



Department of

GEOSCIENCES

University of Massachusetts Amherst

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A LETTER FROM THE DEPARTMENT HEAD

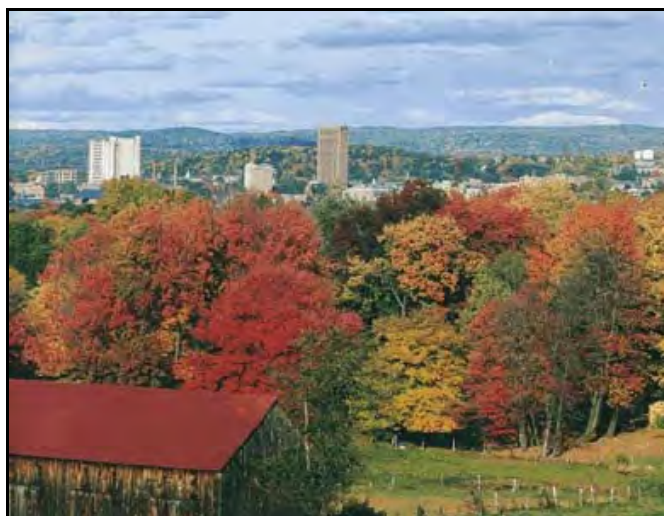
This is the first department newsletter in several years, and much has happened. This edition is somewhat longer than normal in order to catch up, and hopefully we will get back on schedule with regular newsletters after this. Budgets have been tight, but as you will see, the department has made significant progress in a number of critical areas, including faculty and student research, laboratory improvement, and a general broadening of our curriculum. The campus has invested new resources in the department over the past couple of years, which speaks volumes about how we are viewed across the campus. We are commonly cited as an excellent example of a department that delivers on the goals of quality teaching, research, and outreach. Despite the very tight budget, we added one new faculty member last year, in biogeochemistry (Steve Petsch), completed the new 700 ft² low-temperature isotope geochemistry laboratory, now occupied by Steve Burns, and completed renovations for the new electron microprobe facility in preparation for our new “ultrachron” microprobe to be installed in early 2004. More details about the activities of the “Two New Steves” and the new labs will be found in the following pages.

The campus provided funding for a new Finnegan isotope ratio mass spectrometer, a new workstation-based computer modeling facility and matching funds to completely replace all the existing Macintosh computers in the Digital Image Analysis Laboratory (matched by NSF funds to Chris Condit). We also added an ICP in the Geochemistry Lab, thanks again to NSF funds (obtained by Richard Yuretich) and matching dollars from the campus. Work to reorganize and upgrade the paleontology and mineralogy teaching spaces, and to re-locate the Quaternary Laboratory to better space is nearing completion. In all

of these efforts, we have tried to leverage university dollars with federal money, and to strategically invest the funds we receive from our alumni to improve classroom and field teaching facilities. We also work closely with departments in the other local colleges to use our collective efforts when that seems like the best strategy. With all of the new equipment and laboratories, the department is still as active in the field as ever with every faculty member and nearly all graduate students working in some exciting part of the world last year. Some highlights are included in this newsletter, but check our web site to see more about what we have been up to.

Not everything went according to plan last year. Steve Haggerty — who swore he would never retire — unexpectedly decided to retire and move on to Florida International University, where he is continuing his research. David Alexander accepted a new position at Cranfield University in England, and moved at the end of 2002. These are two very distinguished faculty members who are internationally known in their fields, and losing them was a major loss to the department, but, we will strive for the resources to hire new faculty.

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UMass Amherst in the autumn. Photograph by Don Sluter

LETTER FROM THE DEPT. HEAD, CONTINUED

We also lost two stalwart supporters of the department – Annabelle Lucas in the front office and Donna Reppard in Lynn Margulis' lab. Both retired last year and are sorely missed.

One other change occurred last year. Ray Bradley stepped down as Department Head in January, 2003, after 8 years in the position. Ray brought great vision to the department and many positive changes. When he started, we were the Department of Geology and Geography, a name that seemed to define our differences rather than our common interests in the earth and its occupants. During his tenure, we became the Department of Geosciences, introduced a new undergraduate major in Earth Systems, set up a real Department Head office, hired seven new faculty members, bought new

equipment, and renovated labs and classrooms. There is still much to be done, but Ray certainly kept the department on a positive trajectory, and placed it in an excellent position for the future. Thanks for all of your work Ray! We look forward to great things from the Climate Research Center now that you can give it your full attention.

Finally, one of the great achievements of the past year has been the establishment of the Massachusetts State Geologist's office on campus, and the hiring of Steve Mabee as the new State Geologist. In his first year as State Geologist, Steve has received funding for the first Massachusetts USGS State Map proposal, started a cooperative "Surficial Map Digitizing Project" (with Mass-GIS), and helped to develop a new USGS Fed-Map

initiative in Massachusetts. He is one of the co-organizers of the Connecticut River Watershed Initiative, and he has been funded by the National Competitive Grants to study the hydrogeology of the Nashoba Terrane, among many other initiatives. In just one year, the State Geologist's office has become active and visible in almost every part of the state, thanks to Steve's hard work. This is a tremendous addition to the department. The challenge ahead is to convince the state that the new office is a benefit to everyone and a worthwhile investment.

One of my top priorities as incoming Department Head is to establish closer relations with all of our alumni. Check out our web page when you get the chance. Also, let us know where you are and what you

have been doing, and please visit the department if you get back to Amherst.

Mike Williams



Mike Williams on a five-college field trip to Norway led by Pete Robinson. Also on the trip were: Sheila Seaman, Laurie Brown, Chris Condit, John Brady, Jack Cheney, Steve Dunn, Mike Terry, Kurt Hollocher, John Schumacher, Bob Tucker, Frank Spear, Susanne McEnroe, and Sandra Robinson-McEnroe.

REMEMBERING TERRENCE BURKE

Terence Burke, longtime professor (1962-1979) and administrator (1979-1982) at the University of Massachusetts Amherst, died June 17, 2003 at the age of 72 in Tucson, Arizona. He is survived by his wife of 19 years, Philanne "Topsy" Burke, four children, and five grandchildren.

Born in Leicestershire, England in 1931, Terry Burke first came to the United States on Smith-Mundt and Fulbright Fellowships to study historical geography at Clark University in Worcester while doing graduate work at the University of Birmingham in England (M.S., 1958, Ph.D., 1968). Terry served as a Flight Lieutenant with the Royal Air Force for four years before coming to teach geography at the University of Massachusetts Amherst in 1962. Prof. Burke was the first recipient of the Distinguished Teacher Award at the University of Massachusetts Amherst in 1966-67.

Terrence Burke was an Associate Professor of Geography in the Dept. of Geosciences (then called Geology and Geography) between 1969 and 1979, and was full Professor and "Associate to the Chancellor" for Chancellor Henry Kofler between 1979 and 1982. In 1982, he went to the University of Arizona with Henry Kofler, where he served as "Associate to the President" and Professor of Geography in the Department of Geography and Regional Development until he retired in 1998.

A memorial service was held June 23 at the First United Methodist Church of Tucson, Arizona. Donations may be made in Dr. Burke's honor to the American Red Cross or the Community Food Bank of Tucson.

MEMORIES OF HOWARD W. JAFFE (1919-2002)

by S. A. Morse

Howard Jaffe died on May 13, 2002 in Amherst at age 83. Howard was Professor of Geology in this Department from 1965 to 1991 and Professor Emeritus thereafter. Before coming to UMass Amherst, Howard worked for the Bureau of Mines, the USGS, and the Union Carbide Corporation. He was three times Visiting Professor at the University of Geneva, discoverer of the rare-earth+aluminum substitution in garnet, and honoree in 1988 of the mineral jaffeite, a natural analogue of the hydrated calcium silicate used in Portland cement. He was well known at UMass Amherst for his courses in crystal chemistry and petrology, for his research and trail guiding in the Adirondacks, for his marathoning and ski relays, and best of all for his gregarious companionship that ranged over international affairs, music, garden parties, and all things cultural.

Howard Jaffe came to UMass Amherst at the urging of Peter Robinson to teach mineralogy and crystal chemistry, geochemistry and petrology. His tenure here was superbly productive in the advancement of science, the revelation of his unique perspectives on crystal chemistry and refractivity, and the nurture of students. Despite a torrential conversational capacity and a fearsome old-time rigor of presentation, he was first and foremost a defender of students and a force for excellence.

While working for the Bureau of Mines, Jaffe studied the strange rare-earth alkali pegmatites of Mountain Pass, California, and identified, described, and named the unusual mineral sahamalite, which he named after the great Swedish geochemist T.H. Sahama. This feat was recently described by Tony Mariano as a tour de force, which depended critically on Howard's well-honed observational skills with the polarizing microscope.

Howard was the master of the simple Bunsen spectroscopy for the semi-quantitative determination of trace elements in minerals. He knew all the emission lines with Mozartian mastery, and when a strange one appeared too bright, it hit him like a sour note in the music he so ably played. This skill led to one of his most cherished discoveries. In studying manganese garnet from granite pegmatites, he suddenly began to see large abundances of yttrium. That is a trivalent element, unlike the divalent Mn in garnet, so it quickly crossed his learned mind that there must be a coupled substitution of YAl (6+) for MnSi (6+). That got him excited, so he trotted uptown to the Geophysical Laboratory and reported this discovery to the world's reigning garnet expert, Hat Yoder (whose PhD work at MIT was notable for failing to synthesize pyrope!). So Hat said, OK, let's try to make it, but where can we find some good yttria (yttrium oxide)?

"This uniquely skilled, loquacious, eloquent, and passionate scientist and musician graced our lives and this department handsomely, and his legacy to science and to excellence in education will endure in our memories."

So Howard returned to his old stamping grounds in New York, found an obscure chemistry shop, and asked about yttria. After a long search, the proprietor came up with a goodly vial of the stuff, saying "Yes, spec-pure and you can have it for a ten-spot." He delivered it to Hat, who got to work with his high-pressure apparatus with the help of Mac Keith.

They made 10% YAl garnet, then 20%, then 30%, and soon they figured out where this was going, and decided to shoot the moon. They made the end member, $Y_3Al_2Al_3O_{12}$, a silicon-free garnet! At the hands of Bell Labs, this became the famous YAG (yttrium-aluminum garnet), that is now one of the most useful high-energy laser crystals.

Howard was mightily proud of spawning this industry. In the 1990's, out of the blue, he got a check from the Geophysical Lab for ten bucks, in compensation for the vial of yttria, which Hat had stumbled across. Needless to say, Hat Yoder, along with his older brilliant colleague Frank Schairer, was one of Howard's heroes. In those days the monthly evening meetings of the Washington Petrology Club were held in the hallway of the Geophysical Lab, where the refreshments always included Schairer's favorite smoked whitefish. All our lives together, Howard and I would quote to each other Uncle Frank's insistence on what he called "dead fish."

I encountered Howard in 1956 in Hanover, NH, where he had come to collect New Hampshire granites with John Lyons (my Dartmouth professor and MSc Supervisor) for lead-alpha dating. This was in the days when none but the rich and gifted instrument builders had mass spectrometers, so they were roughing it in geochronology by using the Larsen method. The famous Harvard Professor and USGS scientist E. S. Larsen, Jr. had realized that a quick and dirty method of analyzing zircons could, in favorable cases, yield a good age. We had no radiometric ages at all, so any data would be better than none. You measured the lead by spectroscopy, and assumed that it all came from the decay of uranium and thorium. Then you counted the alpha-particle activity with a scintillation counter, and that gave you a handle on the parent uranium content.

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HOWARD W. JAFFEE, CONTINUED

Then it was a simple matter to calculate an age, and if there was no original lead or later lead-loss, and the system was otherwise well-behaved, the age was pretty good – lots better than guessing! This work led to a notable paper by Lyons, Jaffe, Gottfried, and Waring on the lead-alpha ages of New Hampshire granites.

Howard got Lyons and me into trouble on this very first visit. With sweeping disregard for his passengers' warnings, he executed a bold but forbidden U-turn in the middle of the Main Street of Hanover. This turn was gracefully completed at the feet of the cop on the beat, who instigated a discussion of signs, rules, and behavior. When Howard protested ignorance from being out of town, Officer Archie Thorburn turned his gaze on me and said, Well, at least he knows better. Archie and I were well acquainted. I tried hard to look small. How we got out of this affair I don't quite recall, but I think John Lyons pulled his best poker face and announced that Howard was just visiting and would never come back.

At UMass Amherst, Howard's greatest triumph with Pete Robinson was figuring out why the exsolution lamellae in pyroxenes and amphiboles seemed to be lying at irrational angles, not parallel to the crystal axes. Instead, they

realized, the planes of exsolution were optimal phase boundaries, and from the orientation of these they could interpret the temperature-pressure history of the rock that held the exsolving mineral. This was another tour-de-force.

Then came the detailed mapping of the Hudson Highlands and the Adirondacks, the attacks on the anorthosite problem, and the sabbatical trips to Norway and Geneva. When I arrived at UMass Amherst, Howard and the department and much of the college were pleased that we had a full professor of distinction without any post-graduate degree. Nothing but the school of hard knocks. We often celebrated that, but after a year in Geneva, Howard came back with a big surprise: a DSc! He did his residence, presented a dissertation on anorthosites before a distinguished committee of scholars, defended it in French, and got a degree of post-doctoral rank!

