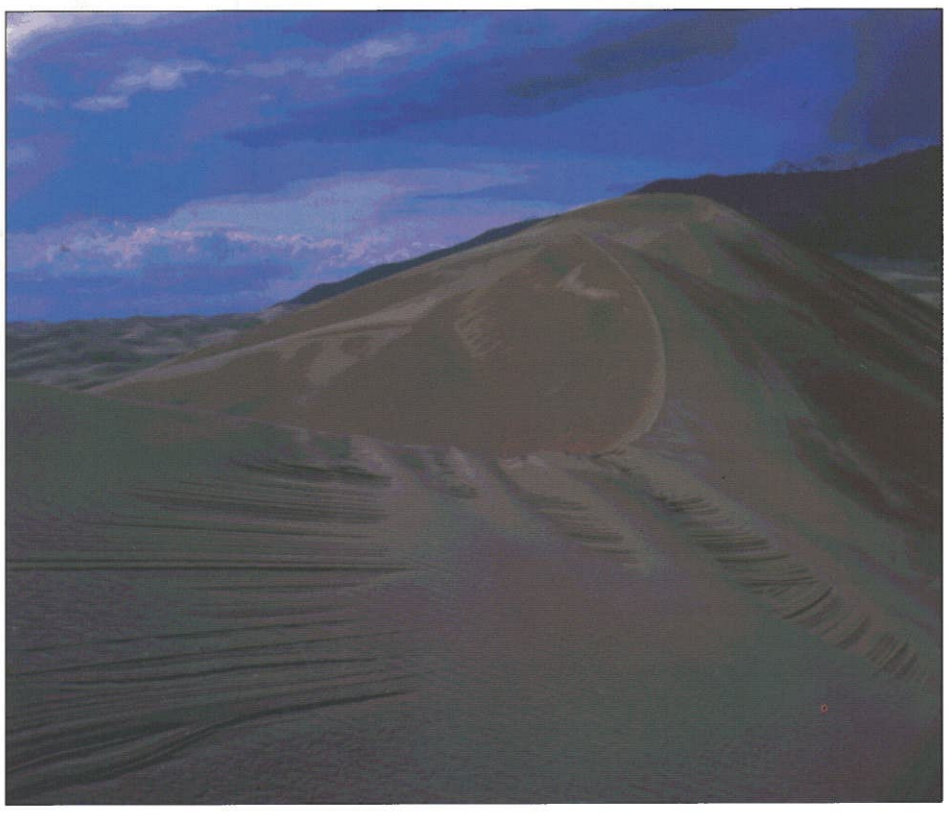
GEOLOGY NEWS

Department of Geological Sciences ▲ University of Colorado at Boulder ▲ Spring 1999



Great Sand Dunes National Monument, CO. Photo by geology senior Ryan Skorecki.

Message from the Chair

Charles R. Stern

Welcome to our newsletter. In it you will find what has been going on in the department during the last year. I believe that it has been a lot. It is a good time to be the Chair and in this message I just touch on some of the highlights.

We have been in our new building now for over a year. The commotion created by the move from the old building has settled down and the faculty are back to business conducting research and teaching graduate and undergraduate students in really wonderful new laboratories and classrooms. The undergraduate majors have equipped their new student lounge with a refrigerator and microwave oven so that they can study day and night. The graduate students don't have a lounge any more, as they did on the fourth floor of the old building, so they can also study day and night. The faculty have a beautiful conference room for faculty meetings, and this has helped attendance a lot.

If you have not seen the new Benson Earth Sciences Building, we are planning to hold an open house and alumni get-together in conjunction with the Geological Society of America annual meeting in Denver next fall. The plan is to run this event, which will approximately mark the second anniversary of the dedication of the new building, on Wednesday night, October 27. If you are coming to GSA or live in the Denver/Boulder area, please plan to join us that evening.

We have new faculty. Craig Jones, a structural geologist and geophysicist with interests in the geologic evolution of the western U.S., has joined our faculty. Greg Asner, a biogeochemist with interest in the interaction of the atmosphere, biosphere and solid earth has accepted an offer to join our faculty, but will not actually be here until next year. Bruce Trudgill, a structural geologists working for the last few years as a Research Associate in our Center for Energy and Mineral Resources (EMARC), has been appointed as a Research Professor. We also lost a faculty member. Research Assistant Professor Mark Rowan left EMARC and the department to pursue private consulting.

Our faculty have been doing good things. Bruce Jakosky published a book, *The Search for Life on Other Planets.* Giff Miller published the lead article in a recent issue of the journal *Science* concerning human induced environmental changes in Australia. Roger Bilham appears every day, all over the country, in the IMAX film *Everest*, and you can also see Roger and his student Rebecca Bendick on the Discover Channel show *Amazing Earth*. Roger and John Andrews have been awarded Faculty Fellowships from the Graduate School for full-year sabbatical leaves of absence next year. We have recommend Associate Professors Lang Farmer and Bruce Jakosky for promotion to the rank of Professor and hope these recommendations will be approved. Also we have nominated Professor John Andrews to the university for the award of Distinguished Professor. I want to thank all the many alumni who wrote letters on behalf of Lang, Bruce, and John for your time and effort.

We are also recruiting and requesting permission to recruit more new faculty. We have recommended Paul Weimer, director of EMARC, for the Benson Endowed Chair in Petroleum Geology. This new endowed faculty position will allow us to expand the petroleum program. Bruce Jakosky has obtained a NASA grant to create a center for the study of astrobiology here at CU and we are requesting from the Dean a new faculty position for an astrobiologist with a geologi-

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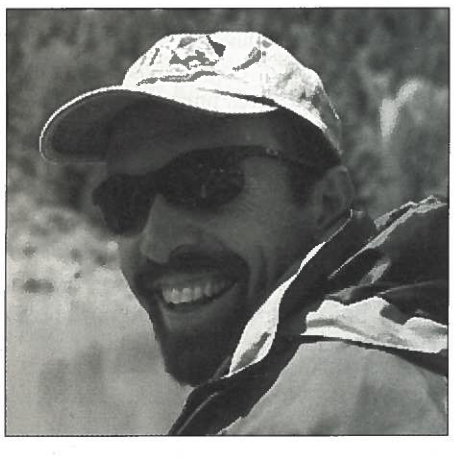
Introducing the new advisory board members

Brent Johnson earned bachelor's degrees in Geology and Spanish from Virginia Tech, a master's degree in International Affairs from The American University and a master's degree in Geology from CU-Boulder. During his studies at CU, Brent worked with Drs. Budd, Runnells, and Amy (CVEN) on his thesis (water-rock interaction), with Drs. Choquette and Larson on various teaching and research assistantships, and with Dr. Bilham on a plate-movement study in the Caribbean. Brent also served as the graduate student representative to faculty meetings and enjoyed the numerous Geology Club festivities.

Brent is currently working in Lakewood as a hydrogeologist/geochemist for Golder Associates, an international environmental and engineering firm. He has focused on mine drainage and water resource issues in the U.S., Central and South America, Africa, and East Asia. Like all geologists, Brent loves the outdoors, travel, and field work. He currently lives in Morrison, Colorado, with his wife, Anita.



New advisory board member, Brent Johnson.

Lisa Morgan (former a.k.a. McBroome, current a.k.a Morzel) attended the University of Colorado from 8/77 to 5/78 and from 1/80 to 8/81 where she received an M.S. in Geology, with an emphasis in igneous petrology. Her thesis advisors were Charles Stern and Ed Larson. She enjoyed her time at CU going on geology field trips to the central Colorado basin and northern New Mexico, especially the Valles caldera and Rio Grande rift zone. While at CU, she also made friends, many of whom are present-day geology collaborators. Morgan attended the University of Hawaii, receiving her Ph.D. in Geology and Geophysics in 1988. While at Hawaii, she specialized in physical volcanology, completing a dissertation concerning explosive volcanism in the Snake River Plain under the direction of G.P.L. Walker.

Morgan currently lives in Boulder, Colorado and is raising three children with her partner. She has been employed by the U.S. Geological Survey since 1977. She is a member of the Mineral Resources Team and her projects focus on the volcanic terrain in the Greater Yellowstone area. In her other life (when known as Morzel), she serves on the

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New Faculty

Craig H. Jones

This past August, Dr. Craig H. Jones joined the teaching faculty as Associate Professor. Craig had been a Research Professor with the department and Research Associate with CIRES (Cooperative Institute for Research in Environmental Science) at CU for the past several years. After receiving a beaver-mascot-only education (B.S. from Caltech and Ph.D. from M.I.T.), Craig bounced from a postdoc at Caltech to a research position at the University of Nevada, Reno and then in 1993 to CU as a researcher in CIRES.

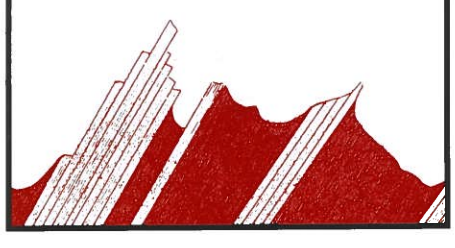
In his teaching, Craig will be bringing expertise gained in his field research projects to the classroom. He has taught Field Geophysics (4740) and Intro to Geology-2 (1020) this past year; the former allowing use of his many years in the field, the latter permitting some exploration of ideas of mountain-building in Colorado's past to be brought to introductory-level students. This coming fall he will teach a new class on Tectonics in the Western U.S. designed both to explore tectonic theory and provide some background in techniques used in integrate tectonic analysis. Beyond this, he is co-chair for the Technical Program for national GSA this fall (with Lang Farmer) and has been acting as webmaster for the department. His research interests, as is common, arise from his Ph.D. dissertation, which included topics in the Basin and Range

New faculty member, Craig Jones.

ranging from a geological and geophysical synthesis of the southern Sierra Nevada and Death Valley to a microearthquake study of northern Utah. This led him as a postdoc at Caltech to conduct a shoestring field experiment in 1988 in the southern Sierra Nevada to test some ideas arising from the earlier synthesis. This experiment led him to conclude that the Sierra lacked a thick crust, as had previously been believed (please X this out of any texts you might have). Controversy associated with that conclusion led to yet another experiment in 1993, this time well funded and with Craig as a member of a large multidisciplinary team. That experiment conclusively showed that the crust under the crest of the Sierra was only slightly thicker than to the east and thinner than that under the foothills to the west. This was not the end of the matter, as now some understanding of how the 4000 m peaks of the Sierra are supported is needed. So in 1997 there was another field experiment, this time with CU's Lang Farmer as one of several collaborators, that was reported in last year's newsletter.

Other than working in the Sierra, Craig has been involved with other cryptic phenomena in the western U.S. His watchword is to try to understand things that are either outside our present models of tectonics or that have very strained explanations. This has led to paleomagnetic work in southern Nevada, a mechanical model for earthquakes near the San Andreas Fault and western Nevada, and a simple physical understanding of the role of body forces in driving deformation in the western U.S. Most recently, this past year he and colleagues from Dartmouth College and Wm. Lettis and Associates published an article in *Geology* demonstrating how to apply principles of body-force driven tectonics to scenarios in the geologic past. One result was to demonstrate that an often-stated model for extension in the Basin and Range is an error: this model has a low-elevation thick crust extending due to body forces within it. The paper shows that the internal body forces would in fact be compressional; high elevations are required for this to actually occur. A second result represents Craig's growing interest in the Rockies: prior to the development of the Rockies, a major marine incursion covered the area soon to be uplifted. This subsidence event resulted in several kilometers of sediment, yet no surface load has been identified to have caused such subsidence. If the subsidence was caused by a subsurface load, the lithosphere would be stressed toward failing in compression. The paper shows that the magnitude of this effect would be enough to have caused deformation to skip over the Colorado Plateau, thus providing an explanation for one of the geologic puzzles of Colorado.

