

ROUND UP
1996

Department of Geological Sciences
University of Kentucky

LETTER FROM THE CHAIRMAN

When we measure where the Department is from one year to the next, we see some positive signs. The support for the Department shown by the alumni is most helpful and gratifying, and the interest of the alumni in the activities of the Department is growing. We intend that the quality of the Department will continue to earn the respect and support of the alumni. In addition, we greatly value the advice of our alumni as we plan for the future. We are currently planning a thorough revision of the undergraduate curriculum, both to modernize it and to provide the very best instruction for our students. The Advisory Board and other alumni have given us very helpful advice concerning the needs of geoscientists who are just joining the profession.

Last year, I reported to you on a very successful recruiting year, and we made some strong gains. Dr. Alan Fryar, who is now beginning his second year, has exceeded even our high expectations for him. In addition to rapidly building his own research and graduate program in hydrogeology for the Department, he has established interdisciplinary ties to faculty in several other departments, especially Agronomy and Forestry. We now have the foundation for a strong interdisciplinary program in water quality and water supply. However, three faculty members who began last year with us are no longer here, and we regret these losses. Ford Cochran, a low-temperature geochemist to whom we looked for a strong role in our environmental geosciences program, decided on a career change, and Ford is now with the National Geographic Society. Dr. Henry Berry, who had a temporary appointment with us to teach introductory-level courses, obtained a permanent position with the Maine Geological Survey, and he now has what for him is an ideal position in bedrock geology. Finally, Dr. Brian Whiting, who had worked with me in post-doctoral and grant-funded positions, and who had been called upon for teaching some courses, has taken a temporary faculty position at the College of William and Mary. On the positive side, Alan Fryar already plays a very significant role in our department's academic programs, and Brian Whiting and I are continuing our joint research electronically. However, the total teaching capacity of the Department has been reduced since last year. We continue to try to make up in quality what we lack in quantity.

Perhaps the most ambitious and positive move this year was initiation of the campaign for The GEOFund. The GEOFund will provide an endowment from which the income will allow purchases of such expensive equipment as vehicles. As our state-appropriated budget decreases, we become more and more dependent on private gifts if we are to continue to offer the quality of programs that our alumni enjoyed. If you have not responded to the letter you received from Mark Gormley for the Advisory Board, please consider doing that now. This fund is essential to the future of the Department, and your support is essential to the success of the fund. Thank you for your continuing interest in the Department.

Bill Thomas

DIRECTORY

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Chairman

William A. Thomas

Professor

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John C. Ferm
Nicholas Rast
Lyle V.A. Sendlein

Associate Professor

Kieran O'Hara
Susan M. Rimmer
Ron L. Street

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Alan E. Fryar
Paul D. Howell
David P. Moecher

Adjunct Faculty

James C. Cobb
James S. Dinger
James A. Drahovzal
Donald C. Haney
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Technical Staff

James A. McHugh

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Debra A. Smith
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Retired Faculty

William R. Brown
Lois J. Campbell
William J. Dennen
William C. MacQuown
Bruce R. Moore
Thomas G. Roberts
John Thrailkill
Frederick D. Wright

* Joint with Agronomy

ANNOUNCEMENTS

GEOLOGICAL SCIENCES ALUMNI WEEK-END AT UK

Our 1997 Alumni Week-End in Geological Sciences is scheduled for April 11, 12, and 13, 1997. The program will include a field trip, picnic, symposium, banquet, and open house. Registration materials will be mailed separately, early in 1997.

CO-OP PROGRAM

The co-op program (matching students with summer and/or part-time jobs) needs help to identify available jobs, and the requirements for staffing them. A similar search for qualified and interested students is underway in the department. Contacts for the program are:

for the Advisory Board—

Stephen B. Sullivan
4610 Deepwood Ct.
Louisville, KY 40241
Telephone 502-587-2641

for the Department—

John C. Ferm
101 Slone Building
Lexington, KY 40506-0053
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If you know of a job opportunity (or a possibility of one), please contact either Steve or John. We hope to provide some meaningful work experience for our students, and to provide employers with some enthusiastic young geoscientists as temporary workers. The potential for mutual recognition of future full-time opportunities is also present.

DEPARTMENT NEWS

1996 ALUMNI WEEK-END

Those who signed in for the 1996 Annual Alumni Week-End included:

John T. Johnson	Julie Johnson
W.E. Rubarts	Chris Bolton
Sue Rimmer	Steven Juscuk
Brian Whiting	Bryant Ramirez
Maggie Brewer	Wm. Jay Sims
Ed Nosow	Marie Sullivan
Cara B. Kiger	Henry Morgan
Frank H. Walker	William M. Andrews, Jr.
John Hohman	Jack Oliver
Dan Liles	Shane Schmidt
Steven White	Steven B. Wood
David Moecher and family	Doug Gouzie
Mark A. Kulp	Bill Champion
Earl J. Johnson	Mary Sue Johnson
Buddy Lewis	Jennifer Forbragd and son
Joe Allen	Bill Thomas
Eric J. Wallin	Jim Drahovzal
David Jackson	Steve Sullivan
Donnie K. Lumm	Nicholas Rast
Zhenming Wang	Kevin Wente
Frank R. Ettensohn	Kieran O'Hara
Alan Fryar	Edward Harris
Jim Hower	Judy Hower
Diana Rast	Mary Bond
Mark Gormley	JoAnn Gormley
Rob Shamir	Rachel Thomas
Lois Campbell	Jim Hough
Penny Alano	Blessing Brown
Claudia Ann Cook	Garland Dever
Dennis Coskren	Bill Brown
Jennifer Miller	Christina Langston
Marge Rees	M. Ford Cochran
Bill MacQwown	Pamela L. Cochran

This year, the annual McFarlan Lecture was scheduled on Thursday before Alumni Week-End. The McFarlan Lecture was given by Dr. Jack Oliver of Cornell University.

The week-end program began with a field trip on Friday afternoon led by Professor Nicholas Rast, on the topic, *Ordovician Seismicity in Kentucky*. The

annual picnic was held at the Kentucky Horse Park.

Our annual Geological Sciences Alumni Symposium was a bit different this year, in that it consisted entirely of presentations by some of our current graduate students. The topics represent thesis and dissertation research that is nearing completion. Alan Fryar organized the program which included,

Fault Boundary for the Ancestral Uncompahgre Uplift between Gunnison and Crested Butte, Colorado
by Wm. Jay Sims (M.S. thesis)

Kinematic Problems in Palinspastic Restorations at Bends in Thrust Belts: The Example of the Ouachita Salient
by Steven Juscuk (Ph.D. dissertation)

Structure of an Ancient Rifted Continental Margin along the Blue Ridge in Tennessee, North Carolina, and Virginia
by Margaret Brewer (M.S. thesis)

Local and Regional Structural Controls on Deposition of the Brassfield Formation West of the Cincinnati Arch, Kentucky
by William Andrews (M.S. thesis)

Rare-Earth Element and Neodymium Isotope Constraints on the Origin of Carbonatite-Type Rocks, Grenville Province, Ontario
Claudia Cook (M.S. thesis)

The Subsiding Mississippi Delta Plain: Causes and Implications
Mark Kulp (Ph.D. dissertation)

Near-Surface Seismic Investigation and Application
Zhenming Wang (Ph.D. dissertation)

An Assessment of Ground-Water Movement within a Perched and Regional Aquifer System in the Jackson Purchase Region of Kentucky
Carl Peterson (M.S. thesis)

Another innovation in this year's program combined our annual Department Awards Program with our annual Alumni Banquet. Thanks to contributions from alumni, student attendance at the banquet reached a new high level, and the awards program produced an enthusiastic climax to the Alumni Week-End. The significant award to students are impressive and are listed elsewhere in the Round Up. In addition, some less-than-serious awards (for example, Dave Moecher's now famous "Wise Guy" awards) provided lighter, humorous moments.

Student Computer Lab

More than a year ago, with the assistance of the College of Arts and Sciences and a generous

anonymous donor, the department upgraded the student computer lab in Slone Building. This facility is used by graduate and undergraduate students in their course work and thesis research. A component of the upgrade involves connecting all the student computers to the internet. These connections should be in place this fall and will provide students with the capability to access data bases worldwide. With the assistance of the College, we will also soon have all the faculty and the department office in Slone Building "internetted". Please feel free to stop in and see the student computer lab during Alumni Week-End!

Erwin J. Lyons

Dr. Lyons (Erv to his colleagues) died on December 27, 1995, at 86 years of age. Erv joined the Department in 1956, coming to us from the USGS. He retired in 1975. During his almost 20 years at UK, his primary teaching assignment was engineering geology and, on occasion, he also taught general physical geology. In the early years, he taught a geology course for students in agriculture, as well.

Alumni Survey

This past June, copies of a survey were sent to all our departmental alumni for whom we had mailing addresses. Our purpose in distributing this survey was to obtain comments and suggestions from alumni on such subjects as degree programs, job outlook, graduate recruitment, and department-alumni relations. We received only 21 replies, or fewer than 3% of the total number of surveys mailed. The alumni who did respond represent a broad range of graduation dates (three from the 1930s and 1940s, three from the 1950s, three from the 1960s, two from the 1970s, and five each from the 1980s and 1990s) and current employment status (five working as university faculty or staff, four in government, four consultants, three in industry, three retired, and two students). Those who received more than one degree from the department were classified by the date of their first degree.

