to Sumatra, Kalimantan, and Sulawesi, and to a few of the coral keys of the Pulau Seribu (Thousand Islands) in the Java Sea, but has not yet made it to the islands on the east — Irian Jaya, Lombok, Flores, or Bali. He also periodically makes trips to Singapore.

William Nellist, MS'86, is now working with the National Imagery and Mapping Agency. His wife, **Catherine Nellist**, has worked for the International Medical News Group. She received an award from the Cancer Awareness Month Organization for a series of articles on breast cancer that appeared in *Ob Gyn News*.

Alan R. Pratt, MA'61, is currently living in Reno, Nev.

Kristian Schneck, BS'92, lives in Seattle. His work involves geologic investigations and evaluations for geotechnical engineering and mining projects throughout North America.

After more than five years in New Orleans with Shell Oil Co., **Thomas Michael Skirvin**, BS'85, moved to Santa Barbara, Calif., where he is in his third year working for Benton Oil and Gas.

Alumni receptions

Alumni socials were held in Bloomington, Houston, and New Orleans during 1995. These events were held to promote fellowship and maintain contact between alumni, inform alumni about the department, meet visitors from the IU Bloomington campus, encourage contributions to the department, and report on the results and impact of alumni gifts.

Approximately 60 faculty, students, and Bloomington-area alumni attended a reception in the foyer of the Geology Building on April 24, 1996, held in conjunction with a special colloquium and open house to celebrate the remodeling of the geochemistry laboratories.

Advisory board members **George Nevers**, **Dan Tudor**, and **Stan Anderson** sponsored a Sept. 2, 1995, Houston social attended by 45 alumni, spouses, and friends. **Susan Green** (of the College), **Lee Suttner**, and **John Hayes** attended from Bloomington as did advisory board members **Marcia Engle**, **Jerry Thornburg**, and **Steve Young**.

In November 1995, about 75 were in attendance at the annual alumni reception at the meeting of the Geological Society of America in New Orleans.

Jonathan E. Snow, BA'83, is now a postdoctoral researcher at the Max-Planck Institute for Chemistry, Mainz, Germany. After earning a BA from IU with a double majors in economics and German and a BS degree in geology, Snow moved to the University of Rochester where he did geochronologic and geochemical investigations on ancient gabbroic complexes using Sm-Nd methods, earning a master's degree in 1986. Subsequently, he earned a PhD in 1993 from M.I.T./Woods Hole, studying Nd, Sr, and Os isotope systematics in oceanic peridotites. He continues to work on oceanic mantle rocks at Mainz. His main hobbies are his family and his continuing participation in bicycle racing.

Mark Storck, MS'88, has made a career change into elementary education. He is a sixth-grade teacher at Heart of the Earth Survival School, an American Indian inner-city school in Minneapolis.

James P. Struhs, BS'87, is currently employed as a hydrogeologist by JBR

Environmental Consultants Inc., Salt Lake City.

Since 1993, **James W. Sukup**, BS'75, has been a hydrogeologist for Keramida Environmental, Indianapolis. He also produces the RPI Ratings of college basketball, provided via the AP to more than 1,400 newspapers nationwide.

Thomas R. Thickstun, BA'82, of Bloomington, recently established T.R. Thickstun Glass Co. His grandfather, Garnet Thickstun, was the founder of

Thickstun Glass, which was owned and operated by the family from 1950 to 1980.

Stephen Wells, BS'71, is now executive director of the Quaternary Sciences Center at the Desert Research Center, Reno, Nev. He was previously professor of geomorphology at the University of California, Riverside.

After graduating from IU, **Dianne White**, BS'88, MS'90, worked for ATEC Associates Inc. and Metcalf and Eddy Inc. for two years as an environmental consultant. From 1990 to 1992, She worked toward an MS in geochemistry, completing her thesis concerning a dike swarm in the eastern Sierra Nevada. Afterwards, she worked for two years at Bechtel Corp. as an environmental consultant. Dianne was married in June 1995 to Tassilo Schneider in a gothic cathedral in Freiburg, Germany. She has been taking intensive German and hopes to find a job in Freiburg as an environmental consultant once she becomes fluent. ■

In memoriam

George Ericksen, MA'49, died on Jan. 14, 1996, in Reston, Va. He received the Owen Award from the department in 1988. Erickson and his wife visited the department in the summer of 1995. He had just celebrated 50 years at the USGS.



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Report on fund-raising

Geological Sciences at the Forefront "\$5 Million in 5 Years"

George Nevers, MA'57, former president of Garnet Resources, and **Lee Suttner** will co-chair a challenging campaign to increase the department's endowment by \$5 million before the end of 2001. More than \$1 million has already been pledged.

A \$5 million endowment will provide continuing annual support for:

- Three graduate fellowships;
- Twenty scholarships for undergraduate students enrolled in summer field courses;
- Travel and relocation expenses for 10 undergraduate interns;
- Two postdoctoral fellowships;
- One full and two partially-endowed faculty chairs; and
- \$40,000 for equipment, instrumentation, and enhancement of analytical and computational facilities.

The department will continue to aggressively pursue sources of funding to support its research and to maintain its facilities. But the endowment will give us a competitive edge in recruiting and retaining the best students and scholars in the nation and the ability to surround them with state-of-the-art equipment and facilities.

The campaign received a jump start from more than \$500,000 in pledges made by members of the advisory board during an intensive three-week period of solicitation last April. **George Nevers** and **Mal Boyce** joined **John Hayes** and **Lee Suttner** in presenting a proposal to **Myles Brand**, president of the university, to raise \$4.5 million in five years if he would commit the university to match the initial \$500,000. He has agreed to do so under the condition that we attain our goal. The challenge is enormous, but the payoff will be even greater. Never in the history of the department has your support been needed more than it is now if we are to reach the summit we have set.

Alumni and friends of the department and the Geologic Field Station will be contacted by mail, by phone, or in person over the next two years. A five-year pledge will be sought. All pledges made by 2001 will count toward the goal. The department welcomes inquiries and comments about the campaign.



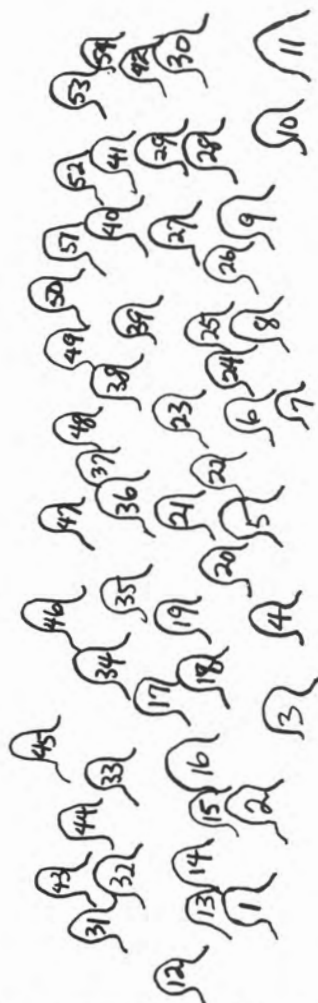
We hope that you will consider making a donation to the Department of Geological Sciences. Please make your check payable, with the one exception noted below, to the IU FOUNDATION.

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