Then came the new mineral jaffeite, and the book on crystal chemistry, and many more years of hard work in courses and guidance of students, studded with relay races on skis, snow days, cookouts, sponsorship of transatlantic scholars, and many more delights.

Howard was an irrepressible character, a runner, and musician who raised his three children to the profession of music. The stories abound about him and his rare companion in science and wife, Elizabeth Boudreau Jaffe. Warmth and vigor come to mind in our memories, which Andy, Steve, Marina, and their children shared with us, with lots of good music, at a memorial service in May.

After retirement, Howard and Elizabeth moved precipitously to northern Vermont, but felt out of touch to us there. After her death, his health deteriorated and he spent his last years back in Amherst with his daughter Marina, and eventually in a nursing home, where by all accounts he still rose to the occasion and badgered the help from time to time.

This uniquely skilled, loquacious, eloquent, and passionate scientist and musician graced our lives and this department handsomely, and his legacy to science and to excellence in education will endure in our memories.

Tony Morse
Naushon Island, Mass
21 July 2002

DAVID ALEXANDER MOVES TO ENGLAND

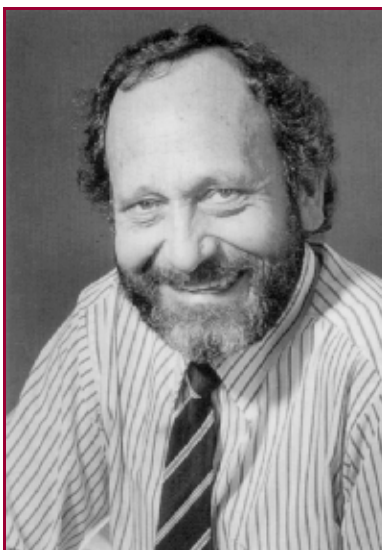
In the summer of 2002 we said farewell to David Alexander, who had been with the department since 1982. David left us to take up the post of Director of the Disaster Management Centre at Cranfield University in England. We (and many of you) will remember David for his creation of immensely popular courses in the areas of natural disasters and natural hazards, his love affair with all things Italian, his outstanding scholarship, including three books, in the field of disaster management, and his editorship of the journal "Environmental Management." David is sorely missed, not least for his sense of humor and concern for world peace and social justice.



STEVE HAGGERTY RETIRES FROM UMASS

By Mike Rhodes

Ray Bradley announced that he was “gobsmacked”. The entire department would also have been “gobsmacked” if they had known what it meant! The news that had rendered Ray “speechless with amazement” was that Steve Haggerty had decided to take early retirement. Steve has been with the Department since 1971 when he was lured here from Imperial College, via the Carnegie Institution Geophysical Laboratory (Gee Whiz lab) by co-conspirators Randolph Bromery and Tony Morse. Most of us thought he would die here, either in some disgusting way in darkest Africa, or in the classroom through apoplectic fury at the inability of some poor benighted student to understand the beauty of crystal symmetry. He wasn't known as Captain Resolute for nothing! In the 31 years that he has been here, Steve has made many remarkable and enduring contributions to science, the department and the campus. On his arrival at UMass Amherst, Steve was already recognized as a leading world expert in the “no see through ums” (opaque minerals to the uninitiated), and was credited with some of “the finest eyes in the business.” His earliest tasks were to obtain funding from NSF for a “state of the art” electron microprobe facility, and an experimental laboratory in which to study the effects of temperature and oxygen fugacity on the stability and composition of oxide minerals. He was also appointed a Principal Investigator in NASA's Apollo Lunar Program, and in the Soviet Union's Luna Program. These were heady, exciting times, leading to a deluge of publications on the implication of opaque mineral compositions for the origin of basalts, lunar rocks, meteorites, kimberlites and other mantle rocks. He was also co-discoverer of the new lunar mineral armalcolite (named after the three Apollo 11 astronauts, Armstrong, Aldrin and Collins). It was during this period that he made important contributions to the



Mineralogical Society's Reviews in Mineralogy on Oxide Minerals, and to the enormous yellow tome “Basaltic Volcanism on the Terrestrial Planets” (BVP for short).

Perusing Steve's very extensive publication list (66 first author papers), one finds the word “diamond” first mentioned in 1979. This heralded the next phase in Steve's research, which for the next 20 years would increasingly focus on the origin of diamonds, and what the rocks that bring them to the Earth's surface can tell us about the upper mantle. Here we learn about kimberlites, eclogites, lamproites and rocks with the weirdest of names such as corganites and corgaspanites! It was from these rocks that Steve crafted his ideas on the nature and state of the upper mantle, and assembled the evidence that the cratonic mantle was heavily metasomatized. They also yielded a whole bunch of new mineral discoveries such as lindsleyite (BaSr)(Ti,Cr,Fe)₂₁O₃₈, (a new titanate mineral in the chrichtonite family, named after Don Lindsley, who brought Steve to the U. S.), mathiasite (K,Ca,Sr)(Ti,Cr,Fe,Mg)₂₁O₃₈ (another titanate) and hawthorneite BaMgTi₃Cr₄Fe₄O₁₉, (a relative of magnetoplumbite). All provided convincing evidence of minerals hosting large ion lithophile and high field strength elements in

the mantle. Perhaps the high point of this research came in 1990 with the discovery of majoritic garnet in eclogite xenoliths. Evidence showed that these rocks had formed at very high pressures, equivalent to a depth of 410-660 km in the Earth's transition zone, making them the deepest rocks sampled to date. These were also the “Indiana Jones” years when Steve was tramping the globe to exotic, and, at times, dangerous places, such as Liberia, Lesotho, Botswana, Namibia, Sierra Leone, Guinea, Mali, South Africa, Australia, Syria, Brazil, Canada, the Soviet Union, China and India.

The research was exciting and intense, and in the 80's the recognition and awards began to come in. These included: Fellow of the Mineralogical Society of America (1980); D.Sc from the University of London (1988); Chancellor's Medal, University of Massachusetts Amherst (1988); Fellow of the American Geophysical Union (1992). In 1997 Steve gave the prestigious Reginald A. Daly Lecture to the American Geophysical Union, entitled “Diamond and high pressure rocks: Clues to the geodynamics of the earth's deep interior”. Perhaps the ultimate accolade is to have a new mineral named after oneself. In 1997, a new Ba-Ti iron oxide mineral discovered, in an Arkansas lamproite, by Danielle Velde and Ian Grey was named haggertyite. Rumor has it that the mineral's discoverers were thinking of calling it hilaryclintonite or whitewaterite because of its place of origin, but thought better of it!

Closer to home, as you all know, Steve has been a stalwart member of the department, teaching with high energy and effect core undergraduate courses such as Physical Geology and Mineralogy, and more specialized graduate and senior courses such as Metalliferous Economic Geology, Microprobe Analysis, Ore Petrology, Planetary Geology and the popular Diamond Seminar.

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HAGGERTY RETIRES, CONTINUED

He was nominated several times for "Best Teacher Award" and in 1990-1991 was a recipient of the University's Lilly Teaching Fellowship. He was also very active in the honors program, both in the department and the campus. Fittingly, Steve has been a frequent member of the University Research Council, and as its Chairman in 1995-96 was deeply involved in a committee to advise on the appointment of a Vice-Chancellor for Research at UMass Amherst. Sadly, then-Chancellor David Scott refused to accept the committee's advice that the best person for the job was the man currently acting in that capacity, Fred Byron.

On the national level, Steve's interest in diamonds and their host rocks has evolved from scientific curiosity and

the process of diamond exploration, to more strategic, geopolitical matters. Diamonds have become the international currency for fueling civil wars, ideological differences and racial atrocities in Africa. He has been invited to the White House to give evidence at a conference on "Conflict Diamonds," and at the last AGU meeting gave an invited Union tutorial on "the Geopolitical Setting of Conflict Diamonds."

The announcement of Steve's retirement came hurriedly towards the end of the Spring semester, but we managed to fit in a lively retirement dinner at the faculty club, before everyone left town. The intent is to have a more formal celebration of Steve's time at UMass Amherst, complete with a seminar. So, where do we go

from here? Almost all of the "Old Guard" are gone, the guys who helped put UMass Geology on the map (Bromery, Wise, Jaffe, McGill, Morse, Robinson, and now Haggerty). Actually, that's not quite true. In fact, many of them are still here! George and Tony are as busy as ever, beaver-ing away in the basement on their favorite research topics. Don recently returned from Transylvania. It turns out, Steve isn't really retiring either. He is just moving location from Massachusetts to southern Florida, where he is taking up a position at Florida International University with the fancy sounding title of "Distinguished Research Professor." You know what? I bet he'll be back. Anyone want to put a case of beer (good beer that is) on it?

WELCOME BACK, DON WISE!

Don Wise is back! After a number of years in southern Pennsylvania, Don and Nancy have moved back to Amherst. They live in town, and Don has an office in the department. He is carrying out research, working with students, leading field trips, and giving everyone he can a hard time. We are thrilled that they are back.

Don has revived an old department tradition, where faculty, staff and students dress in their finest (and field boots) on April Fool's Day.

Members of the department gathered outside of Morrill on April Fool's Day



Don Wise (left) and company, dressed in their finest and ready to head out into the field

MEET OUR NEW FACULTY MEMBERS

STEVE BURNS AND STEVE PETSCH

Stephen J. Burns, Associate Professor (Ph.D. Duke University, 1987)



Greetings to all, or “Gruesseuch Zaeme” as they say in Switzerland. I joined the Geosciences Department at UMass Amherst in January, 2001 after 11 years at the University of Bern in Switzerland. I was an undergrad at Rice University, and went on to do an M.S. at the University of North Carolina studying carbonate sedimentology and a Ph.D. at Duke University on dolomite geochemistry.

My research interests are broad, but mostly fall into two areas: paleoclimatology and sediment diagenesis. In both of these I use stable isotopes as a research tool. Over the past several years, my research has focused on developing records of climate change on the continents, mainly from the tropics. The goal is to produce quantitative estimates of various climate parameters from continental areas at high enough resolution to be able to determine the driving forces behind climate change at different time scales.

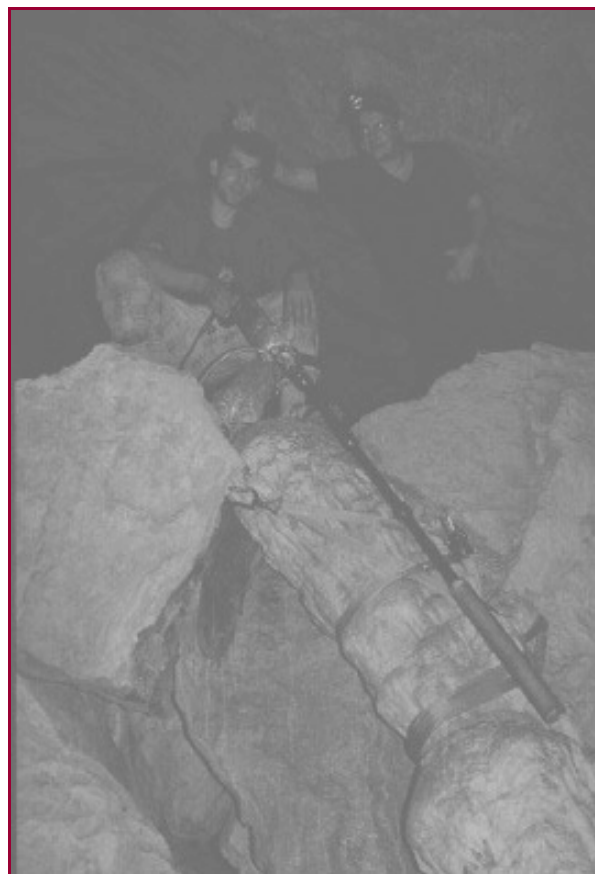
One of the main archives of climate information that I am interested in is speleothems, the family name for cave deposits such as stalagmites and stalactites. Speleothems faithfully record changes in the climate signal contained in O and H isotope ratios of rainfall. I like to think of them as underground ice cores. To date, I've primarily worked in Oman and Yemen studying variation in monsoon rainfall over time. And a new project in Costa Rica and Panama is also now underway. Speleothems record changes in precipitation that extend back over several hundred thousand years.

For the most recent climate period, the Holocene, these records may be up to annual in resolution. I have also used isotopic analyses of planktonic foraminifera, lacustrine sediments and the organic matter in peat bogs to study climate variation in South America and Europe.

My other main research area is investigating the chemical and mineralogical changes that occur in sediments along the way to becoming rocks. In particular, how and when and why massive dolomite forms has long been of interest to me. In January and February, 2001 I sailed on ODP Leg 194 as an inorganic geochemist. The ship drilled into two Miocene, dolomitized carbonate platforms on the Marion Plateau, which is just outside of the Great Barrier Reef National Park, Australia. I have been studying the geochemistry of carbonates and pore fluids recovered from these platforms hoping to find clues to the processes that led to dolomitization.