Numerical rankings and written comments from the respondents were generally, but not uniformly, favorable. Alumni were asked to indicate their agreement or disagreement with the following statements: "My University of Kentucky education prepared me very well for life in general" and "My training in geology at the University of Kentucky

prepared me well for my career." On a scale of 1 to 5, with 1 indicating strong disagreement and 5 indicating strong agreement, responses ranged from 2 to 5 for each statement, averaging 4.14 for the first statement and 3.86 for the second. Although the highest ratings regarding training in the department were offered by alumni from the years 1949 through 1969, no trend in the department's rankings by class year was evident.

Alumni were also asked to recommend changes in the degree program, to comment on the format and content of Alumni Week-End, and to offer other comments on their education and career choice. Five respondents commented on the need for courses in petroleum geology. Others highlighted the need for courses in geophysics, in surficial processes, in field methods, and in the use of computers in geology. Recommended courses outside geology included civil engineering, organic chemistry, finance and business, and cultural diversity. Recommendations for Alumni Week-End included continuing education courses and presentations on recent developments in the geological sciences. Among other comments, the importance of ties with the Kentucky Geological Survey and the value of the Pirtle Geology Library were stressed. None of the respondents indicated any regret at the choice of a career in geology.

For those alumni who have not yet responded but who wish to do so, we are enclosing another copy of the survey in this issue of the Round Up. We recognize the commitment of time and postage necessary to complete and return this survey, and we appreciate your input as we work to improve the department.

HONORED ALUMNI

Hubert King, B.S. 1971

Named a Fellow of the American Physical Society for his work on the structure and dynamics of fluids under pressure. He is a staff physicist with Exxon Research.

Herman H. Reike, B.S. 1959

Received the "Kapitsa Gold Medal of Honor" from the Russian Academy of Natural Sciences in Moscow

given for accomplishments and publications in petroleum geology and engineering. Dubna International University conferred the title of "Professor Honoris causa." The all-Russia Petroleum Scientific-Research Geological Exploration Institute (VNIGRI) in St. Petersburg conferred an "Honorary Doctor of Science" diploma.

ALUMNI NEWS

Ali A. Al-Yazdi, M.S. 1994

Owner and president of VALDEI Resources, Ltd., of Dallas, Texas.

Patricia A. Anderson, B.S. 1980

Has transferred to the Underground Storage Tank (UST) Program in Sacramento, California.

Raimund Bayan, Ph.D.

Now running a successful testing, engineering and consulting company in Jefferson City, Missouri.

Robert B. Boies, B.S. 1947

Owner of Butler Management Consultants, P.E., Consulting Geologists. I am engaged in subsurface and surficial studies in the Rio Grande valley, south Texas and Mexico. We also prepare environmental impact studies for industrial and municipal water and waste-water installations. The engineering branch is engaged in the design of small RO systems, HVAC, and packaged waste-water treatment plants. Thanks for the *Round Up*. It is nice to know so many of the gang are still around.

John Bonita, M.S. 1993

Currently enrolled in a masters of geotechnical engineering program at Virginia Tech. Recommend it to all—it's a great way to avoid working.

A.L. Bryant, B.S. 1958

Since retirement I have been working on possible drilling sites and some general geological consulting. I have eight grandchildren ages 22, 17, 16, 3, 3, 2, 2, less than 1, and less than 1.

James T. Calhoun, B.S. 1994

Working for Fuller, Mossbarger, Scott and May Engineers in Lexington, Kentucky, as a field

geologist.

Walter Brock Clark, B.S. 1928

A pitcher on UK's 1925-1926 baseball team, and played saxophone in the marching band. He was employed by Nevada Cooper Company, Ray, Arizona, and later by the L&N Railroad. Mr. Clark died April 11, 1993.

T. Dennis Coskren, M.S. 1979, Ph.D. 1983

Still working in environmental studies, but I find myself doing as much biology as geology! I'm keeping my hand in mineralogy by continuing my research on water-soluble minerals at Alum Cave Bluff in the Smokies (no alum, no cave—it's just a bluff!). I've found three new minerals there, all REE sulfate oxalates.

Joseph Cupp, B.S. 1992, M.S. 1994

I am currently working as a Project Manager/Hydrogeologist for Aquaterra Environmental Consultants in Chattanooga and Knoxville, Tennessee. I provide hydrogeological support on approximately 25 environmental investigations in Tennessee, Alabama, and North Carolina.

Michael T. Currie, M.S. 1981

Staff geophysicist with British Petroleum. I have spent the last four years in Aberdeen, Scotland, where I was privileged to work as asset geophysicist and project leader on the Foinaven Field (first development in the west of Shetlands area). I have recently written several articles on the design and application of 4D (time lapse) seismic surveys. We transferred to London last June, where I am now working in the west Africa (offshore Angola) team, currently learning Portuguese, which is Angola's national language.

Nancye H. Dawers, B.S. 1984

I am currently in the final stages of completing my Ph.D. on fault growth, at Columbia University. In 1996, I will be moving to the University of Edinburgh, in Scotland, where I will be beginning a post-doc related to faults in the North Sea.

Maureen Enochs, B.S. 1984

In the fall of 1995, I began a tenure-track position as an assistant professor of mathematics at Skyline College. On June 9, 1996, married inventor, John Macdonald, with whom I am part owner of a San Francisco bicycle shop.

Steve Greb, M.S. 1985, Ph.D. 1992

Geologist at the Kentucky Geological Survey working with coal reserves, sedimentology, and earth-science education.

D. Andy Hissam, B.S. 1986

Employed by NASA in Huntsville, Alabama as a design engineer. Currently working on an upper stage engine for the X34 spacecraft.

John W. Hopkins, B.S. 1972, M.S. 1975

In April, 1995, I was laid-off by Parsons Engineering Science, an environmental consulting firm, after being with them for four and a half years. Prior to that, I was a private consultant for four years and worked as an exploration geologist (coal and industrial minerals), with BHP-Utah International, for just over ten years. I am presently looking for permanent or contract employment as an environmental or exploration geologist and am affiliated with ENVision, Inc., an Internet-based environmental consulting firm.

Lowell F. King, B.S. 1958, M.S.

Retired from CALTEX Pacific Indonesia (A 50-50 subsidiary of Chevron and Texaco) in June, 1993. I am loafing around Houston while my wife, Elizabeth, studies for Ph.D. in nursing at Texas Women's University and teaches at the School of Nursing, University of Texas, Houston.

Jeff Mackey, B.S. 1991

I am currently working as an investment representative for the Edward Jones Co., a full-service brokerage firm.

Robert D. Money, B.S. 1986, M.S. 1991

Transferred from Richmond, Virginia, in January as branch manager of Environmental Resources Management, Inc.'s Louisville, Kentucky, office. My wife, Marigail, and I are expecting our first child in September, 1996.

James Montgomery, Jr., M.S. 1994

I have been involved in building the mansion for the Prince family in Wapiti, Wyoming. I have been working on the house for the past 18 months. Mary and I have purchased a house which we are renovating to eventually sell. We also are part owners of a couple of rental properties. We continue to work on our family ranch where we enjoy riding horses. We seem to prioritize skiing when the snow is good.

Eric K. Nicholas, B.S. 1993

After working as a geologist with Groundwater Technology, Inc. and with the State of Kentucky Division of Waste Management/Underground Storage Tank Branch, I returned to school and finished my Master's degree in education. This fall I plan to teach high school science and continue my graduate work in geology and biology. I am planning to be married in the spring to Amy S. Mounce, who will graduate in May of 1997 with a doctorate in Pharmacy from the University of Kentucky, College of Pharmacy.

Alma Hale Paty, M.S. 1984

In January, 1996, I accepted a position as Director of Research at The Gold Institute, an international association that includes miners, refiners, bullion suppliers, manufacturers of gold products, and wholesalers of gold investment products. Its mission is to promote the common business interests of the world's gold industry by increasing the use of gold and public awareness of its money values.

Mike Reed, B.S. 1982

Vice President Tenexco, Inc. Tenexco is drilling in the Gulf Coast states and Permian Basin. We are fortunate to be able to utilize the latest technology in seismic exploration. The exploration department (me) will relocate to Louisville, Kentucky, in 1997.

Herman H. Rieke, B.S. 1959

Events this year were very surprising and beneficial to my academic career. I was honored in Moscow by the Russian Academy of Natural Sciences. The academy bestowed upon me their highest honor—the "Kapitsa Gold Medal of Honor," and I was inducted into the Academy of Foreign Member. The award was given for my accomplishments and publications in petroleum geology and engineering. The medal is named after prominent Russian physicist and Nobel Laureate, Peter L. Kapitsa. Dubna International University located in the nuclear research City of Dubna conferred on me the title of "Professor Honoris causa." In addition, the all-Russia Petroleum Scientific-Research Geological Exploration Institute (VNIGRI) in St. Petersburg conferred a "Honorary Doctor of Science" diploma, and my photograph and biography will be placed in the institute's Gallery of Honor with other past and present exploration geologists and academics. I had a good time, my hosts were wonderful, and there was plenty of fine food and wine.

