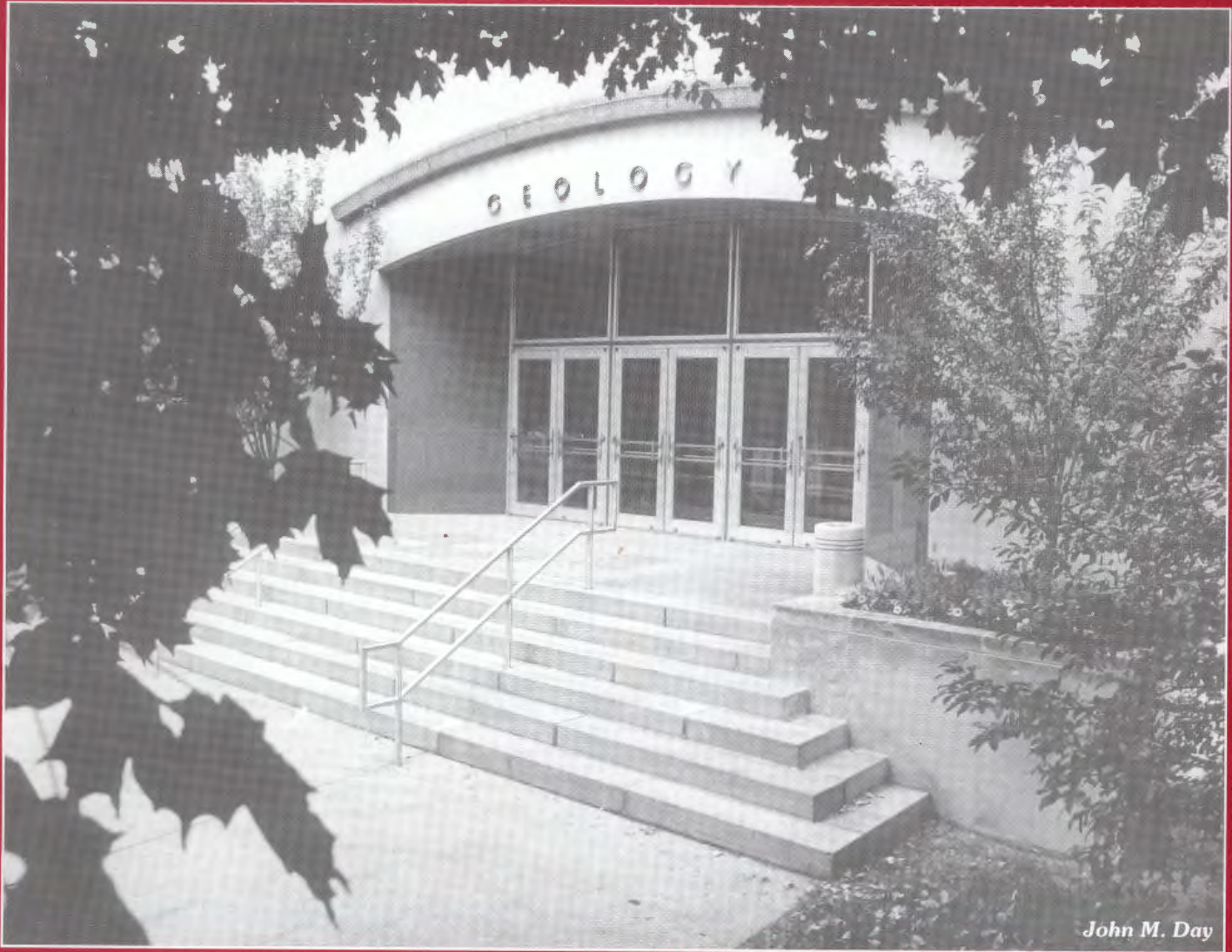


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Indiana University College of Arts & Sciences Alumni Association

HOOSIER GEOLOGIC RECORD

Alumni Newsletter of the Department of Geological Sciences



John M. Day

Winter 1999

HOOSIER GEOLOGIC RECORD

Table of Contents

Chair's Greeting	1
Departmental News	2
Colloquium Series and Presentations	5
Other Presentations	6
Geologic Field Station Update	7
Indiana Geological Survey Update	9
Faculty News	12
Department of Geological Sciences Faculty and Staff	14
Faculty Research Grants	17
Student News	18
Advisory Board Update	19
Alumni News	22
Alumni Receptions	23
Class Note Form	23
1997 Donors	24
Department Photo	inside back cover



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



On Dec. 1, 1998, **Christopher Maples** became chair of the Department of Geological Sciences, replacing **Lee Suttner**, who had returned to the chair following the departure of **John Hayes** in July 1996. Maples comes to IU from positions held as a section chief and senior scientist with the Kansas Geological Survey, a time during which he also held the positions of courtesy professor at the University of Kansas and adjunct professor at Kansas State University. He also has just completed a three-year stint as program director in Earth Sciences at the National Science Foundation. There he

has been lauded for his leadership and interpersonal skills in successfully developing coordinated research programs across divisions and between directorates to support innovative, interdisciplinary initiatives in science funding. Maples' research achievements include almost 50 research publications in first-rate refereed journals, plus articles in guidebooks and open-file reports, and many abstracts. His studies in systematic paleontology have provided crucial evidence of global biodiversity and extinction dynamics and demonstrated the value of collections of exceptionally well-preserved fossils, or Lagerstätten, as pictures of entire fossil communities. He has also demonstrated the value of trace fossils (ichnology) in the understanding of such systems. Chris is also an excep-

tional field geologist and stratigrapher. His scholarly work was recognized by his receipt in 1994 of the prestigious Charles Schuchert Award, given annually by the Paleontological Society, the foremost North American society dedicated to paleontology, to an outstanding paleontologist under the age of forty. Chris has been an exemplary teacher of courses at the introductory and advanced levels and has extensive experience as a lecturer in professional short courses sponsored by the Paleontological Society. He has served on numerous master's and doctoral advisory and research committees. Chris also contributes extensively to the peer review system as a reviewer of manuscripts and proposals and through service on the editorial boards of several professional journals.

Chair's greeting

A promising future and a storied past built by our alumni

Warmest greetings to all of you from Bloomington. I cannot begin to express my thrill and excitement as I write the chair's greeting. Indiana University is the same wonderful place that I remembered as a student. Although I officially began on Dec. 1, my unofficial activities began before that date. I attended the Department's Advisory Board meeting in New Harmony in late October. This was a well-attended meeting at which I met new friends and supporters of the Department for the first time, and became reacquainted with old friends. After that, I traveled to the GSA meeting in Toronto, Canada, where the alumni reception drew more than 50 guests. At both of these functions, as at similar gatherings in the past at GSA, AAPG, and elsewhere, I was struck with the warmth and feeling of togetherness that stems from our Geological Sciences family. The alumni of Geological Sciences continue to be its greatest asset, and as an alumnus, I feel especially honored to have the privilege to return to Bloomington and participate in a promising future for you and us. Quite honestly, much of the future of Geological Sciences has been built by you — our alumni. Without your support and loyalty, our future would not be as bright. This department has the most dedicated, loyal alumni of any department I have ever known. And it is this strength, built on a storied past, that will help see us into the new millennium.

As 1999 begins, we are building on the 8-0 good-news victories outlined last

year in the greeting from Lee Suttner, the previous chair. The number of undergraduate majors continues to increase. Thanks to John Gibson, executive vice president for Landmark Graphics Corp., we have been selected as one of only a few departments in the country to receive a gift of Landmark software, valued at more than \$700,000, along with a multiyear maintenance agreement. We plan to interview for a new position in biogeochemistry this spring. Moreover, thanks to support from our alumni and friends, we are well under way with a departmental endowment campaign and

will be able to fill named chairs and professorships without having to wait for retirements and resignations. This continued vote of confidence from the College of Arts and Sciences runs counter to the trend of overall downsizing in COAS and speaks volumes about the College's perception and expectations of our future — a future that is grounded in our past and brightened by our loyal alumni and friends.

Warmest wishes to all of you for a joyful holiday season and happy, prosperous 1999.

— Christopher Maples

Chair's farewell

Greetings to alumni and friends

As we start the final year of the millennium, we have much to celebrate and a bright future to contemplate. On Dec. 1, Christopher Maples replaced me as department chair. Chris, who was awarded his PhD by Indiana University in 1985, brings to us boundless energy and enthusiasm, as well as unparalleled loyalty to the Department and university. He also comes with a unique vision for the geosciences forged by his previous three years as director of the Geology and Paleontology Program at NSF.

Chris was the unanimous selection of the faculty who voted on the chair candidates following his second visit last fall. Thus he comes with an incredibly broad and solid base of support among our faculty and students (and an easy act to follow, I might add). His appointment has elevated morale to the highest level I have observed in at least the last decade. We continue to celebrate his arrival.

Thanks to the generous contributions of many of you, which have led to remarkable early success in our endowment campaign, Chris will have the critical resources he needs to effectively lead the Department in its pursuit and

(continued on page 2)

Carl J. Smith receives 1998 Richard Owen Award

In October 1998, the Richard Owen Award, which honors a graduate of the Department who has distinguished himself or herself in industry, government, or academia, was awarded to Capt. **Carl J. Smith**, USNR (Ret), West Virginia Associate State Geologist and Deputy Director of Geoscience at the West Virginia Geological and Economic Survey. Carl received the MA degree from the Department in 1969 and then joined Gulf Oil Corp. as a production geologist. As an undergraduate at Columbia University, Carl was a midshipman in the NROTC, and while at Gulf Oil he entered the U.S. Navy during the height of the Vietnam War. He served more than four years of active duty, including in Vietnam, where he was a surface warfare officer and command duty officer.

Carl joined the West Virginia Survey in 1973 as a coal geologist/petrographer and subsequently became head of the Coal Section and associate state geologist/deputy director (1989), a position he currently holds along with an adjunct professorship at West Virginia University. He is a founding member of AAPG's Energy Minerals Division and has served in a variety of roles with the EMD, including those of councilor, vice president, and president. He is currently the division's editor. Carl also has served the Eastern Section of AAPG in many additional ways. These include being secretary, vice president, and president of that organization. The section bestowed the Distinguished Service Award on Carl in 1990 and honorary membership in 1992. The national AAPG gave him the Distinguished Service Award in 1994. He has been named a candidate for national sec-

retary of AAPG for the 1999–2000 term.

Over the years, Carl remained active in the Naval Reserve and was recalled to active duty during Desert Storm in March 1991. He served in Saudi Arabia for nearly a year and was responsible for command and control of all of the Department of Defense shipping in Southeast Asia that returned all U.S. Army and Marine Corps vehicles, tanks, and ammunition to the continental United States or Europe. Reaching the rank of commodore, Smith was the first reserve officer to serve as a military sealift command area commander, at one time commanding

65 ships in Southwest Asia waters. Carl has been awarded the Legion of Merit, two Navy Commendation Medals, the Army Commendation Medal, Meritorious Unit Commendation, Vietnam Service Medal, and others. He has been active in the Reserve Officers Association of America and served two years on the association's board of directors.

On Oct. 19, Carl Smith presented the Richard Owen Lecture, titled "A Memoir of the Gulf War: Another Conflict over Economic Geology," to the Department, following which a reception was held for Carl and his wife, Trudy.



Carl Smith, left, receives 1998 Richard Owen Award from Lee Suttner, chair.

Chair's farewell

(continued from page 1)

dissemination of knowledge. Less than three years ago, the Advisory Board for the Department boldly agreed to lead us in raising the staggering sum of \$5 million in just five years. What then seemed a dream is now approaching reality. We are already within \$1 million of our goal. Because of the campaign success, Chris has been authorized to recruit three new faculty immediately — this during a time

when the College of Arts and Sciences is confronting a 10 percent downsizing in faculty. Additional appointments of new faculty are likely to follow in timely fashion.

Growth of our faculty size is essential if we are to maintain the high national stature of our traditionally strong programs. Of the five programs in geoscience departments ranked in the 1998 annual *U.S. News and World Report* survey, three of ours (stratigraphy/sedimentology, paleontology, and geochemistry)

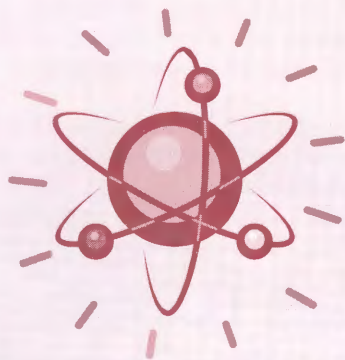
were rated in the top 20 nationwide. But key retirements and resignations by distinguished faculty in each of these areas have left us depleted and certainly will impact our 1999 standing.

Celebration also is the coming year's theme at the Geologic Field Station. In 1949, the first Indiana University students had the pleasure of their initial trip up the South Boulder and first view of Hollowtop. Ten years later, I had the same wonderful experience. This sum-

(continued on page 3)

Science Olympiad State Tournament

Bruce Douglas directed the earth, sea, and sky competition in this year's Indiana Science Olympiad Tournament, held on March 28, 1998. Some 26 teams in the middle school competition focused on everyday weather (storm development, cloud formation, and image interpretation) and tectonics (seismology, volcanism, and environmental impact). The 26 teams in the high school competition were involved in geo-resources (mining, energy resources, and environmental impact) and tectonics (seismology, volcanism, and environmental impact). Volunteers from the Department assisted in supervision of activities, set-up for some of the hands-on activities, and grading of the results.