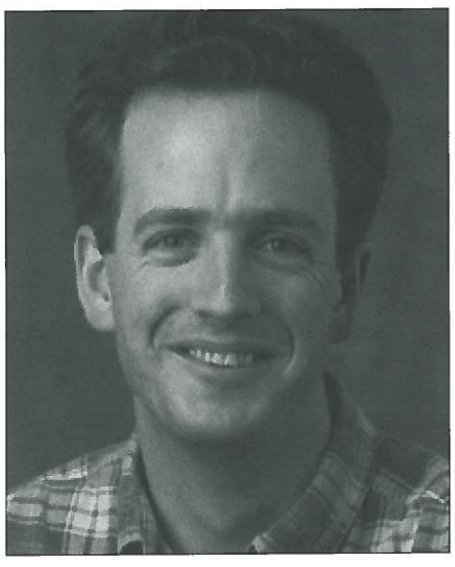
The department will hold an Open House in the Benson Earth Sciences Building on the Boulder campus on Wednesday, October 27, 1999, from 4:30 to 7:30 p.m. in conjuction with the meeting of the Geological Society of America



Bruce Trudgill

Dr. Bruce Trudgill was recently promoted to Assistant Research Professor in the department.

At first glance, Bruce Trudgill's office, (in the EMARC section on the third floor of the Benson Earth Sciences) looks fairly normal, with journals, aerial photographs, and manuscripts scattered across his desk, and geological maps strewn across the walls. What you really notice, however, are the three 20" monitors lined up along one wall, indicating that maybe this structural geologist is a computer nerd. "That's actually rather deceptive," says



New faculty member, Bruce Trudgill.

Bruce with a wink. "Before I arrived at CU I probably didn't know how to turn one of these on. In the past five years I've become competent enough to use these things to my advantage, but I'm certainly not a computer geek." Leaning forward, and in a hushed tone, Bruce admits he once deleted the whole hard drive on a machine by accident. Don't tell Dave Knapp though; he'd get a bit scared if he knew the truth. During these opening conversations, I notice that Bruce has an accent that ain't from around these parts and inquire further. "Actually old chap, I'm as American as the next bloke. I was born in Urbana, Illinois, and then spent the next 28 years out of the country. Quite simple really." Without further prompting, Bruce then summarizes his early geological career. "I was very fortunate at (high) school to have an excellent geology teacher from the age of 13," he says. "He took us on field trips all over Britain, and after five years we were all pretty good field mappers. I was hooked from the first time I spent a whole day with my head in a plastic bag, mapping on the Isle of Arran in late October." He then went on to study geology at the University of Aberystwyth in Wales. Again, there was a very strong field component in all the geology classes. For his second year (out of three), he was an exchange student at the University of California at Santa Barbara where he had a great time—sun, sea, sand, and some great geology courses to boot. At this point Bruce grins ruefully and reaches for a crystal glass on his desk filled with an amber liquid. "Apple juice," he says pointedly. "So what happened after UCSB?" I ask. "Well, I returned to Aberystwyth and completed my degree, and two weeks later I was in the French Alps, mapping again," Bruce replies. He elaborates, "I'd been accepted as a Ph.D. student at Imperial College in London. The topic involved looking at inversion structures in the western French Alps, and as it was midsummer I needed to be out mapping. I spent three summers out there; it was brilliant. Good weather, great scenery, exciting geology and you know what the best thing about working in the Alps is? Bars, they're all over the place in the mountains. After a long day in the field, you can stroll down the hillside and stop at a mountain restaurant or bar. Nothing better than sitting there filling in your maps and with a big glass of ice cold Pernod—does wonders for the imagination!"

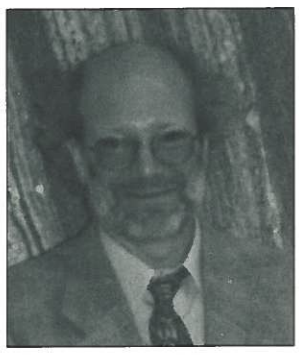
"So what did you do after finishing your Ph.D.?" I ask. "Well, I'd been fortunate enough to get a job offer from Amerada Hess in London, so I spent two years being an oily boy and learning how to interpret seismic data. In those days it was all hard copy and colored pencils. Your office status wasn't measured by how much RAM you had, but by how many colored pencils you could keep lodged behind your ear!" At this point Bruce laughs and reaches for another shot of apple juice. "Anyway, after leaving Amerada, and spending six months traveling, I ended up back at Imperial doing a post-doc, out in Canyonlands, Utah. I was really lucky with that one! Great place to work and an exciting project studying how faults grow." He nods at the aerial photographs on his desk. "I still get out there occasionally, but not as often as I would like. Not the same as the Alps though, no little bars scattered around in the wilderness and the beer is awful!" Sensing a pattern, I move on quickly. "So how did you end up here?" Bruce chuckles. "Another long story," he says. "Basically, my wife and I had visited Boulder while I was out working in Utah. We had some friends here who encouraged us to move out, so when the post-doc finished, we did, at the end of 1993. We didn't have jobs, but Louise got a job fairly quickly and within six months I'd been offered a research associate position in EMARC. For the first two years, I worked on a project in the Perdido fold belt in the deepwater Gulf of Mexico. Since 1996 I've been working on the 3-D evolution of salt, faults and minibasins. It's all new and exciting stuff," he says, waving at the double headed work station which has a crazy mess of pink shapes whirling around on it.

At this point, I figure I should let our new assistant research professor get on and actually do some research. "Cheers then," he says, raising his glass as I make my leave. Suddenly I notice that all the maps in the corner are rolled up and stacked in empty Scotch whisky boxes. "Have you drunk all of those?" I ask. "Well, not all at once, and not here," Bruce replies ruefully and turns back to his work station.

From the Chair, cont.

cal perspective to participate in this new center. We also have requested permission to search for a paleontologist to replace Erle Kauffman.

Our Advisory Board, currently chaired by Jeffrey Abbott, has added Matt Silverman, Brent Johnson and Lisa Morzel (a.k.a. Lisa Morgan and/or Lisa McBroome) as new members. Eugene Shearer, Steve Colman, Vance Holliday, Dick Koepnick, Dave Muller, Rich Reynolds, Barb Tewksbury, Christine Turner and Wayne Ziemianski have now left the board, but we want to thank them very much for their service on our behalf. The board continues to lead a campaign designed to help us support our departmental field trip activities.



New Chair Chuck Stern

Our alumni continue to support us in very significant ways. Bruce and Marcy Benson presented the university with a substantial gift to create the Benson Endowed Chair in Petroleum Geology, which we are actively seeking to fill at the moment. To my knowledge this will be the first endowed faculty position in the College of Arts and Sciences. William Hiss has also promised to provide the financial support to create the William L. Hiss Geological Sciences Endowed Chair. Jack Edwards, previously director of EMARC, created the Dr. John D. Edwards Geological Sciences Graduate Fellowship Endowment Fund and Charles Iglehart created the Charles F. Iglehart Geology Student Support Fund. These and other alumni gifts have a profound positive effect on our department and the educational opportunities we can provide our students.

Our staff has undergone some turnover. We have a new accountant, Ya-Wen Zhang, and a new receptionist and administrative assistant for undergraduate activities, Joyce Bograd. Kathy Freeman continues as our administrative assistant for graduate affairs and Beth Hanson continues as our main office administrator and assistant to the chair. Carrie Kocik will be our student assistant at least until the end of this year.

We also have a new Chair. According to the photographs in the corridor of the third floor, I am the 13th Chair of the Department, the same number as the current Dali Lama. One difference that I can be sure I have from the Dali Lama is that I was not born to be Chair. What special talents or perspectives do I bring to the job? One alumni, Peter Harries, in a letter in which he addresses these same questions, said "I am glad to see that they have put one of the inmates in charge of the asylum." Thanks Peter, I think this pretty much sums it up.

FACULTY NEWS

John T. Andrews

This year had its good points and its bad points. The good points are much more interesting and relevant to the newsletter. In July I was both fortunate and honored to be awarded an honory Dsc (honoris causa) from the University of Nottingham, my alma mater (see photo right). This was in addition to my earned DSc from there which had been awarded in 1978. Martha and I were in England for a holiday, hence it was easy to travel to Nottingham. The University wined and dined us for two days with considerable pomp and ceremony. As other recipients included a Nobel Prize winner in physics and the leader of the cloning team that produced the famous lamb Dolly, I wondered if they had the right person! To add to this I also learned that the American Quaternary Association (AMQUA), in many ways my closest set of peers, had awarded me the Distinguished Career Award. As the biennial meeting for AMQUA was in Mexico, I had a quick trip to receive the award.

The last few months have been fun over in our research labs on the East Campus. Our (Anne Jennings and my) research group has benefitted from the presence of Drs. Morten Hald (University of Tromso, Norway), and Gudrun Helgadottir (Marine Research Institute of Iceland), who are working with us on cores which we collected on joint cruises to East Greenland and Iceland in 1996 and 1997. We are also continuing our work around the Ross Sea, Antarctica (Wendy Cunningham and Kathy Licht), and Heinrich events and other evidence for abrupt changes in ice sheet/ocean interactions (Donny Barber). I think as a group we must have published six or seven papers in 1998. Jorunn Hardardottir defended her Ph.D. dissertation in December 1998, and has returned to Iceland for a post-doc post.

From left to right: Sir Colin Campbell, Vice Chancellor; Professor Johanna Leybourne-Parry (orator); Professor John Andrews; Lord Dearing, Chancellor; and his robe bearer

Bill Atkinson

1998 started off with a bang! We were moving to our new building. Bill was at the end of the list of faculty to be moved, so the break between semesters was taken up with decisions on which specimens of the economic geology teaching collection to keep, and which to toss. As some of you may remember, the volume of the collection is, well, voluminous! But it contains suites of specimens from every major type of metallic mineral deposit known, enough to give a student a good knowledge of what they look like. It's amazing how quickly the space gets filled, and there were some eyebrows raised over the quantity of cabinets he intended to stuff into the new mineral deposits lab. Several truckloads went to a warehouse on the East Campus. Some people wanted the boxes and drawers out of the hallway when they arrived, and so there was a great effort put into squeezing things in. You have probably heard of the problem during the early days of the move—how water pipes in the roof froze, and flooded the upper floors of the building when it warmed up. Moving the economic geology collections dragged on, but Bill made a final note on March 15, "cleaned up the final mess in the lab." But even after that some drill core surfaced in the old building, that looked good enough to salvage, on May 2. Then finally it was done, and we are enjoying new surroundings. Pretty nice!

Most of the graduate students spent the year working hard on their theses. This includes Paul Boni, Abbas Sharaky, Peter Hanke, Lupe Espinoza, Sara Martinez, Alex Iriondo and Becky Sauer. Erin Marsh started a thesis with the help of Rich Goldfarb, of the USGS. Her project is in the Yukon, on gold mineralization around plutons not far from Dawson. Worth Cotton worked hard, too, finished and graduated in August. He returned to Chile, where he got married, and has just now found a job at El Soldado mine. But he intends to return to work on a Ph.D. Paul Boni presented a talk on his research at a meeting on industrial mineral deposits in Oklahoma in May. This is the second year he has presented a talk at a national meeting on his trona research. On a spring field trip, we visited Becky's thesis area, in the Ortiz Mountains, New Mexico, where she is dating rocks and mineral deposits of the San Pedro-Ortiz porphyry belt. Armando Zaragoza, who had to return to Mexico to work after three semesters of classes in Boulder, continued to work on his thesis, and is now ready for his defense.

Our frequent research meetings were enlivened by a visit by Skip Cunningham, whose daughter, Wendy, is a graduate student at INSTAAR. Skip talked about gold deposits associated with dacitic domes in Bolivia. Also in April, we held a big pot-luck party, inviting alumni and friends of mineral deposits. Murray Hitzman, new professor of economic geology at the Colorado School of Mines, gave an inspiring talk on his many years of exploration in Ireland, where he found the Lisheen lead-zinc deposits. Another memorable social event was the annual fall picnic, which Bill organized. Adjunct professors Larry James, Rich Goldfarb and Fred Kruse assisted with the economic geology program, giving valuable advice and assistance to many graduate students.