Don C. Sargent, B.S. 1949

Nothing new here in the land of sand, sun, sea breeze and salt air. Well, maybe a dozen or so more tee-shirt and sea-shell shops, a few more fish-n-shrimp restaurants and another beach bar or two designed to ensnare the tourist. The main recreational activity of the South Padre Island residents is still just sitting around and listening to their cars rust.

Walker L. Shearer, B.S. 1936

Retired in 1977 from Dow Chemical Company, Midland, Michigan, as Research and Development Engineer. Presently, serving on two American Society for Testing and Materials committees concerning soil and rock specifications.

Dennis R. Swager, B.S. 1977, M.S. 1978

I own Swager and Associates, Ltd. in Bridgeport, Illinois. I am also owner/operator and President of Team Energy located in Bridgeport, Illinois. Both businesses conduct geological, as well as engineering, work in North America.

Charles Tabor, B.S. 1990

I resigned from the U.S. Geological Survey in November, 1995, and began work as an organic geochemist with an environmental consulting firm in Boulder, Colorado. I also climb, snowboard, mountain bike, and four-wheel drive.

Tim Tharp, B.S. 1981

Still working as an environmental consultant and project manager with Lockheed Martin in Oak Ridge, Tennessee. Thanks for publishing the Round Up to keep us informed of department news and alumni.

Matthew D. Varney, B.S. 1995

I'm a geologist for the State of Kentucky, Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, Division of Waste Management, Underground Storage Tank Branch, Corrective Action Section. (Whew! Those government hierarchies!) Anyway, my position involves the regulation of petroleum storage tanks underneath gas stations. Specifically, I oversee and review reports of clean-up operations for tanks which have leaked and contaminated the soil and groundwater. There is a large amount of paperwork involved, and there is very little field work. Still, I'm learning a lot, and I enjoy my job.

Thomas R. Webb, B.S. 1983

Serve as Environmental Services program manager for the Lexington-Fayette Division of Environmental

and Emergency Management. I am responsible for coordinating and supervising environmental programs within Fayette County.

Joseph K. Wetherill, B.S. 1941

Consultant in oil and gas matters to Richard King Mellon Foundation—a far cry from going on a field trip with Dr. Mac—so many years ago.

Patricia F. Wonderley, B.S. 1979, M.S. 1982

Patent attorney with law firm of Bogle & Gates in Seattle, Washington.

GSA MEETING

The 1995 annual meeting of the Geological Society of America was held in New Orleans. Those who signed "the book" included:

Doug Gouzie	Brent Owens
Nicholas Rast	Shane Schmidt
Mark Kulp	Elizabeth Haynes
Bill Thomas	Rachel Thomas
Adam Holt	Kevin Pogue
Jack Pashin	Brian Whiting
D.C. Haney	M. Ford Cochran
Wm. Jay Sims	Jim Hower
Jim Dinger	Steven Juscuk
Marie Sullivan	Paul Howell
Randy Keller	Dave Moecher
John Holbrook	Penny Alano
Chris Toles	Sue Rimmer
David Wunsch	Dena Wunsch
John C. Mars	Wes Combs

IN MEMORIUM

This year the department received word of the passing of the following alumni and former faculty members. We are saddened by the loss of these friends, and we extend our sincere sympathy to their families.

Charles W. Boggs, July 22, 1995
Clemont H. Bruce, January 18, 1996
Walter Brock Clark, April 11, 1993
Erwin John Lyons, December 27, 1995
Billy Ray Lawson, 1994
Louis R. Ponsetto, February 3, 1996

FACULTY NEWS

Frank Ettensohn

For a change, I took this summer off from summer field camp and was able to attend two meetings that I normally would not have been able to attend, The Eighth Symposium on the Geology of the Bahamas in San Salvador in the Bahamas, and the Second International Symposium on the Silurian System in Rochester, New York. Although I have been taking students to the Bahamas for 20 years, I have never been able to go to one of these meetings because of field camp. The field trips accompanying the meeting were most rewarding and I learned many new things about the carbonate geology of San Salvador. The symposium on the Silurian System is held rather infrequently, but I lucked out in being able to attend the meeting this year, because the Silurian geology of Kentucky is an aspect that my students and I are beginning to look at in more detail. One student, Todd Hendricks, just finished a thesis on a Silurian unit, and two others, William "Drew" Andrews and Jeremy Middleton are working on other Silurian units in Kentucky. At the meeting I was also able to present two papers on the use of Silurian stratigraphy in the Appalachian basin to support the ideas regarding the continuation of Taconian orogeny into Early Silurian time as well as regarding the nature of the Salinic disturbance.

The free summer also gave me time to rework and resubmit a proposal regarding the recognition of paleoseismicity in the Ordovician and Devonian rocks of central Kentucky. Together with Nick Rast and Ron Street, preliminary research done this summer suggests the very real possibility of being able to recognize epicentral areas and interpreting approximate magnitudes of paleoearthquakes which we believe are represented by numerous examples of penecontemporaneous soft-sediment deformation throughout the area. We believe that this could result in wholly new concepts about the nature of epicontinental sedimentation.

Finally, the free summer gave me the opportunity to write up a discussion about the new modes of instruction I have been using during my last two terms in summer geology field camp. Inasmuch as most of our students will probably be working for

engineering or consulting companies as parts of teams under budgetary and time restraints to accomplish projects, I thought that it would be worthwhile to set up field camp in the context of company teams working collaboratively to map a given area. As in real life job situations, there are contracts, deadlines, reports, fines and bonuses, and students are paid for their work in geobucks which can be translated into advancement credits or grades. Although most of the work is done collaboratively, there are also opportunities for students to show what they can do individually. The students seem to like the new approach, and it seems to alleviate much of the isolation and competition that sometimes characterize field-camp exercises. So overall, this free summer has proven to be very productive one for me.

John Ferm

John was busy flying around last year. In October, he and Doris flew to Wellington, New Zealand, to attend the New Zealand Coal Conference. John gave one of the keynote addresses which was entitled "Some avoidable problems in a privatized coal industry." In this address, he related some of the problems that he has observed in the American Coal industry and his comments were well received. A second technical presentation dealt with prediction of small-scale displacements in underground coal mines. This also was of interest to underground mining people.

In the spring, John went to New Castle, Australia, for another keynote address, this time to the New Castle Symposium. The address was entitled "The life and death of hypothesis concerning coal and coal-bearing rocks" which stressed the problems of hypothesis generation and testing and the failure of geologists to relate their observation to basic principles of chemistry and physics. The talk generated considerable discussion.

Both in New Zealand and Australia, John was able to take a few field trips and see some very exciting geology.

Alan Fryar

This time last year, I was beginning my activities at UK with two graduate students, a modest grant, and a sense of limitless possibilities. I now have six graduate students, two modest grants (one of which is pending), and a better understanding of the competing demands facing faculty members. I taught the senior

seminar class last fall and the hydrogeology course this past spring, and I am teaching the undergraduate environmental geology class this fall. I also taught part of a new, week-long field course in hydrologic methods offered by Dave Brown in the Department of Forestry this past summer. He, I, and three M.S. students (Eric Wallin, Chris Sweat, and David Butler) are studying ground-water flow and contaminant degradation at the U.S. Department of Energy Paducah Gaseous Diffusion Plant (with support from the Kentucky Water Resources Research Institute). Beth Nodurft, a student in Civil Engineering, is continuing thesis work with me on abiotic degradation of trichloroethene in basalt (with support from DOE). Sunil Mehta is beginning Ph.D. research with me and Bill Thomas on cross-formational flow of basinal brines in the Texas High Plains. Reuben Gillispie is working with KGS staff and me on his thesis work to delineate the boundary of the Royal Springs watershed in Fayette and Scott Counties. We attracted several visiting speakers in hydrogeology and environmental geochemistry to the department, and I organized a monthly brown-bag seminar series in water resources with the help of KWRRI. Finally, the department now has a World Wide Web site (address <http://www.uky.edu/ArtsSciences/Geology/>), which I will be maintaining with creative direction from Paul Howell.

Paul Howell

This has been a fun year for me with the opportunity to teach new courses, oversee substantial development of our Gulf Coast research program, and launch into new areas of educational interest. In the spring I developed a seminar course in Environmental Studies which led a diverse group of seniors through the morass of *Economics and the Environment*. Our work on the Environmental Studies program has blossomed, with growth in the *Introduction to E.S.* course growing from 12 to 18 to 40 in three years. In May, I ran 15 grad and undergrad students down to the Georgia coast to study modern detrital depositional environments for a week, then flew to Gunnison, Colorado, to contribute a spell with the department's summer field camp.