As mentioned, stable isotopes are my main research tool. The Geoscience department now houses a new Stable Isotope Laboratory. Construction was completed at the end of September, 2002. A new Finnigan DeltaXL+ ratio mass spectrometer is up and running, and we have already measured close to 10,000 samples. Attached to the instrument are a Kiel III automated preparation system, for C and O isotopic analyses of carbonates, and a Gas Bench II for analyses of O and H isotopes of water. The lab also includes a micro-milling device for fine-scale sampling of, for example, stalagmites. Together with Steve Petsch, our newest faculty member, I hope to soon expand the SIL to include a second mass spectrometer dedicated to measuring C, N, S, and O isotopes of organic matter.

For a list of recent publications, please visit:
<http://www.geo.umass.edu/faculty/Burns>



Drilling a large stalagmite in Hoti Cave, Oman

STEVE PETSCH

Assistant Professor (Ph.D. Yale, 2000)

Steven Petsch is a new Assistant Professor in the Department, having joined the faculty in the summer of 2002. Continuing the Department's strengths in Earth Systems History and Environmental Geochemistry, Dr. Petsch is developing a first-class research facility in the remodeled Biogeochemistry Laboratory on the first floor of Morrill Science Center. His laboratory includes analytical instrumentation and support for investigations in organic geochemistry, geomicrobiology and general biogeochemistry.

Before joining the UMass Amherst community, Dr. Petsch was a postdoctoral scholar in the Department of Marine Chemistry and Geochemistry at the Woods Hole Oceanographic Institution. At Woods Hole, he teamed with organic geochemist Dr. Timothy Eglinton and geomicrobiologist Dr. Katrina Edwards to investigate the role of microorganisms in the degradation of extremely refractory and non-reactive forms of natural organic matter in sedimentary rocks. Measuring the radiocarbon content of specific organic compounds found within bacterial cell membranes, the team verified that common soil bacteria

are able to use shale organic matter as a carbon source. This means that microorganisms play a very important (and as yet unquantified) role in consuming atmospheric oxygen and releasing carbon dioxide as part of the rock weathering cycle, thus forming a central component of the processes determining the composition of Earth's atmosphere over geologic time. Steve also holds a B.S. in Geosciences from Penn State and a Ph.D. in Geochemistry from Yale University, where he worked on controls on atmospheric oxygen concentration over geologic time with Professor Robert A. Berner in the Department of Geology and Geophysics.

Dr. Petsch's academic interests center on how specific chemical environments on the Earth can be both precursors and products of microorganisms. Most of his research focuses on microbial processes in geologic environments rich in natural organic matter: black shales, nearshore marine sediments, rivers and estuaries. His work has taken him to field sites throughout the U.S.: the California Borderlands, the Green River Canyon country of Utah, the western slope of the Colorado Rockies, Arbuckle Mountains of Oklahoma, the Knobs of eastern Kentucky, the watershed of the Hudson River and most recently, northern Lower Michigan where he and his colleagues are examining whether the extensive natural gas reservoir in this region is actually the product of an active microbiological community living several hundred meters below the earth's surface.

In addition, Petsch, his graduate student Brett Longworth (M.S. 2004) and colleagues are showing that erosion and weathering of Paleozoic sedimentary rocks provides a significant source of organic carbon to rivers along the east coast of the USA, placing important constraints on the magnitude of terrestrial carbon fluxes. Dr. Petsch is teaching several graduate-level and undergraduate courses. These include seminars and upper-level courses in biogeochemistry, organic geochemistry and geochemical cycles, as well as historical geology offered to undergraduates.

Dr. Petsch shares his home with his wife (an organic chemist specializing in natural products synthesis), three Newfoundland dogs, two Toulouse geese, and a resident herd of wild turkeys. This whole household is very happy to be a part of the UMass Amherst community.



FACULTY NOTES

Ray Bradley During a sabbatical leave in 2001-2002 I caught up on a few projects and co-authored a book, *Climate Change and Society* (Nelson Thornes Publishers, UK) with an old friend of mine. The book is aimed at high school and university entrance level students, so it was a fun project to pursue. I also co-edited a book that was published earlier this year (by Springer Verlag), *Paleoclimate, Global Change and The Future*. Together with my colleagues in the Climate System Research Center, we continued studies of tropical ice caps and glaciers – in Bolivia and Tanzania (Kilimanjaro – which I managed to climb in July 2002!) as well as carrying out research on climatic changes recorded in lake sediments from the Canadian Arctic and Arctic Norway. I was also very pleased to be appointed Distinguished Professor by the University's Board of Trustees, and to receive a D.Sc. from my *alma mater*, Southampton University in England.

Julie Brigham-Grette continues to pursue a broad research program in Beringia, including projects in Russia and a new undertaking in the Bering and Chukchi Seas. She coordinated a successful field program at Lake El'gygytyn during the summer of 2000, including the logistical challenge of moving 11 people from three countries and 4 tons of gear to the remote site just 100 km north of the Arctic Circle in NE Russia. The lake was created by a meteorite impact some 3.6 My ago and Julie's team is focused on the paleoclimate history in the lake sediments. The group returned to the lake for the summer of 2003 to complete pre-site survey work. A deep drilling proposal to access the entire 3.6 My paleoclimate history will be submitted to the International Continental Drilling Program in January, 2005. Thesis work by **Celeste Asikainen** and **Mike Apfelbaum** (MS, June 2003) on the sedimentology, microstratigraphy and clay mineralogy will soon be published in a special issue of *Paleolimnology* dedicated to El'gygytyn research and co-edited by Julie with Russian and German colleagues.

Have you ever wondered what it would be like to stand on the edge of the Earth, if the Earth had such an edge? During the summer of 2001, Julie served as a field assistant to **Lyn Gualtieri** (BS, 1992; Ph.D. 1998; now post-doc at the Quaternary Research Center, University of Washington) working on the glacial and sea level

history of Wrangel Island in the East Siberian Sea, north of Chukotka. Looking northward over the ice of the Arctic Ocean from an island north of Russia *feels* like the edge of the Earth. A paper on this work appeared in the May 2003 issue of *Quaternary Research*.

Research work on Chukotka Peninsula, NE Russia, continued with the completion of a MS thesis by **Trent Hayden**. Trent used Julie's new gas chromatograph to separate ratios of D/L Aspartic acid in fossil mollusks from Chukotka to separate climate events that took place there 75,000 vs. 120,000 years ago during the last interglacial.



Julie Brigham-Grette aboard the US Coast Guard Ice Breaker Healy

During the summer of 2003, Julie started a new project as co-chief scientist, along with new collaborators **Lloyd Keigwin** (Woods Hole) and **Neal Driscoll** (Scripps) to investigate the paleoceanography and post-glacial sea level history of the Bering Straits. The work was conducted on board the new US Coast Guard Ice Breaker Healy on its maiden science mission in Alaskan waters during two 3-week long cruises into the Bering and Chukchi seas. Julie found the ship a luxury after all these years working out of a tent. MSc students **Zach Lundeen** and **Beth Caisse** will complete theses on the different aspects of the cores collected.

Julie's role in promoting the Quaternary

sciences is intensifying to a new level. She is now President-Elect of the American Quaternary Association (2002-04) becoming President in 2004. She is now also chair of the PAGES (Past Global Changes) Science Steering Committee of the IGBP. Julie was elected a new Fellow of the Geological Society of America in April 2002 thanks to the nomination spearheaded by alum Gail Ashley (MS UMass; Rutgers).

Laurie Brown has returned from a Spring 2003 sabbatical that took her to the Southern Hemisphere not once but twice. She made one last trip to Tataro-San Pedro, the Chilean volcano she has been working on for 10 years, in late January. This one included all day horse rides, lots of drilling, and plenty of food. Laurie, Chris and kids spent 2 months in New Zealand – climbing volcanoes, crossing glaciers and checking out a wealth of spectacular geologic features. The trip ended with 2 weeks in Australia where Laurie worked in the Rock Magnetism Lab at CSIRO. The rest of sabbatical was spent quietly in Amherst writing, writing, writing. Projects continue in the Andes as well as magnetic investigations on layered intrusions, Neoproterozoic anorthosites and Archean granulites with Suzanne McEnroe (BS, MS, Ph.D. '93) at the Norwegian Geological Survey. Teaching duties still include the myriad of Geophysics courses, as well as taking over Geologic Mapping (field part of old F&S II) for Mike Williams – a fun but challenging course for both the instructor and students!

Chris Condit Part of Chris Condit's \$300K NSF-CCLI grant (2002-2005) to develop ways to publish data- and image- intensive geologic maps has resulted in updating the Digital Mapping Lab with new 1.8 GHz Macintosh G5 computers in November 2003. Chris is using the lab during the fall 2003 semester to teach a course in making Dynamic Digital Maps, and has 10 very nifty students building some fun DDMs in it. Examples of digital geologic map publication can be seen at the site <http://ddm.geo.umass.edu>, where several cross-platform and web-enabled Dynamic Digital Maps can be downloaded, and those from the course will be posted between semesters. Chris' most recent work in petrology resulted in an August 2003 Geology publication entitled "Cross section of a magma conduit system at the margin of the Colorado Plateau" with **Keith**

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Putirka. That work was discussed in a two column article in the August 16th issue of the Economist, causing several colleagues to quip that this was clearly the widest circulation any of his work has ever received to date!

Michele Cooke Since the last newsletter, I've been very busy both professionally and personally. My students and I continue to work on active tectonics of southern California and ancient three-dimensional fault-related folding. The exciting research developments of the Geomechanics group are manifest in the number of papers coming out soon as well as recent grants funded. Former students **Heather Savage, Susan Murphy, Ashley Griffith** and **Erik Olson** each have papers in review or in press at the *Journal of Structural Geology*, the *Bulletin of Geological Society of America* or the *Journal of Geophysical Research*. With the help of these fabulous students I've managed to secure funding from the Southern California Earthquake Center, National Earthquake Hazard Reduction Program, the Petroleum Research Fund and the National Science Foundation. Whew – I get kind of exhausted just listing these papers and grants!

New PhD student **Ryan Shackleton** and I have started a new project in the Pyrenees looking at lateral fold propagation and associated fracturing. This project stems from work by **Erika Davis** (Maschmeyer) at Sheep Mountain anticline in the Big Horn basin but the advantage of the Pyrenees is that the syn-tectonic strata record the details of fold growth. We are combining field work with computer models of lateral fold propagation so that we can use the fractures and sedimentary architecture of the growth strata to unravel the fold history. Our first field season, funded by an UMass Amherst Faculty Research Grant, has given us a lot of exciting data and reasons to return to Spain (not just for the wine).

I've introduced a new Geologic Hazards course on characterization and mitigation of geologic hazards. This new course focuses on the practical side of landslide and earthquake hazards and has attracted students from the engineering school as well as the four colleges. Another new course was Tectonophysics co-taught with **Laurie Brown**. We did our best to make bi-harmonic equations come to life in the analysis of heat flow and

deformation. Within my Structural Geology course, I've implemented a new rock crushing experiment where students prepare 2" diameter samples to be crushed in our new uniaxial compression rig in the back of room 161. There is nothing like seeing and hearing rock break to motivate discussion of Mohr failure envelopes.

My personal news is the arrival of my daughter, Robin Sage Andresen, on August 30, 2000 and then my son, William Jasper Andresen on April 24, 2002. As babies Robin and Will were regulars around the department, hanging with cohort Leif Stevens, as well as attending faculty meetings, structure seminar and meetings with students. We were concerned that Robin's first words may have regarded solutions to the biharmonic equation - but fortunately not.



Michele Cooke and her field assistant measuring joint locations along a canyon wall at East Kaibab Monocline, Utah

Rob DeConto continues using numerical models of the global climate system to explore some of the biggest climatic shifts recognized in the geologic record. Based on a combination of model results and geologic data, Rob and his colleague **Dave Pollard** (Penn State) recently published a paper in the journal Nature, suggesting the initial Paleogene glaciation of Antarctica was more likely the result of decreasing atmospheric CO₂, rather than changing ocean currents in the Southern Ocean as has long been believed.

Through this work, Rob has become heavily involved in two international research initiatives focused on understanding the climate and glacial history of Antarctica. ACE (Antarctic Climate Evolution) is a new program operating under the

umbrella of the Scientific Committee on Antarctic Research. Last summer, Rob and our department hosted the first international ACE workshop. Thirty scientists attended, from as far away as Europe and New Zealand. ANDRILL (ANtartic DRILLing) is also a new, international research program investigating Antarctica's role in Cenozoic global environmental change. ANDRILL's focus is on drilling the sedimentary basins around the continent and comparing drill core data with numerical modeling studies. UMass is leading the modeling component of ANDRILL. While most of Rob's work is theoretical, he doesn't spend all his time working on computers. In fact, he'll be spending the better part of December and January in Antarctica, doing ANDRILL-related fieldwork with a team of New Zealand scientists.

Two of Rob's graduate students graduated last year. **Alan Condron** finished an MS on the linkages between the abundance of North Atlantic Salmon and climate change over the last 100 years. Alan is now in a Ph.D. program at the University of Sheffield. **Brooke Olson's** thesis work was on the Neogene paleoceanography of the western Coral Sea. Brooke has moved on to a Ph.D. program at Rice University.

Chris Duncan is wrapping up his research program in preparation for his departure from UMass Amherst and academics. He is finishing his projects on Himalayan geomorphology, and working with a graduate student on a study of inner gorges in the world's mountain belts. He is assisting the State Geologist (Steve Mabee) on some GIS-and mapping-related projects, and developing future work based on his expertise in GIS, remote sensing, spatial analysis, data visualization, and software development.