Bill taught intro physical geology classes both spring and fall semesters, and feels he now has the hang of it, more or less. It's always a puzzle how to get the attendance up, especially since they are paying for it, but the big classes have a funny psychology. It's like they are going to a movie. They often get up and leave in the middle of class, or come in when they feel like it. There is always about a third of the class missing. Bill taught Intro to Ore Deposits in the spring, and Geochemistry of Ore Deposits in the fall, both enjoyable, with sufficient students to keep from having them canceled. In the spring, we went on field trips to the Clipper mine and the Hyatt Pegmatite. At the end of the spring semester, Bill took his students to New Mexico and southern Colorado for a week, where they saw the Ortiz gold mine, the San Pedro copper skarn mine, the Pecos massive sulfide mine, the Harding pegmatite and the Creede district. In the fall, the geochem class visited the Cross gold mine near Nederland, and the Schwartzwalder uranium mine.

Early in the spring semester, Bill carried out a search for a student who would qualify for a scholarship from the Sloan foundation, which had just provided him with a grant for underrepresented minorities for Ph.D.s in the geological sciences. After a while, it was clear that there were no minority candidates in economic geology, so the search was widened to all fields of geology we teach at CU. Soon, we found an excellent candidate interested in remote sensing and landslides, Lorna Jaramillo of Puerto Rico. Lorna was able to make a week-long visit as a recruiting trip the week of our annual fall picnic, where she was able to interview the students and faculty in depth. We were able to convince her to come, and at this writing, she is attending classes.

Bill was able to devote a couple of months in the summer to research. For all of June, Stephen Redak, an undergraduate, through the Undergraduate Research Opportunities program, accompanied him to Moctezuma, Sonora, where Bill has been pursuing field research for a number of years. It got up to 110°F every day, but Stephen managed to slog through the thorn bushes with Bill and be of tremendous help. Stephen had a chance to learn a lot about volcanic rocks and hydrothermal alteration around mineral deposits, as well as practicing his Spanish.

In economic geology, mining companies are the equivalent of the federal funding agencies to other researchers. Bill has established a relationship with a Mexican mining company as a consultant, that is leading to funded research opportunities. He spent spring break and a week in August at Tayoltita, Durango, at a large gold-silver mine, where the owners are eager to sponsor research.

Bill's most enjoyable trip of the year was to a week-long research conference in Oviedo, Spain, where the conferees reported on research on recently discovered gold deposits in the area. Actually, the deposits were mined by the Romans, but only recently was it determined that the deposits could be mined further. Bill's interest in them was aroused when he visited the area a few years ago, and found that these deposits resemble porphyry copper deposits of the American cordillera, a fact that will be the subject of a planned research paper.

Roger Bilham

As expected, the Earth continued to deform beneath our various geodetic networks in 1998. The Hayward fault slipped uneventfully under the watchful of eyes of our tireless creepmeter array which monitors each minute the potential status of a million or so pipes buried beneath the East Bay area live on the web. The data reaches the web via an unlikely brief bounce off the GOES satellite parked over Peru, plus a few secondary relays from other data link satellites. Data from the Long Valley caldera arrives in Boulder using the same links in space and tells us that the magma chamber beneath Mammoth Lakes continues to inflate at a rate of roughly 1 barrel of magma per second, a deeply warming concept for the ski industry above it. A brief excitement occurred there in October when a local fault slipped silently causing the tiltmeter to register apparent minor collapse of the magma chamber. After two days of weak microseismicity a M=3.1 earthquake on the nearby Hilton Creek fault signified the end of the slip episode and the surface resumed its slow inflation.

The biaxial tiltmeter was overhauled significantly this year after a decade of puzzling low lunar tide amplitudes on the north-south component. Verification that all was well resulted in the production of one of the least interesting movies we have ever seen, a view of the inside of the 450-m-long water pipe between the north and south sensors. To drag the televiewer through the pipe required blowing a balloon tethered to a nylon fishing line from one end to the other. Unfortunately the advertised 100 mph muzzle velocity of the blower in the north end of the pipe created enormous waves at the far end that accidentally flooded the lower inch of the Caltech Terrascope instrument in the southern vault, requiring extensive repairs. The new electronics are now located above the 5000 gallons in the water pipe. My apologies to Caltech.

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New board members, cont.

Boulder City Council, elected in 1995, and addresses issues regarding land use, the environment, and transportation.

New advisory board member, Lisa Morgan

Matt Silverman received his M.S. in Geology from CU in 1983. He is now Vice President–International for Gustavson Associates, an international petroleum firm based in Boulder.

His career has focused on evaluating frontier opportunities around the world and in finding and developing oil and gas reserves in the western United States. He has completed several major oil and gas field studies in China and the former Soviet Union. Matt has managed large-scale basin analysis studies and hydrocarbon resource appraisals in Eastern Europe, South America and Asia. He leads the company's exploration efforts in Hungary and Turkey, where they are exploring large blocks of wildcat acreage. Prior to joining Gustavson, he was employed by TOTAL in Denver.

New advisory board member, Matt Silverman

Faculty News, continued

Over Spring Break we remeasured part of our 1994 Venezuelan GPS array crossing the El Pilar fault that obligingly slipped in 1997. Re-measurement from Aves Island to near the Orinoco Basin revealed both the half-meter of co-seismic slip, and, for the first time, the long term 20 mm/year motion of the Caribbean plate.

In May Rebecca Bendick and I managed to complete a quick traverse from Pockara to Jomoson in Nepal before the monsoon made conditions unfavorable for Himalayan GPS work. While Becky traveled to Ladakh with Peter Molnar away from the advancing monsoon, I spent a soggy additional month in Nepal repairing fixed receivers struck by lightning and attempting to organize phone lines for future data. While in Kathmandu I was asked to present our seismic hazard scenarios to members of an international conference on "Earthquakes and Kidney Failure(!)." It is not well known that muscle trauma overloads the kidneys, resulting in death days after accidental crushing. Many of these later deaths can be prevented if casualties crushed beneath buildings are made to drink lots of water, especially if appropriate salts are added in solution. Subsequent talks on seismic hazard to the UN and U.S. Embassy staff in Kathmandu were made more interesting by a chance encounter with a himalayan pebble in a plate of rice. The resulting emergency dental field operations were completed just before Becky returned to Nepal and we flew to Shanghai for the next phase of Asian adventures.

Although our destination, Urumchi, was due north of Kathmandu, due to problems with obtaining a visa to go via Lhasa we found ourselves catching the four-day train from Shanghai to Urumchi a fascinating and much less expensive route than flying via Beijing. The weakness in the plan was what to do with our ten bags of GPS gear on the platform in Shanghai. Despite the train's enormous length, there was no baggage compartment and the baggage allowance for each passenger was two small bags supposed to go under the seat. It looked as though our gear would be staying in Shanghai without us, but with seconds to go, our friendly Chinese railway guards finally came to an agreement where we parted with a large number of Yuen in exchange for an official receipt, and the bags were tossed on as the train began to move. It was perhaps fortunate that we did not understand the negotiations and discussions between our fellow passengers which at times became extremely heated.

Railway journeys are fun because of the people you meet on them. While waiting for the train we had purchased a Chinese atlas that showed our route, and we and our fellow passengers would stare at the map as we crossed it, and as I look at the book before me now I see their excited faces as they tried to teach us to speak Chinese, and their pained expressions as we uttered their strange words.

Thoughts from grad student Becky Bendick

I once had a dream. Maybe when I was very small, and first read under the covers with a flashlight that some people traveled to far away places and met strange people and made fantastic new discoveries. Now, there I was, in a vintage, cherry-red Land Cruiser with no starter, bouncing across infinity in the Taklamakan Desert, with an expedition in Ladakh already finished and another through Tibet looming ahead.

As one of Roger Bilham's grad students, I spent a total of seven months in Asia last year, measuring and remeasuring GPS and gravity networks designed to illuminate the kinematics of deformation in the far reaches of the Himalayan system. The net results of efforts by many: a GPS network through central Nepal from Pokhara to Jomosom; new maps of offset on the Karakoram fault in Ladakh, India (a project with visiting CIRES fellow Peter Molnar); remeasurement of a 1994 GPS array crossing the Altyn Tagh fault in Xianjiang, China; new kinematic and static GPS measurements throughout eastern and northeastern Tibet; and new GPS and gravity networks in far western Nepal. And there were corollary results all my own: a deep love for desert-grown Chinese watermelons, new friends in Kham, a vocabulary of Ladakhi animal words, a chocolate birthday cake at 4000 m, and several thousand blisters, duct-tape repairs, and platefuls of rice.

Back here, home again, I am reminded that our explorations continue. In these days of technological science, we are still discovering, still exploring long after we leave the trail. We are processing GPS data now, running models of elastic strain and gravity anomalies, trying again and again to understand the underlying reasons for those things we saw. I have learned so much since those under-the-covers days. I hope I never stop.

Outside the window the fields of rice and rivers gave way slowly to the deserts and arid mountains of NE China, eventually following segments of the great wall and the silk road. On the fifth morning and 3000 km later we were met in Urumchi by our colleague Yin Guanghua with whom we were to travel another 9000 km by road, first northward to the Altai Mountains, and then south through the Tien Shan across the Taklamakan desert to the Altyn Tagh and back to Urumchi. Despite an unreliable starter motor on our vintage Toyota, the month of July resulted in a gigabyte of kinematic GPS data for a planned NASA mapping Shuttle Mission, and an additional 25 fixed GPS measurements. Fueling this segment of the journey was a supply of endless watermelons ("another one?" were the two most frequently heard words from Guanghua), ice cream, noodles and shishlik. After each stop we used up calories push-starting the jeep.

Midra and Giff Miller in Australia.

Our re-measurement of our 1992 Altyn Tagh array was to result in a surprisingly low estimate for slip on the fault. Anticipating a future return to the region we planned another traverse across the central simpler part of the fault near 85 deg E. Here no roads exist either in the desert or the mountains so Becky and Guanghua rented donkeys and traveled towards the plateau and the snow, while I headed north into the Taklamakan desert to be fried in our unfriendly Toyota.

The August segment of the measurements was to have been a journey across the Tsaidam Basin to Golmud and thence to Lhasa, but this was rendered difficult by communications problems and by the timing of funding. Instead we returned to Urumchi where Becky flew off to Xian to join Prof Yin and Jeff Freymuller, and I returned to Boulder to start a lengthy process of analysis and documentation. From Xian Becky flew to Lhasa and completed a month of measurements reporting on the general collapse of the road system of southern Tibet using infrequent e-mail bazaars, and finally flying back to Kathmandu where after the monsoon in September and October she completed a second traverse across the Himalaya of western Nepal.

Shemin Ge

The hydrogeology group graduated its first Ph.D., Miles Waite, since Shemin joined the department a few years ago. Now managing projects on cleanup of contaminants in soil and groundwater, Miles works for an environmental company in Burlington, Vermont. He is happy to be back to the New England area where he grew up. The group had another graduate, Jeff Bails, who graduated in December with a master's degree. Jeff participated in and will continue working for the National Water Quality program of the U.S. Geological Survey. His thesis is on the water quality of French Gulch in Breckenridge, Colorado.