Between these two efforts, I took a workshop in use of the World Wide Web in the classroom and got hooked. I now have a *WebDoGS* page that is becoming a site for my students (and those of others) to "publish" their efforts, as an alternative to traditional term papers in the lower level classes, and have begun contributing to the ongoing campus Web

workshops. I also co-taught a two-week summer institute in Science and Mathematics for the Long Beach (California) school district in July, as a scholar with the National Faculty, an organization focused on enhancing the quality of the nation's K-12 teachers.

Mark Kulp has really taken off on the Mississippi delta subsidence project, getting many computer simulations underway and spending a week in D.C. with our NASA collaborator, Bruce Bills. We hope to submit grant proposals and our first manuscripts based on our preliminary results this fall.

David P. Moecher

Big news on the graduate student front! Eric D. Anderson completed the requirements for the M.S. degree. Eric investigated the origin of carbonatite-like rocks in the Grenville Province of Ontario. These rocks are in part responsible for formation of skarn hosted Mo, U, Th, and REE mineralization. Eric's thesis was a state-of-the-art study employing stable isotope geochemistry and mineral analysis employing the electron microprobe. Upon completing his thesis, Eric hit the road to pursue his real passion, climbing rocks (rather than analyzing rocks, although this is a close second). He spent time climbing in British Columbia and Alberta, and then returned to West Virginia to continue working as a climbing guide.

Claudia Cook spent last summer as a visiting scientist at the University of Maryland performing rare earth element and Sm-Nd analysis of the Grenville carbonatites. She will finish up her thesis requirements this semester. The data collected by Eric and Claudia will be the basis for a paper to be submitted soon for publication.

Field trips continue to play an important role in undergraduate and graduate education. In addition to my yearly sojourn with students in Igneous and Metamorphic Petrology to the Blue Ridge, and with the Mineralogy students to collect minerals in the Bluegrass, Paul Howell and I have begun spring field trips to selected localities. Two Mays ago it was Ontario, Canada (brmmrr!) to look at Grenville structure, the mineralization at Sudbury, and other hard rock features. Last spring it was Sapelo Island, GA (mmmm, nice and hot), to investigate modern clastic depositional environments. This spring we plan a trip to New England and the Adirondacks. Any alumni wishing to come along are more than welcome to do so. Contact Paul or I for travel dates.

As for me, I have begun collaborative research with Craig Dietsch on the evolution of the Waterbury

Dome in Connecticut, and continue to collaborate with Kieran O'Hara and Dr. Joe Allen (Ph.D. '94) on rocks formed by frictional fusion of wall rocks in brittle fault zones ("pseudotachylite"). The generation of a melt during faulting has important implications for behavior of a fault zone. This research required that we visit the University of Lausanne in Switzerland, where we are collaborating scientists on argon and oxygen isotope analysis of pseudotachylite for the Homestake shear zone, Colorado. I also had the opportunity in August to do field work in Connecticut, and in September to attend a meeting at the University of Kingston (just outside London, England).

Kieran O'Hara

David Moecher, myself, and students continue to work on NSF funded projects related to the chemistry of mylonites and isotopic composition of pseudotachylites (melted rocks produced during seismic events). From the work on mylonites, it is becoming increasingly clear that fluid-rock interaction in shear zones in the upper crust (< 15 km) involves pressure solution and chemical reaction of feldspars but, that at deeper levels, crystal plastic mechanisms take over, reducing the effectiveness of fluid flow. Teaching advanced structural geology and mineralogy for the first time in the spring, however, put research on the back burner. The summer allowed time to catch up on writing up the data collected over the past year. After copious e-mail, reams of fax, and many Fed Ex deliveries, we have at last submitted the revisions to a multi-authored paper on deformation and the significance of isotopic temperatures in mylonites. Getting co-authors in three countries to agree on the text was a lot like herding cats. Doctoral student, Xin-Yue Yang, has the first part of his dissertation, which documents the importance of tectonic mixing in a deep crustal shear zone in the Grenville province, ready for submittal for publication. We have also submitted a paper on fluid-rock interaction in accretionary prisms, based on data Xin-Yue collected in the Altay orogenic belt, northwest China, several years ago, but never got around to analyzing. The interesting thing about these oxygen isotope data is that they strongly indicate that seawater was tectonically ingested into the accretionary prism to a depth of 10 km, and then possibly recirculated back to the surface as hot water. In August, Xin-Yue and I attended the 30th International Geological Congress in Beijing where the main theme was continental tectonics and global

environmental systems. We also visited the Changsha Institute of Tectonics in Hunan. This trip was partly funded by the Chinese National Science Foundation. I continue as Director of Graduate Studies for one more year and I will be teaching Field Methods in the Fall (two wet weekends already!) and Physical Geology in the Spring.

Nicholas Rast

This year Nicholas Rast's research has been essentially concerned with: a) the development of ideas about paleogeography of continents and oceans in geological time; b) the impact of earthquakes on contemporaneous sediments (seismites) and; c) the details of the evolution of the Appalachian structure. All these endeavors are still being pursued. Evidence for seismic activity has been demonstrated during the alumni field trip in the spring of 1996. The paleogeographic reconstructions of continents has been written up as part of a major symposium and some details of Appalachian structures are to be presented at the annual (1996) meeting of the Geological Society of America.

Ron Street

It has been busy year for the students and myself in the Seismic Lab. We managed to shoot several kilometers of SH- and P-wave CDP reflection lines in the area of Kentucky Bend, which is at the southwestern tip of the state. We also managed to complete our efforts in western Kentucky and southeastern Missouri to obtain a representative matrix of shear-wave velocities of the sediments in the Jackson Purchase region. These results were then used to develop dynamic site periods, that are to be used by the Kentucky Transportation Cabinet for assessing the seismic vulnerability of bridges and overpasses in the Jackson Purchase region.

Bill Thomas

This has been the year of the unexpected. For many years, I have worked on the tectonics of the late Precambrian-Cambrian rifted margin (the Iapetus margin) of southeastern North America. Part of my interpretation of the history of rifting involved a shift from the Blue Ridge rift to the Ouachita rift at about the beginning of Cambrian time. In that interpretation, a block of continental crust that had

been part of southern North America broke away during Cambrian time to form the Ouachita embayment; the departed fragment originally extended from east Texas to southern Alabama and across what is now the northern part of the Gulf of Mexico. For my research, the important consideration was that the block left North America. I didn't need to be concerned with where it went (somewhat like a rocket scientist whose job is to make them go up—I don't care where they come down). Last fall, I was invited to attend a GSA Penrose Conference in the Precordillera of northwestern Argentina, where Argentine geologists have found a block of Cambrian carbonate rocks that contain the same trilobites as equivalent rocks in southern North America. In the Precordillera, they have found the block that rifted away from North America! The stratigraphy is just like that in Alabama, Mississippi, Oklahoma, and Texas, including the Knox, Arbuckle, Ellenburger carbonates and redbeds like the Rome Formation of the Appalachians.

Ricardo Astini of the Universidad Nacional de Córdoba and I, realizing that we had the two halves of the same story, integrated the entire process of rifting of the Precordillera block from North America to its collision with western South America (Gondwana). We published that interpretation in an article in *Science* in August. At the same time, an article in *Discover* magazine described our story and the results of the Penrose Conference. I've been publishing results of my research for nearly forty years, but never before has anything I've done attracted the public news media. Articles about our research have appeared in the *Washington Post*, *New Scientist*, *Science News*, *Courier-Journal*, and newspapers in Dallas, Cleveland, Baton Rouge, Madrid, Sao Paulo, and Buenos Aires. I also taped interviews for the Latin American edition of Voice of America and for two different programs of the British Broadcasting Corporation. My eastern Kentucky accent provided an interesting contrast to that of the BBC reporters. This has been fun, and I hope that the international publicity will generate more recognition and support for research at the University of Kentucky.

ADJUNCT FACULTY

James C. Cobb

As Assistant State Geologist for Research, I oversee the research program at the Kentucky Geological Survey. The Survey's main areas of

research are in groundwater hydrology, coal, oil and gas, and minerals. As in all fields, computer applications are a large part of all our efforts. A new grant to produce digital geologic maps for Kentucky will allow us to become the first state with digital geologic map coverage.

James Drabovzal

The former Petroleum and Stratigraphy Section at the Kentucky Geological Survey has been renamed the Geologic Mapping and Hydrocarbon Section and I continue to head up this group. With the cutbacks in oil and gas research in this country, our group has been doing some refocusing. We have initiated several programs in digital geologic mapping for the state's 7 1/2-minute quadrangle series. In addition, we have begun some neotectonic studies in western Kentucky associated with the Paducah Gaseous Diffusion Plant. We continue to carry out oil and gas research and service.

Personally, I have continued to conduct research in the Cambrian rift basins of Kentucky and mapping of the Precambrian basement, utilizing newly available reflection-seismic data for the state. This past year, I looked again at the East Continent Rift Basin and began examining some other associated Precambrian rifting events in the western part of the state. Last year, I traveled to the Gulf of Corinth to examine some of the modern and recent rifting and fan development that I think is similar to that in the Cambrian sequence of Kentucky.