Equipment acquired

Major equipment acquisitions for the isotope geochemistry laboratories were made in 1998. Two Finnigan MAT stable isotope mass spectrometers have recently been purchased. The first comes from Shell Oil Co., Houston, and includes a gas chromatograph and elemental analyzer system. The second mass spectrometer was purchased with an NSF grant awarded to **Lisa Pratt** and **Ed Ripley** at IU, along with **Tim Lyons** of the University of Missouri and **Tom Anderson** of the University of Illinois. This state-of-the-art isotope ratio instrument will be dedicated to high precision sulfur isotopic analyses of small volume samples.

President Brand attends geology class

Each spring, IU President **Myles Brand** takes on the role of a student during "president's switch day" on the IUB campus, and the student attends to presidential duties. As a consequence, on Feb. 11, Brand attended **Al Rudman's** introductory geology lecture in course G103 and chatted with Al before class (see photo). Both Al and Myles enjoyed the experience, though there were some nervous moments on Al's part when the high-tech classroom had some computer problems that were not resolved until a few minutes before Brand's arrival.



Al Rudman, left, chats with IU President Myles Brand after Al's class during "president's switch day."

Chair's farewell

(continued from page 2)

mer, the 50th group of students will have their opportunity to follow in the tracks across the section traversed by more than 5,000 students before them. The 50th anniversary will be special. We hope many of you will choose this summer as a time to re-visit a piece of Indiana in Montana. More about the anniversary celebration is found elsewhere in this publication.

The support and encouragement offered by so many of you have made my nearly seven years as department chair memorable, rewarding, and satisfying. For this I am most grateful. My travels to various parts of the country for alumni receptions have given me opportunity to meet many alumni who pre-dated my

arrival at Indiana University in 1967. All seem to share fond memories of their days in Bloomington and a commitment to their alma mater. Support, encouragement, commitment — these are what we depend on from our alumni. We need them to successfully complete the endowment campaign; more important, we need them to foster outstanding learning experiences for the generations of students who will follow in their path. I do hope we can count on you to support us, to encourage us, and to commit to us.

Sincere thanks to all of you who have given me so many wonderful memories in my 32 years at IU for my own personal celebration. And I, indeed, am looking forward to the future as a "normal" member of the faculty again.

— *Lee J. Suttner*

Departmental news

(continued from page 3)

Exxon hosts Green River Basin field trip

Exxon Corp. invited five graduate students — **Tom Kulp**, **Karl Leonard**, **German Mora**, **Carrie Nolan** and **Chris Willan** — and **Simon Brassell** as accompanying faculty as representatives from the Department to join students and faculty from the University of Utah, the University of Wyoming, and Louisiana State University on a post-AAPG field trip conducted in the Green River Basin in late May 1998. The emphasis of the trip was on the sequence stratigraphy and geochemistry of lacustrine rocks. The field trip was led by **Kevin Bohacs**, accompanied by other Exxon personnel. The three days in the field focused on examinations of stratigraphic sections of freshwater, alkaline, and hypersaline sediments, and was supplemented with evening classroom sessions and discussions leading to an exercise in regional identification and assessment of sequence relationships.

Burton leaves

Sarah Burton, administrative assistant and a devoted staff member of the Department from May 1986 through March 1998, has resigned that position and accepted an administrative appointment with the School of Library and Information Science. Everyone in the Department extends sincere appreciation to Sarah for her outstanding service over the past 12 years and wishes her every success in her new job. Sarah was honored with a reception on March 25, 1998. **Kim Schulte**, formerly secretary for the Geologic Field Station, has become administrative assistant for the Department.

Department gains Sun workstations

A new cluster of Sun computer workstations opened in September in renovated Geology Room 226. This Unix cluster provides a tremendous computing resource for our students.



Overall productivity shows growth

For the fourth consecutive year, there has been a rise in number of undergraduate majors in the Department, which now total 73 relative to a low of 43 four years ago. This has been partially offset by a drop in the number of graduate students from 60 to 46. Faculty research grants during fiscal 1997–98 totaled 52, with total expenditures of \$4.1 million compared to 40 grants and expenditures of \$3.5 million in 1996–97. The 1997–98 totals are essentially equivalent to totals in 1993–94 when the faculty was 27 percent larger in size. Increased teaching demands on a faculty reduced by recent retirements and departures emphasize the need for growth in personnel in the near future if productivity is to be increased further.

The recent undergraduate and graduate curriculum innovations are now fully in place and have had significant effects, especially at the undergraduate level with the change to multiple (~100 students) sections of a variety of 100-level courses. These include both new topics-centered courses (e.g., earthquakes and volcanoes, meteorites and planets, oceanography, prehistoric life, and environmental geology) while retaining the traditional introductory courses in physical and historical geology. Increased enrollments and interest in these courses is manifest in an increase in the number of undergraduate majors being recruited.

Library builds for the future

Major contributions from the **Exmin Corp.** and **Harold Kaska** have enabled us to establish a new endowment for the IUB Geology Library. The endowment will create a stable source of support for the “little extras,” which will enhance the excellence of our widely acclaimed library, including the technology to provide access to 21st-century information sources and state-of-the-art computers to explore new research avenues.

This is the 17th consecutive year of contributions totaling more than \$85,000 for the library from Exmin, which has its North American office in Bloomington and is one of the world's leading diamond exploration companies.

If you would like to designate a gift or make a pledge for the new library endowment, contact Lee J. Suttner, director of development for the Department.

Raymond Fletcher visits IUB

Raymond C. Fletcher, adjunct professor of geological sciences, University of Colorado at Boulder, visited IU as a Fellow of the Institute for Advanced Study during April 1998. Ray was hosted by **Enrique Merino** of the Department. Fletcher's field of research is rheology and structural geology, on large and small scales, theoretical and observational. He has studied folding, Basin-and-Range-type deformation, decollement and ramp folding, glacier dynamics, pressure solu-

tion, metasomatism, and other physical and physico-chemical subjects. Ray also has authored an outstanding book on folding of viscous layers (with **A. Johnson**, Columbia University Press, 1994). At IU, Fletcher worked on interacting rock deformation and mineral-reaction kinetics, gave a colloquium lecture, visited the IU Northwest Geology Department, and led meetings of Merino's course in petrography/geochemistry (G490/G690).

Endowment campaign: \$5 million in five years!

Much good news surrounds the department's historic endowment campaign, but we remain \$1 million short of our goal, so an enormous challenge continues to confront us. We need your support!

In May, a gift of \$500,000 was contributed to the Department to establish the Robert Shrock Professorship in Sedimentary Geology in honor of one of the Department's most distinguished alumni

and its first Owen Award recipient. With the Malcolm and Sylvia Boyce Professorship, which was announced last year, the first two endowed professorships in the history of the Department now are in place. A third professorship in Emeritus Professor Judson Mead's honor and targeted for geophysics is nearly 80 percent funded, following a \$250,000 gift recently given to the Department along

(continued on page 5)

Look who's talking: 1997-98



• Sept. 15, **Tony Park**, Indiana University: "CIRF.B Basin Simulator: Its Chemical Compaction Model and Other Nonlinear, Reaction-transport-mechanochemical Processes"

• Sept. 29, **Jeff White**, Indiana University: "Greenhouse Gas Production in Peatland Soils: Stable Isotopic Evidence of Seasonal Cycles"

• Oct. 6, **Mal Boyce**, Chevron Petroleum Corp. (retired): "Change, Instant Replay and Fast Forward" (Owen Award Address)

• Oct. 13, **Lawrence Taylor**, University of Tennessee: "Kimberlites as Windows into the Mantle: An Unexpected

Origin for Diamonds" (Owen Award Address)

• Oct. 15, **Mark Richardson**, Exxon Research Laboratory: "Integrated Petroleum Geochemical Studies of the United States Gulf of Mexico"

• Oct. 28, **Ray Russo**, Northwestern University: "Mantle Dynamics and Plate Motion: The Andes, the Atlantic, and the Alps"

• Nov. 3, **Richard Hay**, University of Illinois: "Authigenic K-feldspar in Uppermost Precambrian and Lower Paleozoic Rocks of the North American Midcontinent: "Dating and Speculation about Origin"

• Nov. 10, **Hubert Staudigel**, Scripps Institution of Oceanography: "Biologically Mediated Alteration of Volcanic Ash in Seawater: Litho-, Bio-, and Hydrosphere Interaction"

• Nov. 17, **John Holbrook**, Southeast Missouri State University: "Valley-fill Sequence Stratigraphy and Bounding Surface Hierarchies"

• Nov. 24, **Alan Horowitz**, Indiana University: "The Fossil Record of the
(continued on page 6)

Landmark Graphics Corp. gives state-of-the-art software

In October 1998, Landmark Graphics Corp., the leading supplier of software for the oil and gas industry, informed the Department that it would become one of only five nationwide that submitted a successful proposal requesting software and related maintenance from the corporation. The estimated value of the package is \$713,000 for the first three years of the grant with an option for renewal. Much of this software has been installed and testing has begun. There will be a resulting quantum jump in the availability of computing power for researchers and

students in the Department to do seismic processing, unified well logging, and integration of data sets with an interpretive workstation. State-of-the-art software includes Promax (both 2-d and 3-d

packages for processing seismic reflection data), Seisworks (standard 2-d and 3-d interpretation software for reflection data), and Stratworks (integrates seismic and well log information).

Come visit our World Wide Web pages

- Department of Geological Sciences: <http://www.indiana.edu/~geosci/>
- 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/>
- Mailboxes and home pages: <http://www.geology.indiana.edu/folks.html>
- Indiana Geological Survey: <http://adamite.igs.indiana.edu/index.htm>

Endowment

(continued from page 4)

with several smaller pledges. Contributions toward the Haydn Murray Chair in Applied Clay Mineralogy continue to accumulate. We hope to be able to announce in next year's newsletter the successful completion of the fund-raising for this \$1 million chair.

The Department also was one of six selected nationwide this year (see below) to obtain software from the Landmark Graphics Corp. valued at more than \$730,000. Although this cannot be counted toward the campaign goal, it represents the largest gift-in-kind in the history of the Department. Landmark Graphics is a leading supplier of software for the oil and gas industry. This gift will have an impact on the training of all of our incoming graduate students, each of whom will be required to enroll in at least one course utilizing the software.

Two numbers help to place the mag-

nitude of our campaign goal and endowment in proper perspective. The College of Arts and Sciences five-year endowment campaign target is \$35 million. Just five years ago, before its campaign began, a total of only seven chairs and professorships were endowed in the entire College. We are one of the smaller of the 38 departments in the College, yet, if successful, we will be raising nearly 15 percent of the College goal and will almost double the number of chairs/professorships that existed in the College prior to the start of its campaign. This gives us much to be grateful for and gives you, our alumni and friends, much to be proud of.

But our job is far from over. We need your continued support if we are to finish the final 20 percent. Our incentive to do so is great. President Brand has promised to match in perpetuity the income generated by the initial \$550,000 raised in the campaign if we can meet our goal. We are committed to making him implement his promise.

By now you have received a letter from us asking that you make a five-year pledge. If you have not already done so, please give this serious consideration. All pledges made before the end of the campaign can be counted toward the goal. Designate how you would like your gift to be used — for scholarships, research and teaching technology, fellowship support, or for the Field Station. (Dick Gibson's generous offer to match all contributions to the Field Station up to \$5,000 annually remains in effect, adding still more incentive.) Contributions for the Mead Professorship and Murray Chair also are still needed. Much of the income for these positions is to be used for support of students working with the faculty member holding the chair or professorship, so your gifts for these causes can have a direct impact on students. For more information on giving opportunities, call Lee Suttner, director of development, at (812) 855-4957, or e-mail him at suttner@indiana.edu.



Other presentations: 1997-98

● Oct. 6, **Robert Henchoz**, Schlumberger Geco-Prakla: "Career Opportunities in Schlumberger Geco-Prakla"

● Oct. 8, **Nathaniel Tilander**, Chevron Oil Co.: "Processing of Seismic Data from Overthrust Areas in Latin America"

● Oct. 14, **Lawrence Taylor**, University of Tennessee: "Magmatism on the Moon: The Magma Ocean and Basaltic Volcanism"

● Oct. 14, **Fabian Wirnkar** and **Lee McRae**, Amoco Oil Co.: "Overview of Amoco for 1996 and the strategy for the next five years"

● Oct. 16, **Barbara Rassmann**, Exxon Production: "Typical Steps to Upstream Evaluations"

● Oct. 28, **Ray Russo**, Northwestern University: "Seismicity and Structure of the SE Caribbean Plate Boundary Zone"

● Dec. 9, **Christopher Maples**, National Science Foundation: "NSF Funding in the Earth Sciences and Proposal Writing Tips"

● Dec. 16, **Jeffrey Park**, Yale Univer-

sity: "Metamorphic Dehydration and Earthquake Nucleation"

● Jan. 20, **Barbara Ransom**, Scripps Institution of Oceanography: "Clay Minerals and Cl Isotopes: New Ways of Looking at Fluid Generation and Migration"

● Feb. 3, **Timothy Lyons**, University of Missouri: "The Geochemistry of Modern Anoxic Marine Basins: Exploring the Paradigm Using Examples from the Black Sea, the Cariaco Basin, and Other Classic Sites"

● Feb. 9, **Joseph Callis**, Geco-Prakla: "Removing Seismic Multiples Using PRT"

● Feb. 17, **Brian Willis**, University of Texas: "Low-stand Deltas in the Frontier Formation of Central Wyoming"

● March 3, **Peter Harries**, University of South Florida: "Isotope Paleontology in the Pierre Shale: Paleoclimatic and Paleoceanographic Implications"

● March 5, **William Jones**, Indiana University: "In Search of the Taino Indians — Archaeological and Limnological Investigations in the Aleta Sinkhole, Dominican Republic"

● March 23, **Isabella Velicogna**, University of Trieste, Italy: "Geodynamic Implications of Elastic Thickness in the Central Mediterranean Region"

● March 27, **J. Robert Dodd**, Indiana

University: "Tales from the West Pacific or Macro Adventure in Micronesia"

● April 2, **Ronald Seavoy**, Indiana University: "SEG Mid-Andean Field Trip, November 1997, Bolivia and Northern Chile"

● April 17, **John Brahana**, University of Arkansas/USGS: "Savoy Experimental Watershed, a Major Karst Hydrogeologic Study"

● April 23, **Raymond Fletcher**, University of Colorado: "Emplacement of the Mickey Salt Glacier, Gulf of Mexico"

● April 27, **Seth Stein**, Northwestern University: "Thermal Evolution of Oceanic Lithosphere from Bathymetry, Heat Flow, and Gravity"

● May 5, **David Dilcher**, Florida Museum of Natural History: "Angiosperm Leaves as Guides to Climates, Past, Present, and Future"

● May 6, **Kevin Furlong**, The Pennsylvania State University: "Complex Patterns of Seismic Anisotropy in Regions of Active Tectonics"

● May 8, **Christopher Maples**, National Science Foundation: "The Theoretical Underpinnings of Cluster Analysis (Is What You See Really What You Get?)"