Piper Gaubatz has been working on several different research projects over the past year, including a study of the impacts of globalization on the urban planning process in China and an analysis of the environmental history of Hohhot, Inner Mongolia. She presented this work at Oxford University last fall ("Urban Development and Environmental Change in China"), and at the bi-annual meeting of the International Seminar on Urban Form in Trani, Italy ("Planning the Chinese City") over the summer. She is preparing to present her work ("Central Business Districts, Globalization and Urban Form in

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Contemporary Chinese Cities") and to chair a session on land reform and urbanization at the International Conference on Globalization, the State, and Urban Transformation in China in Hong Kong this December.



Near Hobhot, Inner Mongolia

Julie Graham Since the last newsletter, Julie continues to work on alternative economic practices and organizations. She has completed work with her research team on their NSF-funded project on the hidden and alternative economies in the Pioneer Valley. The research team has also completed a Public Service Endowment Grant to create a sustainability best practices website for the Pioneer Valley Planning Commission. For the summer of 2003 Julie was awarded a fellowship at the Humanities Research Center at the Australian National University, where she worked with her co-author **Katherine Gibson** on a book on community economies, alternative development, and post-capitalist politics. She has also recently published several papers with **Stephen Healy** (and others) on their joint research. Information about past and ongoing projects is available at www.communityeconomies.org.

Jim Hafner has begun a new research project on mapping biodiversity conservation and protected forests in the Mt. Apo Nature Reserve in Mindano, Philippines. He expects to begin preliminary work at UMass in the spring 2004 with on-site follow-up with the Philippine Eagle Foundation and University of the Philippines Mindanao in Davao City during a 2004/05 sabbatical. He has also relinquished his role as Director of Asian Studies at UMA to take on this new project.

John Hubert continues to enjoy teaching and research. Since the last newsletter, I

published a paper with **Larry Tanner** and **Dennis McInerney** in *Nature* that uses stable isotopes in caliche paleosols to demonstrate the stability of atmospheric carbon-dioxide levels across the Triassic-Jurassic boundary, a time of severe extinctions of marine and terrestrial biota. Contrary to a popular theory, these extinctions evidently were not the result of outgassing of carbon dioxide from the eruptions of plateau basalts in the Central Magmatic Province. Also, I wrapped up several years of work on the burial and hydrothermal diagenesis of sandstones in the Deerfield basin, with a paper in *Northeastern Geology and Environmental Science*. The core of the project is the thesis of **John Taylor**, augmented by structural data gathered with **Pete Panish** and argon spectra for detrital microcline contributed by **Casey Ravenhurst**, who was an adjunct member of our department. Currently **Jim Dutcher** and I have written a paper on the Jurassic lacustrine strata exposed at Chard Pond, Sunderland, with emphasis on the pillow structures that are syndepositional in origin rather than the previous interpretation of earthquake sheets.

John's spouse Mary Alice is very well and is enthusiastically working on the family genealogy. For those who remember our children, Nancybeth and her husband Will moved to Ridgecrest, California, where she works as a computer programmer for the U. S. Navy. Amy moved to Kauai, the northern island of Hawaii, where she continues painting and belly dancing (!). John Jr. is a senior electrical engineer with Lockheed-Martin in Orlando, Florida. Mary Alice and I enjoy visiting him, Theresa, and our five grandchildren, where as grandparents we are allowed to hug 'em, spoil em', and hand 'em back to their parents!

Mike Jercinovic The last year has seen great progress in the development of a new, trace element electron microprobe in collaboration with Cameca, Inc. We are nearing completion of this project and, as the challenging technical aspects and system testing have been progressing briskly, much of my attention continues to be devoted to this project. Associated technique development, specifically toward microprobe monazite geochronology, has led to a number of recent papers and abstracts. These include recent submissions to *American Mineralogist* discussing the analytical difficulties and some applications, and several contribu-

tions to the monazite theme session at the 2002 Denver GSA meeting. Numerous collaborations have provided the valuable opportunity to apply these powerful techniques to an expanding list of tectonic/geochronologic problems (for example: Saskatchewan and the Southwestern U.S., with **Mike Williams**, **Karl Karlstrom**, and **Laura Crossey**; the Black Hills and Tobacco Roots, with **Peter Dahl**; the mid-continent-Lake Superior region, with **Daniel Holm** and **David Schneider**; the different aspects of Adirondacks research, with **Laurie Brown** and **Suzanne McEnroe**, **Pat Bickford** and **Jim McLelland**, and with **Peter Dahl** and **Mike Hudson**).

Mark Leckie sailed as a paleontologist on the final leg of the Ocean Drilling Program in July and August of 2003 (he sailed on the first leg back in 1985 just months before starting at UMass Amherst). ODP Leg 210 drilled on the lower continental rise of the Newfoundland margin, just east of the "tail" of the Grand Banks (remember "The Perfect Storm"?) and south of the Flemish Cap. It was just two years ago that Mark participated in ODP Leg 198 in the western North Pacific, about 1000 miles east of Japan.

The Micropaleo Lab has been hopping with activity these past several years with projects ranging from the Cretaceous and the Miocene to the late Pleistocene and Holocene. The titles of some of these projects will give you an idea of the diversity of research that's coming out of the lab. **Neil Tibert** finished his Ph.D. ("*Systematic paleontology, paleoecology, and biostratigraphy of ostracodes and agglutinated foraminifera from the western margin of the Cenomanian-Turonian Western Interior Sea, southwest Utah*") in 2002 and began a tenure-track teaching job at Mary Washington College in Fredericksburg, VA this past September.

Brooke Olson (co-advised with **Rob DeConto**) also finished her M.S. ("*Late Middle to Early Pliocene Paleooceanography of the Western Coral Sea: Foraminiferal Population and Isotopic Analyses of Hole 1195B, ODP Leg 194*") in 2002 and is now pursuing a Ph.D. at Rice University in Houston. Mark's research group has greatly benefited from the addition of Steve Burns to the faculty as well as from the expansion of analytical capabilities to our department. For example, Ph.D. candidate **Steve Nathan** ("*Development of*

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the Western Pacific Warm Pool During the Late Miocene: A Planktic Foraminiferal Study of the Indonesian Seaway Closure") is combining population analyses of planktic forams with stable isotope analyses of a benthic and planktic species in order to investigate changes in water column structure and ocean circulation of the western Pacific during the late Miocene.

Last year, senior honors student **Karla Hubschwerlin** conducted research on late Pleistocene isotope paleoecology of planktic forams ("Planktic foraminiferal isotope paleoecology from the Western Pacific Warm Pool: Comparison of Isotope Stage 2 (Glacial) and Isotope Stage 5e (Interglacial)"). Karla was a co-winner of the L.R. Wilson Award for the top graduating senior in Geology in 2003. And let's not forget the old stuff; we've still got an active research program in the U.S.

western interior Cretaceous, as well as the deep-sea. **Desiree Polyak** finished her M.S. thesis ("Benthic and Planktic Foraminiferal Paleocology and Paleooceanography of the Cenomanian-Turonian Greenhorn Sea, U.S. Western Interior") early in 2003 and is now working at the USGS in Reston, VA. **Erica Sterzinar** will finish her M.S. thesis ("Benthic and Planktic Foraminiferal Biostratigraphy and Paleocology of the Turonian-Campanian Niobrara Cycle of the Mancos Shale, Mesa Verde, Colorado") in the spring. **Adam MacConnell** is currently writing up his M.S. thesis on "Oceanic Anoxic Event 1b and Secular Changes in Seawater Chemistry in the Aptian-Albian (Mid-Cretaceous)" and should defend in the first of the year. Last year's L.R. Wilson award co-winner **Liz Smith** did an Honors Thesis entitled "Volcanism, Paleontology, and Depositional Environment of the Lower Devonian Eastport Formation, Seward's Neck, Coastal Maine". Liz is now pursuing a Ph. D. at the University of Michigan. **Paul McLain** recently began M.S. research dealing with late Miocene paleoceanography and Milankovich cyclicity.

Jon Lewis works on shallow crustal deformation primarily at plate boundaries in the circum-Pacific. Recent efforts have focused on (1) fluid flow along fault zones in the Paleogene accretionary prism exposed in SW Japan, (2) contemporary crustal strain associated with motion of the Oregon coast block, (3) offshore and onshore contemporary strain associated with the subduction of seamounts at the



Colorado Transplants! Many of the UMass Amherst Geoscience faculty and their spouses are alums of the University of Colorado. Gifford Miller, past-chair of the CU-Geosciences visited the Five College campus last year. The CU alums pictured here are, (left to right standing) Ray Bradley, Jane Bradley, Gifford Miller, Roger Grette, Al Werner (Mt Holyoke Geology), Rob Deconto and Sandy Litchfield; (left to right sitting) Bill McCoy, Julie Brigham-Grette, Mark Lockie. The only CU alum from our department not shown is John Hubbert.

Costa Rica convergent margin, and (4) the partitioning of seismogenic and neotectonic (<4 Ma) strain in the wake of the Sierran microplate in eastern California's Mojave Desert.

Lynn Margulis - In the week before Thanksgiving Lynn gave four different lectures in five days in Madrid and Barcelona, all in Spanish. Amongst them she closed "Banquete" a cultural two-month exposition with a talk on "Hunger and the Ecosystem". She presented "Gaia and the Evolution of Machines" to the Institute of Philosophy opening a program on Las Culturas de la Ciencia y la Tecnología.

With **Dr. Michael Dolan** and other co-authors the paper "Cysts and symbionts of *Staurjoenina* from *Neotermes*" was accepted (with revision) in the European Journal of Protistology. After completion of her 17-min video "Eukaryosis: Origin of eukaryotic cells" at the beginning of November she showed the "world premiere" at UMass Amherst. She also showed it at the Conde-Duque cultural center (Madrid), and in New York City (at The House of the Redeemer). Lynn was elected President of Sigma Xi, The Scientific Research Society, for Fiscal Year 2004.

Bill McCoy is continuing research on the stratigraphy and correlation of European loess, including paleotemperature estimates based on rates of amino acid racemization over independently dated

intervals of time. To learn more about the thermal properties of European loess and the current ground temperature regimes in loess across Europe, dozens of temperature probes with dataloggers have now been installed at sites from Belgium to Romania. The work is being done in collaboration with **Eric Oches** (UMass Ph. D., 1994) who is now at the University of South Florida in Tampa. This past year **Thomas Stevens** completed an important part of the project with his Master's thesis on the aminostratigraphy of loess in parts of Hungary and Serbia. Field work will continue next summer with more sampling and data collection in Central and Eastern Europe.

George McGill is a typical "working retired" Professor Emeritus. At present, he has one MS candidate on Program Fees, a second MS candidate scheduled to receive her degree in February, and 3 in-residence PhD candidates. He currently is PI or Co-I on 4 NASA research grants, and is the nominal PI on a NASA Graduate Student Research Grant obtained by one of his 3 PhD candidates. These grants provide Research Assistantship support for 3 graduate students, and travel support for his students and himself. Current research involves geologic mapping, structural image analysis and quantitative modeling, and stratigraphic studies. All projects are directed ultimately toward gaining an understanding of crustal evolution on Mars and Venus. In addition, George served on a NASA Steering Committee that assisted NASA

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headquarters and the Jet Propulsion Laboratory in selecting target sites for the two Mars rovers (Spirit and Opportunity) scheduled to land on Mars in January, 2004. Recently, he also served on a review panel assessing applications for NASA support of space science programs at minority colleges and universities. Although he studiously avoids any administrative or significant teaching assignments now that he is retired, he has continued to offer his one-credit reading seminar in Planetary Geology every semester.



Tony Morse continues to be involved in melting rocks to learn about melting and crystallization in the Earth. Current grad student **Deb Banks** has tracked the phase relations for the parent magma of the Kiglapait Intrusion up to 15 kilobars, and we are homing in on the likely depleted mantle source mineralogy near 10 kb.

I have finished a big paper with **John Brady** and **Brad Sporleder** (MS 98) on the Lower Zone liquid path. Among other things, this work demonstrates that the linear partitioning principle holds for plagioclase, so we can recover liquid compositions (An-Ab) for any plagioclase composition. I have also just finished a major paper on the augite series in the Kiglapait Intrusion, which turns out to be more fun than we expected. Recent papers took me down to the Earth's core again. Having sworn off teaching in 1997, I bit the bullet last fall and offered "The Bulk Earth" again, to a small group of grad students, a Dean, and another actively retired faculty member. It was a bit of work to catch up on the latest hot and exciting developments in the deep earth, but the effort was well received so I can't complain.

Dorothy and I took another "sabbatical" at the University of Cambridge, Feb-May 2003, and enjoyed it tremendously as usual. Greeted by a big snowstorm that shut down the motorways for 24-36 hours, but a lovely spring later on. Skied in Lech, Austria, 2 weeks; attended EUG-AGU

meeting in Nice with 11,000 others a zoo, but we met many dear friends (even Mike & Sheila). Went to St. Petersburg for a week in May and saw all the treasures we had hoped to see, including three spectacular pieces in famous theaters - Nutcracker, Swan Lake, and War and Peace. Then a brief visit to the West Country near Hay on Wye with old friends. Social life in Cambridge full as ever, and warm friendships make us feel that is our second home.