As an adjunct associate professor in the department, this past year I participated on the committees of nine Master's and Ph.D. candidates. Their research includes organic geochemistry, remote sensing, earthquake geophysics, structural geology, and stratigraphy. Two of the department's geology undergraduates have student appointments with the Geologic Mapping and Hydrocarbon Section at KGS.

Jim Hower

We continue to concentrate research efforts on coal-combustion by-products. This has led to some productive efforts with engineers at several utilities and fly ash marketing companies. I am continuing to conduct some geologic research in cooperation with KGS and USGS geologists.

Every summer, the CAER hires 6 high school students as interns for two weeks. I have been a mentor to a student and have conducted field trips to

a mine and to a power plant as part of the program. The intern from 1995 came back to work in my lab for the entire summer of 1996, giving him a better understanding of the focus of the entire CAER.

In October, 1996, I will be receiving the Gordon H. Wood, Jr., Memorial Award from the Eastern Section of the American Association of Petroleum Geologists. The award is in recognition of work in coal geology, particularly in the territory covered by the Eastern Section.

EMERITUS FACULTY

Lois Campbell

I have nothing much to report for this year. I am still here in Lexington, and my travels have been confined to the eastern U.S. While at home I am active in the local chapters of the League of Women Voters and the United Nations Association of the USA. Recently these have kept me rather busy, but I still find time to continue research into the economic geology of ancient civilizations. Oh yes, I look forward to the monthly meetings of the BOGS (Bunch of Old Geologists).

Irving Fisher

After having served for six years on the Portland (Maine) Planning Board, I did not apply for my third three-year term. I am still an officer in a couple of organizations, but none with clout. Ginny is also an officer in organizations somewhat more impressive than mine. Ginny and I celebrated our fiftieth wedding anniversary last June and our kids gave us a big party on Great Diamond Island where we live most of the year. (We get mail for only two months of the year, therefore the P.O. box.)

Bobby Timmons came by last year and John and Lavine Thrailkill stopped by and we were delighted to see them. We don't have many UK related visitors. We keep up with UK through son, Chuck, who is at the computer center.

We are planning a trip to Alaska this fall. Just waiting for last confirmations. We will probably be in Lexington in May.

Thomas G. Roberts

Dr. Roberts remains in a nursing home where he appears to be quite content. His memory is almost

entirely gone, but we think he appreciates our stopping in to see him. Receiving picture cards gives him pleasure and, if you wish, you can drop him a card at the following address:

Lexington Centre for Health and Rehabilitation
353 Waller Avenue
Lexington, KY 40504

1995-1996 DEGREES AWARDED

BACHELOR OF SCIENCE

Dawn Crutcher
Kevin M. Durham
Jeffrey A. Esterle
Todd J. Milici
Brenton E. Millay

David A. Remley
Gary W. Stone
Christofer J. Sweat
Ian Thomas

MASTER OF SCIENCE

Eric D. Anderson, 1996, M.S., The stable isotope and chemical composition of calcite from marble, skarn, and calcite-apatite-biotite rocks southwestern Grenville Province, Ontario: Constraints on the origin of potential meta-carbonatites.

Advisor: David Moecher

Richard T. Hendricks, 1996, M.S., Stratigraphy and sedimentology of the Silurian (Wenlockian) Laurel Member of the Salamonie Dolomite in Kentucky and adjacent southeastern Indiana.

Advisor: Frank Ettensohn

Michael W. Hiatt, 1996, M.S., Wellhead protection study for Cascade Spring in Coffee County, Tennessee.

Advisor: Lyle Sendlein

Carl Petersen, 1996, M.S., An assessment of groundwater movement within a perched and regional aquifer system in the Jackson Purchase Region of Kentucky.

Advisor: Lyle Sendlein

William J. Sims, 1996, M.S., A fault boundary for a segment of the northeast Ancestral Uncompagre

uplift, Ancestral Rocky Mountains, Colorado.

Advisor: William A. Thomas

Nicholas S. Sirek, 1996, M.S., Abundance, distribution, and predictability of fractures (joints) in relation to the flow of groundwater in the eastern Kentucky coal fields.

Advisor: William A. Thomas

Page B. Taylor, 1996, M.S., Hydrologic assessment, sedcad model validation, and infiltration basin performance for the Appalachian coal region in Kentucky.

Advisor: Lyle Sendlein

DOCTOR OF PHILOSOPHY

James Coble, 1996, Ph.D., Metamorphic development of the Hayesville fault, Haywood and Jackson Counties, North Carolina.

Advisor: Nicholas Rast

GRADUATE STUDENT RESEARCH

Penny Alano (B.S., Indiana)

M.S. thesis: Pyrite distribution and association in the Lower Block, Upper Block and Buffaloville coal members of the Brazil Formation (Davies County); Implications for the depositional environment.

Advisor: Sue M. Rimmer

Liane B. Alessi (B.S., Arizona)

M.S. thesis: Mineralogical and chemical composition of brecciated clay-carbonate sequences associated with No. 13 coal, western Kentucky: Implications for origin.

Advisor: Sue M. Rimmer

William M. Andrews (B.S., Kentucky)

M.S. thesis: Stratigraphy and structural controls on deposition of the Brassfield Limestone of western Kentucky.

Advisor: Frank R. Ettensohn

Aaron R. Baldwin (B.S., East Carolina)

M.S. thesis: Structural intersection in the

Appalachian thrust belt in northwestern Georgia.
Advisor: William A. Thomas

Margaret C. Brewer (B.S., Hunter)
M.S. thesis: Structure of an ancient rifted continental margin along the Blue Ridge in Tennessee, North Carolina, and Virginia.
Advisor: William A. Thomas

David L. Butler (B.S., Kentucky)
M.S. thesis: Biodegradation of trichloroethene in wetland soils from McCracken County, Kentucky
Supported by the Kentucky Water Resources Research Institute
Advisor: Alan E. Fryar

Denny J. Cantrell (B.S., Kentucky)
M.S. thesis: Organic maturation of the Devonian black shales in eastern Kentucky.
Advisor: Sue M. Rimmer

Claudia Cook (B.S., Vanderbilt)
M.S. thesis: Rare earth element and neodymium isotopic composition of "carbonatite" and related rocks, Grenville Province, southern Ontario.
Advisor: David P. Moecher

Tony L. Cooley (B.S., Washington [St. Louis])
Ph.D. dissertation: Characterization of the macropore system and water movement through soils and soil/rock interface over a shallow karst conduit system.
Advisor: Lyle V.A. Sendlein

Thereseann Dowdy, (B.S. Kentucky)
M.S. thesis: Application of a GIS to a hydrogeologic study of the Inner Blugrass Karst Region in Scott County, Kentucky.
Advisor: Lyle V.A. Sendlein

Alan Gentry, (B.S. Louisville)
M.S. thesis: Application of RISK PRO to USG sites in Kentucky.
Advisor: Lyle V.A. Sendlein

Reuben Gillispie (B.S., Marietta)
M.S. thesis: Increased resolution of the ground-water basin boundary of Royal Springs, a karst water-supply aquifer in Scott and Fayette Counties, Kentucky.
Advisors: James S. Dinger and Alan E. Fryar

Peter J. Goodman (B.S., Iowa; M.S., Temple)
Ph.D. dissertation: Numerical models of basin analysis in the autochthonous Appalachian basin in

Kentucky, Cumberland Plateau region.
Advisor: Nicholas Rast

Brian Higgins, (B.S., Morehead State)
M.S. thesis: Site responses due to seismic loading in Henderson, Kentucky.
Advisor: Ron L. Street

Daryl Hines, (B.S., Kentucky)
M.S. thesis: Hydrogeologic investigation at an industrial site of Scott County, Kentucky.
Advisor: Lyle V.A. Sendlein

Peter Idstein, (B.S., Eastern Illinois; M.S., Eastern Kentucky)
Ph.D. dissertation: Investigation of current and alternative groundwater sampling methods for contaminants moving in a karst flow system.
Advisor: Ralph Ewers (Eastern Kentucky University)

Scott Johansen, (B.S., Kentucky)
M.S. thesis: The Carboniferous limestone in southeastern Kentucky.
Advisor: John C. Ferm

Walter Johnson (B.S., Louisville)
M.S. thesis: Stratigraphy of the Ste. Genevieve-Girken contact in western Kentucky.
Advisors: Frank. R. Etensohn and Nicholas Rast

Steven Juscuk (B.S., Queens; M.S., Texas Christian)
Ph.D. dissertation: How do the late Paleozoic structures within the Southern Oklahoma aulacogen relate to the late Paleozoic structures of the Ouachita-Marathon orogenic belt?
Advisor: William A. Thomas

Mark A. Kulp (B.S., Juniata; M.S., Kentucky)
Ph.D. dissertation: Isostatic contributions to subsidence and uplift in the northern Gulf coast.
Advisor: Paul D. Howell

Dennis G. Lewellen (B.S., Oregon State; M.S., Eastern Washington)
Ph.D. dissertation: Control of sedimentation by contemporaneous structure, Pocahontas Formation, Buchanan County, Virginia.
Advisor: John C. Ferm

Donald Lumm (B.S., Illinois; M.S., Vanderbilt)
Ph.D. dissertation: Re-examination of the Pennsylvanian-Mississippian unconformity in southern Illinois.