● May 12, **Don Elthon**, National Science Foundation: "Discussions of Research Interests"

Look who's talking

(continued from page 5)

Bryozoa: Species Diversity"

● Dec. 1, **J. Robert Dodd**, Indiana University: "Similarity between Indiana and New Zealand Limestones — Is the Tropical Model Adequate for Interpreting Paleozoic Limestones?"

● Dec. 8, **Robert Stanton**, Texas A&M University: "Coordinated Stasis: Is It Real?"

● Jan. 20, **Barbara Ransom**, Scripps Institution of Oceanography: "Organic Carbon Preservation in Continental Margin Sediments: Mineralogy, Surface Area, and the 'Monolayer' Hypothesis"

● Feb. 2, **Timothy Lyons**, University of Missouri: "Reconstructing Precambrian Paleoenvironments: An Integrated Geochemical Approach with Examples from the Belt Supergroup (Montana) and the Canadian Arctic"

● Feb. 5, **Vincent Andrews**, Arizona State University: "The San Andreas Fault: Past, Present, and Future"

● Feb. 16, **Brian Willis**, University of Texas: "Evolution of Fluvial Dominated Valley-Fill Deposits in the Cretaceous Fall River Formation"

● Feb. 23, **Stanley Ambrose**, University of Illinois: "Reconstructing African Hominid Environments with Paleosol Stable Isotopes"

● March 2, **Peter Harries**, University of South Florida: "Comparing and Contrasting Mass Extinction Repopulations: Patterns and Controls"

● March 11, **Victor Targulian**, Russian Academy of Science, Moscow: "Soil as an Open Earth System of Biotic and Abiotic Repopulations: Functioning, Recording, Regulation"

● March 30, **James Farlow** and **Jack Sunderman**, Indiana University Purdue University Fort Wayne: "A Late-Tertiary Biota, Pipecreek Junior Sinkhole, Grant County, Indiana"

● April 6, **Paul Doss**, University of Southern Indiana: "Transient Groundwater Flow: Shorelines, Swamps, and Schists"

● April 13, **Thomas Johnson**, Univer-

sity of Illinois: "Selenium Isotope Ratios As Indicators of Sources and Cycling of Selenium in Modern and Ancient Environments"

● April 22, **Raymond Fletcher**, University of Colorado: "Folding and Mineral Growth in Rocks: Focus on the Physical Process"

● April 27, **Seth Stein**, Northwestern University: "Space Geodesy and Plate Tectonics"

● May 4, **David Dilcher**, Florida Museum of Natural History: "Biostratigraphy and Evolution of Early Flowering Plants"

● May 5, **Kevin Furlong**, The Pennsylvania State University: "Geodynamics of the San Andreas: Why Mendocino Matters"

● May 7, **Christopher Maples**, National Science Foundation: "Ichnology: A Multi-Proxy Tool for 'Soft Rock' Geoscience"

● May 11, **Don Elthon**, National Science Foundation: "Magmatic Processes in Ophiolites and Oceanic Crust"

Geologic Field Station update

As the Field Station is poised to enter its 50th anniversary year, a look back over the past year will once again point to many changes, including three faculty retirements, three new faculty hires, personnel changes at the resident manager level, the introduction of a new environmental science course (G329), and moderate re-structuring of the traditional and environmental options of G429. It has also been a year of sorrow stemming from a fatal traffic accident (the first in Field Station history) that took the lives of three visit-

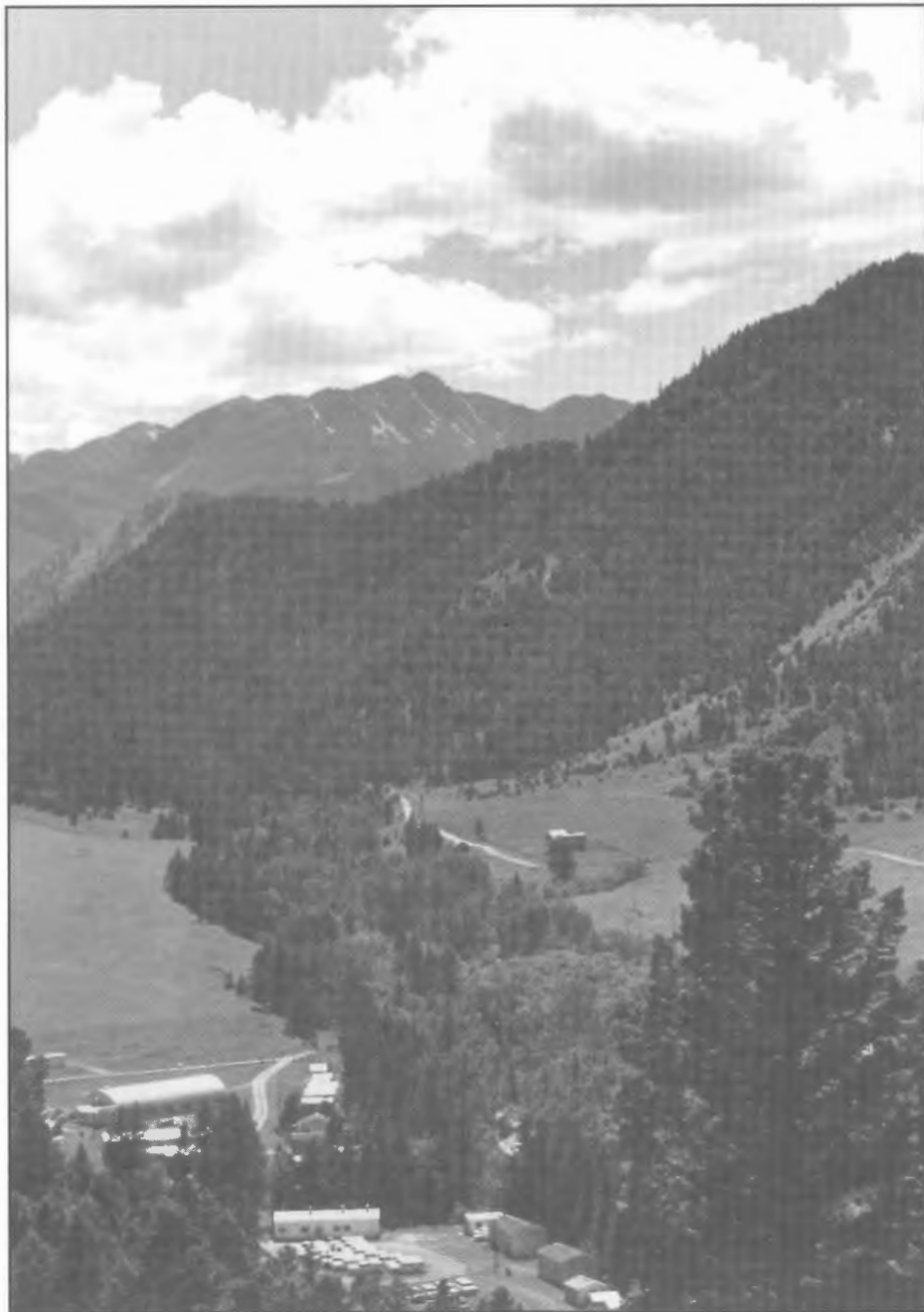
ing students. But, finally, the year has ended on a positive note with a gala Field Station celebration that drew more than 50 people representing both current and past faculty, staff, and families.

First and foremost, a report on the enrollment situation. For several consecutive years, the Field Station has witnessed a decline in overall enrollment. Last year, the trend was halted, and this past year the enrollment numbers started to climb once again. In 1997, the total enrollment in both options was 73. The 1998 total enrollment was 84. This in-

crease can in part be attributed to an active recruiting program in New England and the Midwest that was instituted early in 1998. We are hopeful that even more vigorous recruiting will lead to a steady enrollment increase in the years to come.

After innumerable years of combined service to the Field Station, **Garry Anderson** (St. Cloud University), **Bob Cassie** (SUNY Brockport), and **Lloyd Furer** (Indiana Geological Survey) retired this year. Garry Anderson, an IU PhD with a specialty in paleontology, first joined the program in 1972 as a faculty member in Option II. For several years, he was in charge of the Option II academic program and faculty. Garry's years of experience and expertise are irreplaceable, and he will be sorely missed. Long remembered will be his daily salutation to the Golden Sunlight Mine during the early morning drive into the field. Bob Cassie, a fellow PhD student with Lee Suttner at Wisconsin, first joined the program in 1968 as an Option II faculty member. Except in 1969, when he taught in both options (!), Bob taught most summers in Option II until 1978, when he permanently moved to Option I. Bob's specialty is structural geology and metamorphic petrology. Over the years, he has trained generations of G429 students in the intricacies of field structural geology and petrology. In the view of this writer, Bob is one of the best "all around" geologists in the business and can simply not be replaced. Bob's teaching duties in Option I will be taken over by **Sue MacDonald** (Morningside College), who will move over from Option II, where she has been a faculty member for five years. Lloyd Furer (another Wisconsin PhD student with Lee Suttner and Bob Cassie), joined the Option I faculty in 1986. Lloyd is currently a research scientist with the Indiana Geological Survey, but spent many years "in the oil patch" as an exploration geologist with both major and independent oil companies. Stemming from his work in the oil industry, Lloyd has a vast knowledge of the stratigraphy of the western U.S., as well as the subsurface stratigraphy, structure, and oil and gas potential of all of the intermontane basins where G429 visits or works. His expertise has provided a very important "practical" component to the instruction that students have received.

(continued on page 8)



Field Station

(continued from page 7)

Since Lloyd's departure, we have all done our best to provide this same level of relevancy and practicality in the work that we do, but at best we can only imitate, never replace his contributions.



Many Glacier Hotel, Glacier Park, Montana, July 1956. From left, Jud Mead, Charles Deiss, Tom Perry, Wayne Lowell, and Ray Gutschick

As three faculty members leave the Field Station (but never the family), three new faculty members have joined the program. **Paul Doss** (University of Southern Indiana) will join us next year as a full-time faculty member in Option

II. Paul's specialty is hydrogeology and most of his efforts will be directed towards further developing and teaching the environmental option, G429e. Paul has been associated with G429 for some time, first as a student, then as an AI, and finally as a part-time faculty member in Option II during the past two years.

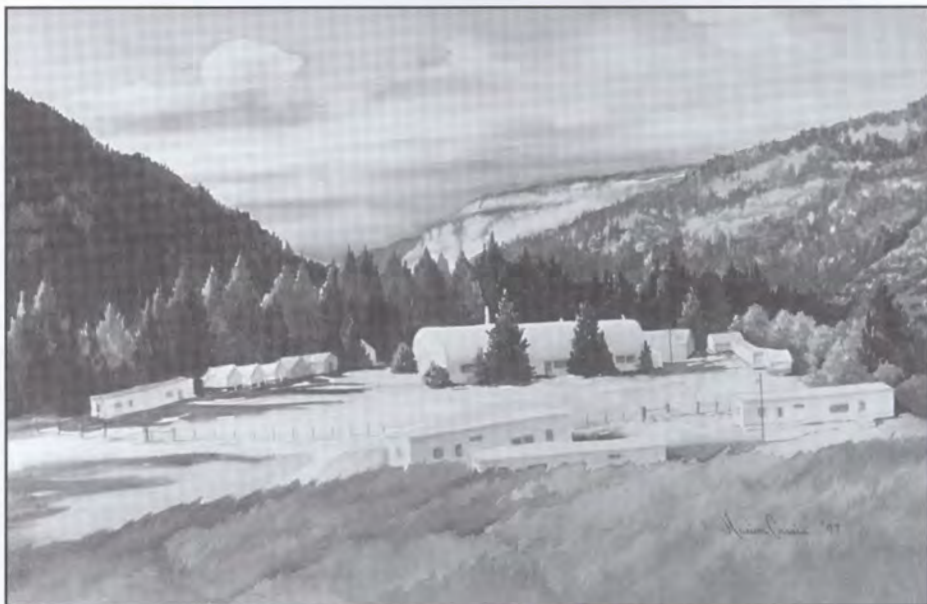
has expertise in the areas of plant and aquatic biology and ecology, and Ginger, who lives year-round in Bozeman, brings a specialty in geomorphology and field ecology.