Continuing graduate students David Kinner, John Marler, and Cheree Stover work very hard and hardly find time to go skiing. The hydrogeology research lab in the new building is so well equipped, not only as a research facility but also with essential items for survival such as a refrigerator and microwave, that the students can work day and night. Dave's research is aimed at a better understanding of the effects of deforestation in the tropic environment by examining the interplay between precipitation, runoff, soil moisture, and groundwater movement. Dave has completed his field work and is conducting computer modeling and writing his thesis. John has dived into a research area combining hydrology and structural geology and is trying to better understand the role of faults in regional hydrology. With the help of the hydro-crew, he conducted several aquifer tests in the Elkhorn Thrust fault zone in Park County, Colorado, and hopes to characterize the hydrologic function of the fault. Moving away from the continental setting, Cheree has been pursuing her research in marine settings so that she could spend time on cruises. She is exploring the coupling mechanisms between different processes such as sediment compaction, fluid flow, and heat and solute transport in marine environments. In collaboration with the EMARC group, she is trying to unveil the history of fluid flow and petroleum generation/migration under active sedimentation and structural evolution in the Gulf of Mexico. Concurrently, she is also studying these processes in a modern environment, the Woodlark Basin, northeast of Australia, where she spent two months in the summer on an Ocean Drilling Program cruise to study the in-situ sediment properties. The cruise experience will, no doubt, help her research immensely. These active research projects have led to several refereed journal articles and have provided opportunity for numerous presentations at conferences by the students, CU and USGS colleagues, and Shemin.

The hydro-group also welcomed one new graduate student, Stephanie Tomusiak, in the fall. Stephanie has a B.A. from the University of Washington in St. Louis and came to CU from a biotechnical company in Boulder. Finally, Dr. In-Wook Yeo has recently joined Shemin's group as a postdoc. A Korean native, In-Wook received his Ph.D. from the Imperial College in London. With different emphases, both In-Wook and Stephanie have initiated their research on fracture flow problems.

Shemin continues to teach the undergraduate hydrogeology and intro geology classes. The new computer classroom has greatly enhanced the modeling component of the hydrogeology course. The summer field course on surficial geology and hydrogeology, co-taught by Shemin and Pete Birkeland, has survived its third year. They plan to continue the offering in which students can get a taste of both Pete's grilling of traditional field mapping and Shemin's "high-tech" aquifer testing experience.

Mary Kraus

The clastic sedimentology group welcomed one new student, Tim Farnum, this year. Tim has a B.A. from Williams and has been working for the past year with Kirk Johnson, paleobotantist at the Denver Museum of Natural History (DMNH). Tim will be working with both Mary and Kirk on a multidisciplinary research project under the auspices of the DMNH and the USGS. This project focuses on the stratigraphy, paleobotany, sedimentology, paleoclimatology of

. . . all the news

Thanks to all those who sent us your news. We love to hear from all of you. We prepare our annual *Geology News* in the beginning of January, and would like to include any significant professional or personal information you may wish to share with us. Please send your news to:

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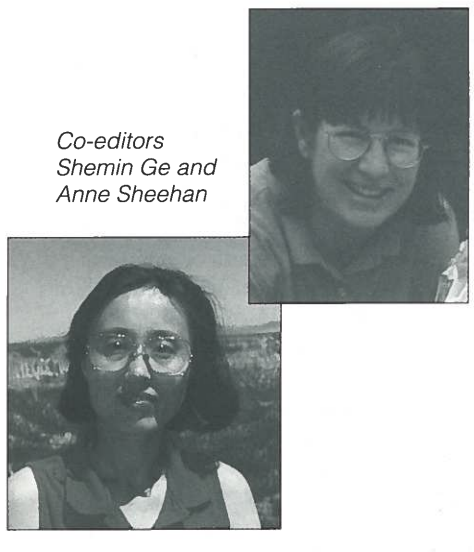

Co-editors Shemin Ge and Anne Sheehan

Upper Cretaceous and lower Tertiary rocks in the Denver Basin. Debra Mickelson, although not a new graduate student, also moved to the clastics group this year. Deb is working on sedimentology and taphonomy of part of the Morrison Formation.

Graduate student Mason Dykstra, Andy Pulham (EMARC sedimentologist), undergraduate student Terry Church and Mary spent parts of June and July in the Bighorn Basin. The four of them were starting the fieldwork on an NSF-funded study of Eocene fluvial rocks. The focus of this research is to field test recent computer simulations of alluvial architecture, which is the three-dimensional arrangement of channel sandstones and associated floodplain mudstones. Despite wet and cool weather (even snow!), they had a successful field season. Mason, in particular, covered vast amounts of ground and has more than enough data on the sandstones for his M.S. thesis. They will present preliminary results at the April AAPG meeting, and Mason should have his thesis completed by May.

In former grad student news, Mihaela Ryer received her Ph.D. in mid-1998 and accepted a position with Marathon Oil in Houston. Steve Hasiotis (Ph.D. 1997) is also in Houston, working for Exxon, and still looking at any and every trace fossil he can get his hands on. Andres Aslan (Ph.D. in 1994) started a new position with the Texas Bureau of Economic Geology in Austin. At the GSA meeting in Toronto, former student Tina Wells and Mary presented a paper on river avulsion and how this process can be recognized in the stratigraphic record. They also have a paper, which will be published this spring, that synthesizes the research on ancient avulsion deposits that my students and Mary have conducted over the past five years. This paper will be important because it proposes a model that other sedimentologists can use to recognize avulsion deposits in other rock sequences.

Along with David Budd, Mary is gearing up for the GSA Annual Meeting to be held in Denver during the last week of October of this year. We remind all alumni and friends to attend the CU alumni party on Monday night during the conference.

Alan Lester

Last spring, Alan Lester, an instructor in the Department of Geological Sciences (and an alumnus, Ph.D. '93), was awarded one of four university-wide "Teaching Recognition Awards" by the Student Organization for Alumni Relations. SOAR's Teaching Recognition Awards are the only awards chosen and administered completely by undergraduate students at CU-Boulder. They have been given annually for 37 years to honor faculty members for their ability to both inspire and work with students. Alan's SOAR award, for the 76-and-larger class size, is the first for this department.

This year, in addition to introductory-level courses in the department, Alan is teaching sections of Physical and Historical Geology for the Honors Program. In spring semester, he will also teach a research seminar for advanced undergraduates sponsored by the Undergraduate Research Opportunities Program. This class will have as its focus a joint research project (with Professors Larson, Farmer, and Stern) dealing with Front Range kimberlites and their xenolith samples of the continental lithosphere.

Gifford Miller

Giff writes from the Research School of Earth Sciences at the Australian National University in Canberra, where he is on a year-long sabbatical: After five years as Chair, it is a true change of pace to have a full year to return to research, especially research in Australia, where the skies are always blue and the weather always warm. On arrival last June, Giff linked with colleagues at the ANU and departed for what became a 4+ month field campaign. They first returned to Lake Eyre in the center of the continent where the two have been working off and on for the past seven years, and spent five days getting into an almost inaccessible region at the north end of the playa. They located a series of eolian dunes that contain the first record from this region of the extinct marsupial megafauna in deposits as young as 60,000 years. Later, they met up with Jim Bowler, the grand old man of Quaternary Science in Australia, and Sean Pack, a new graduate student from CU, in Alice Springs, and crossed the desert on the infamous Tanami Track. They spent a month at Lake Gregory, and Aboriginal Station at the base of the Kimberley, and directly in the path of the summer monsoon, looking for evidence to test their hypothesis that the Australian monsoon was more effective in watering the north of Australia before humans arrived on the scene some 50-odd thousand years ago. They had some fascinating interactions with the traditional owners, and made extensive collections. Analyses are currently underway. Giff then spent 3 weeks in Darwin, and as the build-up to the wet progressed, he put the finishing touches on a paper on the extinction of the Australian megafauna based on our analyses of fossil eggshells, that subsequently appeared in *Science* early this year. Midra joined him in Darwin in early October, and the two travelled down the west coast to Perth, looking for more eggshell and taking time to enjoy the scenic wonders of WA. Except that it was by then so hot in the north (45°C in the shade, and there was no shade), that they abandoned their plans to tour the Kimberley, seeking relief from the heat farther south. But Ningaloo Reef was spectacular, the stromatolites at Shark Bay were classic, and he highly recommends Broome and Karijini National Park. Eventually, they arrived in Perth, where after a week working with colleagues, and time to sample the famous Margaret River wines, they headed across the Nullarbor Plain, collecting eggshell wherever the sediments looked promising, finally arriving back in Canberra just after Thanksgiving.

Here in Canberra, Giff's writing up the many papers that were postponed while he was Chair (or at least that was his excuse). The phone seldom rings and so he can work without interruption, even though e-mail knows no borders. He's also working with colleagues at RSES to improve researchers' ability to date and interpret the deposits they study. He plans another long field campaign in the coming Austral winter (the ONLY time to be in the desert in this country), and will return home in August, in time to gear back up for the new academic year, refreshed and invigorated from a year in Australia.

Kathy Nagy

Associate Professor Kathy Nagy survived her first year in academia teaching a graduate class in aqueous geochemistry, the upper level undergraduate class Writing in the Geosciences, Introduction to Physical Geology, and team-teaching undergraduate geochemistry with Lang Farmer in 1998. And, she still smiles in the hallways! This spring she is teaching a new graduate class, Environmental Chemistry of Soils and Sediments. Topics in the class include the formation of soils, mineral/water interface chemistry related to mineral dissolution and formation, sorption of contaminants, and the interactions of organic matter with mineral surfaces.

Kathy's research group is off the ground and running. Members include post-doctoral research associate Dr. Hongting Zhao, who has a background in soil chemistry from the University of Wyoming, graduate students Brad Wakoff and Jake Waples, and undergraduates Chris Weaver and Marc Marcoux. Hongting is working on a project sponsored by the U.S. Department of Defense through their Strategic Environmental Research and Development Program (SERDP) to precipitate in-situ clays and claylike solids in order to make a containment barrier that would prevent the flow of contaminated ground water. Chris is helping with aspects of this work. The project is being conducted in collaboration with researchers at Sandia National Laboratories and the University of Wisconsin. Brad is investigating the synthesis of solid materials that "probably are" in the sludges of the radioactive waste tanks at the U.S. Department of Energy facility at Hanford, Washington. Although some record was kept of processed radioactive wastes that went into the tanks, there is little understanding of what might be in the sludges at the bottom of the tanks today and how these solid phases might be partitioning the remaining radioactivity in the tanks (cesium or strontium, for example). Brad's research involves experiments at 95°C in high pH (~14) Fe-Al-nitrate solutions. In order to start cleanup of the liquids and solids in these tanks, an understanding of the basic phase chemistry of the materials is needed. Jake is studying the formation of cinnabar and metacinnabar (mercury sulfide) in natural waters in the presence of dissolved organic matter. Mercury is of great concern because of its ingestion by organisms at the bottom of the food chain. This is a new project with funding from the National Science Foundation that Kathy obtained as a co-principal investigator with Joe Ryan, an assistant professor in the Department of Civil and Environmental Engineering and George Aiken of the U.S. Geological Survey in Boulder. And finally, senior Marc Marcoux is assisting with an investigation of nucleation and growth of carbonate phases on mica grains (something observed to occur in micas in sandstones) using the atomic force microscope to observe the process in real time. This fits in with Kathy's ongoing research on the role of minerals as substrates for the formation of secondary minerals in soils and sedimentary rocks.

Kathy's travels included appearances as department colloquium speaker at Arizona State University last February and the University of Wyoming in March. She attended the Clay Minerals Society annual meeting in Cleveland in June and gave an invited talk in a symposium on crystal growth at the International Mineralogical Association meeting in Toronto in August. She also visited the U.S. Army Waterways Experiment Station in Vicksburg, Mississippi, and participated in a symposium in Washington, D. C., for the SERDP project in the fall.

Reappointments as associate editor for the two journals, *American Mineralogist* and the *American Journal of Science*, keeps Kathy busy in her spare time in addition to various committee work for the Clay Minerals Society and the Mineralogical Society of America. She hopes to actually find time to go cross-country skiing this year, if not read a (nonscientific) book or two, or maybe just see a movie! She's very glad she joined the department and is gradually discovering the wide variety of interesting science conducted by her fellow faculty members and their research groups.

Peter Robinson

Peter is continuing work in the Early Tertiary of the Rockies, particularly in the Powder River and Bridger Basins. He is focusing on the diversity response in both native and immigrant populations that seems to be a result of immigration events and is looking at lots of little bones. He has several graduate students, Paul Murphey, Jon Bennett, Lisa Torick, David Daitch, and Melissa Burke, working with him.