Advisor: John C. Ferm

Sunil Mehta (B.Sc., Jodhpur; M.Sc., Poona; M.S., Northeast Louisiana)

Ph.D. dissertation: Cross-formational discharge and flow of basinal brine within the Ogallala aquifer, Southern High Plains, Texas

Advisors: Alan E. Fryar and William A. Thomas

Jeremy Middleton (B.S., William and Mary)

M.S. Thesis: Stratigraphy and depositional Environments in the Crab Orchard Formation (Silurian).

Advisor: Frank R. Ettensohn

Roger J. Paulson (B.S., Wisconsin-Plattville)

M.S. reports: Revision of input and output for Prickett, Naymik, and Lonquist random walk solute transport modeling program; and Contaminant hydrogeology of a site in Jefferson County, Kentucky.

Advisor: Lyle V.A. Sendlein

Shane Schmidt (B.S., Indianapolis)

M.S. thesis: Stratigraphic and paleoenvironmental controls on Upper Ordovician coral "reefs" in west-central Kentucky.

Advisor: Frank R. Ettensohn

Wm. Jay Sims (B.S., Arkansas-Little Rock)

Ph.D. dissertation: The geometry and kinematics of the Pennsylvanian-Permian central Colorado trough.

Advisor: William A. Thomas

V. Marie Sullivan (B.S., Juniata)

M.S. thesis: Physical and chemical comparison of uncompacted coal mine soil to forest soils; eastern Kentucky.

Advisor: Paul Howell

Christofer J. Sweat (B.S., Kentucky)

M.S. thesis: Reactions of trichloroethene with lignite and pyrite of the McNairy Formation, Jackson Purchase region, Kentucky

Supported by the Kentucky Water Resources Research Institute

Advisor: Alan E. Fryar

Yalan Tang (B.S., Shanxi; M.S., Beijing)

Ph.D. dissertation: Coal petrology, mineralogy, and geochemistry of the Fire Clay coal bed, southeastern Kentucky.

Advisor: Sue M. Rimmer

Jennifer A. Thompson (B.S., Smith)

Ph.D. dissertation: Organic facies in the Devonian shales, central Kentucky.

Advisor: Sue M. Rimmer

Eric J. Wallin (B.S., Georgia Southern)

M.S. thesis: Spatial and temporal variability in seepage fluxes between the continental deposits and Little Bayou and Bayou Creeks, McCracken County, Kentucky.

Supported by the Kentucky Water Resources Research Institute

Advisor: Alan E. Fryar

Zhengping Wang (B.S., Wuhan; M.S., Beijing)

Ph.D. dissertation: Comparison of macroscopic and microscopic coal lithotypes.

Advisor: John C. Ferm

Zhenming Wang (B.S., Peking; M.S., Kentucky)

Ph.D. dissertation: Source characteristics of earthquakes in the New Madrid seismic zone.

Supported by Martin Marietta Energy Systems, Inc.

Advisor: Ron L. Street

Mark Warrell, (B.S., Kentucky)

M.S. thesis: Determination of the origin of groundwater in a fly ash landfill in northern Kentucky.

Advisor: Lyle V.A. Sendlein

Anna E. Watson (B.S., Kentucky)

M.S. thesis: Stratigraphy and depositional environments of the Pennington Formation, southeastern Kentucky.

Advisor: Frank R. Ettensohn

Edward Woolery, (B.S., Eastern Kentucky; M.S. Kentucky)

Ph.D. dissertation: Near-surface structural investigation and seismic hazard analysis of the northern Mississippi Embayment.

Advisor: Ron L. Street

Xin-Yue Yang, (B.S., Central South University of Technology; M.S., Changsha Institute of Geotectonics, Academia Sinica)

Ph.D. dissertation: Chemical changes in ductile shear zones as a function of depth in the continental crust.

Supported by National Science Foundation

Advisor: Kieran O'Hara

NEW GRADUATE STUDENTS

David Butler (B.S., University of Kentucky)
 David M. Campbell (B.S., Morehead State University)
 Gregory B. Graham, (B.S., University of Wisconsin-Milwaukee)
 Jeremy D. Middleton (B.S., College of William and Mary)
 Sunil Mehta (B.S., University of Jodhpur, India; M.S., University of Podna, India; Northeast Louisiana University)
 Christofer J. Sweat (B.S., University of Kentucky)

TEACHING ASSISTANTS

Aaron Baldwin
 Margaret Brewer
 David Campbell
 Gregory Graham
 Reuben Gillispie
 Walter Johnson
 Steven Juszczuk

Mark Kulp
 Sunil Mehta
 Jeremy Middleton
 Shane Schmidt
 Wm. Jay Sims
 Christofer Sweat
 Eric Wallin

STUDENT AWARDS

**Kentucky Environmental Protection Cabinet and
 Kentucky Water Resources Research Institute**
 Dena Wunsch

Chevron Fellowship
 William M. Andrews, Jr.

Undergraduate Research and Creativity Awards
 David Butler

Graduate School Allocated Fellowship
 David Butler

Hudnall Scholarships

Scott Boyer
 David Butler
 David Campbell
 Takeshi Hirano
 Adam Holt
 Anthony Keeton
 Kara Kiger
 Kevin Lyne
 Julie Osborne
 Thomas Reed
 Steven White

Pirtle Graduate Fellowships

William M. Andrews, Jr.
 Claudia Cook
 Wm. Jay Sims

McFarlan Fund, Research

Margaret C. Brewer
 Steven Juszczuk
 Mark A. Kulp
 Bryant Ramirez
 Wm. Jay Sims

McFarlan Fund, Travel

William M. Andrews, Jr.
 Margaret C. Brewer
 Claudia Cook
 Steven Juszczuk
 Bryant Ramirez
 Xin-Yue Yang

**Tarr Award (Sigma Gamma Epsilon) -
 outstanding graduating senior**
 David Butler

**Pirtle Award - outstanding junior showing
 promise in geology** Christina Langston

RESEARCH ASSISTANTS AND FELLOWS

V. Marie Sullivan, Robinson Forest Trust Grant
 Zhenming Wang, Martin Marietta Energy Systems
 Xin-Yue Yang, National Science Foundation

STUDENT PRESENTATIONS

William M. Andrews, Jr.

Local and regional structural controls on deposition of the Brassfield Formation west of the Cincinnati Arch, Kentucky

Southeastern Section, Geological Society of America; Jackson, Mississippi, March, 1996.

William M. Andrews, Jr.

Regional and local structural controls on deposition of the Lower Silurian (Llandoveryan) Brassfield Formation west of the Cincinnati arch -

The James Hall Symposium: Second International Symposium on the Silurian System: Rochester, New York, August, 1996.

Stephen F. Barnett

A new graben-bound, Middle Devonian black-shale unit at the base of the New Albany Shale in central Kentucky: Characterization and significance

Northeastern Section, Geological Society of America; Buffalo, New York, March, 1996.

William M. Andrews, Jr.

Coal production in Perry County, Kentucky: Effects of markets, technologies, and transportation availability

Southeastern Section, Geological Society of America; Jackson, Mississippi, March, 1996.

Margaret C. Brewer

Structure of an ancient rifted continental margin along the Blue Ridge in Tennessee, North Carolina, and Virginia

Southeastern Section, Geological Society of America; Jackson, Mississippi, March, 1996.

Steven J. Juscuk

Kinematic problems in palinspastic restorations at bends in thrust belts: The example of the Ouachita salient

South-central Section, Geological Society of America; Austin, Texas, March, 1996.

Zhenming Wang

A comprehensive geological and geotechnical study of site response at selected sites in the New

Madrid seismic zone.

Eleventh World Conference on Earthquake Engineering; Acapulco, Mexico, June, 1996.

Bryant R. Ramirez

Textural and chemical zoning constraints on interpretation of Acadian P-T conditions, southern Connecticut Valley zone, New England

Northeastern Section, Geological Society of America; Buffalo, New York, March, 1996.

David L. Butler

Isostatic compensation in the Mississippi delta, Part II: Distribution and rates of subsidence and uplift

Geological Society of America; New Orleans, Louisiana, November, 1995.

Mark A. Kulp

Isostatic compensation in the Mississippi delta, Part III: Implications for sequence stratigraphy

Geological Society of America; New Orleans, Louisiana, November, 1995.

Chris Toles

Production of activated carbons from hvA vitrinites, hvA intertinites, and a gymnospermous lignite

Geological Society of America; New Orleans, Louisiana, November, 1995.

Claudia A. Cook

Geochemical constraints on the origin of carbonatite-like rocks in the central metasedimentary belt, Greenville Province, southern Ontario

Geological Society of America; New Orleans, Louisiana, November, 1995.

John C. Mars

Tectonically influenced genetic stratigraphic sequences of the Mississippian lower Parkwood Formation in the Ouachita foreland

Geological Society of America; New Orleans, Louisiana, November, 1995.

Steven J. Juscuk

Geological and geophysical studies of the Bally Mountain area, western Slick Hills, southwest Oklahoma

Geological Society of America; New Orleans, Louisiana, November, 1995.