On the academic front, significant changes have been taking place. Faced with reduced enrollments and potential budget deficits, G429 and G429e were scaled back from six-week / seven-credit to five-and-a-half-week / six-credit courses. To reduce the length of the courses, the initial caravan trip has been shortened by two days, the Glacier trip by one day, and time at the Field Station by one day. This cost-cutting measure, coupled with active recruitment efforts and frugal spending habits have turned around a several-year slide in the financial health of the Field Station, and we are now climbing back to our former position of security. The Field Station is also encouraged by the early success of G329, our new course in environmental field geology. This four-week course was developed as part of the new BSES degree program on the Bloomington campus. The course emphasizes field geology, geomorphology, climatology, soil geology, and plant and aquatic biology and ecology. Faculty members include **Lee Suttner** and **Greg Olyphant** (IU Geological Sciences), as well as **Clara Cotten** and **Ginger Birkeland**. Our initial offering last summer, with an enrollment of seven students, far exceeded our expectations, and we are very excited about the future.

After innumerable years, the position of full-time resident manager has been
(continued on page 9)

Clara Cotten (IU Department of Biology) and **Ginger Birkeland** (University of Arizona) constitute the full-time core faculty of G329, a new course in environmental field science taught for the first time this past summer (see below). Clara

To commemorate the 50th anniversary of the IU Geologic Field Station, Marion Cassie, wife of former Option I faculty member Bob Cassie, has painted a handsome watercolor of the Field Station, copies of which are available for purchase. Color photographs or digital prints are available in the following sizes and prices: 5"x7", \$10 (photo) / \$5 (print); 8"x12", \$20 / \$10; 11"x14", \$30/\$15; and 16"x20", \$50 / \$25. Orders should be sent to IU Geologic Field Station, Department of Geological Sciences, Indiana University, Bloomington, IN 47405. Please make checks payable to the IU Geologic Field Station. Specify choice of size and photo or print. A black-and-white copy of the painting is shown here.



Watercolor by Marion Cassie

Indiana Geological Survey update

On June 24, 1998, **Norman C. Hester**, 13th state geologist and director of the Indiana Geological Survey, was honored upon his retirement at a reception in Bloomington at the DeVault Alumni Center. **John Hill**, assistant director of the IGS, presented the Sagamore of the Wabash to Norm on behalf of Governor **Frank O'Bannon**. Among the many contributions for which Norm was recognized in receiving the award, cited as particularly meritorious,

were the creation of a multistate consortium of geological surveys, a revitalized geologic mapping program, earthquake hazards zonation mapping, and transfer of the Geological Survey from the Department of Natural Resources to Indiana University. Also during the retirement program, Senator **Robert Meeks** of Elkhart presented Norm with the Indiana Senate's Outstanding Service Recognition Award. Additional awards were presented by representatives of the State

Emergency Management Agency and the State Board of Health.

To honor Norm Hester's 12 years of outstanding service to the Indiana Geological Survey and to the citizens of Indiana, the Hester Fellowship has been established to help fund geologic mapping in Indiana. The faculty and staff of the Department of Geological Sciences, in which Norm has held the rank of professor, also extend their appreciation and congratulations upon his retirement.

A message from Indiana's new state geologist, John Steinmetz:

I was very pleased recently to be selected as the 14th director of the Indiana Geological Survey and state geologist of Indiana. I had been serving in a similar capacity as the director of the Montana Bureau of Mines and Geology. While I know many people are a bit incredulous that someone would actually choose to leave Montana (especially the faculty, staff, and students who have in one way or another experienced Indiana's Geologic Field Station), the opportunities and challenges at the IGS were what attracted my attention and were ultimately strong enough to pull me away from a wonderful position in a beautiful state.

I am no stranger to the Midwest, having been born and raised in Minnesota and Illinois. I received my BS and MS degrees in geology from the University of Illinois at Urbana-Champaign. During my upper-level undergraduate and graduate years there, I worked part time and later full time at the Illinois State Geological Survey, first in the Stratigraphy and later in the Industrial Minerals sections. I even worked for Norman Hester, then a fresh PhD from the University of Cincinnati.

While performing research on the sorptive properties of limestones and dolomites for removing sulfur dioxide from coal-burning power plants, I learned and became fascinated with scanning electron microscopy and energy dispersive X-ray analysis. These two magnificent tools and my interest in paleontology led me to completing my master's and doctoral research in micropaleontology. Following completion of my master's degree at Illinois, I began my doctoral studies at the Rosenstiel School of Marine and Atmospheric Science at the University of Miami.

At Miami, I spent five years "in the dark" and paying my way through school by running the SEM Lab. I also participated in a Deep Sea Drilling Project cruise to the North Atlantic and utilized that experience to collect some of the sample materials for my dissertation on the biostratigraphy and global distribution of Miocene calcareous nannofossils. Following my graduation from Miami, I taught marine geology, micropaleontology, and scanning electron microscopy (still in the dark) at the University of South

(continued on page 10)

Field station

(continued from page 8)

downsized to that of part-time summer caretaker. **Grant Estey**, who has held the resident manager position for the past four years, has decided to leave the Field Station and return to the construction business in the Flathead Lake area of northern Montana. Faced with a Field Station potentially devoid of a year-round resident, **Dick Gibson**, a former G429 student, associate instructor, and long-time volunteer staff member in Option I, has agreed to move his geophysics consulting business from Golden, Colo., to Cardwell, Mont., and take up permanent residence at the Field Station! During the nonsummer months, Dick will act as a

resident manager and keep an eye on things. During the summer months, the appointment of a formal summer caretaker will give Dick the opportunity to participate in the teaching of G429. A better solution to a very tricky problem could not have been found!

The low point of the year was a fatal traffic accident involving the deaths of two IUPUI biology students and a visiting guest. The students, along with their faculty supervisor, were using the Field Station as a base for studies of conifer forests in and around the Field Station area. The single-vehicle accident occurred on I-90 between Cardwell and Bozeman when the driver lost control of the vehicle. In memory of the victims, many of last year's G429 students donated money

for a memorial tree, which is now growing strong in the front lawn of the Field Station.

Finally, on a most pleasant note, the retirements of **Garry Anderson**, **Bob Cassie**, and **Lloyd Furer** provided the opportunity for a Field Station gathering in Bloomington in early November. People came from as far away as New York and Minnesota to take part in the event. More than 50 people, representing several generations of Field Station faculty and families, attended. It was an evening of friendship and memories, and has provided the best evidence yet that the "Field Station Family," and hence the Field Station itself, is alive and well and poised for the decades to come.

—James G. Brophy

Survey

(continued from page 9)

Florida in St. Petersburg.

After five years on the faculty in St. Pete, I accepted an offer to join Marathon Oil Co.'s Denver Research Center in Littleton, Colo. For 12 of some of the most rewarding years of my career in geology, I pursued research in the applied aspects of micropaleontology and biostratigraphy, first in domestic U.S. ventures, and later in the international arena. I was also able to investigate high-resolution biostratigraphy applied to petroleum exploration, and I published numerous papers on stable isotope stratigraphy and sedimentation of nannofossils. Additionally, I worked with colleagues and published on aspects of Marathon's exploration in Indonesia, Tunisia, Kenya, Egypt, Syria, and Argentina. My only regret was, for as many years as I studied Egyptian stratigraphy in the Red Sea and the Nile Delta (I think I could have led field trips there), I never found an airline ticket to Cairo in my project requests!

My research and management experience at Marathon must have been what Montana required, for I was the successful applicant in 1994 to become the director of the Montana Bureau of Mines and Geology and state geologist. Situated on the campus of Montana Tech, the Bureau (as it is known in Montana) was a wonderful place to work. I thoroughly enjoyed my three-and-a-half years there, and my departure was rather bittersweet.

Nevertheless, trading Butte for Bloomington has certain obvious advantages. Surprisingly, the Bureau and the Geological Survey here are quite similar in many ways: Both obviously have similar missions, both have staffs of about 60, both have highly dedicated and motivated staffs, both are situated on university campuses, both have budgets that are established biennially, and both are NOT in the capital city. The advantage to the last factor becomes important during the legislative sessions, when rumors rule, and the physical distance from "the action" can play to one's advantage (and save one's sanity).

The differences between the two insti-

tutions are notable as well. Because the Geological Survey is an institution of Indiana University, it is not nearly as politicized as the Bureau, which is a state agency located some distance from Helena. IGS has a slightly greater budget, but a greater proportion of it is committed to salaries and benefits than the Bureau's. (One immediate priority of mine will be to maintain current employee strength in the Geological Survey's many programs while discovering means to raise more operational and discretionary resources.) Finally and clearly, the



John Steinmetz, left, and Norman Hester upon the occasion of Steinmetz succeeding Hester as Indiana state geologist and director of the Indiana Geological Survey.

greatest difference between the two surveys is the immediate and very beneficial association IGS has with Indiana University and, most especially, the Department of Geological Sciences. I am still discovering the enormous resources available to the Geological Survey staff, and to me — whether administrative, human resource, training, or research.

I am humbled to be associated with such a fine organization as the Indiana Geological Survey. In many ways, I feel my entire career has been in preparation of the task ahead of me. My years in academia, in research in the petroleum industry, and, most recently, at another geological survey, prepared me well for the responsibility. It is too early to relate exactly how I will change the IGS. I certainly don't intend to fix something that is running so well. My management style is different, and I will most assuredly bring that to bear. Internally, we are adding new efficiencies with various per-

sonnel, project, and records tracking databases. With these tools, I hope to discover resources I can apply with more discretion.

One clear direction the Geological Survey will be moving is in one that began under my predecessor, Norm Hester, into digital capabilities. Already, the Geological Survey has one of the best GIS capabilities of any state geological survey in the country. That capability will strengthen and grow with internal and external access to increasingly more digital resources. The IGS is an enormous

repository of natural resources information that other state agencies, universities, private companies, and citizens want to access more readily. The IGS' World Wide Web capabilities will serve as one means to provide that access. The Geological Survey's Web site will also serve as a primary means of public outreach and education. Society's information needs are changing, and we intend to anticipate those needs with innovative products. I am excited about the fu-

ture of the Indiana Geological Survey, and I am confident in my ability to lead it well into the next century.

Other IGS news

Be sure to visit the Survey's new Indiana Geology Today Web site at <http://adamite.igs.indiana.edu/index.htm>.

This site is targeted at a general public audience and includes a collection of articles about Indiana geology and other useful features, such as geology road logs, teaching resources, and a visual dictionary. Work has also begun on a Web-delivered unit on water for use in classrooms. The IGS also has another Web site that presents information about the Survey. This site is now being redesigned and will feature access to IGS databases and more technical information.

Editor **Deborah DeChurch** and the IGS recently agreed to host the 1999

(continued on page 11)

Survey

(continued from page 10)

annual meeting of the Association of Earth Science Editors in Bloomington. This meeting will take place on Sept. 23–26 at the Bloomington Convention Center. The AESE is an international group of geology editors from various areas of scientific publishing — state and provincial surveys, the USGS, Natural Resources Canada, such organizations as AGI and AGU, various geology journals in the U.S. and Europe, and freelance writers and editors. Deb also recently attended the 1998 annual meeting in Washington, D.C., on Sept. 9–14, which was a joint meeting among the AESE, the European Association of Science Editors, the Council of Biology Editors, and the International Conference on Geoscience Information (GeoInfo).

Brian Keith was named a 1998 recipient of the Distinguished Service Award of the American Association of Petroleum Geologists, presented in May 1998.

The highlight of the year for **Erik Kvale** was the discovery of the Red Gulch dinosaur track site in Wyoming in May of 1997. Erik discovered the site with Al Archer (Kansas State U.), Row and Cliff Manuel (Erik's aunt and uncle), and Fran Paton (Erik's aunt). The track site is the most extensive ever found in Wyoming, with thousands of tracks preserved, and is one of the rare middle-Jurassic (165–170 Ma) dinosaur finds in North America. It was found in the lower part of the Sundance Formation in the Bighorn Basin of northern Wyoming in a part of the section once thought to be totally marine in that part of the state. Participating researchers include Gary Johnson (Dartmouth College), Allen Archer (Kansas State U.), Michael Brett-Surman (Smithsonian Institution), Brent Breithaupt and Beth Southwell (U. of Wyoming), Ty Naus (South Dakota School of Mines and Technology), and Debra Mickelson (U. of Colorado, Boulder). Support for the research has come from the Bureau of Land Management (BLM), Department of the Interior. The site is currently being developed into an educational site. Research will continue for at least two more years.

Erik completed a study of the bedrock geology of the Washington and Wheatland 7.5-minute quadrangles in

Indiana as part of a groundwater investigation sponsored by the IGS and the USGS, and finalized a poster on tidal theory and tidal rhythmites with co-authors **Kim Sowder** and **Barb Hill**. The poster was scheduled to be published by SEPM during fall 1998 and marketed in conjunction with SEPM Special Publication 61, *Tidalites: Processes and Products*, which was to be published in November 1998. Erik has been continuing his research on the depositional settings of low-sulfur coal and coal-gas potential in Indiana and has co-authored a paper with



Maria Mastalerz on the geologic evidence for freshwater tidal deposits; it will be published as SEPM Special Publication 61. He also taught a series of short courses (including one for the USGS office in Reston with **Maria Mastalerz**) on the recognition and application of tidal rhythmites as a key to understanding the geologic record of tide-dominated areas.