He recently received an NSF grant to improve the collections in the Museum and is busily working on that. The Museum will move into the old Geology Building (now renamed the Museum Collections Building) in January 2001. He was recently named an Honorary Member (no more dues payments) of the Society of Vertebrate Paleontology.

Anne Sheehan

The 93rd Annual meeting of the Seismological Society of America was held on March 16-18, 1998, at the University Memorial Center (UMC) at the University of Colorado at Boulder. The meeting was co-hosted by the University of Colorado at Boulder and the United States Geological Survey; Anne Sheehan (Assistant Professor, Department of Geological Sciences, CU) and Kaye Shedlock (USGS) served as co-chairs. Approximately 180 papers and posters, divided into 16 technical sessions, were presented during the three day meeting, which drew over 250 participants. Special sessions included Structure and Dynamics of the North American Lithosphere, Seismic Hazards of the Intermountain West, and Applications of High Resolution Seismic Imaging to Neotectonics. In addition to the technical sessions, there was a special meeting of the Council of the National Seismic System.

Hartmut Spetzler

Hartmut is enjoying his role as undergraduate advisor and am getting to know our

continued on page 6

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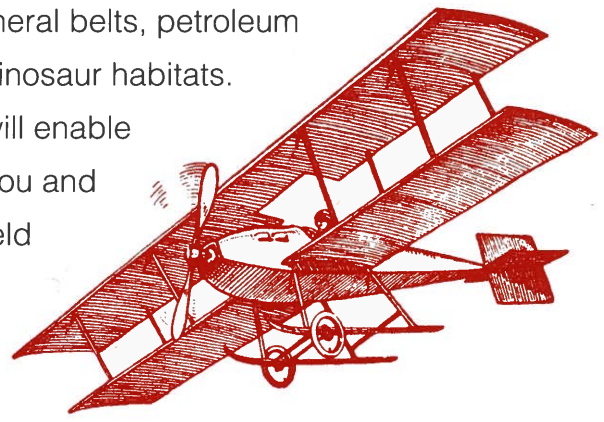


See *Geology Soars* on page 10

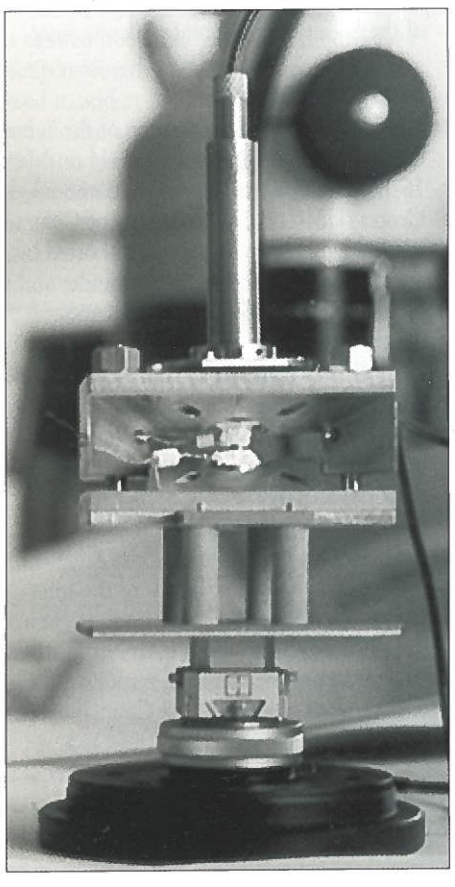
Faculty News, continued

students better. He laments with those who are having trouble and rejoices with those who excel. Often they can work through temporary difficulties and find innovative ways to help those in the former category to excel as well. Discussing life beyond the baccalaureate degree is often very enlightening, both for the advisor and the advisee. He gets to look over their resumes, make recommendations on letters of applications, write recommendations, discuss switching fields of interest, and generally their future dreams and aspirations. These conversations are often rather lengthy and are of a type that can be difficult with parents, especially if they involve the possibility of taking a break in the studies or considering switching to a different field of study.

On a field trip to Yucca Mountain near Las Vegas, Nevada, Hartmut and his class studied the geology and hydrology of the proposed site for the nuclear waste repository. Dr. Daniel J. Soeder from the U.S. Geological Survey conducted an outstanding field trip for the group from 6 a.m. to 5 p.m. They were able to see some of the controversial geologic features above ground and then enter the 25-foot-diameter tunnel and study them below ground, a fantastic opportunity. Congress is so busy that they have not yet decided if, indeed, the accumulated nuclear waste will be stored there. The trip was part of a course in Societal Problems and Earth Sciences.

In the research area Hartmut and Hart Schutte, a post doctoral fellow, are working with Professor Shemin Ge on problems of water flow through fractures of ever-greater complexity and the effect that contaminants can have on the absorption of seismic waves in the undersaturated zone. With Professor Joe Smyth and students he is investigating the properties of mantle materials under pressure and temperature. They are finally combining Joe's insight gained from the study with X-rays with the measurements made with sound waves. All of these studies are made in a diamond anvil cell on samples with a thickness of up to several human hair diameters (typically 50 microns) that uses sound waves that not even a mouse could hear. Mice can hear up to 100,000 cycles/second; this project uses 1,000,000,000 cycles/second. The wavelengths are near those of optical waves, around one micron. Part of the developments for this technology was done at the Geoinstitut at the University of Bayreuth in Germany. Joe is collaborating there from January to July of 1999 and Harmut will join him and Steve Jacobsen, a graduate student, and others for three months during the summer of 1999. In the fall of 1999 the group will meet back at CU in Boulder.

On a personal note: Hartmut is continuing his annual bicycle trip across trail ridge. He notices that he is getting older! He had to purchase a new bicycle, the first in 20 years, peddle 1,200 miles from the Oregon-California border to Green River in Utah, just to get into shape for the Trail Ridge ride. He thoroughly enjoyed seeing the spectacular scenery and geologic features as he cycled from the Pacific, through redwoods, giant forests, wetlands, and the basins and ranges of the Basin and Range Province. Highway 50, "the loneliest road in America," from I-80 to I-70 was absolute awe-inspiring.



Hartmut's high precision toy, diamond cell.

DEPARTMENT NEWS

Formation of CU Center for Astrobiology

Bruce Jakosky of Geological Sciences led a consortium of faculty members from several different departments in a successful proposal to be a part of the new NASA Astrobiology Institute. The field of astrobiology involves understanding the origin and evolution of life on Earth, the potential for life to exist elsewhere in our solar system, and the possibility for life on planets around other stars. The field is broad enough to include the origin of the elements and their accumulation into planets at one end, and the future of humans in space at the other.

The newly created CU Center for Astrobiology will support research on all aspects of astrobiology. Specific research problems include the formation of protoplanetary disks and their evolution into planets, the RNA world and the origin of life on Earth, major events in the history of life on Earth, the climate and habitability of the Earth and planets, and the ability of geochemical energy to support life on Mars or Europa. Faculty members who are participating in the program include John Bally (from the Dept. of Astrophysical and Planetary Sciences), Michael Yarus (from Molecular, Cellular, and Developmental Biology), William Friedman (from Environmental, Population and Organismic Biology), and Brian Toon (from Atmospheric and Ocean Sciences). In addition, an important component of the CU program will be a focus on the philosophical implications of the search for life elsewhere and what it would mean to find (or not find) extraterrestrial life; Carol Cleland from the Philosophy department. provides this connection. Two dozen faculty members from across campus and from nearby institutions are participating in the intellectual aspects of the program but will not be supported directly from the NASA Grant, and two new faculty members will be hired during the coming years to focus in astrobiology. One of them will be in Geological Sciences, and will focus on understanding the geological record of ancient life on Earth.

As part of the astrobiology program, Jakosky will be helping to create both a graduate and an undergraduate program. The undergraduate program likely will be a "minor" in astrobiology rather than a major, and will include the newly created junior-level course in "extraterrestrial life." This course, offerred for the first time in Fall 1998, provided a broad introduction to the biological, geological, and astrophysical constraints on the possibility of life elsewhere, and included discussion of the philosophical and sociological significance of the search itself. The course was filled to capacity, and is now being offered every semester jointly with the department of Astrophysical and Planetary Sciences.

CU is one of eleven institutions chosen nationally to be initial members of the NASA Astrobiology Institute. Other universities include UCLA, Arizona State University, and Harvard. With the creation of the Institute, NASA hopes to be the instigator of a national effort in astrobiology. Participants will be connected electronically, and will provide joint colloquia, courses, and research collaborations between institutes. This program will provide support for the NASA program to find out if there is life on Mars or Europa and to search for Earth-like planets that might be orbiting other stars.

James Syvitski

Professor Syvitski leads CU's stratigraphic modeling effort that includes research scientists Dr. David Bahr, Dr. Scott Peckham, Ph.D. students Mark Morehead and Damian O'Grady, and numerical analyst Eric Hutton. Scott Peckham joins them from the USGS where he worked with James Dungan Smith on distributed hydrological modeling. Dr. Lincoln Pratson remains part of the team but has recently relocated to take a tenure-track teaching position at Duke University. The group operates INSTAAR's Geophysical Modeling and Oceans Laboratories in association with an academic consortium involving ONR, NSF, petroleum and aerospace industrial support. The group continues to develop computer simulation models for the study of basin stratigraphy, seafloor characteristics, river and ocean current dynamics. Topics emphasized this year include river hydrology, turbidity currents, debris flows, compaction, sea level fluctuations, abrupt climate changes, and littoral sediment transport. Of the 40 presentations in 21 locations, the following noteworthy addresses were provided in 1998: 1) SEPM-IAS Research Conference: "Strata and Sequences on Shelves and Slopes, Sicily "; 2) International Workshop on Sedimentary Processes and Paleoenvironment in Fjords, Norway; 3) AGU 1998 fall meeting in San Francisco; 4) 28th Arctic Workshop in Boulder; 5) International Association of Mathematical Geology Conference, Italy; 6) ONR-STRATAFORM meetings in Keystone, San Francisco and Dallas; (7) International Conference of Recognition of Abrupt Climate Change in Clastic Sedimentary Environment, Sweeden; and (8) ONR-NSFs Submarine science in the arctic (SCICEX 2000), Virginia. Together 22 journal publications made print this year. Substantive reasearch support continues from MOBIL Oil, augmented recently by Raytheon Corp. Professor Syvitski remains editor of the international journal *Arctic, Antarctic and Alpine Research*, Associate Editor of *Oceanography*, and on the Editorial Board of *Marine Geology*. Syvitski recently joined the Science Steering Committee of the IGBP (Global Change) Core Program LOICZ (Land Ocean Interaction in the Coastal Zone). In the spring of '98, Syvitski taught GEOL 5710, High latitude Glacimarine Processes and Products. In the spring of '99 Syvitski will teach GEOL 4060/5060, Oceanography.

Paul Weimer

Paul Weimer served as the Associate Chair for Graduate Studies for the Department during AY 1998/1999. During the fall semester, he taught Petroleum Geology (with Jack Edwards) to 15 graduate and undergraduate students. He co-organized the reservoir session at the AAPG Hedberg Conference titled "Reducing Risk in the Gulf of Mexico" in mid-September in Galveston. He was a co-organizer of the AAPG/EAGE Third Research Conference titled "Developing and Managing Turbidite Reservoirs: Case Histories and Experiences." The conference was held in Almeria, Spain, in early October. The conference results will be published later this year in the AAPG Bulletin. In Almeria, he also visited many movies sets (Spaghetti westerns, Ben Hur, Lawrence of Arabia, Mad Max). In early November, he attended the AAPG International Conference in Rio de Janeiro where he chaired an all-day session on deep-water reservoirs of the world, and co-taught a one-day short course on the subject. He also is serving as the AAPG Oral Program Chairman for the 1999 AAPG International Conference to be held in Birmingham, England next September. The technical program committee met in London in early December to finalize the program at The Geological Society. He continued to serve on the Subcommision of the International Stratigraphic Code commission. He began his four weeks on the AAPG Distinguished Lecture Tour in mid-December, and continued it during March and April.