Peter Panish continues to teach some combination of Dynamic Earth, Introductory Oceanography, and Mineralogy every semester for either the Continuing Education division or the Department of Geosciences. Primarily interested in New England geology, he does digress into other topics. Most recently he has coauthored papers with **John Hubert** on sandstone diagenesis in the Mesozoic Deerfield basin and with **Peter Robinson** and **Suzanne McEnroe** on Norwegian iron oxides. Past digressions have included studies of the mineralogy and microstructure of dinosaur bones (with **John Hubert**), asbestiform tremolite (for NEIHS) and railroad ballast.

Rud Platt delivered a keynote address to a UNESCO Conference on Urban Biosphere & Society: Partnership of Cities in New York in October. His Ecological Cities Project (www.ecologicalcities.org) continues to grow. His research group of six graduate students (two in Geography) are studying urban watershed management under a two-year NSF grant. In outreach, the EC Project is working with regional environmental leaders and colleagues in various cities across the United States as well as Toronto, Bogota, Quito, and Istanbul to promote and share experience in urban greening efforts.

Rud has completed a revised edition of his widely-adopted text: "*Land Use and Society: Geography, Law, and Public Policy*" (Island Press, Spring, 2004). Next in the pipeline is an edited book: "*The Humane Metropolis: People and Nature in the 21st Century City*" and a video/DVD, both drawing on the Humane Metropolis Symposium held by the EC Project in New York in June, 2002.. Rud completed a three-year term on the National Research Council Water Science and Technology Board this past summer and still serves on the NRC Committee on Water Quality Issues in the Pittsburgh Region.

Mike Rhodes' current research is concerned with the workings and magmatic evolution of Hawaiian volcanoes, and of Mauna Loa, Mauna Kea, and Kilauea volcanoes in particular. Work on Kilauea started in 1983, in collaboration with Mike Garcia at the University of Hawaii, when the present ongoing eruption first got started. Twenty years and 5 publications later, we are still at it. My God will this eruption never stop! Mike is a major player in the \$11 million Hawaii Scientific Drilling Project. The aim here is to drill through, and sample, a Hawaiian volcano over as much of its eruptive history as possible. The idea being that changes in lava composition will reflect changes in melting parameters and source compositions as the volcano moves across the chemically and thermally zoned Hawaiian plume. To date we have drilled and sampled 3.5 km of Mauna Kea volcano. The hole first penetrated about 1 km of subaerial lavas followed by 2.5 km of submarine pillow lavas and hyaloclastites. Most of the lavas are typical of Mauna Kea, but below 2km, inter-bedded with the Mauna Kea lavas, are lavas that resemble lavas from Loihi, the new submarine volcano growing off the coast of the Big Island. Does this mean that we have sampled the early stages of Mauna Kea? Watch this space, the next phase of drilling is expected to start later this year!



Mike Rhodes out in the field

Mike was also Co-Chief Scientist on a very successful cruise, last November, to use the un-manned submersible Jason-2 to sample lavas from Mauna Loa's submarine flanks. We came back with 115 samples and a new, detailed bathymetric

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map of Mauna Loa's submarine SW rift zone. We also discovered, sampled and mapped 11 new underwater vents on Mauna Loa's western flank. This work will be presented in a poster at this fall's AGU.

Sheila Seaman - The past two years have provided many happy research and teaching opportunities. I began a new research program, in collaboration with Darby Dyar of Mount Holyoke College, on identifying water in 'anhydrous' minerals such as feldspar, and associating water in the crystal structure with magma and eruption fluctuations. We are also studying the ratio of ferrous and ferric iron in feldspars as a further way of characterizing the oxygen abundance in magmas as they evolve. The analyses are done at Brookhaven National Lab on Long Island. Graduate student **Britt Cartwright** finished her master's degree on this project in September. I am also working on Proterozoic ultramafic rocks that are exposed in the Grand Canyon and are associated with a major 1700 million year old crustal suture. **Paul Low**, now finishing his master's program, has done detailed petrography, field work, and phase analysis of these rocks and has come up with a well-constrained model to account for their crystallization conditions. He is going to stay at UMass Amherst for a Ph.D. and will be involved in the water-in-minerals study, with a focus on growing feldspar crystals from melts of controlled water concentrations in John Brady's experimental lab at Smith College. I continue to work in Maine, and am now beginning a project in collaboration with John Hogan of the University of Missouri, Libby Anthony of the University of Texas at El Paso, and **Mike Williams** and **Mike Jercinovic** of this department, on using monazite crystals in granites of coastal Maine to identify the source rocks of granitic magmatism and hence of growth on continental crust. These projects, and teaching mineralogy, petrology, optical mineralogy, and environmental geology to especially fine groups of students over the past few years, along with being the graduate program director for Geosciences until relieved of that task by **Richard Yuretich** in January, 2003, have kept me busy.

Stan Stevens continues to teach part time in the geography program, and has developed a new general education course that he will teach this spring (Geosciences 150, The Imperiled Earth:

World Environmental Issues). During the year he wrote a major article on "Tourism and Deforestation in the Mt. Everest Region of Nepal" for the Royal Geographical Society (London) flagship journal, the *Geographical Journal* (Vol. 169, part 3, September 2003), worked on an invited chapter on "Critical Issues in Cross-Cultural Research" with Australian geographer **Richard Howitt** for the second edition of *Qualitative Methods in Human Geography* (Oxford University Press), and finalized "Struggles Over Forests: Contestation and Conservation in the Chomolungma/Mt. Everest Region of Nepal" for *Forests, Fields, and Fallows: Contested Resources in Politicized Indigenous Landscapes* (Michael Steinberg ed., University of Texas Press, 2004). Stan also acted as a primary consultant on a National Geographic article on the Sherpas/Sharwa mi-tiwa of the Mt. Everest/Chomolungma region and two National Geographic Society-produced maps of that part of the world, one of which is the first published map to present Sherpa (Sharwa mi-tiwa) names for their settlements rather than solely Nepalese ones and carried out research in the photo archives of the Royal Geographical Society on a project documenting historical change in landscape and environment in the Mt. Everest/Chomolungma region. For the spring 2004 centennial meeting of the Association of American Geographers in Philadelphia he has organized and will chair two sessions on Indigenous Peoples and Protected Areas. He plans further Himalayan fieldwork in 2004.

Dick Wilkie continues to serve as Geography Graduate Program Director, helping to shepherd 11 Masters and 1 Ph.D. student through the program last year. His work on the importance of place in the lives of people is reflected both in his courses--especially Spirit of Place--and in an article, "Sense of Place and Selected Conceptual Approaches to Place" in the spring 2003 issue of CRIT55/Place for the American Institute of Architecture. He also received a grant from the Center for Teaching on campus to continue development of his seminar: Visual, Spatial and Graphic Thinking, a course that explores the visualization of knowledge. He will be on sabbatical during spring 2004.

Mike Williams - I spent the past year learning (perhaps more than I want to) about department and university administration. In addition, I am continuing to

study the interaction of deformation and metamorphism at various levels of the crust. Rocks from northern Saskatchewan provide an unparalleled view of the deepest crust. Ph.D. student **Kevin Mahan** is studying a number of major shear zones, including one that played a key role in bringing the region back to the surface. Ph.D. student **Greg Dumond** has just begun a project to investigate the two dominant fabrics in the region. **Lori Krikorian** completed her M.S., extending the limits of the high-pressure terrane much further north and west. In the southwestern U.S., we are continuing to study Precambrian rocks in the Grand Canyon, northern New Mexico, and Colorado, and we are just finishing the first phase of a collaborative seismic experiment to investigate the crust and upper mantle from Wyoming to New Mexico. **Liane Stevens** finished her M.S. on xenoliths from the deep crust along the seismic line. **Peter Davis** finished his M.S. on a very cryptic shear zone in northern New Mexico. In addition, we are continuing to work on rocks from western Massachusetts, where **Konrad Scheltema** finished up his M.S. on crenulation fabrics in the Moretown Fm.



Cora Lake mylonite, East Lake Athabaska, Saskatchewan

One major focus of attention has been the effort, with **Mike Jercinovic**, to date monazite using the electron microprobe (see following article). **Philippe Goncalves** has joined the project as a Post-Doctoral Fellow. One exciting discovery is that the thick Proterozoic quartzites from the Southwest contain abundant monazite, both detrital and metamorphic. **Joe Kopera** (M.S. student), has just completed his M.S. using the monazite to characterize Precambrian tectonic events. In early 2004, we will be installing our second electron microprobe, this one optimized for the dating technique. Finally, **Dan Gibson** has just joined the group as a Post-doctoral Fellow. He

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comes from Ottawa, where he finished his Ph.D. at Carleton University. He will work in the structure-tectonics research group and will help out with teaching while I am Department Head.

Don Wise is slowly extracting himself from Pennsylvania and back into Amherst. He spends most days in his office just off the old coffee room 254. From there he hassles students, participates in several seminars, helped **Mark Leckie** teach the field course last spring, and continues work on several projects. He taught YBRA field camp last summer and ran a revised Deerfield Basin field trip for NEIGC this fall. One set of projects involves New Zealand cleavage origins. Another involved publication of a new model for the origin of the Lancaster (Pa) seismic zone. He spent the month of July working on geology of the Pennsylvania Piedmont with three undergraduate majors (see article). Most recently he finished a manuscript compiling tectonic transport vectors from ancient theses of his students in the Central Piedmont and from this proposes a new, two-stage motion model for the origin of the Pennsylvania Salient of the Appalachians.

Richard Yuretich successfully concluded his role as one of the principal investigators for STEMTEC, the Massachusetts Collaborative for Excellence in Teacher Preparation. This project has involved 21 colleges across the state and over 150 science and math faculty members with the goal of doing a better job of preparing the next generation of K12 science and math teachers. The capstone of the project was an international conference that he helped organize held in Arlington, VA. For further information about STEMTEC, see the web site, <http://k12s.phast.umass.edu/~stemtec>.

In other areas, Richard oversees the operation of the ICP-OES (Inductively Coupled Plasma Optical Emission Spectrometer) and the Ion Chromatograph (IC) which was acquired in 2000-01 as part of a grant from NSF. Together with a new analytical balance, refrigerator, vacuum filtration system, water purification system, and some field meters, our analytical capabilities for aqueous and sedimentary geochemistry have reached an all-time high. Richard served as a Distinguished Speaker for the National

Association of Geosciences Teachers in 2001, and he also was a Hewlett Teaching Fellow during 2001, with the goal of bringing additional improvements to our huge oceanography course. As a result of these activities, he has been traveling around the country giving workshops on teaching and learning at various colleges and universities. He is also part of a team that has received a \$2 million grant from NSF (STEM Connections) to give graduate students in the sciences experience with teaching in elementary, middle, and high schools, and this project is being started this summer. He is still actively involved in research dealing with the Earth's environment. Most recently he received a large grant from NSF to lead a multidisciplinary team studying the processes of natural attenuation of acid mine drainage in Rowe, Mass (see separate story). He also used a recent sabbatical to investigate the environment of Rosamond Playa in the Mojave Desert and Jurassic lakes in the Morrison Formation of western Colorado, the latter of which will be the Ph.D. dissertation of graduate student **Paula Valencik**.

PETE ROBINSON HONORED AT NEIGC



Robinson (center) showing the characteristics of the Monson Gneiss at Richards Ledges, Quabbin Reservoir (Oct. 2003)

The 2003 NEIGC (New England Intercollegiate Geologic Conference) was held in Amherst in October. The conference was dedicated to Peter Robinson for his many contributions to New England geology and because Pete attended his first NEIGC fifty years ago this year. After his first NEIGC, Pete missed a year and then began his record-setting 45 (or so) straight years of attending. Sadly, the string was broken last year when Pete was in Australia. Pete was back for the meeting this year, and he even led several trips, including a trip back into the Quabbin Reservoir.

Pete, Susanne McEnroe, and their daughter Sandra now live in Trondheim, Norway, where Pete works for the Norwegian Survey. He has become the same expert on basement nappes in the Caledonides as he is on nappes in New England. Pete comes back to Amherst several times a year to work on his many projects in Massachusetts and to compile maps (now in conjunction with the State Geologist, Steve Mabee). Pete, we hope you will continue to come back often, and congratulations on your 50th NEIGC anniversary. Here's to 50 more!