The last major project Erik has been involved with during the past year is the development of a "geoscience adventure" for IU alumni who want a vacation that is educational, exciting, and comfortable. The program, which Erik is developing with Jerry Tardy, executive director of the IU Alumni Association, will focus on presenting simple concepts of geology and paleontology in a field situation in the context of some of the most important and exciting dinosaur sites in the western United States. The program is based out of a western guest ranch in

northern Wyoming and is a five-day/six-night course that will combine science adventure with a western ranch experience. A typical day will include hiking, fossil hunting, and horseback riding in some truly spectacular scenery. Erik hopes to get this program off the ground by summer 1999.

Maria Mastalerz was elected to the Council of the Society for Organic Petrology (international organization of organic petrologists and geochemists) for a period of two years. She also finished editorial work on a book, *Organic Matter and Mineralization*, being published by Chapman & Hall and edited by her and M. Glikson. Maria was a member of the organizing committee of the International Conference on Coal Seam Gas and Oil in Brisbane, Australia, which was held in March 1998.

Kim Sowder, **Rick Hill**, **Paul Irwin**, **Rea Kersey**, and **Walt Hasenmueller** attended a conference on digital mapping techniques in Champaign, Ill., May 27–30, 1998, hosted by the USGS, the Association of American State Geologists, and the Illinois State Geological Survey. Rea created a poster for a talk presented by Kim titled "A Process for Utilizing Database Information to Produce High-quality Direct-to-printer Digital Map Files." Walt also made a presentation about computer contouring. Kim, Rick, Paul, Rea, and **Ned Bleuer** attended the annual Environmental Systems Research Institute GIS Conference in San Diego, July 27–31, 1998.

Todd Thompson is now funded by the USGS to extend his lake-level work to other Great Lakes over the next several years. In addition to his geologic work, Todd directed a project that created a beautiful full-color calendar for the IGS — call (812) 855-7636 to purchase a 1999 calendar — and contributed greatly to the development of the new IGS Web sites. On a personal note, Todd's son, Adrian James, was born on Oct. 6, 1997.

On Nov. 7, 1998, a number of past and present staff members of the IGS received honors from the Professional Geologists of Indiana for their devotion to excellence, education, and public service, and accomplishments during their careers. **Henry Gray**, **Norman Hester**, and **Charles Wier** each received the PGI Distinguished Service Award. **Carl Rexroad** was presented with the PGI Lifetime Achievement Award.

Faculty news

Two outstanding members of the departmental faculty retired during the past year. The following tributes to them were presented at the reception honoring all retiring faculty, held in Alumni Hall of the Indiana Memorial Union on April 23, 1998.

J. Robert Dodd

At the end of December 1997, J. Robert Dodd completed 31 years of devoted service to Indiana University, the Bloomington community, and the geological profession. His retirement is merely another milestone in a career that has been highlighted by outstanding contributions to science, dedication to teaching excellence, and tireless service to local, regional, and national organizations.

To Bob, a native of Bloomington, Indiana University was a logical institution at which to continue his formal education. He received the BA degree in geology in 1956, earning membership in Phi Beta Kappa, and completed his MA degree in geology in 1957. While at IU, Bob met and married Joann Emerson, who has been his soul mate for all the ensuing years. Bob pursued advanced studies at the California Institute of Technology, where he earned the doctorate in geology in 1961. His dissertation was a forefront study of the relationships between molluscan shell mineralogy, chemistry, and structure, on the one hand, and the environment on the other. This investigation led to the publication of numerous articles in major scientific journals and established Bob as a leader in the emerging field of paleoecology.

Armed with exceptional research credentials, Bob entered employment at the Texaco Research Laboratories in Bellaire, Texas, but, ever heedful of the call to teach, left that company in 1963 to join the geology faculty at Case Western Reserve University. There he continued research on the environmental control of molluscan shell chemistry and mineralogy, reinforcing his stature as a paleoecologist. At this time the IU Department of Geology had only embryonic offerings in paleoecology and enticed Bob to come home and establish a full-fledged program in that discipline. Bob arrived in Bloomington for the 1966 fall semester. He soon introduced a series of courses in paleoecology and oceanography and established a research program

that attracted outstanding master's and doctoral students.

During the 1967 spring break, Bob and a departmental colleague offered a special field course on the geology of tropical marine environments in the reef tract off the Florida Keys. The next year this offering evolved into a five-week summer course, which Bob co-taught through 1971. This exciting new activity led to the publication of several research articles describing and interpreting phenomena that were new to science and that fostered Bob's growing interest in

and Applications, which is now in its second edition and remains one of the most highly regarded textbooks in the field. Bob Dodd's extensive research on paleoecology and the publication of the textbook established him firmly in the first rank of North American paleoecologists.

In the mid-1980s, Bob's interests expanded yet again to include sedimentologic and environmental analysis of Mississippian-Age limestones of the Midwest. His research on these strata has been aimed primarily at interpretation of



Don Hattin, left, presents yet another award to Bob Dodd upon the occasion of the latter's retirement in December 1997.

carbonate sediments and their post depositional alteration.

Early in his career, Bob entered a research partnership with Robert Stanton of Texas A&M University that was to endure throughout their respective careers. Together they authored a series of seminal studies on faunal and geochemical analyses of invertebrates from renowned Pliocene-Age outcrops of the Kettleman Hills in California and on biostratigraphy and paleoecology of Pliocene deposits in coastal and other inland areas of California. In 1970, one of the articles they shared earned them the Outstanding Paper Award of the prestigious *Journal of Paleontology*. These joint research efforts also spurred the two Bobs to write and publish, in 1981, the landmark textbook *Paleoecology: Concepts*

depositional environments of rock formations that had been little studied or largely misunderstood by earlier geologists. His skillful guidance of an enthusiastic team of graduate-student researchers has led to publication of research articles on storm deposits, mud mounds, and windblown carbonate sediments, the existence of which previously had not been suspected.

Over the years, Bob has directed the master's and doctoral work of an impressive number of graduate students, whose own successful careers in industry and academia are ample testimony to the value he places on rigor in the classroom, in the field, and in the laboratory.

Bob's service to the department has been exemplary. He has long been one of

(continued on page 13)

Faculty news

(continued from page 12)

our most effective teachers, offering courses at all levels and willingly accepting responsibility for teaching large classes of nonmajors in freshman courses. He has also performed yeoman service on many of the department's most demanding committees, and from 1987 to 1990, he served as department chair. He also served on the College of Arts and Sciences Curriculum Committee, the University Library Committee, and the Bloomington Faculty Council.

Bob's dedication to and accomplishments in science have been complemented by numerous activities outside the university. He is a disciplined athlete who has both run and cycled for many years. One of his more notable accomplishments was cycling with his two sons across the United States from south to north — from New Orleans to Sault Ste. Marie! He has participated many times in the Hilly Hundred, the Bloomington Triathlon, and local and regional running events. In addition to his athletic pursuits, Bob is a regular volunteer in the book drive that precedes the annual Book Fair of the American Red Cross and has devoted time to teaching geology to elementary student in the Spencer schools, where he is known as the "dinosaur man." Bob is also a member of the session and a trustee of the First Presbyterian Church.

Bob's retirement will not end his illustrious career. We will miss the excellence of his teaching and the wisdom of his counsel in faculty meetings, but we expect to see him busily engaged in the completion of current research programs. Bob also plans to increase his involvement in community service and spend more time in his beloved rose garden. His colleagues give sincerest thanks for the strongly positive role he has played in the Department and extend to Bob and Joann their best wishes for many happy retirement years.

— Donald E. Hattin

Albert J. Rudman

Al Rudman describes himself upon his arrival at Indiana University in 1945 as a bright-eyed, 16-year-old freshman, fresh out of a Chicago boys' school. He recalls his arrival at North Hall as the beginning of an immediate love affair with the university and the town of Bloomington. Over the course of the next 50 years — though most of the faces around him have been succeeded by new ones, his

academic world has been transformed, and the university itself has been through an ocean of changes — Al has never abandoned his teenage excitement about academic exploration and his enthusiasm for the joys of the academic life. And he's been a confirmed Hoosier ever since.

In his first year at IU, Al enrolled as a journalism major, following the path suggested by his summer jobs as a copyboy for the *Chicago Tribune*. After only one semester at IU, however, he left the university to enlist in the Army, where he served for two years in the U.S. Army of Occupation in Italy, working as editor for a military newspaper, among other duties. Upon his return to Indiana in 1947, Al's academic work took a new direction. Al decided to abandon his former major for what appeared to a returning GI to be a more practical career: He took his first course in geology from (now emeritus) Professor Charles Vitaliano and immediately decided to major in that field. Shortly thereafter, he took a geophysics course that was to transform his academic career. Al received his bachelor's degree in geology in 1952, which was followed by the MA degree in geophysics in 1954. With master's degree in hand, he began several years of work as an exploration geophysicist in Jackson, Miss., and Mattoon, Ill., with Carter Oil, now part of Exxon Corp.

Al returned to IU in 1957, when he began working towards his PhD degree with Judson Mead. During his graduate

career and for two years thereafter, Al worked full time as a research geophysicist with the Indiana Geological Survey. In 1963, Al completed his PhD thesis on the structure of the basement rocks of southern Indiana. Al joined the IU faculty as an associate professor in 1965.

In the course of his research career, Al's work has carried him across the entire breadth of the discipline of geophysics. His early research, both at the Geological Survey and at IU, drew on his experience as a geophysicist with Exxon. He belonged to the first generation of Midwestern researchers to apply state-of-the-art geophysical methods to the understanding of the "geologic basement" that is obscured by the thick layers of sedimentary rocks that cover the earth's surface throughout the midcontinent.

In the 1970s and early 1980s, Al's research interests turned towards mathematical and computer applications in geophysics. He applied signal analysis techniques from the emerging field of digital electronics to geophysical problems such as well log analysis and processing of seismic reflection data. His work on correlation of velocity and resistivity logs is still widely used, and industry texts still refer to his empirical law relating the two as "Rudman's equation." Since that time, his work in computational geophysics has grown into an ever-broadening sphere of academic interests.

Al's latest research interests focus on
(continued on page 14)



Al Rudman, left, a.k.a. "the Hawaiian connection," celebrates with Joan Lauer during the retirement celebration for Al in May 1998.

Faculty news

(continued from page 13)

the area that started his research nearly four decades ago: the structure of the basement rocks in southern Indiana. Working with colleagues and graduate students in the IU geophysics group and the Indiana Geological Survey, Al has been the leader of an interdisciplinary tectonic study that applies geological, geophysical, and geodetic methods to the study of earthquakes and earthquake-generating structures of the Wabash Valley seismic zone, now widely recognized as a potential site of large earthquakes in the Midwest.

It was in the late 1970s that Al's love affair with the state of Hawaii began. Starting with summer appointments at the Hawaii Institute of Geophysics and culminating in sabbatical-year appointments at Hawaii's School of Ocean and Earth Science and Technology, Al has been able to conduct deep geophysical research in the shade of the swaying palms off Waikiki. His work in Hawaii has included oceanographic investigations in the western Pacific, fieldwork on an irradiated atoll in the central Pacific, theoretical work on seismic wave propagation, and computational work on earthquake location, heat flow, and geophysical modeling. Since 1994, his summer research has carried him to the University of Colorado at Boulder, where he has served as a research associate at the Cooperative Institute for Research in the Environmental Sciences.

Along with his colleague Judson Mead, Al has been largely responsible for forging a national-caliber geophysics program at IU. From the time of his initial

appointment until he was joined by colleagues Gary Pavlis and Michael Hamburger in the mid-1980s, Al developed and taught all of the graduate courses in the program. During that period he directed master's and doctoral research for approximately 30 graduate students. Al's teaching has always been widely appreciated by his students. He has a remarkable knack for guiding students through complex mathematical applications in geophysics by using a direct, informal teaching style punctuated by his unique wit and offbeat storytelling. He has been honored by the National Science Teachers Association and received an IU Teaching Excellence Recognition Award.

Outside of the geology classroom, Al has always been something of a visionary: He was one of Bloomington's first joggers, beginning about 40 years ago and competing in a dozen marathons and half marathons; he was the department's first vegetarian, long before the discovery of the zucchini; he was one of our first and only computer nerds; and he claims to have been one of the only Democrats in Rankin County, Miss.!

Al is the proud father of three eminently successful kids: Philip, who is a physician in Bloomington; David, a physicist in Colorado; and Lynn, a physician in California.

Asked about his retirement plans, Rudman paraphrased Winston Churchill: "I view retirement neither as the end, nor the begging of the end, but with excitement as the end of the beginning." He intends to remain active in geophysics research and teaching, continuing collaborative research projects at Indiana University and pursuing summer research programs in Hawaii and Colorado.

— Michael Hamburger

Department of Geological Sciences faculty & staff

Professors: Abhijit Basu, Simon Brassell, James Brophy, Jeremy Dunning, Michael Hamburger, Norman Hester, Noel Krothe, Christopher Maples (chair), Enrique Merino, Greg Olyphant, Lawrence Onesti, Gary Pavlis, Lisa Pratt, Edward Ripley, Lee Suttner, David Towell, and Robert Wintsch.