During the spring semester, he taught Applied Sequence Stratigraphy and Basin Analysis to 13 graduate students. In 1999, he began serving as the Vice-Chairman of the AAPG Distinguished Lecture Committee, and serves on the Technical Liaison Committee to merge future AAPG/SEPM/SEG activities. He attended the AAPG Leadership days in early February in Tulsa to discuss future trends in industry and what the AAPG can do to help matters. In early March, he was a keynote speaker at the AGI Associates Program held in Houston titled "Academic-Corporate Associates Conference Programs." The event was attended by 150 people from industry from many companies and Universities. His talk was on "Corporate/Academic Partnerships." He is working actively on organizing the December 2000 GCSSEPM Research Conference in Houston on Deep-Water Reservoirs of the World. Abstracts are due November 2 this year.

He is chair of ten thesis committees, with three students graduating in AY 1998/1999. During the summer of 1998 he visited the spectacular Pennsylvanian outcrops in West Ireland with Trevor Elliott (University of Liverpool). His hope is to begin a new joint research there in the next few years when industrial support picks up again. He is writing a book with Roger Slatt (CSM) titled *The Petroleum Geology of Turbidite Systems* that will be published by the AAPG in early 2000. They wrote two summary papers on this topic that appeared in the April and May issues of *The Leading Edge*.

Department to host annual GSA Meeting

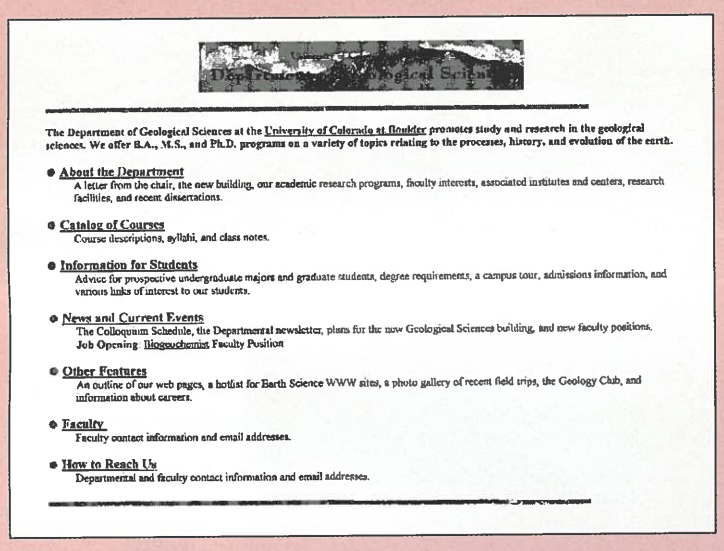
The Department was asked by the Geological Society of America (GSA) to help organize the 1999 annual meeting that will be held in Denver (October 25-28). A few stout hearts have taken on the various tasks of the local organizing committee. David Budd and Mary Kraus are serving as Co-General Chairs, which means they twist arms to get more volunteers and take on whatever job no one else will do. Lang Farmer and Craig Jones have taken on the significant chore of overseeing the technical program, while Alan Lester and Bruce Trudgill are serving as Co-Field Trip Chairs. Others helping out include Lisa Barlow (Education Program), and Suzanne Larsen and Karl Mueller (student assistants).

The proximity of the meeting both in space to the Continental Divide and in time to the end of the 20th century inspired the theme of "Crossing Divides." The intent is to celebrate the cross disciplinary nature of the geosciences and to encourage a scientific program that "crosses divides" between the various chemical, biological, and physical disciplines of our science. Our hope is that the program will instill in attendees a broadened sense of the contributions geological sciences can make as a discipline and the degree to which an individual's research is linked to many other specialties.

The technical and field trip programs are already set and indeed appear to meet our expectations. The exhibits hall should be larger than any previous GSA meeting with an ever increasing presence of technology-orientated exhibitors. Good science, good exhibits, and good times generally leads to a successful meeting and we hope that many of our alumni will be able to join us. For more details and registration information, check out the GSA web site www.geosociety.org). Even if you can not attend the meeting, plan on coming to downtown Denver for the traditional alumni night cocktail party, which will be held on Monday night, October 25th. The where and when of that gathering was not yet set at press time, so check out the Department's web page for up-to-date details!

Also, the Department will hold an open house in the Benson Earth Sciences Building in Boulder on Wednesday, October 27 in conjuction with GSA.

Geology on the Web



www.colorado.edu/GeolSci

Research opportunities and involvement by undergraduates

Our Department and the University at large encourage the involvement of undergraduate students in research. The opportunities abound and all undergraduates who wish to do research can find a way to participate. They need to be proactive and should consider the following programs:

- **Department of Geological Sciences Mentor Program**—funded by our alumni— Up to $1000 is available for research expenses and salaries. The student, typically with junior- or senior-level standing, is expected to file a joint proposal with a faculty member (or graduate student or post doc) outlining the project and budget considerations.

- **Undergraduate Research Opportunities Program/UROP**—http://www. colorado.edu/Research/UROP—supplies salaries and research monies (up to $2400) for freshman- to senior-level students, who participate in faculty research. At the junior- or senior-level, students submit a detailed proposal of the research program. Our departmental UROP representative Alan Lester (lestera@spot.colorado.edu) is anxious to help students get started and help them throughout. The SURF acronym, which stands for Summer Undergraduate Research Funds, is a UROP grant that is used to support a student during the summer.

- **Honors Program**—With a cumulative GPA of 3.3 or greater, students are eligible for the honors program. This includes honors courses and/or the option to do an honors thesis and, thereby, graduate with honors. The research funding programs described above are an excellent way to support work associated with the honors thesis. In some cases, students with strong research motivation but with lower GPA standing are allowed to do honors theses. Contact Hartmut Spetzler (spetzler@colorado.edu) and see <http://ucsub.colorado.edu/~honors/honfaq.html>.

For any questions, including ones regarding research opportunities, students are encouraged to take advantage of the Associate Chair for Undergraduate Affairs, Hartmut Spetzler, spetzler@colorado.edu, http://spot.colorado.edu/~spetzler/.

Here are some examples of present or recent undergraduate involvement in research:

Kris Nuttycombe: "Geochemical influence on stratigraphic controls on oremineral-ization in Carlin-type gold deposits." This was an honors thesis under the direction of Prof. Bill Atkinson, funded by the mentorship program.

Diane Fordik: "Evidence of Sediment Remobilization in 2 Ross Sea Cores." Dr. Kathy Licht and Prof. John Andrews supervised this honors thesis.

Hanna Gilbert: "Effects of land use on the turbidity of James Creek, Northwest Boulder County, Colorado." This is an honors thesis in the making. Professors Jim White, Shemin Ge and Joe Ryan of the Civil, Environmental, and Architectural Engineering department are joint supervisors. Funding is being sought through UROP and some is in place from the Environmental Protection Agency.

Mike Kelly: "Direct observation of moving contact lines under different contamination conditions in a Hele-Shaw cell." This research is supervised by Prof. Hartmut Spetzler and was initially supported by the mentorship program. Continued support came from the Department of Energy. Mike reported the results at the fall American Geophysical union meeting in San Francisco.

Aaron Shoolroy: "Determination of the subsurface orientation of the green mountain kimberlite." Prof. Anne Sheehan supervised this senior thesis.

This year, students participating in the SURF Grant Program are Scott Cook, Abigail Geary, Rae Hateley, Braden Van Matre, and Stephen Redak.

The funding is very diverse and comes through the department as well as the associated institutions, EMARC (Energy and minerals applied research center), INSTAAR (institute of arctic and alpine research), CIRES (cooperative institute for research in environmental sciences), CSES (Center for the Study of Earth from Space), the University Museum and LASP (Laboratory for Atmospheric and Space Physics). To get started in research, students are encouraged to contact faculty as well as other fellow students who are already involved in research.

EMARC

1998-1999 was a productive year for the EMARC.

First, the entire May issue of the *1998 AAPG Bulletin* was dedicated to the research generated from our first Gulf of Mexico consortium. About 35,000 copies were printed and distributed globally to all members. The issue included nine papers that addressed the stratigraphy, structure, petroleum systems, and fields in one area of the northern Gulf of Mexico. An entire issue of the *Bulletin* has never been dedicated to one group's research, so the publication was an important landmark for the group.

Second, two papers reflecting the final results of the Perdido Foldbelt exploration project were published in the January (Bruce Trudgill et al.) and April (Carl Fiduk et al.) issues of the *1999 AAPG Bulletin*. This research project was completed in mid-1996. The Alaminos Canyon 601 well was drilled from in 7,612 feet of water. The four companies (Shell, Texaco, BP-Amoco, Mobil-Exxon) are planning to drill another well in late 1999.

Third, the seventh Gulf of Mexico research consortium meeting was held in Boulder on May 27-28. About 90 people attended representing 27 companies. Research results presented at the meeting included 2-D and 3-D structural restorations of salt structures, regional and field-scale sequence stratigraphy, maturation and fluid modeling for the entire northern Gulf of Mexico, and biostratigraphy. The final meeting of this consortium is on May 26 and 27, 1999. Presenters included Paul Weimer, Bruce Trudgill, Mark Rowan, Bob Ratliff, Josh Turner, Jaime Barcelo, Dong-Lim Choi, Jennifer Crews, Carl Fiduk, Ray Fletcher, Eric Nelson, Julia Caldaro Baird, and Cheree Stover.

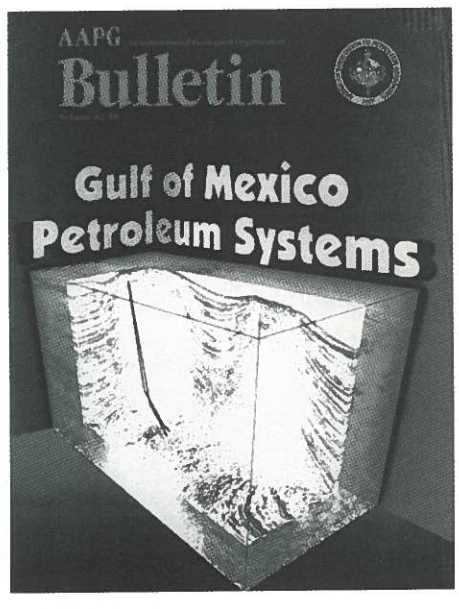
Fourth, the second Reservoir Geology Research meeting was held on January 7 and 8, 1999. This project is currently supported by eight companies, and is a collaborative study with the University of Alberta at Edmonton. The principal investigators are Dr. Andy Pulham at CU and Prof. S. George Pemberton at UA. Specific research themes presented and discussed during the January 1999 meeting included; assessment of reservoir quality in siliciclastic oil and gas reservoirs, the application of ichnology and biostratigraphy in reservoir description and characterization, ichnology and fluid flow, stratigraphic events and fabrics and their effects on reservoir behavior in (1) incised valley systems, and (2) deltaic and nearshore systems, and allied outcrop and subsurface studies. This year's research results were distributed on a single CD that included all existing study results interlinked within a single project file. Companies were able to read and follow the research meeting on their own laptop computers. A consequence of this approach was that the meeting was paperless, an enormous change from previous EMARC meetings. Our hope for 1999 is that we will see major cost savings and quicker reporting times by moving all our results to CD formats. We will also be working with supporting companies in developing and helping them put our research results on their own intranets.

Presenters at the January 1999 Reservoir Geology Meeting included Dr. Andy Pulham, Prof. S. George Pemberton, David Bowen, Thomas Saunders, Prof. Mary Kraus, Mason Dykstra, John Roseink, Eric Paul, Tad Frizzell and Nubia Santiago.

Fundraising for the core facility proceeded. We hope to hear from the University by May for plans to proceed with construction.

Recruiting in the fall was still strong as 10 companies recruited at CU.

Although 1999 is not looking to be a great year for the support of applied programs, we will persevere and hopefully start two new research consortia later this year.