Steven J. Jusczuk

An integrated MacIntosh geological workstation:
Structural geology in the Slick Hills of Oklahoma
Geological Society of America; New Orleans,
Louisiana, November, 1995.

FACULTY RESEARCH SUPPORT

U.S. Department of Energy:

Laboratory studies of abiotic reductive
dechlorination of trichloroethene by basalt and
sediments.

Alan E. Fryar

National Science Foundation:

Stable isotopic study of pseudotachylite-
implications for melting during frictional fusion on
brittle faults.

Kieran O'Hara and David Moecher

Martin Marietta, Inc./DOE:

Far-field ground motions study of engineering
interest at the Paducah Gaseous Diffusion Plant.

Ron Street

U.S. Geological Survey:

Dynamic site periods in the northern Mississippi
Embayment area of western Kentucky and
southeastern Missouri.

Ron Street

U.S. Geological Survey:

High-resolution P- and SH-wave seismic reflection
investigations of the Reelfoot and Kentucky Bend
Scarp in the New Madrid Seismic Zone.

Ron Street

National Science Foundation:

A joint proposal by the Departments of Geological
Sciences and Civil Engineering for the acquisition
of state-of-the-art instrumentation to do high-
resolution shear-wave investigations in the New
Madrid Seismic Zone.

Ron Street

National Science Foundation:

Subsidence history of a foreland basin within a
thrust-belt recess: The need for a three-dimensional

approach.

William A. Thomas and Brian M. Whiting

U.S. Geological Survey:

Geological mapping in the Appalachian thrust belt
in northwest Georgia.

William A. Thomas

REPRESENTATIVE FACULTY PUBLICATIONS

This list provides examples of faculty publications;
a complete list is available on request.

James A. Drahovzal, Adjunct

Drahovzal, J.A., 1995, Exploration strategies and
possible submarine fan complexes in the Rough
Creek Graben, western Kentucky [abs.]: American
Association of Petroleum Geologists Bulletin, v. 79,
no. 9, p. 1412.

Drahovzal, J.A. and Noger, M.C., 1995,
Preliminary map of the structure of the Precambrian
surface in eastern Kentucky, Kentucky Geological
Survey, Series XI, Map and Chart Series 8, 9p.,
1:250,000-scale map.

Drahovzal, J.A., 1996, Precambrian and Cambrian
rifting in the southeastern Midcontinent [abs.]:
Seismological Research Letters, v. 67, no. 2, p. 36.

Frank Ettensohn, Professor

Barnett, S.F., Ettensohn, F.R., and Norby, R.D.,
1995, The Carpenter Fork Bed, a new — and older
— black-shale unit at the base of the New Albany
Shale in central Kentucky: Characterization and
significance: Southeastern Geology, v. 35, p. 187-
210.

Ettensohn, F.R., and Brett, C.E., 1996, Did
Taconian convergence continue into Silurian time?
— stratigraphic evidence from northwestern parts of
the Appalachian foreland basin: Geological Society
of America Abstracts with Programs, v. 28, p. 52.

Ettensohn, F.R., Kulp, M.A., and Rast, N., 1996,

Far-field foreland responses to Taconian orogeny: Evidence from the Jessamine Dome region and the Lexington Limestone, central Kentucky: Geological Society of America Abstracts with Programs, v. 28, p. 52.

John C. Ferm, Professor

Ferm, J.C., 1996, Life and death hypothesis about coal and coal-bearing rocks: Proceedings of the 30th New Castle Symposium, University of New Castle, New Castle, NSW, Australia, p. 43-52.

Ferm, J.C., 1995, Some avoidable problems in a privatized coal industry: Proceedings of the 6th New Zealand Coal Conference, Coal Research Association of New Zealand, Wellington N.Z., p. 279-282.

Liu, Y. and Ferm, J.C., 1995, Prediction of small scale displacements of coal beds in the Appalachian region: Proceedings of the 6th New Zealand Coal Conference, Coal Research Association of New Zealand, Wellington N.Z., p. 123-136.

Alan Fryar, Assistant Professor

Fryar, A. E., and Mullican, W.F., III, 1995, Delineating controls on the composition of ground water in the vicinity of the Pantex Plant, Southern High Plains, Texas: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for the U.S. Department of Energy under subgrant to DOE Grant No. DE-FG04-90AL65847, 88 p.

Mullican, W.F., III, Johns N.D., and Fryar, A. E., 1995, Development and sensitivity analysis of steady-state and transient Ogallala aquifer ground-water flow and particle tracking models: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for the U.S. Department of Energy under Subgrant to DOE Grant No. DE-FG04-90AL65847, 115 p.

Paul Howell, Assistant Professor

Howell, P.D., 1996, Let's Get Physical: Lab Manual for Physical Geology: Loveland, OH, Ross Publishing, 188 pp.

Butler, D., Howell, P.D., and Kulp, M.A., 1995,

Isostatic compensation in the Mississippi Delta, Part II: Distribution and rates of subsidence and uplift: Geological Society of America, Abstracts with Programs, v. 27, no. 6, p. A341.

Howell, P.D., Kulp, M.A., and Butler, D., 1995, Isostatic compensation in the Mississippi Delta, Part I: Quantitative models and mechanisms of uplift and subsidence: Geological Society of America, Abstracts with Programs, v. 27, no. 6, p. A341.

Kulp, M.A. and Howell, P.D., 1995, Isostatic compensation in the Mississippi Delta, Part III: Implications for sequence stratigraphy: Geological Society of America, Abstracts with Programs, v. 27, no. 6, p. A341.

James Hower, Adjunct

Hower, J.C., 1995, Uncertain and treacherous: The cannel coal industry in Kentucky: Nonrenewable Resources, v. 4, p. 310-324.

Hower, J.C., Robertson, J.D., Thomas, G.A., Wong, A.S., Schram, W.H., Graham, U.M., Rathbone, R.F., and Robl, T.L., 1996, Characterization of fly ash from Kentucky power plants: Fuel, v. 75, p. 403-411.

Wang, Z., Hower, J.C., Ferm, J.C., and Wild, G.D., 1996, Characteristics of lithotype thickness and sequential association of some Kentucky coals: Organic Geochemistry, v. 24, p. 189-195.

David Moecher, Assistant Professor

Moecher, D.P., Cosca, M.A., Hanson, G.N., in press, Ar isotope and petrologic constraints on the middle to late Paleozoic thermotectonic history of the southern Connecticut Valley zone, New England Appalachians: Geological Society of America Bulletin.

O'Hara, K.D., Kirschner, D.L., Moecher, D.P., 1995, Petrologic constraints on the source of fluid during mylonitization in the Blue Ridge Province, North Carolina and Virginia, U.S.A.: *Journal of Geodynamics* 19, 271-287.

Kieran O'Hara, Associate Professor

O'Hara, K.D., 1995. A note on the structural and

fluid-inclusion characteristics of quartz veins at Hourth, County Dublin. *Irish Journal of Earth Sciences*, v. 14, p. 59-64.

O'Hara, K.D., Kirschner, D.L., and Moecher, D.P., 1995. Petrologic constraints on the source of fluid during mylonitization in the Blue Ridge province, North Carolina and Virginia. *J. of Geodynamics*, 19, 271-287.

O'Hara, K.D., 1995. The effects of rupture and diffusion on the salinity of fault-related fluid inclusions. *J. Struct. Geology*, 17, 257-264.

Nicholas Rast, Hudnall Professor

Skehan, J.W., and Rast, N., 1996. Late Proterozoic to Cambrian evolution of the Boston Avalon Terrane, in Hibbard, J.P., Van Staal, C.R., and Cawood, P.A., eds., *Current perspectives in the Appalachian-Caledonian orogen: Geological Association of Canada, Special Paper 41*, p. 207-225.

Rast, N., 1996. Plate relations between the Grenville orogenic belt and the Neoproterozoic Avalon Superterrane (extended abstract): Proterozoic evolution in the North Atlantic realm, Goose Bay, p. 146-148.

Ronald Street, Associate Professor

Harik, I.E., Street, R., Wang, Z., and Allen, D.L., 1996. Accelerations and time histories for earthquakes affecting Kentucky bridges, analysis and computation: Proceedings of the Twelfth Conference held in conjunction with Structures Congress XIV, ed. F.Y. Cheng, American Society of Civil Engineers, New York, 464-469.

Street, R., Woolery, E., Wang, Z., and Harik, I.E., 1996. Soil classifications for estimating site-dependent response spectra and seismic coefficients for building code provisions in western Kentucky: *International Journal of Engineering Geology*, in press.

Woolery, E., Street, R., Wang, Z., and Harris, J., 1996. A P- and SH-wave seismic investigation of the Kentucky Bend Fault Scarp in the New Madrid Seismic Zone: *Seismological Research Letters*, 67(2), 67-74.

William A. Thomas, Professor

Thomas, W.A., and Whiting, B.M., 1995. The Alabama promontory: Example of the evolution of an Appalachian-Ouachita thrust-belt recess at a promontory of the rifted continental margin, in Hibbard, J.P., van Staal, C.R., and Cawood, P.A., eds., *Current perspectives in the Appalachian-Caledonian orogen: Geological Association of Canada Special Paper 41*, p. 3-20.