NEWS FROM THE MASSACHUSETTS STATE GEOLOGIST

STEVE MABEE

The Office of the State Geologist has been in operation for 15 months. The goals of the office during this period have been to:

- Rejuvenate quadrangle-scale geologic mapping in Massachusetts
- Generate cooperative projects and research activities with other faculty and state and federal agencies
- Increase the visibility of the office among state agencies and stake holders

Some of the recent activities and accomplishments include:

- For the first time, Massachusetts received funding under the STATEMAP component of the National Cooperative Geologic Mapping Program. This is a program that provides federal funding to State Surveys for quadrangle-scale geologic mapping. Currently we are mapping in the Marlborough quadrangle and are in the process of preparing some new mapping products to augment the traditional bedrock and surficial geologic maps. These new products include a fracture characterization map and surficial materials map. Next year we are proposing work in the Reading, Wilmington, South Groveland, Lawrence, Hudson and Oxford quadrangles.
- Another major effort underway is digitizing existing published geologic maps. We are currently working with MassGIS to vectorize 75 of the published, 7.5-minute surficial geologic maps.
- We are also working closely with the USGS in developing a plan for completing the unpublished surficial geologic maps in Massachusetts. The surficial geology of most of the quadrangles in the state has been mapped to some degree, but the maps have not been published or open-filed. With our strong recommendation, the USGS submitted a proposal and received a FEDMAP grant in FY04 to begin processing the unpublished maps to be open-filed. The ultimate goal is to complete a statewide surficial geologic map sometime in the next 5 to 8 years.
- We received a grant from the National Institutes for Water Resources to begin studying the hydrogeology of the Nashoba terrane. The project will involve close collaboration with the USGS in Northborough and Michele Cooke.
- We just signed a cooperative agreement to become a Cooperating Technical Partner with FEMA under their Map Modernization Program. The work will involve converting paper flood insurance rate maps to digital flood insurance rate maps.
- We are currently negotiating with Minerals Management Service at the Department of Interior to examine potential offshore sand and gravel deposits for beach nourishment. We are working with Duncan Fitzgerald at Boston University and Mark Leckie in our department. The first phase of the project is underway and is being conducted by BU.
- The Office is working collaboratively with the Department of Natural Resources Conservation and the USGS on a Connecticut River watershed initiative that brings researchers and land use managers together in an effort to develop a decision-making framework for economic and environmental sustainability in the watershed.
- A State Mapping Advisory Committee was formed this year to advise the State Geologist on mapping priorities. The committee is made up of a broad group of professionals from federal and state agencies, the academic community, private sector consultants and individuals from the state legislature.



The Office has a new web page that can be found at www.geo.umass.edu/stategeologist. In the past year we have had over 45 requests for geologic information reaching as far west as California. Requests range from third graders to seasoned professionals. Other outreach activities include talks and visits with the New England Water Works Association, Water Supply Citizens Advisory Committee, New England Interstate Water Pollution Control Commission, the Association of Engineering Geologists, Town of Cummington and the Girl Scouts.

At the present time, the Office has generated about \$309,000 in funding. We are supporting 6 RA positions, 2 mapping contractors and 2 undergraduate field assistants. Joe Kopera, a recent department graduate and M.S student of Mike Williams, has joined the Office as the bedrock mapping contractor. Carol Hildreth, a former USGS employee, is the surficial mapping contractor.

The office is off to a good start. We are certainly buoyed by the overwhelming support we have received in the past 15 months, from the federal and state agencies down to the stakeholders. Your support and enthusiasm is greatly appreciated. If you are in the area, please stop by and say hello.

MONAZITE GEOCHRONOLOGY AND ADVANCES IN ELECTRON MICROPROBE ANALYSIS



Mike Jercinovic and Philippe Goncalves testing the new probe on Cameca's test platform in Paris

In 2001, UMass Amherst Geosciences (Williams and Jercinovic) received a grant from the National Science Foundation to develop a new, optimized, high-resolution electron microprobe with Cameca, Inc. (France). This project is nearing completion, and installation of the new instrument at UMass Amherst is expected in early 2004. This new instrument will be the world's most advanced electron microprobe, with substantially improved analytical-spatial resolution and counting precision over previously available instrumentation. This project was inspired by advances in the evolving technique of electron microprobe geochronology, primarily applied to polygenetic monazite in complex metamorphic terranes. Although developed primarily for geochronologic applications (optimized particularly for the analysis of Pb, Th, and U), this instrument will advance microprobe technology in general, and will offer specific advantages to the broader microanalysis community. Essentially any scientific or engineering application requiring either trace element microanalysis or extra-high spatial resolution could benefit.

As the electron microprobe combines high spatial resolution analysis with integrated compositional imaging, it has the potential to provide extraordinary detail for non-destructive, in-situ geochronologic analysis. Research and technique development in monazite geochronology have been major priorities in the UMass Amherst microprobe facility for the past several years, and the new instrument is expected to open new frontiers in this exciting field. At UMass Amherst, these techniques have already been applied to rocks from Saskatchewan and the Southwestern US, where continental assembly has resulted in multiple episodes of deformation and metamorphism. This work has led to remarkable insights into the relationships of absolute time and tectonism, clarifying tectonic histories covering hundreds of millions of years, and providing new insights into the rates of large scale tectonic processes. The microprobe-monazite research effort at UMass Amherst now includes a Post-Doc, Philippe Goncalves, who is involved in all phases of this project. One of Philippe's efforts involves the experimental synthesis of monazite at Smith College, in collaboration with John Brady. Synthetic monazites are necessary for the accurate determination of spectral properties such as variation of background intensity with Th content, and the quantification of various X-ray line interferences. Philippe is also actively involved in the instrument development and application efforts.

BIOCOMPLEXITY AT THE DAVIS MINE

Some of you may remember visiting the site of Davis Mine in Rowe, Massachusetts, as part of one of your courses while you were at UMass Amherst. The "Aqueous Geochemistry" course has had it as a destination for many years as a local example of acid mine-drainage, where stream water has a pH of 3 and a correspondingly high content of iron and trace metals. Recently, Richard Yuretich has become the lead investigator of a team studying the processes of natural attenuation of this contaminated water. They have received a grant from the National Science Foundation "Biocomplexity in the Environment" program that has allowed them to drill multi-level monitoring wells around the site and conduct laboratory experiments to document both geochemical and microbiological processes regulating the water chemistry. In addition to faculty members from Environmental Engineering (**Sarina Ergas**, **David Ahlfeld**), Microbiology (**Klaus Nüsslein**) and Education (**Allan Feldman**), the project involves 10 UMass Amherst students from these departments and 2 area high-school teachers. The team from Geosciences is focusing on the geochemistry and hydrogeology of the site, with monthly collection of samples from wells and streams, and subsequent analyses of the waters using our ICP and ion chromatograph. Geosciences graduate students **Amy Cerato**, **Kate Berti**, and **Jessica Bloom** are completing M.S. projects, and **Melissa Russell** and **Liam Bevan** are conducting undergraduate research.



Drilling at Davis Mine. Preparing to drill a well into the tailings piles at the Davis Mine site last April. The driller has just excavated a hole in the snow to the ground surface and the rig will be raised into drilling position. From left to right are Mercedita Monserrate (M.S. student in Environmental Engineering), the driller, Melinda Solomon (student in School of Education), and Kate Berti (M.S. student in Geosciences).

THE ECOLOGICAL CITIES PROJECT

RUTHERFORD PLATT



The population of metropolitan areas in the United States nearly tripled between 1950 and 2000, increasing from 84 million (55% of the 1950 U.S. total) to 226 million (80% of the 2000 total). During the same period, the number of metropolitan areas, as designated by the Bureau of the Census, grew from 169 to 347, and their aggregate land area doubled from 9% to about 19% of the “lower 48” states. The physical results of this metropolitan growth are painfully familiar: visual monotony, overcrowded highways, loss of open space, pollution of air and water resources, rising natural disaster losses, and social inequity.

Degradation of aquatic and terrestrial ecosystems in urban areas has impaired what Gretchen Daily has termed “Nature’s services,” including such benefits as flood reduction, water quality filtering, moderation of microclimate extremes, and emotional refreshment in natural settings. This has compelled society to substitute technology for those lost services, as with structural flood protection, water treatment plants, mechanical heating and air conditioning, and long distance trips to experience “nature” beyond the urban fringe.

The Ecological Cities Project, launched at the University of Massachusetts Amherst in 1999, seeks to promote a different vision for American cities and suburbs: a more “Humane Metropolis.” Building on the principles of “Smart Growth” and “sustainable development,” the Humane Metropolis concept focuses on the functions of *green open spaces* of various type and size in protecting “nature’s services” within the urban environment. Today, public and private initiatives in many metro areas are underway to revitalize old parks and create new ones, lay out greenways and bike paths, plant gardens on urban vacant lots, and rediscover local streams, wetlands, woodlands, and grasslands. In the process, environmental educators are teaching that nature can be found at one’s doorstep, not just in remote places, and social benefits accrue from grass-roots involvement in ecological restoration.

The Ecological Cities Project seeks to identify, compare, and promote such “green urbanism” (in Timothy Beatley’s phrase) through research, outreach, and regional Ecological Cities symposia. The EC Project is itself quite “ecological” in its disciplinary and regional diversity. Directed by Dr. Rutherford H. Platt, a geographer/lawyer, its steering committee, collaborators, and students represent the fields of planning, landscape architecture, urban ecology, hydrology, geology, environmental engineering, among others. Through the web and personal contacts, it is forming a widespread network of researchers, practitioners, and organizations.

The current EC Project evolved from a 1990 Symposium on Sustainable Cities and the ensuing book: [The Ecological City: Restoring and Preserving Urban Biodiversity](#) (Platt and others, eds. University of Massachusetts Press, 1994). That symposium, held at the Chicago Academy of Sciences, established the template for the series of regional EC symposia now in progress, namely to draw on regional expertise in urban greenspace protection and management, with invited speakers representing diverse stakeholders, disciplines, and geographical localities. To date, two locally funded and organized EC symposia have been held in collaboration with the UMass Ecological Cities Project: in Boston (November, 2000) hosted by the Boston College Watershed Institute and in Columbia, SC (March, 2001) hosted by the University of South Carolina Sustainable Universities Initiative and Department of Geography.

On June 6-7, 2002, the University of Massachusetts Ecological Cities Project conducted a “flagship” conference in New York City: “The Humane Metropolis: People and Nature in the 21st Century City—A Symposium to Celebrate and Continue the Work of William H. Whyte.” The two-day event paid tribute to Whyte and his work and reviewed contemporary initiatives that apply and build on his vision of cities amenable to people and nature. Selected papers prepared for the symposium will be edited as a book that will expand on some of the themes and issues presented in New York.

Meanwhile, the National Science Foundation has awarded a grant to the Department of Geosciences and the Center for Policy and Public Administration for a two-year study of “Stream Corridor Management in the United States: The Interaction of Ecology and Policy.” The study plan envisions four major tasks: (1) Survey of the state of practice of multi-purpose urban watershed management; (2) Regional workshops on urban watershed management in selected metropolitan areas; (3) Detailed case studies of 3-5 selected urban watersheds; (4) Dissemination of findings. The emphasis of the study will be to document significant experience in achieving multiple objectives in small to medium sized watersheds that are or soon will be substantially urbanized.

We invite communications regarding promising candidates for selection of regional workshops and watershed case studies. We also invite anyone interested in the Ecological Cities Project to obtain more information from our website (www.ecologicalcities.org), and to suggest additional links to relevant organizations and programs.

UNDERGRADUATE RESEARCH IN PENNSYLVANIA WITH DON WISE

This past summer **Don Wise** spent the month of July with three UMass Amherst undergraduates doing honors studies on multiple deformations of the Piedmont schists in large exposures below Holtwood Dam on the Susquehanna River. **Kathy Staffier '04** is trying to unravel the early deformations and metamorphisms of the schists in relation to monazite dating. **Kendra Clark '04** is trying to unscramble the structures of the ductile to brittle transition in these rocks, including several generations of quartz mineralization. **Tamee Albrecht '04**, in conjunction with **Laurie Brown**, is working on the magnetic mineralogy of these rocks and its relationship to the overall magnetic signature of the region. Don has finally gotten around to publishing tectonic transport data of the Piedmont from his and his students' work of 40 years ago and from it has developed a new tectonic model for the origin of the great curve of the Appalachians of Pennsylvania.

KILIMANJARO RESEARCH

Ray Bradley, Doug Hardy, Mathias Vuille

The snow-capped summit of Kilimanjaro, viewed from nearby national parks, is an enduring image of East Africa and one of the principal tourist attractions of the region, bringing in significant foreign exchange income for both Tanzania and Kenya. However, recent changes in the climate of the region have raised serious questions about environmental stability in East Africa, and in particular about the possibility that the glaciers and ice caps of the high mountains will disappear entirely, perhaps as soon as 2020. Some have argued that this is a direct consequence of worldwide global warming, driven by increases in greenhouse gases. However, the situation on Kilimanjaro is undoubtedly more complicated than that, and we have launched a research project to investigate why the glaciers are receding at such a rapid rate.

One of the first signs of environmental change in the mountains of East Africa was the recession of glaciers on Kilimanjaro shortly after the first ascent in 1889. At that time, there was an ice cap that extended over 12km² of the summit. Today, the icefields and glaciers have receded to cover only ~2km². The impact of large scale global environmental conditions on the observed retreat are not well understood. Furthermore, other regional environmental changes are underway in the region, such as regional drought episodes which may be associated with the retreat of glaciers.

Although observations are limited, it

appears that the most recent changes in the glaciers did coincide with a widespread drought in the region. Tanzanian government water experts say the mountain's annual rainfall has declined every year since 1984. This has had other major environmental impacts, such as an increase in fires. Wildfires in 2000 claimed roughly 5,000 hectares – nearly 5 percent of the mountain's still-existing rain forests. These high-elevation forests are also under heavy logging pressure. The resultant combined effects of drought and human impact have been dramatic. On the south side of Kilimanjaro, where roughly one million inhabitants rely upon subsistence agriculture, irrigation channels have dried up. For these people, climate change has become potentially life-threatening.