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

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

Research Scientists: Michael Dorais, Bruce Douglas, Erika Elswick, Arndt Schimmelmann

Postdoctoral Fellows: Paul Blanchon, Anthony Lowry, Michael J. Zaleha

Librarian: Lois Heiser

Library Staff: Dennis Scoville (technical services), Linda Stewart (circulation/reserves)

Staff: Kim Schulte, administrative assistant, chair's office; Patty Byrum, administrative secretary, chair's office; Lorie Canada, secretary, fourth floor; Ruth Droppo, secretary, third floor; Tricia Miles, secretary, fifth floor; Richard Gibson, resident manager, Geologic Field Station, Montana; Gillian Leonard, office services assistant, business office; Mary Iverson, student records; Candace Franz, senior administrative secretary, Geologic Field Station; Brian Snow, computer systems manager; Terry Stigall, geophysics electronics technician; Steve Studley, manager, mass spec. lab



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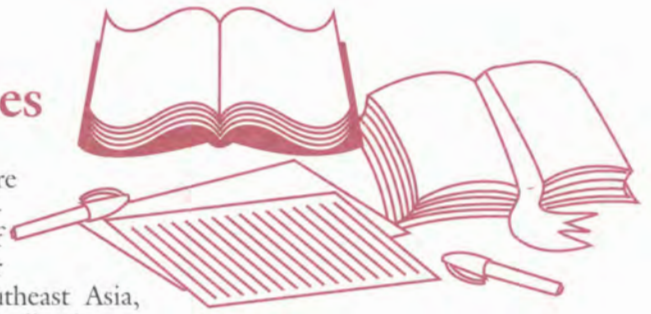
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More faculty news from the Department of Geological Sciences



Abhijit Basu and undergraduate students doing research under his direction have been very active. **Sue Riegsecker** and Basu co-authored a poster paper on toxic metals and sediment movement in the lagoon of Venice, Italy, at the October 1998 Toronto GSA meeting. In September 1998 in Houston at the NASA/LPI Workshop on New Views of the Moon, Sue presented a paper co-authored with Basu and **Amy Tieman** on average mineral composition of Apollo landing-site soils. At the same meeting, Basu presented a paper co-authored with Sue on the reliability of calculating average soil composition of Apollo landing sites. Sue also received a \$400 travel grant from the Lunar and Planetary Institute.

Bob Dodd's retirement was marked in the Department with a reception and dinner on Dec. 6, 1997 at Chapman's Restaurant and Banquet Center in Century Village, Bloomington. The delightful celebration included Bob's colleagues and friends from IU, the Bloomington community, his family, and numerous former students, friends and colleagues from elsewhere. In lieu of personal retirement gifts, friends made a major contribution to one of Bob's and Joann's favorite community agencies, one for whom they have worked over the years: the American Red Cross. Bob remains active in the Department, and Joann and he have taken numerous trips in the past year, including to Micronesia in January and to Wales in June 1998.

Jeremy Dunning, dean of continuing studies, has written and co-produced with IU's Instructional Support Services an eight-segment instructional video titled *The Earth Explored*. The video is designed for the introductory college-level learner and is applicable to physical, environmental, and historical geology, and can also supplement lab exercises. The eight segments include "Where do Rocks Come from?" "Geologic Map Making," "Mass Wasting and Slope Stability," "Here Today; Trash Tomorrow," "Streams, Erosion, and Deposition," "Rock and Water Chemistry," "Earthquakes and Energy," and "How to Know if the Earth Moves" (featuring **Gary Pavlis**, who wrote and co-produced this segment).

Colin Harvey resigned his appointment as research scientist in spring 1998 and returned to New Zealand. Colin is the senior consultant at Design Power

GENZL in Auckland. There he is responsible for exploration and development of geothermal systems for power generation in Southeast Asia, China, Japan, Indonesia, India, Australia, and New Zealand. On a personal note, Colin has built a new home on the ocean 40 miles north of Auckland and is busy refurbishing a sailing vessel 32 feet in length with his son Mark. Colin's addresses are 60 Cook St., P.O. Box 3935, Auckland, New Zealand, and charvey@genzl.co.nz on the Internet.

John Hayes, past distinguished professor of chemistry and geological sciences and chair of the department from 1994 to 1996, is now at Woods Hole Oceanographic Institution and was elected to the National Academy of Sciences in April 1998. Congratulations go to John for this honor in recognition of distinguished and continuing achievements in original research.

Alan Horowitz, although retired, is still compiling lists of bryozoan taxa and their geologic ranges, which involves a lot of library work as well as requests for interlibrary loans. He is especially appreciative of the efforts on his behalf by **Lois Heiser** and her staff in the Geology Library. Alan attended the International Bryozoology Conference in Panama City, Panama, in January 1998, where he delivered a paper with Joe Pachut of IUPUI. Alan also enjoyed attending the GSA North-Central Section meeting and visiting with numerous IU alumni.

Gary Lane finished his part of three manuscripts on Chinese, British, and German Famennian-Age crinoids during the past year. He also gave an oral presentation and poster session at the 1997 GSA meeting in Salt Lake City. The former was on British Late Devonian crinoids from the type Devonian, and the latter was on the early literature on fossil and living crinoids, co-authored with **Bill Ausich**, MA'76, PhD'78. Gary also introduced the Paleontological Society short course on echinoderms. He hopes to make a sixth trip to China in 1999, dependent upon funding. At the October 1998 GSA meeting in Toronto, Gary presented two abstracts, one on the Frasnian-Famennian extinction event (a non-event as far as crinoids are concerned) and the other on the folklore of fossil crinoid stems. On a personal note, Gary is pleased to advise us that Mary and

he are the proud grandparents of Aurora Lane, born in July 1997.

Haydn Murray taught clay mineralogy during the fall semester 1998 because of the resignation of Colin Harvey and the latter's return to New Zealand (see above). Haydn remains a very busy retiree. In March 1998, he presented a paper on clay deposits for emerging markets at the annual SME meeting in Orlando, Fla. At this meeting, **Jun Yuan**, MS'90, PhD'95, received the Young Scientist Award from the Industrial Minerals Division. He is the fourth IU graduate from Haydn's group of students to receive this award, the others being **Tom Dombrowski**, MA'82, PhD'92, **Jessica Elzea-Kogel**, MS'87, PhD'90, and **Robert Pruett**, MS'88, PhD'93. This award is restricted to scientists under 35 years of age who have achieved prominence in the field of industrial minerals. Murray also has been asked to organize and chair a symposium on clay mineral applications at the 1999 Euroclay Conference in Krakow, Poland. Haydn presented an invited paper at the Science of Whitewares II conference held at Alfred University (New York) in May 1998. Also to be noted, the goal of the campaign to raise \$1 million to establish the Murray Chair of Applied Clay Mineralogy at IU has been approximately 75 percent filled.

Lisa Pratt has accepted a half-time appointment as associate dean for science and research in the College of Arts and Sciences. She also is in the second year of her four-year tenure as a Gill Fellow in the College. Lisa is one of five recipients of these faculty fellowships funded by **Linda** and **Jack Gill**; Jack, PhD'62, is a partner in the Vanguard Venture Partners, a venture capital firm with offices in Palo Alto and Houston.

Ed Ripley reports that his group's study of the hydrothermal flow systems related to the placement of the Duluth Complex continues to be supported by NSF. **Young-Rok Park** completed his dissertation on stable isotopic studies of hydrothermal flow systems located above and below the Duluth Complex. **Iskandar Taib** is expected to complete his doctoral

(continued on page 16)

Faculty news

(continued from page 15)

study of the Babbitt Cu-Ni deposit of the Duluth Complex this year. **Tim Johnson** continues his PhD study of topaz rhyolite-related beryllium mineralization at the Spor Mountain deposit, Utah. Tim was awarded a Society of Economic Geology Grant to help him complete his research. A joint project with the University of Toronto is supported by the Canadian Research Council and International Nickel Co. to study the Voisey's Bay Ni-Cu-Co deposit. Ed returned for his second trip to the Labrador mine in June 1998, where development drilling and geophysics continue. Work on the mine itself has been held up pending modification of the environmental impact statement. On the personal side, Ed informs us that his son Jonathan has decided to attend DePauw University, where he has been awarded both music and academic scholarships, will play soccer, and double major in music and business. His son Eric is a junior at IU, majoring in environmental management, and is a member of the IU soccer team, which once again won the Big Ten Championship, achieved a number two ranking in the country, and was awarded a trip to the NCAA tournament. In Richmond, Va., IU defeated Stanford on Dec. 13, 1998, to win the university's fourth NCAA soccer championship.

Al Rudman's retirement was marked in the Department with a reception and dinner on May 2, 1998, at Chapman's Restaurant and Banquet Center in Century Village, Bloomington. The festive celebration included Al's colleagues and friends from IU, the Bloomington community, his family, and numerous former students, friends, and colleagues from elsewhere. In lieu of personal retirement gifts, friends made a major contribution to a new fund in the department, the Albert J. Rudman Geophysics Fund. This fund has been established in recognition of Al's contributions to geophysics education at Indiana University and will provide a special source of support for training of geophysics students at both the graduate and undergraduate levels. In order that this fund may serve IU students in perpetuity, the fund has been established as an endowment, from which only the earnings will be used each year. The fund is to be administered by the chair of the Department of Geological Sciences and the geophysics faculty. Although use of the funds will be unrestricted, student support is a primary target. Some possible uses include awards

to outstanding geophysics majors, support for student field work, travel to scientific meetings, and publication costs. The fund also may serve to provide special support for geophysics-related field and laboratory equipment needed for geophysics education.

Arndt Schimmelmann recently received a collaborative research grant from NATO to study nitrogen and hydrogen isotopes in coal and kerogen through maturation. He also has been awarded a research grant from NSF-OCE, Earth System History for reconstructing extreme southern California flood events from gray flood deposits in the Santa Barbara Basin since 5000 B.P.

Lee Suttner notes that his research group is in the final year of NSF-supported study of tectonic controls on Cretaceous fluvial systems in the Western Interior foreland. **Craig Rankin** and **Nate Way** completed their thesis research related to this project in the Black Hills and eastern Powder River Basin and have joined Exxon in Houston. Taking their places are **Carrie Nolan** and **Chris Yokoyama**, who are doing paleohydraulic reconstructions on sand bodies in the Tensleep and Casper areas, respectively, under the direction of **Mike Zaleha**, who finished his third year of a post-doc appointment. Interpretations of the group's first-of-a-kind quantitative estimates of a variety of paleohydraulic parameters for Cretaceous rivers were published as an extended abstract for the annual AAPG meeting in Salt Lake City. **Bill Elliott** is expecting to supplement the earlier work on the sandstone facies with a detailed geochemical study of the associated lacustrine and overbank deposits for his PhD dissertation. Bill began this work in August 1998, following a summer internship with Shell in Houston.

Lee concluded his appointment as associate dean in the College of Arts and Sciences last fall and completed his second stint as department chair in November 1998. He looks forward to his first academic year with no major administrative responsibilities since 1981. To partially fill the void, he has accepted a trustee position with the Geological Society of America Foundation and will chair the Development Committee for the Foundation. On the personal side, Lee notes that his wife, Ginny, continues to be principal at St. Charles School in Bloomington. Their twin daughters are both elementary teachers, Lori in Grand Rapids, Mich., and Lisa in Bloomington. Jennifer, their oldest daughter, has been a personnel director for a major Midwestern bank and has recently re-located to Evansville after giving birth this past

year to a second grandson for Lee and Ginny. Son Jim Suttner successfully passed his CPA exam last year, and, after working for a local tax firm, has recently been hired as a controller for the Bloomington *Herald-Times*. As retirement nears, Ginny and Lee seem to be smiling more broadly and more frequently.

Dave Towell continues to edit *Hoosier Geologic Record*. He also serves as secretary of the Bloomington Athletics Committee, chairs the subcommittee on student welfare, and is a member of the legislative review subcommittee. In addition, Dave has been designated to serve on the newly-created Athletics Coordinating Council, an all-university body created largely as a consequence of IUPUI moving to NCAA Division I status. After teaching his 31st session at the Field Station, Dave attended the 1998 major league all-star game at Coors Field in Denver with son Brian, BS'91. As baseball junkies, Brian and Dave had a blast not only at the game, but also at the workout day, celebrity hitting contest, and the fan fest held at the Denver Convention Center. The two of them even appeared in a fan-in-the-street interview in the *Rocky Mountain News*. The end of the summer was topped off by Dave's spending the better part of an hour talking one-on-one baseball with Hall of Fame pitching great **Bob Feller** at his home near Cleveland.

Jeff White (part-time, SPEA) was one of 28 IU faculty members representing a wide variety of disciplines from IU campuses across the state to be selected to receive a 1998 Faculty Colloquium on Excellence in Teaching Award. These awards are presented to IU faculty members who have demonstrated their exceptional commitment to teaching; their ability to be catalysts for students and colleagues; their capacity for self-evaluation; their creativity in course preparation and presentation; their skill in integrating instruction, research and scholarship; and their influence and impact on student learning.

Michael Zaleha was cited in the geoscience highlights issue of *Geotimes* (February 1998) for a recently published work on the Siwaliks. The magazine referred to Mike's paper as one of the "exceptional studies relating large-scale (tectonic) controls to molasse sedimentation." Out of the hundreds of articles that were published in clastic sedimentology during the previous year, only 10 to 15 merited mention in this review. Kudos to Mike!



Faculty research grants 1997-98

● A. BASU (NASA)—“Petrologic evolution of lunar and meteorite parent body regolith.”

● S. BRASSELL (NOAA)—“Development and calibration of paleoclimate proxies: a sediment trap study in the Santa Barbara Basin.”

● B. DOUGLAS (NSF)—“Curriculum development for interdisciplinary field courses in environmental geoscience.”