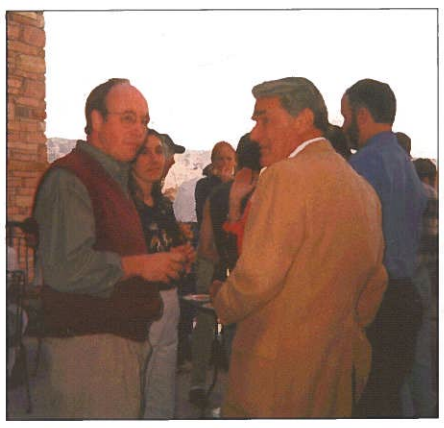
This AAPG special issue, May 1998, was dedicated to Bob Graebner, a CU geology alum.

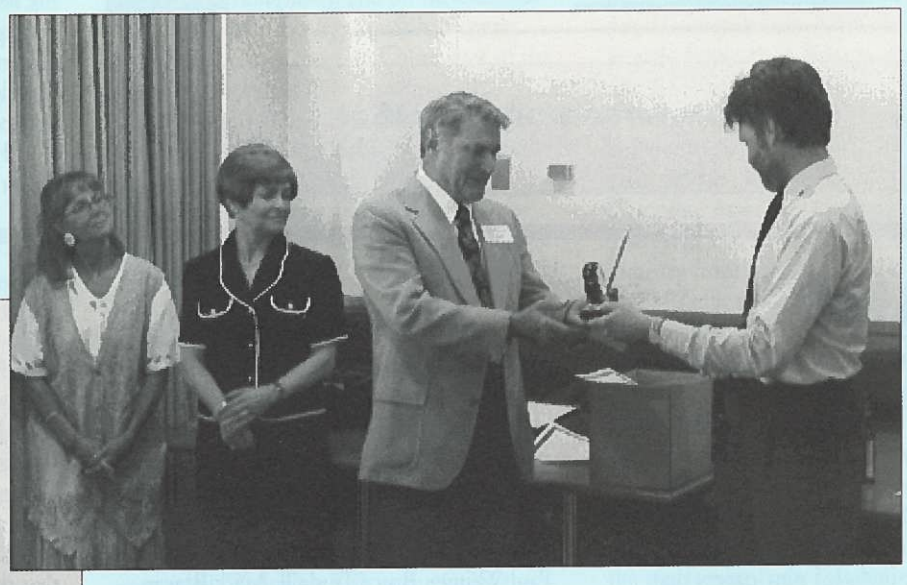
GEOLOGICAL SCIENCES CONGLOMERATE

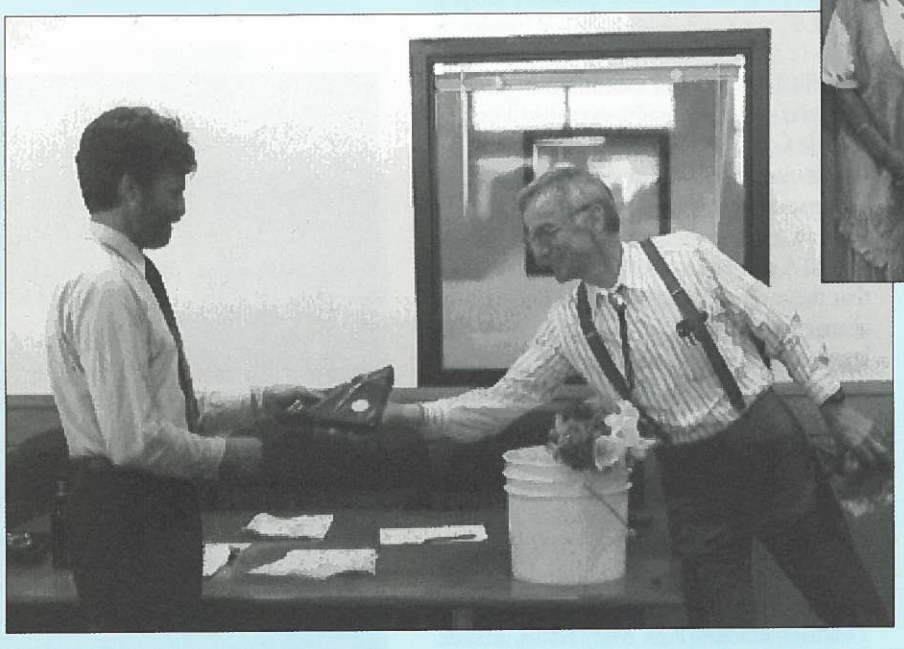
Left: Folds in Eagle Valley Evaporite, Geology Field trip, fall 1998.

Below, left: David Budd, Mary Kraus, and Gene Shear at the Spring Reception.

Below: John Marler conducting aquifer tests in South Park, Colorado.



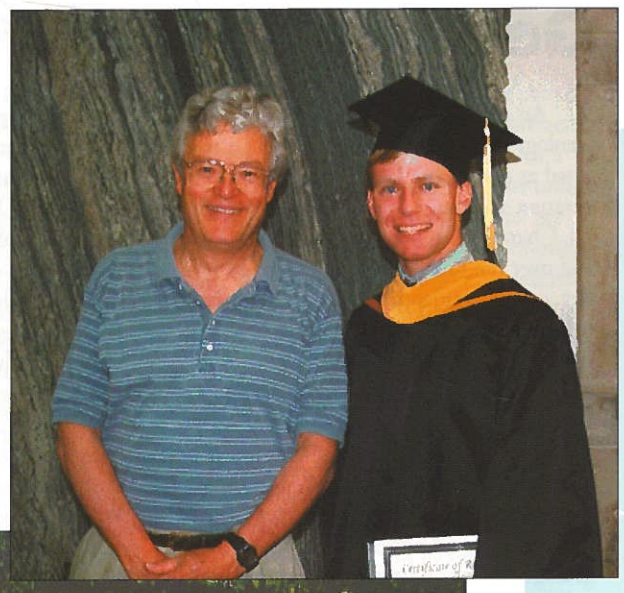




Above: Retiring from the department Chair post, Giff Miller (left) receives a gift from Hartmut Spetzler.

Right, above: Farewell to the chair of the advisory board, Gene Shear, third from left. Adria Miller, Beth Hansen, and Giff Miller.

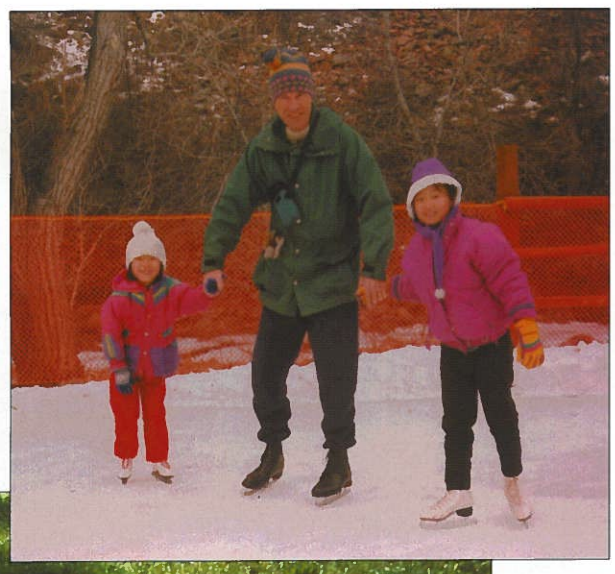
Right, below: Spring reception, from left: Chuck Stern, Christopher Ballard, Terry Church, Becky Broadik, Winston Seiler, and Ryan Crow.



Top: Alex Goetz and David Hulslander at the May graduation.

Above: Summer hydrology field class measuring groundwater level at the Cottonwood Grove site in Boulder. From right to left: Jennifer Vance, Jennifer Louis, Diane Fordik, Kim Eastman, and Darin Findley.

Josh Cohn, from the Field Geophysics class, conducting seismic refraction experiments near Nederland, Colorado.



Right: Retired Pete Birkland has plenty of time to enjoy a skating lesson with Shemin Ge's daughters. (But who's holding up whom?)

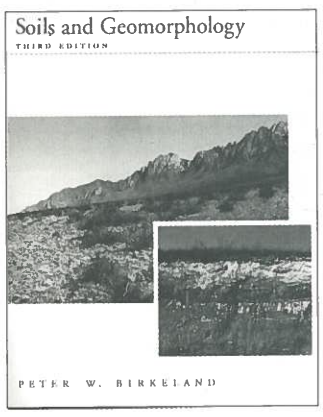
Below: New Madrid drilling—Jocasta Champion retrieving a soil probe.

Top: Do geologists REALLY want coal in their stockings?

Above: Kathryn Sheehan Jones and Santa.

News of Emeritus Profs

Pete Birkeland finally finished the third edition of the soils book. The initial book took one year and this revision took three years! Says something about brain deterioration. He and Sue spent one month cross-country skiing in Norway, and had great skiing. He needs to sell many books so he can afford beer in Norway. A former student in Trondheim, Ola Saether, helped with ideas. Look for Ola's book *Geochemical processes, weathering and groundwater recharge in catchments* (Balkema).



Bill Bradley continues to lead the geology part of canyon trips for Audrey Benedict's company. Right after Christmas, Louise hauled him off to London for some much needed culture—the plays and concerts.

Don Eicher finally completed the part-time teaching contract he took on when he retired. Most of it was introductory historical and beginning field. He and Val travel a lot, and the latest trip was to Thailand to cash in on the good exchange rate.

Ed Larson has kept up his running in the hills near his house. He is back into downhill skiing and has the cheater shaped skiis. He also went on a canyon raft trip. Many of these activities are with Eric Miller, former student who teaches at Fairview H.S.

Jim Munoz still puts in time with E-Town. He has bought a piece of land in Helena, and will move there once he gets a house built. Hard to believe, but he claims it is a better place than Boulder for an artist to show off his work.

Ted Walker continues to be a biking maniac. He bikes about 5000 miles/year, more than Birkeland puts on his '95 Saturn. Ted and Barb again spent three weeks biking the Swiss Alps, this time with son Scott and wife Val. Some might recall this was an arranged marriage as Val is a former student of Ted's.

Geology Soars!

An old activity is being renewed—the Geology Flyover! The tradition will be reactivated as part of the 1999 Homecoming celebration scheduled for Saturday, September 18. Chartered flights along the Front Range and over the Rockies will be offered to geology alumni, students, and buffs. This flight helps you to gain a perspective of time and space. Learn of ancient seas, mineral belts, petroleum reservoirs, and dinosaur habitats. Part of the cost will enable students to join you and round out their field training. A two-hour flight is being offered following a light breakfast and a short pre-flight geology briefing. Professor Ed Larson of the semi-retired geology faculty and newer faculty members will escort the flight and contribute their expert knowledge of this area. Lunch will be provided upon return. You need not go to the game to participate in the flight, nor participate in the flight to attend the game. The original event took place about twenty years ago when a planeload of faculty and students took a chartered flight along the Front Range and the Rockies. The geology came alive as the faculty explained the relationships of the features observed. In order to promote field geology we are asking that the non-students participating in the flight help to promote student participation by encumbering part of their cost. Although he final cost has not yet been established, we hope to keep the actual flight cost do $200 per person. It is hoped that our alumni would support ?? of a student flight, thus paying $300 ($100 of that would be tax deductible). The CU-Boulder Alumni Association is organizing this special event for us. Please check their web site for the homecoming events: http://www.coloradoalum.org/events/event_reunion.html. Eileen Gordon will be making the flight arrangements; you may contact her to make reservations (303-492-1876 or gordon_e@cufund.colorado. edu). Please also watch our departmental web site for new postings, call us at the office at 303-492-8141 or inquire via email geolinfo@colorado.edu. We hope that many of you will join us and be part of this first Alumni/Student airborne fieldtrip. It promises to be the start of what surely will be a long and cherished tradition.

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"IN THE FIELD" needs your support!