Thomas, W.A., and Astini, R.A., 1996. The Argentine Precordillera: A traveler from the Ouachita embayment of North American Laurentia: *Science*, v. 273, p. 752-757.

STUDENT PUBLICATIONS

Andrews, W.M., Jr., and Ettensohn, F.R., 1996. Local and regional structural controls on deposition of the Brassfield Formation west of the Cincinnati Arch, Kentucky: *Geological Society of America Abstracts with Programs*, v. 28, p. 2.

Ettensohn, F. R., Kulp, M.A., and Rast, N., 1996. Far-field foreland responses to Taconian orogeny: Evidence from the Jessamine Dome region and the Lexington Limestone, central Kentucky: *Geological Society of America Abstracts with Programs*, v. 28, p. 52.

Barnett, S.F., Ettensohn, F.R., and Norby, R.D., 1996. A new graben-bound, Middle Devonian black-shale unit at the base of the New Albany Shale in central Kentucky: Characterization and significance: *Geological Society of America Abstracts with Programs*, v. 28, p. 37.

Andrews, W.M., Jr., and Ettensohn, F.R., 1996. Regional and local structural controls on deposition of the Lower Silurian (Llandoveryan) Brassfield Formation west of the Cincinnati Arch: Program and Abstracts, *The James Hall Symposium: Second International Symposium on the Silurian System: Rochester, University of Rochester*, p. 25.

Butler, D., Howell, P.D., and Kulp, M.A., 1995, Isostatic compensation in the Mississippi Delta, Part II: Distribution and rates of subsidence and uplift: Geological Society of America, Abstracts with Programs, v. 27, no. 6, p. A341.

Howell, P.D., Kulp, M.A., and Butler, D., 1995, Isostatic compensation in the Mississippi Delta, Part I: Quantitative models and mechanisms of uplift and subsidence: Geological Society of America, Abstracts with Programs, v. 27, no. 6, p. A341.

Kulp, M.A., Howell, P.D., 1995, Isostatic compensation in the Mississippi Delta, Part III: Implications for sequence stratigraphy: Geological Society of America, Abstracts with Programs, v. 27, no. 6, p. A341.

Wang, Z., Hower, J.C., Ferm, J.C., and Wild, G.D., 1996, Characteristics of lithotype thickness and sequential association of some Kentucky coals: Organic Geochemistry, v. 24, p. 189-195.

Harik, I.E., Street, R.L., Wang, Z., and Allen, D.L., 1996, Accelerations and time histories for earthquakes affecting Kentucky bridges, Analysis and computation: Proceedings of the Twelfth Conference held in conjunction with Structures Congress XIV, ed. F.Y. Cheng, American Society of Civil Engineers, New York, 464-469.

Street, R.L., Woolery, E., Wang, Z., and Harik, I.E., 1996, Soil classifications for estimating site-dependent response spectra and seismic coefficients for building code provisions in western Kentucky: International Journal of Engineering Geology, in press.

Woolery, E., Street, R., Wang, Z., and Harris, J., 1996, A P- and SH-wave seismic investigation of the Kentucky Bend Fault Scarp in the New Madrid Seismic Zone: Seismological Research Letters, 67(2), 67-74.

Mars, J.C., and Thomas, W.A., 1995, Tectonically influenced genetic stratigraphic sequences of the Mississippian lower Parkwood Formation in the Ouachita foreland: Geological Society of America Abstracts with Programs, v. 27, no. 6, p. A-459.

Juscuk, S.J., and Thomas, W.A., 1996, Kinematic problems in palinspastic restorations at bends in thrust belts: The example of the Ouachita salient: Geological Society of America Abstracts with

Programs, v. 28, no. 1, p. 21.

Brewer, M.C., Thomas, W.A., and Whiting, B.M., 1996, Structure of an ancient rifted continental margin along the Blue Ridge in Tennessee, North Carolina, and Virginia: Geological Society of America Abstracts with Programs, v. 28, no. 2, p. 4.

Andrews, W.M., Jr., and Hower, J.C., 1996, Coal production in Perry County, Kentucky: Effects of markets, technologies, and transportation availability: Geological Society of America Abstracts with Programs, v. 28, n. 2, p. 2.

Toles, C., and Rimmer, S.M., 1995, Production of activated carbons from hvA vitrinites, HvA intertinites, and a gymnospermous lignite: Geological Society of America Abstracts with Programs, v. 27, no. 6, p. A-139.

Anderson, E.D., Cook, C.A., and Moecher, D.P., 1995, Geochemical constraints on the origin of carbonatite-like rocks in the central metasedimentary belt, Greenville Province, southern Ontario: Geological Society of America Abstracts with Programs, v. 27, no. 6, p. 115.

Juscuk, S.J., and Donovan, R.N., 1995, Geological and geophysical studies of the Bally Mountain area, western Slick Hills, southwest Oklahoma: Geological Society of American Abstracts with Programs, v. 27, no. 6, p. A-389.

Juscuk, S.J., and Donovan, R.N., 1995, An integrated MacIntosh geological workstation: Structural geology in the Slick Hills of Oklahoma: Geological Society of America Abstracts with Programs, v. 27, no. 6, p. A-195.

DEPARTMENTAL SEMINARS 1995-1996

The dramatic crustal response to Caledonian deep continental subduction in southern Norway - Henry Berry, Department of Geological Sciences

Subsidence of the Mississippi Delta: Mechanisms,

evidence, and implications - Paul Howell, David Butler, and Mark Kulp, Department of Geological Sciences

Seminar organization - Nicholas Rast, Department of Geological Sciences

Stratigraphy, structural geology, and groundwater: Examples from Kentucky and Alabama; and what can we learn from transverse zones in thrust belts - William A. Thomas, Department of Geological Sciences

The structural geology of the Bally Mountain area of southwestern Oklahoma + Something completely different - Steven Juszczuk, Department of Geological Sciences

Abundance, distribution, and predictability of fractures (joints) in relation to the flow of groundwater in the eastern Kentucky coal fields - Nicholas S. Sirek, Department of Geological Sciences

Evidence of limited denitrification beneath plays recharging the Ogallala Aquifer - Alan Fryar, Department of Geological Sciences

Big science, small ocean: Ocean Drilling Program, leg 160, eastern Mediterranean - Brian M. Whiting, Department of Geological Sciences

JOI/USSAC Distinguished Lecture
Subduction zone dewatering and seafloor hydrogeology on the Cascadia margin: A view from the bottom - Bobb Carson, Lehigh University

Porphyroblast growth and rotation - Nicholas Rast, Department of Geological Sciences

Evolution and primitive life - Frank Ettensohn, Department of Geological Sciences

The sum of its parts? Toward a holistic weathering budget for the Hubbard Brook sandbox experiment - Ford Cochran, Department of Geological Sciences

Using thermobarometry to solve petrological problems: A case study on a pelitic schist from western Connecticut - Bryant Ramirez, Department of Geological Sciences

Karst and structure, central Kentucky karst - Walter Johnson, Department of Geological Sciences

Mapping radiogenic isotopes in western Norway: Caught in the act of violating assumptions - Henry Berry, Department of Geological Sciences

AAPG Distinguished Lecture
Recognition of lowstand wedges, paleokarst reservoirs, and drowning - insights from seismic modeling, and outcrop studies - C. Robertson Handford

The photocatalytic degradation of 4-nitrophenol using aqueous TiO₂ slurries - Melissa Diechmann, Eastern Kentucky University

Travel and geology in southern Siberia and Poland - Frank R. Ettensohn, Department of Geological Sciences and Don Chesnut, Kentucky Geological Survey

Chronology of shelf collapse, ophiolite obduction, and India-Asia collision in the westernmost Himalayas - Richard Beck, Miami University (Ohio)

Contaminant transport in weathered and fractured shales in east Tennessee - Larry McKay, University of Tennessee-Knoxville

NGWA Henry Darcy Distinguished Lecture
Organic liquid contaminant entrapment and persistence in the subsurface: Interphase mass transfer and implications for remediation - Linda Abriola, University of Michigan

Fractal description of soils - Ed Perfect, Agronomy, University of Kentucky

The structure and stratigraphy of an ancient rifted continental margin - Maggie Brewer, Department of Geological Sciences

Lithostratigraphy of the Brassfield Formation west of the Cincinnati arch, Kentucky - William Andrews, Department of Geological Sciences

The Paleontological Society Distinguished Lecture
Paleozoic paleobotany - R.A. Gastaldo, Auburn University
Manifestation of variable density flow in ground water - Frank Schwartz, Ohio State University

NAGT Distinguished Lecture
New methods in teaching - Tim Rowe, University

of Texas at Austin

McFarlan Lecture

Megatrends in Geoscience - Jack Oliver, Cornell University

In-situ vitrification: using artificial magmas for stabilizing waste sites - Gary Jacobs, Oak Ridge National Laboratory

East Tennessee seismic zone - Christine Powell, University of North Carolina at Chapel Hill

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