● B. DOUGLAS (NSF)—“Field and laboratory equipment support for student training in interdisciplinary environmental geoscience.”

● M. HAMBURGER (IRIS)—“Teacher-training workshop conducted in support of the Princeton earth physics project.”

● M. HAMBURGER (NASA)—“Application of global positioning system measurements to continental collision in the Pamit-Tien Shan Region, Soviet Central Asia.”

● M. HAMBURGER (USGS)—“GPS measurement of crustal deformation in the Wabash Valley seismic zone.”

● M. HAMBURGER (NSF)—“Application of global positioning system measurements to continental collision in the Pamit-Tien Shan Region, Soviet Central Asia.”

● M. HAMBURGER (NSF (equipment))—“Acquisition of GPS instruments for measurement of crustal deformation at Pinatubo and Taal Volcanoes, Philippines.”

● M. HAMBURGER (NSF)—“Collaborative research: GPS Measurement of crustal deformation at Pinatubo and Taal Volcanoes, Philippines.”

● C. HARVEY (SIGECO)—“The potential use of coal waste fines as a co-firing fuel in southern Indiana.”

● J. HAYES (PETROBRAS)—“Co-operative agreement for research in biogeochemistry and petroleum geochemistry.”

● E. KAUFFMAN (NSF)—“Testing the hypothesis of a Cretaceous subtropical climate zone in the Caribbean Province: do climate simulations and observational data support the concept of tropical stability?”

● N. KROTHER (U.S. Army Corps of Engineers)—“A hydrogeologic study to determine the groundwater flow, aquifer characteristics and chemical transport in the Big Clifty/Beach Creek aquifer be-

neath the Ammunition Burning Grounds.”

● N. KROTHER (WESTINGHOUSE)—“Comparison of the hydrogeology and hydrochemistry at the Lemon Lane landfill and Neal’s landfill.”

● G. LANE (NSF)—“Echinoderm rebound and diversification after the Late Devonian extinction: evidence from Asian Carboniferous and Eurasian Famennian 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.”

● G. OLYPHANT (IDEM)—“Development of a 3-d aquifer visualization groundwater flow model in the upper reaches of the Lake Michigan basin, NW Indiana, and creating a GIS for the Lake Michigan drainage basin in Indiana.”

● G. OLYPHANT (IDEM)—“Development of a statistically valid program for monitoring pesticides in groundwater in the state of Indiana.”

● G. OLYPHANT (IDEM)—“Hydrologic monitoring and watershed modeling associated with the Great Marsh restoration project.”

● G. OLYPHANT (IDNR)—“Evaluation of the hydrologic and chemical effects of reclaiming a coarse-refuse deposit with ash fill and Poz-o-tec Cap, Reclamation Site No. 1087 (Midwestern).”

● G. OLYPHANT (IDEM)—“Hydrologic suitability of mine spoil as a medium for septic-tank absorption fields.”

● G. PAVLIS (IRIS)—“Joint seismic program: broad band array.”

● G. PAVLIS (IRIS)—“Event location and array processing software development for the IRIS broadband array system.”

● G. PAVLIS (AF)—“Innovative seismic array analysis for studies of wave propagation in the Earth.”

● E. RIPLEY (NSF)—“Isotopic studies of the North Shore Volcanic Group and related hypabyssal rocks, Midcontinent Rift system, Minnesota.”

● E. RIPLEY (NSF)—“Isotopic studies of hydrothermal flow systems above and below the Duluth Complex, Midcontinent Rift system, Minnesota.”

● E. RIPLEY (NSF)—“Acquisition

of a sulfur isotope-ratio mass spectrometer.”

● A. RUDMAN (USGS)—“A comprehensive geophysical investigation to assess seismic hazards in the Wabash Valley Seismic Zone: A case study of the New Harmony fault.”

● A. SCHIMMELMANN (NSF)—“High-precision hydrogen isotopic GCMS,” a subcontract to IU from Woods Hole Oceanographic Institution.

● A. SCHIMMELMANN (NASA)—“Isotopic biogeochemistry,” a subcontract to IU from Woods Hole Oceanographic Institution.

● A. SCHIMMELMANN (AM. CHEM PRF)—“Isotopic responses and exchange of hydrogen and nitrogen in kerogen during thermal alteration across the oil window.”

● A. SCHIMMELMANN (NATO)—“Nitrogen and hydrogen isotopes in coal and kerogen through maturation.”

● A. SCHIMMELMANN (NSF—OCE), Earth System History, “Reconstructing extreme Southern California flood events from gray flood deposits in Santa Barbara Basin since 5000 B.P.”

● L. SUTTNER (NSF)—“Effects of intra-basinal structures on Early Cretaceous fluvial systems (Lakota/Cloverly Formations), Central Cordilleran foreland basin.”

● R. WINTSCH (STATE CT)—“Bedrock geology mapping of the Rockville 7.5 “minute” quadrangle, Connecticut.”

● R. WINTSCH (AM. CHEM PRF)—“Isotopic responses and exchange of hydrogen and nitrogen in kerogen during thermal alteration across the oil window.”

● R. WINTSCH (NSF)—“History of terrane assembly, eastern New England.”

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Student news

The following companies sent representatives to the Department to recruit both full-time employees and interns during 1997-98:

- Geco-Prakla (Schlumberger), Houston, Texas (Robert Henchoz and Joseph Callis)
- Chevron, Houston, Texas (Carole Rock and Nathaniel Tilander)
- Shell Oil Co., Houston, Texas (Michael Vogel)
- Amoco Exploration and Production, Houston, Texas (Lee McRae and Fabian Wirnkar)
- Exxon Exploration/Production Operations, Houston, Texas (Barbara Rassmann)
- Exxon Research Laboratory, Houston, Texas (Mark Richardson)
- Geco-Prakla (Schlumberger), Houston, Texas (Spring) (Robert Henchoz)

Awards and Grants

Undergraduate

- N. Gary Lane Award: Brian Howard (Carmel, Ind.)
- Junior Professional Development Award: Sue Ellen Riegsecker (Noblesville, Ind.)
- Senior Professional Development Award: Jeffrey Dick (Hammond, Ind.)
- Junior Award: Amy Tieman (Barrington, Ill.)
- Senior Faculty Scholarship Award: Mark Panning (Columbus, Ind.)
- Chevron Geophysics Award: Adam Haulter (Russiaville, Ind.)
- Field Station Scholarships (IU): Mark Panning (Deiss Award) (Columbus, Ind.); Jeffrey Dick (Hammond, Ind.); Lynn Neakrase (Washington, Ill.); Roger Cohen (Zionsville, Ind.); Sue Ellen Riegsecker (Noblesville, Ind.); Amy Tieman (Barrington, Ill.); Christi Snedegar (Bloomington, Ind.)

Graduate

- Shell Oil Fellowship: Jennifer Eigenbrode (New Cumberland, Pa.)
- Chevron Oil Fellowship in Geophysics: Catherine Thibault (Indianapolis, Ind.)
- Chevron Minority Fellowship: Kenneth Arroyo (Bronx, N.Y.)
- Phillips Petroleum Fellowship: Dorothy Payne (Berkeley, Calif.)
- Estwing Award and Outstanding Academic Achievement: Jennifer Eigenbrode (New Cumberland, Pa.)

● Department of Geological Sciences Award for Academic Achievement: Scott Neal (San Bernardino, Calif.) and Alex Sessions (Lexington, Va.)

- Outstanding Associate Instructor: Mark Buehler (Bloomington, Ind.)
- Outstanding Student Paper Award, AGU Fall National Meeting, San Francisco: Scott Neal (San Bernardino, Calif.)
- GSA Grant-in-Aid of Research Award: Jennifer Eigenbrode (New Cumberland, Pa.)
- John B. Patton Awards: Eung-Seok Lee (Kwacheon, Korea); Karl Leonard (Palouse, Wash.); Scott Neal (San Bernardino, Calif.); Nelson Shaffer (Bloomington, Ind.)

Degrees Awarded

Bachelor of Arts

- Daniel Cox (South Bend, Ind.)
- William Fallowfield (Norcross, Ga.)
- Jodi Foss (Naperville, Ill.)
- Molly Gould (Indianapolis, Ind.)
- Bethany Hodge (Chandler, Ariz.)
- Lynn Neakrase (Washington, Ill.)
- Amanda Reynolds (Wintersville, Ohio)
- Zidek Michal Umbanhowar (Dennison, Minn.)
- Jennifer Wessell (New Orleans, La.)

Bachelor of Science

- Terry Arcuri (Bloomington, Ind.)
- Joseph Brumley (Richmond, Ind.)
- Stephanie Chow (Ottawa, Ontario, Canada)
- Julie Ciasto (Greenwood, Ind.)
- Karen Cyr (Fort Wayne, Ind.)
- Steven McIntire (Seymour, Ind.)
- Kari Ann Murphy (Noblesville, Ind.)
- Barbara Tillotson (Wantagh, N.Y.)
- Rebecca Travis (Zionsville, Ind.)
- Mimi Tzeng (Bloomington, Ind.)

Master of Science

- Christopher Amato; Queens, N.Y. (1998), "Progressive Evolution of Metamorphic Differentiation Preserved in a Contact Aureole"
- William Elliott, Latrobe; Pa. (1998), "Tectono-Stratigraphic Control of Quaternary and Tertiary Sediments and Structure Along the Northeast Flank of the Tobacco Root Mountains, Madison County, Montana"
- Eric W. Feuerstein; Ridgewood, N.J. (1997), "Hydrologic Function of an Interdunal Wetland Prior to and During Marsh Restoration: Indiana Dunes Na-

tional Lakeshore"

- Katrina E. Gobetz; South Windsor, Conn. (1998), "Morphological and Taphonomic Study of a Local Assemblage of Flat-Headed Peccaries (*Platygonus Compressus Leconte*) from a Late Pleistocene Sinkhole Deposit in Northwestern Ohio, U.S.A."
 - Jessica Chao-Chi Hung; Vancouver, B.C., Canada (1998), Research Project: "A Sensitivity Analysis of Factors Affecting Steady-State Groundwater Flow Model Performance in a Wetland Watershed"
 - Alex J. Krueger; Clinton, Mich. (1998), "Seismicity and the State of Stress in the Pamir-Tien Shan Collision Zone"
 - Sean R. Machovoe; Lancaster, N.Y. (1998), "High Resolution Stratigraphic Analysis of an Amalgamated Sequence Boundary, Cretaceous (Turonian-Coniacian) Western Interior Basin"
 - Scott L. Neal; San Bernardino, Calif. (1998), "Variations in the Electrical Conductivity of the Upper Mantle Beneath North America and the Pacific Ocean"
 - Katherine A. Pickford; Mantua, Ohio (1998), "Recent Estuaries as a Testing Ground of methods Used to Interpret Paleosalinities of Ancient Marginal Marine Environments"
 - Sandra G. Talarovich; Petersburg, Va. (1998), "Stable Isotopic Three-Component Storm Hydrograph Separation of Illinois Central Emergence Located in Monroe County, Indiana"
 - Michiru Tomida; Ise, Mie, Japan (1998), "Tectonics of Incipient Subduction at the East Luzon Trough, Philippines"
 - David C. Wilson; Losantville, Ind. (1997), "Near-Surface Site Effects in Crystalline Bedrock: Azimuthal Dependence Scale Lengths of Spectral Variation, and Change in Spectral Character with Depth"
- #### Doctorate
- Steven J. Baedke; Cedar Falls, Iowa (1998), "Hydrogeologic and Geochemical Assessment of the Porous Media and Karstic Flow Regimes of the Beech Creek Aquifer, Ammunition Burning Grounds, Naval Surface Warfare Center, Crane, Indiana"
 - Glenn W. Bear; Fostoria, Ohio (1998), "Integration of Seismic Reflection and Potential Field Analysis: Architecture of Precambrian Sedimentary Ba-

Advisory board update

History made in New Harmony — again

For the first time in its history, the Department's external Advisory Board met off the Bloomington campus this past year. The 1998 annual meeting was held Oct. 22–24 in New Harmony, the cradle of Indiana geology. It was here on the east bank of the Wabash that **William MacClure**, the first president of the American Geological Society and considered by many to be the father of American geology; **Robert Owen** who had purchased the site; and other voyagers on the "Boatload of Knowledge" settled in January 1826 in their quest for utopia and the beginning of their great educational experiment. In 1837, Robert Owen's son, **David Dale Owen**, was named Indiana's first state geologist after completing the earliest federally supported geological survey of a substantial part of the mid-continent area, including the old Tri-State lead/zinc district of Wisconsin, Minnesota, and Iowa, as well as other surveys of parts of Arkansas, Kentucky, and Tennessee. Another son, **Richard Owen**, would also become state geologist, a professor of geology at Indiana University (after whom Owen Hall was named), and then briefly president at Purdue before returning to IU.

It was fitting that the Board meeting begin with an evening reception for board members and their spouses at the original Rapp-Maclure-Owen Home, graciously hosted by **Jane Owen**, the wife of **Kenneth Owen**, a direct descendent of Robert Owen. Mrs. Owen provided guests with individual tours of this beautiful mansion, one of New Harmony's most famous historical landmarks. Following this reception, **Tom** and **Odessa Straw** hosted Board members, their spouses, and several of our alumni from the Ohio and Wabash River Valley area for cocktails and dinner at their home.