There is increased concern on the part of the Tanzanian government regarding the possibility of mass migration by inhabitants seeking more reliable and adequate water resources. The government recognizes the enormous instability that would follow if hundreds of thousands of people left the region. Furthermore, environmental changes may impact revenues from tourism, which currently draws 20,000 tourists to the Kilimanjaro region annually. High quality measurements of climate-related parameters in the mountainous regions of Tanzania and Kenya are extremely sparse, making it very difficult to monitor and quantify to what extent the environmental changes being observed are more

related to local and regional factors, or to global warming. Without understanding what is driving the observed environmental changes, the future cannot be adequately evaluated and appropriate plans prepared to minimize or avoid serious future consequences.

Against this general background, in February 2001 we established an automatic weather station on the northern icefield of Kilimanjaro (at 5794m, 19,004 ft). Further details can be found at <http://www.geo.umass.edu/climate/kibo.html>. The research was supported by NSF (Earth System History Program) and carried out in collaboration with colleagues at Ohio State University who recovered ice cores from the same location. Our expectation is that the meteorological measurements that we make will help in the interpretation of the ice core records, and provide a more reliable long-term perspective on the recent climatic changes in the region. So far, the station has operated with almost no data loss, with measurements relayed to the Department's Climate System Research Center by satellite each day. Our results so far show continued, significant mass losses from the icefield, leading us to plan a major investigation of the mass and energy balance of the ice caps and glaciers on the mountain, to better understand the mechanisms involved and how they relate to regional and global climate trends. In future newsletters we will provide an update of these investigations as they progress.

GEOSCIENCES GROUP LAUNCHES NOVEL BALLOON FOR ATMOSPHERIC RESEARCH

On Friday, November 7th, with clear skies and brisk winds, a team from the Department of Geosciences launched a unique research balloon over the Berkshires. The balloon, which is the subject of a provisional patent application, is designed for high efficiency and the largest possible altitude range. Future versions should be able to travel between the surface and the stratosphere and remain in the atmosphere for months as they record meteorological data, serve as communications platforms, and support scientific missions.

According to **Paul Voss**, the project PI, the first launch was a real success. The one-kilogram instrument functioned perfectly, sending its location and engineering data via satellite link to the ground station in the Climate System Research Center. Strong vertical winds (exceeding 3.5 m/sec), however, carried the balloon to its 5,500 ft ceiling where it terminated under computer control 30 minutes into the flight. The balloon was recovered shortly afterwards about 13 miles downwind. According to Voss, the flight was too short to prove unequivocally that the novel altitude control system was functioning according to theory. More flights are planned for early January. "Since we presented at an American Institute of Aeronautics and Astronautics (AIAA) conference last week, there has been a lot of interest in the project. We are now in a race to prove that it works", said Voss.



Special thanks to **Chris Condit** (chase pilot), **John Sweeney** (aerial photographer), **Emily Riddle** (mission control), **Rob Aquadro** (project meteorologist), **Darren Maczka** and **Mike Waud** (payload electronics), and **James Bradbury** (recovery crew and woodsman extraordinaire).

STUDENT AWARD WINNERS — 2003

Tamee Albrecht

Elinor Fierman prize, a **Leo M. Hall** prize and **H.T.U. Smith** prize—for summer fieldwork on the Susquehanna River, PA.

Kendra Clark

Elinor Fierman prize, **H.T.U. Smith** prize and a **Leo M. Hall** prize—for summer fieldwork on the Susquehanna River, PA.

Alfred Garraffa

H.T.U. Smith prize and a **Leo M. Hall** prize—for summer field camp at the University of New Mexico.

Kelly Hallock

H.T.U. Smith prize and a **Leo M. Hall** prize—for summer field camp at the University of New Mexico.

Sheila Smith

H.T.U. Smith prize and a **Leo M. Hall** prize—for summer fieldwork in the Tusas Mountains, New Mexico.

Kathy Staffier

Elinor Fierman prize, a **Leo M. Hall** prize and a **H.T.U. Smith** prize—for summer fieldwork on the Susquehanna River, PA.

Brian Conz

Geography Alumni Award—for summer fieldwork in Guatemala.

Gregory Dumond

Leo M. Hall prize—for summer fieldwork in southern Rocky Mountains.

Micah Dunthorn

Leo M. Hall prize—for attendance of the symbiosis meeting in Halifax.

Natalie Kehrwald

Leo M. Hall prize—for summer laboratory work to study landscape evolution of the Phobjikha Valley, Bhutan.

Ted Lewis

Gloria Radke prize—for summer fieldwork at Lake Tuborg, Ellesmere Island.

Brett Longworth

Gloria Radke prize—for summer fieldwork in the Hudson-Mohawk watershed in upstate New York.

Adam MacConnell

Elinor Fierman prize—for summer laboratory work at Yale.

Anja Mueller

Gloria Radke prize—to attend a summer course at the University of Hawaii.

Emily Riddle

Geography Alumni Award and the **Gloria Radke** prize—for summer research of the first test flight of the orbiting temperature probe.

Paula Valencik

Leo M. Hall prize—for summer fieldwork in the Grand Junction Area of Western Colorado.

ALUMNI NEWS

Joy Abbott (LARP masters alum directed by Rud Platt) is a community planning specialist for the Allegheny County Conference on Community Development in Pittsburgh. In that capacity, she is beginning to organize a Pittsburgh regional Ecological Cities forum in collaboration with Sustainable Pittsburgh and the Nine Mile Run Watershed Association. (From Rud Platt)

Miriam Anderson has moved to Madison, Wis. with her family after completing several years as a floodplain management planner with the Massachusetts Department of Emergency Management. (From Rud Platt)

George "Buzz" Baldwin continues to work for The Hartford [insurance company] doing Catastrophe Risk Management work, including keeping track of our policies exposed to potential losses from natural and man-made hazards. (From Rud Platt)

Ron Bucchino (Geol MS '95, BS '91) I have a new position as a Sr. Project Manager with Cygnus. My work focus will change from petroleum remediation to Brownfields remediation. I continue to be a Conservation Commissioner in Marlboro, MA. My volunteer environmental work includes being a member to a taskforce which is charged with changing the way former pesticide contaminated agricultural land is reused in Massachusetts. Currently, this type of contamination is excluded from oversight by the state and federal regulatory agencies.

Margaret Carruthers published a book on the "Giants of Geology (people like Gilbert, Shoemaker, Hutton, Wegener, etc.), written specifically to appeal to teenagers in 2001.

Charles Coombs (Geog BA '82) I moved from CT to MA in August '99. Am working for Wood Structures, Inc. of Biddeford, Maine. Married a UMass grad, Pamela-Sue (Mariani) and we have a son Charles, 5th.

Chris Covell (Geol BA '85) I am a graduate student in Resource Management in the Environmental Studies program at Antioch New England Graduate School in Keene, NH.

James Cummings (Geog BA '77) Retired from the Army. Working now as a RSI/GIS instructor at the Defense Mapping School, Ft. Belvoir, VA. I still work for the same (Anteon) corporation, but this is a new, big Omnibus contract that Lockheed and many sub-contractors put together with the National Imagery and Mapping Agency (NIMA) to administer and conduct training throughout NIMA.

Dan Daly (Geog BS '85) I am now working as Director, Strategic Relations for e-learning leader Element K (formerly ZD Education), an on-line training, content development, and learning management technology

company located in Rochester, NY. Am traveling frequently to the usual big urban spots, while maintaining home office in Rindge, NH.

Doug Denatale (Geol MS '83) I am still with Earth Tech (my company) is owned by TYCO International. I live in Groton, MA with my wife Valerie (she was at UMass in Plant & Soil. We have three growing kids - Joseph, 13, Chiara, 12 and Thomas, 8. They are all healthy and happy, and usually loud and boisterous.

Andy Dimitriou (Geol MS '90) has recently moved back to Anchorage from Washington state. Andy manages Alaska operations for SLR Corporation. Andy and his wife Kathy had their first child, Aidan, born March 30, 2002.



UMass Amherst Geoscience students in the field.



Automated weather station on Mt. Kilimanjaro in Tanzania. The AWS was installed by geoscience climatology researchers. Visit www.paleoclimate.org for more info.

ALUMNI NEWS, CONTINUED

Michael Field (Geol Phd '75) Married Camilla Cai in '97 and accompanied her to Norway where she was invited to do musicological research—while there, went on a field trip with Peter Robinson. Now in Ohio where Camilla is a Prof. Of Music at Kenyon College. Am semi-retired and work at college bookstore. My son is in the Peace Corps in Tanzania and daughter Andrea is in Paris working in the overseas program for Sarah Lawrence College.



M.S. student Brett Longworth (pictured) and Steve Petsch doing field work in the Hudson River watershed.

Agnes Fung (Geol MS '94) I am still with C.F. Mineral Research, Ltd. In Kelowna, BC. I continue to work on diamond exploration projects, including drilling programs at the Ekati Diamond Mine in Canada's Northwest Territories. More importantly, I was married on 11 September '99 to Jon Carlson, who is also a geologist.

Glenn Gaetani (BS '85) in the alumni news. He now holds a rather prestigious position as a research scientist in the Geology and Geophysics research group at WHOI, where he has set up a laboratory for experimental phase equilibria and kinetic studies. (From Mike Jercinovic).

Frederick Goodrich (Geog BA '95) I am currently employed as a County Planner with the Montgomery County Planning Commission in Morristown, PA. I defended my MS at the University of Toledo in the fall of 2000.

Rusty Gilbert (Geol MS '80) I work for Chevron Overseas Petroleum in San Ramon, CA. My position is Team Leader for our onshore China Exploration effort in China's Shengli oil field. Prior to this, I worked on assignments in SE & Central Asia, Texas and California. Most of the time I live in Pleasanton, CA, near San Francisco. My wife, Barbara, and 5 children are doing fine. I would enjoy hearing from some of my fellow UMass grads and friends. My email address is jorg@chevron.com

Walter Handy (Geol MS '76, BS '68) I have been working in West Africa and China. Our son graduated from medical school in 2000.

Susan Howle (Geog MS) She has taken a new position beginning in January 2004 as NEPA Coordinator on the Green Mountain & Finger Lakes National Forests. She will be living in Vermont, and leaves a very productive and successful record at the U.S. Bureau of Land Management in Ely, NV (From Jim Hafner).

Jim Kendra is now an Assistant Professor of Geography at the University of North Texas after a three-year post-doctorate at the Disaster Research Center at the University of Delaware where he worked on emergency management and social issues of the World Trade Center attack.

Karen Olson is now working for the U. S. Forest Service and happily living in Ellensburg, Washington. (From Rud Platt)

Jonathan Klane (Geol BA '84) In August of 1998 I formed my own health and safety consulting and training firm, Klane's Education Information Training Hub or KEITH for short (named after my dad). I'm thoroughly enjoying working for the toughest boss I've ever had—me!

Katherine Klinger (Geol BS '96) Have a position with an electrical engineering company doing a multitude of

tasks including surveying, fieldwork and mapping.

David Korejwo (MS '99) After working for several years for the US Geological Survey, Dave just started a job in August 2003 as a Geologist for the Federal Bureau of Investigations (FBI). (From Julie Brigham Grette)

Joanne LaFond (Geog MS '85) I have been recovering from breast cancer and am going to be fine. Before that debacle I had been an Adjunct Faculty member at a local University teaching Environmental Science as well as working in Tech Support at Stair-Master. I tried teaching at a private high school and eliminated high school teaching from the list of possible professions! I am glad to stay close to home in Kirkland, WA for the few years my 14 year old son will still be with and work on a project on Labrador that I started a few years ago.

Michael Leonard (Geog BA '83) Michael and Lucy have a son Bryce, born Mar '99. Michael is an active duty naval officer assigned to USS Nimitz in Norfolk, VA.



Mike Williams' field supplies, Northern Canadian shoreline

David Lehnus (Geol BS '96) & **Kathy Umstot** (Geol BS '96) set a wedding date of July 21, 2001 on Martha's Vineyard. They both work as environmental consultants in CT. Kathy works for Rizzo Associates and David for HRRP Associates.

ALUMNI NEWS, CONTINUED

GSA reception, Fall 2003 — Seattle, WA



Donald McFadden (Geol BS '95) I spent a few years in MA after graduation doing the typical investigation and remediation of oil and gasoline releases, then I moved back to Maine. I currently work for a primarily civil engineering company in the Portland area; however, an Environmental Engineer and I are part of a small environmental department (two of us). I am currently finishing up some geology course work at USM and look to site for my MEE CG in the fall.

Bill McIvride (Geol MS '82) is now working as a self-employed consultant—has started business, “Rock Stream Associates” offering expertise in ground water and soil contamination remediation. Contact me for information about Electrochemical Geoxidation—a new technology for in situ destruction of organic chemical contaminants.

Dennis McInerney is the proud father of four children and continues as an Environmental Risk Manager for Fleet Bank. Dennis lives in Glastonbury,

Connecticut, where his proximity to Amherst facilitated preparation of our paper on fluvial deposits of the New Haven Arkose published this year in a volume on the Mesozoic Supergroup by Columbia University Press (From John Hubert).

Amy McLanahan (Geol BS '87) Am no longer in geology, but my husband is a geologist so keep up that way. Finishing up as a graduate student in mathematics at UC Santa Barbara. Have two children, Sam and Carly.

Van Morrill (Geog MS '97) I've moved to a new home in Marstons Mills, MA and still work at the Cape Cod Commission, but now in a permanent position as a planner. The job mostly involves coordinating the review process of major development projects (commercial and residential) that would have regional impact. I'm also helping revise our guiding Regional Policy Plan, and keeping my foot in the fieldwork by compiling an atlas of tidally restricted streams on the Cape.

William Nechamen directs the Floodplain Management Program for New York State and is Treasurer of the Association of State Floodplain Managers. (From Rud Platt)

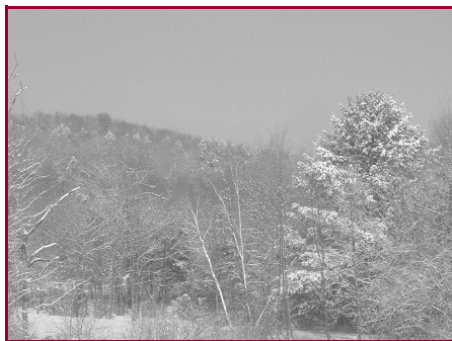
Amanda Nims (Geog BA '01) lives in Greenfield, Mass. and is working on farmland protection in the Connecticut River Valley for the U.S. Department of Agriculture. (From Rud Platt)

Sessy Nyman (Geog MS) gave birth to a baby girl in Chicago in spring 2003. She continues her legislative work in Illinois on behalf of pre-natal and post natal issues (From Jim Hafner).

Sharon O'Loughlin (Geol BS '83) Work for ATC Associates in Easthampton, MA. I'm back working in the environmental consulting world. After working for the Federal Deposit Insurance Corp. (FDIC) for the last 9 ½ years, I've taken the plunge back into the “billable time” pool. The properties are still just as much fun, though, so I should stay busy.

ALUMNI NEWS, CONTINUED

Linda Reinen (BS, '84; MS, '88) won the Biggs Award for Excellence in Earth Science Teaching from GSA this year. I don't know much about it, but there is a notice to that effect in the November GSA Today. The award "encourages and rewards excellence in teaching among college-level professors of earth science who are in the early stages of their careers." Linda is an associate professor in the Department of Geology at Pomona College. She got her Ph.D. from Brown in 1994. (From Laurie Brown)



Winter in Amherst
Photograph by Don Sluter

Peter Scott (Geol BS '91) First child, Theodore, was born 7/6/00. I graduated from law school at Lewis & Clark College in '99 and worked as a judicial clerk at the Oregon Court of Appeals. I hope to return to Montana where I want to work in Natural Resource & Public Land law, especially federal reserve water rights.

Jean Slosek lives in Alpine, California in San Diego County and reports that she narrowly survived the fires there last month. (From Rud Platt)

David Sommers (Geol PhD '66) I have been involved in GIS application work for the past three years. This involved going back to school and interning to learn the rather complex ArcInfo software used in GIS applications. Fortunately, I already knew about database management and have

reasonable computer expertise. I now have a part-time job for a couple of days per week with the City of Irvine in the GIS Group. This leaves me the remainder of the week to spend on short-term consulting geology/environmental contracts and to pursue my favorite recreational pursuits. I spent a couple weeks in Alaska last fall on a consulting assignment with an Anchorage law firm.

Lynne Stopen (Geol MS '87, BS '83) I have been teaching at Athol High School for 7 years and have been reasonably successful at developing an advanced level geology course for juniors and seniors. I have developed a research science course as well, as an avenue for students who want to compete in the Regional and State Science Fairs. Our biggest news is we are expecting to adopt a child from China around November (01). My husband, John O'Keefe (Umass Forestry, MS '91, PhD '87), are pretty sure our new child will be a daughter.

Richard Stromberg (Geol BS '80) I'm now with Levine Fricke, Inc. in Braintree, MA and continue in the environmental consulting field. Although I'm trained in structural geology and hydrogeology, I find fewer and fewer opportunities to apply these skills in the environmental field. Under the LSP Program in MA and LEP Program in CT, I find myself doing environmental science evaluations, risk assessment, and hazardous material management. I'm looking for **Gill Paquette** (BS Geol '80). Gil, if you're out there, call me! Tel. 781-749-8069 email RICK.STROMBERG@LFR.COM

Kurtis Suhs (Geol BA '86) After graduation from UMass I went on to commercial banking and received my MBA in accounting from Western New England College in '89. I currently work for the 9th largest insurance agency in the U.S., Brown & Brown Insurance, where I specialize in computer breach of security insurance programs. I really enjoy living in

Atlanta and am not far from the North GA mountains which I hike and enjoy the outdoors.

Stephanie (Tassier) Surine (Geol MS '99) We bought a house in a small town outside of Iowa City and we're enjoying it very much. Tim is doing well on most fronts. He finished his degree in Science Education and has been teaching at a small junior high school south of Iowa City. So far he's having a great time. I'm still really enjoying my job and some interesting projects have been coming up. Lately I've been spending most of my time working on a surficial mapping project. It also looks like we've got the go-ahead to drill a series of nested wells in the "Cleona Channel". This is an ancient bedrock channel (unknown age) that may have close to 400' of Pre-Illinoian tills and associated sands/gravels. Stratigraphically this is completely new territory. Given that I was hired to work on stratigraphy this could be a gold mine! The only downside right now is that the state is reorganizing so the deck is getting completely shuffled. According to the latest it doesn't appear there will be too many changes that will directly affect me, but time will tell! And I'm still plugging away at the dissertation. Slowly. No speed records here. By the end of next year I should be done with classes. Due to logistics, I've also chosen a new research topic ... The latest plan is working on loess in eastern Iowa looking at detailed grain-size distributions, transport directions, and mass accumulation rates to get at last glacial atmospheric dust loading and climate. Basically I can piggyback all of my field work and drilling under the State map surficial mapping program at the survey and can collect all my core courtesy of the USGS surficial mapping contract. Most everything else can be done in-house except the dating, and I've managed to chip away at enough student research grant dollars to get started.

ALUMNI NEWS, CONTINUED

Larry Tanner (Geol PhD '90) I was promoted to Full Professor a few years ago, finished my first textbook project—a combination Physical/Historical text (co-authored w/ Chernicoff & Fox) have a contract w/ Houghton Mifflin for my next and nabbed another NSF-CCLI grant (for purchase of an SEM). I am continuing my work on the early Mesozoic world, which has resulted in recent papers in the Journal of Sed Research and Nature (coauthored w/our own John Hubert), and the sedimentary consequences of volcanic activity in southern Italy. My wife Linda, an exercise physiologist, maintains a busy schedule with research on pediatric obesity and working on her own textbook. Our daughter, Emily, keeps us both running around with her activities.

Aaron Weieneth is an environmental planner with Metcalf & Eddy in their Wakefield, Mass. office. Among other projects, he has been working on an environmental impact statement for the controversial siting of a water

filtration plant for New York's Croton Reservoir. (From Rud Platt)

Hongbin Xiao (Geol MS '85) I worked for Chevron for 10 years on different geologies from Papua New Guinea to the North Sea to West Africa. I now work for Saudi Aramco in Dhahran, Saudi Arabia, probably for the next 10 years. Geology here is fascinating as well. I have three children, Emily 12, Alex 7, and Jason 5.

Additional Alumni News from Tony Morse

Carl R. Thornber (Pitsiulak 74; BS 76), of the USGS Cascades Volcano Observatory, lectured here to a full room this November on the history of Kilauea's eruption over the past 20 years, and joined us for a fine beer dinner in South Amherst. **Mike Hamilton** (D 93) has landed at a good place, the Royal Ontario Museum - Univ. of Toronto Geochronology Laboratory, inherited from **Tom Krogh**. We saw

him and Kath at GSA in Seattle. **Karin Olson Hoal** (D 90) has kept up some exploration and academic work in their home with two sons and ridge-back Logan in Colorado, delivering a well-received paper on xenoliths from the Premier Mine at a Kaapvaal Craton conference last spring in Victoria, BC. **Ruth Kalamarides** (D 83) has moved back east as far as the Syracuse area, where she has a real job and a good life. **Jennie Thomson** (D 92) came all the way from WA to NEIGC in honor of PR, along with **Ginny Peterson** (D 92), both of whom we also saw at GSA in Seattle. **Steve Ball** (MS 84) is now the Systems Manager for Math. and Stat. on campus. Our rare and valued anorthosite colleague **Brent Owens** (MS 86) from William & Mary was a welcome presence at scientific and ceremonial sessions at GSA in Seattle.

We would enjoy hearing from you!
Please send us your news items and
let us know what you have been up to!



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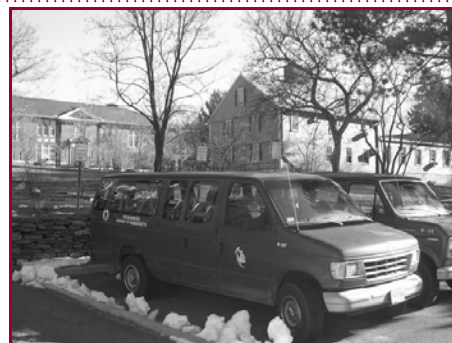
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KEEP US IN THE FIELD — GOOD NEWS!

One of the greatest things about having our vans right behind the building is that we can head for the field whenever the weather is right, which means anytime at all! The "Keep Us In The Field" fund drive has raised approximately \$16,000 to date. The Dean of the College, Lee Osterweil, has agreed to match our funds, and so we will be adding a new van to the fleet this year. This is just in time because our oldest van (#316) has been restricted to local trips only. Also, with the new twelve-passenger restriction, it takes more vans to get us out there! Thanks to all who contributed!

Unfortunately, we can't relax and enjoy the success. We now must kick off our drive to replace another aging van, Van-340 (Fred). Your contribution will help us keep our field component as strong as ever.



A SPECIAL THANKS TO THE FOLLOWING PEOPLE FOR CONTRIBUTING TO OUR "KEEP US IN THE FIELD" FUND, JUNE 2000-JUNE 2002

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Memorial Funds Support Student Research

The Department of Geosciences has five relatively modest Alumni Memorial Funds (see listing at right). The proceeds go directly to students, most commonly helping to support field expenses, attendance at field camp, or other costs associated with student research. Many alumni, at one time or another, have received some support from these funds, and many claim that the funds were critical in allowing them to complete their thesis or senior research. All of these funds are limited, and there is never enough to support all requests. Please consider contributing to one of the memorial funds or possibly making a general contribution in support of student research, visiting lectures, or field excursions. Please use the attached envelope or www.geo.umass.edu to contribute online. If you are considering a larger gift, please contact Mike Williams (head@geo.umass.edu). Alumni support can make a critical difference for students in the Department of Geosciences.

—Mike Williams

Elinor Fierman Memorial Fund - Established in 1983 by a matching gift from Jack Fitzpatrick (BS '76, MS '78). Elinor Fierman graduated in the class of '76 and went on to Duke University. In the spring of 1977, she was killed by a car while studying roadside geology. This award in her name is given to a student researcher (undergraduate or graduate) with preference given to laboratory studies.

Geography Alumni Award Fund - Established in 1995 from gifts given by Geography alumni, the award is given either to support Geography graduate student research or to any student in the Geography program for other worthy purposes.

Gloria Radke Memorial Fund - Established in 1984 from gifts given by family and friends for the purpose of establishing this award. Gloria Radke was a graduate student interested in Pleistocene geology. At the end of her first year here, she was killed by a drunk driver on the S-curve by Atkins Farm Stand in South Amherst. This award in her name is given to graduate students in support of field research.

H.T.U. Smith Memorial Fund - H.T.U. Smith was Head of the Department from 1956-1969. This award in his name is given to support field work with preference to undergraduate students (including enrollment in a field course).

Leo M. Hall Memorial Fund - Leo Hall was Professor of Geology in this Department from 1967 until his death on December 26, 1985. Among many other qualities, Leo was noted for his devotion to field study and to the teaching of field methods. This award in his name is given to graduate students in support of field research.

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**We apologize if we have omitted anyone from our list. Please contact us if you recognize an omission.*

THE RANDOLPH AND CECILE BROMERY FUND

Thanks to a generous gift from Bill and Cecile Bromery, the "Randolph and Cecile Bromery Fund" has been established for the Department of Geosciences. The fund has three main objectives: 1) to recruit and support undergraduate and graduate minority students, preferably African Americans; 2) to seek and engage minority professional geoscientists to visit the Department of Geosciences as guest lecturers; and 3) to strongly encourage undergraduate students in the Department of Geosciences to include a field mapping component as part of their programs of study.

Encouraging minority students and minority role models as well as encouraging field work and geological mapping at all levels of study are important priorities in the department. Additional contributions to the Randolph and Cecile Bromery Fund would be gratefully accepted.

Our sincerest thanks to Bill and Cecile Bromery!



Bill Bromery with guest lecturer Warren Washington after his lecture in Memorial Hall, UMass Amherst, Spring, 2001.



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Please feel free to contact us if you have any questions or comments regarding this publication. We hope to continue the newsletter on a regular basis, so let us know if you have any suggestions as to how we can improve our next issue.

We would also enjoy hearing about you, so please send us your news updates, either by returning the enclosed form (via postal mail or fax), or by sending e-mail to: head@geo.umass.edu

Happy New Year, and best wishes in 2004!