Mrs. Owen gave an inspirational wel-

come to the Board at the start of its meeting the following day in place of her husband, who was unable to be in New Harmony during the meeting. **Lee**

Field Sation, and matters related to implementation of the department's strategic plan. A number of faculty and representatives from the Student Advisory Com-



Mrs. Kenneth Owen, left, and Lee Suttner at the Advisory Board meeting in New Harmony, Ind., in October 1998.

Suttner then introduced **Chris Maples** as the incoming chair of the Department and new board members **John Bubb**, now retired from Exxon; **John Gibson**, executive vice president of Landmark Graphics Corp.; **James R. (Dick) Harris**, owner of Dick Harris and Assoc., and **Robert G. Jones**, manager of specialty products for Rogers Group, Inc. The Board then went into business session, focusing on the status of the endowment campaign and plans for its formal announcement, activities at the Geologic

mittee also made presentations. Faculty and spouses joined the Board for the traditional Friday evening dinner, this year held in the New Harmony Inn. The meeting was continued on Saturday morning with a breakfast followed by additional faculty presentations. The session was completed by the Board with a meeting overview and the conduct of administrative business.

Continuing members of the Board who were present at this historic meeting
(continued on page 20)

Student news

(continued from page 18)

sins in Indiana, Illinois, and Kentucky"

● Lorie L. Bear; Creve Coeur, Mo. (1998), "The Use of Multiwavlets in Seismic Array Data Processing"

● Cara L. Davis; Honolulu, Hawaii (1998), "Paleoceanographic Influences on Accumulation of Organic Matter and

Trace Metals in Cretaceous Black Shale and Carbonate, Western Maracaibo Basin, Venezuela"

● Sujoy Ghose; Calcutta, India (1997), "Seismotectonics in an Active Intra-continental Orogen: The Tien Shan of Central Asia"

● Young-Rok Park; Chunchon, Korea (1998), "Stable Isotopic Studies of

Hydrothermal Systems Located above and below the Duluth Complex Midcontinent Rift System, Minnesota"

● J. Nathan Way; Bloomington, Ind. (1998), "Incipient Structural Development of the Western Interior Foreland as Inferred from Tectonostratigraphic Analysis of the Latoka Formation (Early Cretaceous)"

Alumni board

(continued from page 19)

were **Robert Blakely** (geophysicist emeritus, Indiana Geological Survey), **Malcolm Boyce** (Chevron Overseas Petroleum, Inc., retired), **Michael Cowen** (petroleum geologist, retired), **Derek Fullerton** (president, Exmin Corp.), **Richard Gibson** (consulting geologist, Gibson Consulting), **Steve Graham** (professor, Stanford University), **Judson Mead** (professor emeritus, Indiana University), **George Nevers** (Garnet Resources Corp., retired), **Frank Pruett** (director, Indiana Geosciences Institute), **Tom Straw** (Western Michigan University, retired), and **Jerry Thornburg** (geophysicist, Conoco Inc.). Unable to attend the meeting were new member **Bruce Mason** (director, Indiana Mineral Aggregates Association) and continuing members **Thomas Dobecki** (manager of geophysics, Fugro-McClelland), **Ferrol Fish** (Gas Research Institute, retired), **Michael Graham** (project manager, Rechtel Hanford, Inc.), **Glenn Hieshima** (senior research geologist, Exxon Production Research Co.), **Michael Mound** (vice president, QCX Systems), **Daniel Sullivan** (Indiana Geological Survey, retired), **Daniel Tudor** (Chevron Exploration & Production Services Co., retired), **Kenneth Vance** (Anadarko Petroleum Corp., retired), and **Steven Young** (geological associate, Exxon Exploration Co.). **Richard Gibson** is the new president of the Advisory Board, following the very productive two years of leadership by **Malcolm Boyce**. **Derek Fullerton** replaces Dick as vice president. Next year's meeting is scheduled for Oct. 14-16 and will once again be on the Bloomington campus.

New member profiles

John Neal Bubb, PhD'63, joins the Advisory Board after serving 34 years with Exxon Corp. as an exploration geologist and geophysicist. John spent considerable time working in international areas, including Indonesia, Malaysia, Europe, and Africa.

Upon retirement in 1996, he was working for Exxon Exploration Co.'s Far East Business Unit as frontier/special studies coordinator. John serves as president of both the Shadowood Association and Stanvac Reunion, and also is a board member of the Exxon Mac Club. Hobbies include golf, tennis, fly-fishing, quail hunting, and genealogy.

James R. Harris, AB'51, currently operates the consulting firm of Dick Harris & Associates, in Evansville, Ind., representing clients to industry and state government. Dick says, "As you will see, my background is somewhat eclectic, to say the least. I guess I've always had a short interest span." His impressive career began early. As an early undergraduate at what was then Evansville College, Dick worked full time (nights) at the Sunlight Coal Co. surface mine at Boonville. At IU he was a lab assistant in the coal laboratory of the Indiana Geological Survey. From 1951 to 1955 he served in the Navy, graduating from Navy Officer Candidate School in Newport, R.I., and serving on board the *U.S.S. Rehoboth*, where he was the chief engineering officer. During the late

'50s and the '60s, Dick worked in a variety of positions in the oil and coal businesses in southern Indiana and became a partner in a geological consulting firm. By the early '70s, he added the position of Indiana state representative to his activities, and by the late '70s, he had been elected to the Indiana Senate. In the Senate, he rose to chair a number of important committees, including the Senate Standing Committee on Natural Resources, Environment, and Agriculture. He also chaired a two-year interim study committee on surface mining, charged with the responsibility for drafting surface mining and reclamation legislation to bring Indiana into compliance with the 1977 Federal Surface Mining Act. Dick also chaired the Natural Resources Advisory Committee, a statutory legislative oversight committee for the Indiana Department of Natural Resources. From 1981 to 1984, Dick served as director, Office of Surface Mining Reclamation and Enforcement, U.S. Department of Interior, having been nominated by President Reagan and confirmed by the U.S. Senate. During that period, he was instrumental in the revision of federal regulations to utilize performance standards rather than design criteria. The State Abandoned Mine Lands Program was funded for the first time, and state programs, granting primary enforcement responsibilities to the states, were approved. Since leaving his federal post, Dick's consulting has continued in the evaluation of hydrocarbon fuel properties, and he appears as an expert witness

in cases involving mining reclamation, property evaluation, etc. It should also be noted that while serving in the Indiana Senate, Dick shepherded the bill establishing the certification of professional geologists and also was instrumental in the transferring of the Indiana Geological Survey from the Department of Natural Resources to Indiana University.

Robert G. Jones, BA'77, is area manager, specialty products for Rogers Group, Inc., in Bloomington. Bob joined Rogers immediately after completing his undergraduate studies at IU in 1977. Rogers is heavily involved in the construction aggregates business throughout the Midwest. The Speciality Products division produces finely ground high calcium limestone products for a variety of uses, including poultry grit, scrubber stone for SO₂ removal, animal feed supplements, coal mine rock dust, asphalt cement fillers, masonry sands, clay target fillers, asphalt roofing fillers and backdusting material, and golf course bunker material. Bob also has duties that include the search and exploration of mineral reserves for new sites and additional reserves. He heads the core drilling program and directs the search for and testing of these sites. Bob has been very active in the Indiana Mineral Aggregates Association, serving both as past president and member of the board of directors. He has been an active member and has served on planning committees of the National Stone Association. On the personal and family side, Bob enjoys many activities with his wife, Nancy, and sons. With oldest son, Tophie, who lives in Ohio, Bob enjoys playing and talking golf and also being with his first grandchild. Son Ryan lives in Montana — Bob has done extensive camping and hiking trips with him. His third son, Ben, attends IU, and his youngest son, Nic, is a sophomore heavily involved in ice hockey for the past 10 years. This has resulted in enjoyable travel on weekends from October through February to attend hockey games. Nancy returned to college and became an elementary school teacher after the boys were well into school.



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50th Anniversary of the IU Geologic Field Station

It's our golden anniversary — so come to the GOLD RUSH!

Schedule of events

- ◆ July 3–11: The “Main Event”
- ◆ July 4: Landowner's Day & Pig Roast
- ◆ July 5 or 6: Highway 10 Map Area field trip
- ◆ July 8 or 9: Sailor Lake hike
- ◆ July 10: Faculty Day honoring former faculty, directors, and AIs
- ◆ August 15–18: Reserved for a laid-back field station experience; lodging and meals available for a fee



If you cannot visit during the times given above, come anyway, almost anytime! Just give us some advance notice and meals and lodging will be arranged if possible — always remembering that when the geologic courses are in session, they have priority!

For more information, please visit the Web site listed below. If you don't have Internet access, contact Dick Gibson by writing to P.O. Box 523, Golden, CO 80402, or phoning (303) 278-0867. If after May 1, 1999, write to IUGFS, 633 S. Boulder Rd., Cardwell, MT 59721, or call (406) 287-3323. Dick can also be reached by e-mail via rigibson@earthlink.net.

We are still seeking photos and stories for the anniversary book. Please contact Dick Gibson to contribute.

Souvenir T-shirts, coffee mugs, baseball caps, and photos will be available.

Check it out on the Web!

<http://www2.csn.net/~rigibson/fs50th.html>

Alumni news

William I. Ausich, MA'76, PhD'78, is the 1998-99 past chair of the North-Central Section, Geological Society of America.

Ron Belak, MA'78, earned an MBA degree at the University of Colorado and has worked for the past 10 years as an energy and natural resources analyst at the U.S. General Accounting Office in Denver. He is also a freelance writer and photographer who specializes in magazine articles on fly-fishing at high-altitude glacial lakes.

Josh Brown, BA'90, has been living in Atlanta for the past 10 years and is working in incentive marketing. He and his wife are proud parents of a seven-year-old boy, and they enjoy the mountains best, preferably on horseback.

James R. Fitch, BS'84, MS'94, continues as a senior engineering geologist with C&S Engineers, Inc., of North Syracuse, N.Y., overseeing tank removals and performing environmental water and soil sampling. Jim and his wife, Christina,

have a daughter, Shannon, who is now 2-and-a-half years old.

James F. Goss, BS'75, MA'77, completed 20 years with Cypress Amax Minerals, Inc., in 1997. Jim works and resides in Gillette, Wyo., where he is supervisor of mine engineering and quality control. He serves on an ASTM committee on coal and coke. Jim also is an accomplished flyer and a member of AOPA.

John Guthrie, PhD'94, is a senior geochemist with Mobil Technology Co., Farmers Branch, Texas.

Charles D. Harrington, MA'68, PhD'70, continues to work as a technical staff member at Los Alamos National Laboratory. Chuck was recently appointed to the position of project leader for performance confirmation for the Yucca Mountain Project.

Samuel F. Huffman, MA'67, PhD'70, has been elected to the position of treasurer of the National Association of Geoscience Teachers.

Thomas W. Kammer, MA'78, was elected in 1998 as treasurer of the Paleontological Society.

David A. Kring, BS'84, continues to work as a senior researcher at the University of Arizona's Lunar and Planetary Laboratory. Recently, David and colleagues reported on the Gold Basin meteorite field in northwest Arizona, where some 2,000 meteorite fragments have been found (associated with a meteor that fell to the Earth about 20,000 years ago). In order to accomplish detailed mapping, description, and collection at the site as well as to maintain its scientific integrity before being disturbed by collectors, the research group kept their findings secret until essential field work was completed.

Lucia Kuizon, MA'76, has been named national paleontologist for the U.S. Forest Service.

J. David Lazor, MA'68, PhD'71, informs us that the Houston Geological Society will be sponsoring another Grand Canyon rafting field trip for June 2000. Interested persons can reach Dave at (713) 728-0917 or at lazorb@aol.com on the Internet. Dave reports that he has recently opened an office for a Tulsa company.

Jerry A. Lineback, PhD'64, is now working as an environmental geologist for the Kansas Department of Health and Environment, Bureau of Environmental Remediation, in Topeka.

Insung Lee, PhD'94, is now an assistant professor at Seoul National University, having vacated his previous position at the Korea Basic Science Institute.

Allan Ludman, MA'65, is the 1998-99 chair of the Northeastern Section, Geological Society of America.

Wulf F. Massell, MA'69, PhD'74, has served as 1998 first vice president of the Society of Exploration Geophysicists.

William Nellist, MS'86, remains busy working with the National Imagery and Mapping Agency, where he has been promoted to GS-12.

Carl J. Smith, MA'69, was presented with the Richard Owen Award by the IU Department of Geological Sciences in October 1998. (See above in *Department news*.)

Larry H. Skelton, BA'60, has completed a term as president of the Kansas Geological Society. During that term, the society obtained passage by the Kansas Legislature of a geologist registration act. Larry has been promoted to assistant director of the Kansas Geological Survey and is in charge of Wichita operations. He also was elected vice president of the Kansas Geological Foundation for 1998. Larry organized a symposium on the history of oil and gas exploration in North America, which was held in Wichita in August 1998.

Stephen G. Wells, BS'71, has been elected to the Council of the Geological Society of America for the term 1999-2001.

Milton A. Wiltse, MA'66, PhD'68, is director and state geologist at the Alaska Geological Survey. Milt and Flora's son, Nathan, is attending the University of Ottawa. Flora still enjoys teaching sixth-graders.

Larry D. Woodfork, BS'64, MA'65, was granted the Distinguished West Virginian Award by Governor Cecil H. Underwood during the West Virginia Survey's recent centennial celebration. Woodfork also received the Kentucky Colonel Award from Kentucky Governor Paul E. Patton.

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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COLLEGE

In memoriam

We have learned of the death of **R. William Orr**, PhD'67, of Muncie, Ind. We extend our condolences to his family and friends.

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

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