A request from members of the Department of Geological Sciences Advisory Board

Do you remember that great departmental field trip to the Elk Mountains? Perhaps you recall the week-long adventures in Quaternary geology to different western regions, or that fabulous structural geology/igneous petrology field trip through British Columbia and the northern Rockies. The list is long, but wherever those trips led you during your years at CU, they undoubtedly made an indelible impression and provided a unique, hands-on chance to apply lessons from the classroom and lab to real-world geology.

There is no alternative to observing geological principles IN THE FIELD. The Rocky Mountain region—Boulder and beyond—offers tremendous opportunities for experiential learning, and the Department has long demonstrated a strong commitment to field-based education. Generations of classes have crawled over such local outdoor labs as Flagstaff Mountain, the Valmont dike, and Six-Mile fold. Ambitious upper-division and graduate-level trips recently have traveled as far afield as Hawaii and Mexico.

Maintaining this commitment to field-based education, however, is expensive and the Department's budget can not come close to covering the full costs. Students have shouldered many of these rising expenses themselves and many have been denied the experience simply because they could not afford travel expenses.

The aims of the Advisory Board include fostering closer ties among the Department, alumni, friends, and private industry, and guiding and assisting the Department in improving the quality of education for undergraduate and graduate in the geological sciences. The Board has made the IN THE FIELD program one of its top priorities.

The Board has set a goal of $500,000 for an IN THE FIELD endowment. Income from this endowment will enrich the Department's support of field studies at all levels by:

1) subsidizing travel expenses,
2) purchasing field equipment,
3) giving travel grants to students unable to meet the costs of field trips,
4) hiring and/or paying expenses for local experts.

Imagination is the only limit to what IN THE FIELD can accomplish for the Department. For example, a "Fall in the Field" course, visiting classic North American geological localities, could become reality with support from IN THE FIELD.

IN THE FIELD can only succeed with your support. Help make one of the nation's best departments even stronger. Please send a generous contribution to the Department today, using the form provided below.

Contribution Form

I/we wish to contribute to the IN THE FIELD program of the Department of Geological Sciences. Check one of the following boxes.

Enclosed is a check for $_____.

I/we pledge to make an annual contribution of $_____ for _____ years.

Name(s) _____

Address _____

Please make check payable to: The Department of Geological Sciences, University of Colorado at Boulder and mail it with this form to the Department of Geological Sciences, University of Colorado, Boulder, CO 80309-0399.

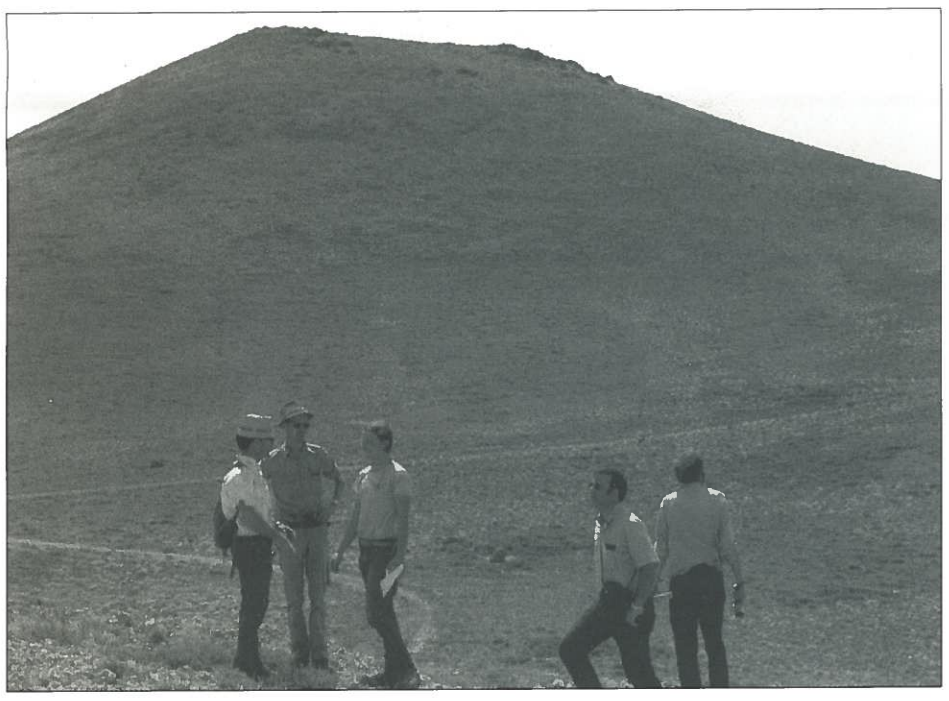
FRONT OFFICE NEWS

We are happy to report that the front office retains its function as the place where business is accomplished and the "meeting/greeting" place in the Department. Most faculty and many grad students and undergrad students pass through every day for assistance in a myriad of details. Our first year in the new building was somewhat of a blur, as we dealt with meeting all of the "normal" requests and the multitude of details regarding habitation of the new building. Now that we are settled in, we are all very appreciative of the spacious, clean, administrative offices which are flooded with natural light from the many large windows. Our front office staff work well together as a team and endeavor to meet the needs of Geological Sciences faculty and students in a friendly and timely manner. We would also be glad to assist alumni and friends of Geological Sciences with questions they have regarding the Department, former faculty, students, and staff.

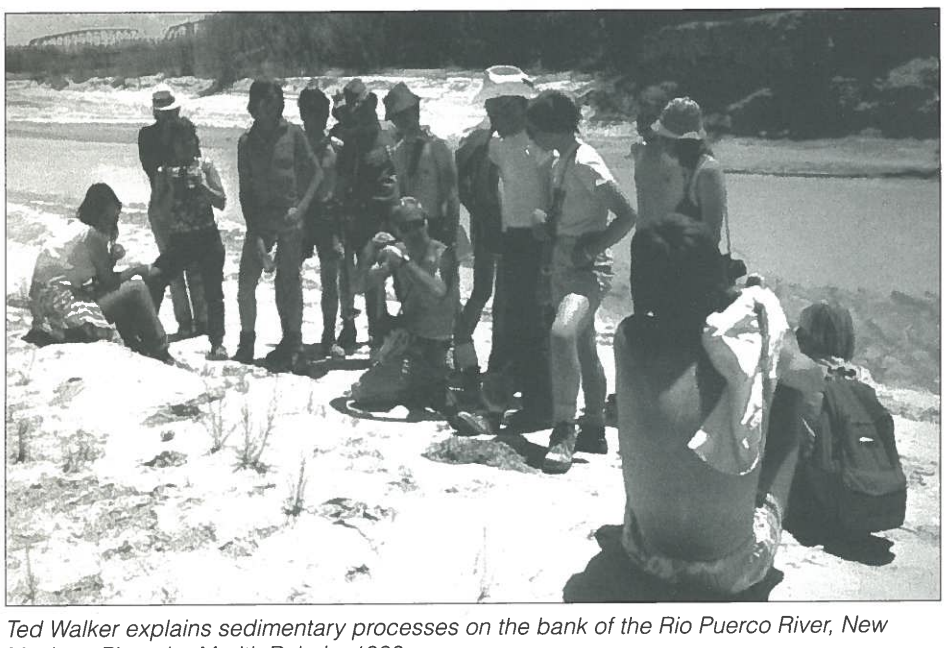
The month of November brought change and new faces in the front office. Kathy Madsen left us to return to teaching in the public schools and Joyce Bograd assumed her responsibilities as our front line person on questions from the public, and departmental academic scheduling. Jane Sims left for a promotion in the Administrative Streamlining Project, and Ya-Wen Zhang assumed her responsibilities of departmental accounting, assisting with ordering equipment, teaching and technical supplies, and grant account management. Both Ya-Wen and Joyce are vital to the smooth functioning of our departmental front office and we are delighted they have joined us. Our student assistant, Carrie Kocik, continues to carry out her myriad duties with initiative and accuracy. We wish her success as she graduates this spring and begins a new phase in her life. She will be missed. Kathy Freeman continues to guide the graduate students from application to graduation, which she accomplishes with aplomb, patience, and congeniality. Beth Hanson continues as lead administrative officer, office supervisor, and assistant to the Chair.

The Departmental office can be contacted at (phone) 303-492-8141, (fax) 303-492-2606, and (e-mail) geolinfo@colorado.edu.

Front Office crew: from left to right, Ya-Wen Zhang, Kathy Freeman, Joyce Bograd, and Beth Hanson.



Ed Larson, Bill Braddock, and Jim Munoz (back to camera), with Tim Grove and Les LaFountain, in the Leucite Hills, Wyoming. Photo by Dick Smith, 1970.



Ted Walker explains sedimentary processes on the bank of the Rio Puerco River, New Mexico. Photo by Marith Reheis, 1980.

Colloquium speakers

James Syvitski and Lincoln Pratson, INSTAAR
Stratigraphic Predictions for the Navy and the Oil Industry

Randall Marrett University of Texas at Austin
Structure, Kinematics, and Development of the Sierra Madre Oriental Salient, Mexico

Bruce Trudgill, EMARC, University of Colorado
The Growth of Normal Fault Systems through Time: Field Examples, Models and Applications

Lisa Barlow, University of Colorado
Geoscience Education: What's Going On?

Mary Kraus, University of Colorado
Recognizing Avulsion Deposits in the Ancient Stratigraphic Record.

Ray Fletcher, University of Colorado
You Can Only Pile It So High: Observations and Modeling Namakiers (Salt Glaciers) and Accretionary Wedges

Craig Jones, University of Colorado
Hidden Tectonics: The Mantle's Role in the Geodynamics of Southwestern U.S.

George Hornburger, Hydrogeosciences Distinguished Lecturer, University of Virginia
Hydrological Controls on Transient Fluxes of Weathering Products from a Saprolitic Catchment, Shenandoah National Park, Virginia

Kurt Knesel, UCLA/CU
Roof-rock Contamination of the Taylor Creek Rhyolite, NM, Recorded by Sr Isotopes

Jan Amend, Washington University–St. Louis
Microbes in High Temperature Aqueous Environments: Biogeochemical Constraints on Their Reaction Energetics

Gordon Southam, Northern Arizona University
Geomicrobiology—A Look at Bacteria-Metal Interactions

Gregory P. Asner, CIRES, University of Colorado
Understanding Regional Biogeochemical Cycles: Human, Edaphic, and Biotic Controls

Daniel Sigman, Princeton
The Nitrogen Isotope System in the Southern Ocean and its Implications for Glacial/Interglacial Variations in Atmospheric Carbon Dioxide

Steve Wesnousky, Center for Neotectonic Studies, University of Nevada, Reno
A Geologist's Experience in India: Uplifted Terraces, Earthquakes, and Evolution of the Himalaya

Shemin Ge, University of Colorado
Potential Impact of Sea-Level Change on Fluid and Transport Processes in Marine Sediments

Chuck Stern, University of Colorado
Geoarchaeology of Southernmost Patagonia

Paul Weimer, University of Colorado
Sequence Stratigraphy of Intraslope Turbidite Systems: Models for Exploration and Development

Emmett Evanoff, University of Colorado
Stratigraphy and Origin of the Eocene/Oligocene White River Tuff in the Great Plains

John Behrendt, INSTAAR, University of Colorado
Is There a Spreading Center Beneath the West Antarctic Ice Sheet?

Jonathan Overpeck, NOAA, INSTAAR
Environmental Change of the Last Millenium and Its Implications for the Future

Frank Ethridge, Colorado State University
Avulsion and Crevassing in the Sandy Niobrara River: Complex Response to Base-Level Rise and Aggradation

Julio Betancourt, U.S. Geological Survey, Tucson, Arizona
Mesoscale Disturbance and Ecological Response to Decadal Climatic Variability in the American Southwest

George H. Davis, University of Arizona
Amazing Displays of Deformation Band Shear Zones Within Structure-Tectonic Systems of the Colorado Plateau from Zion to Bryce and Beyond

Bill Hay, GEOMAR/CU Geological Sciences
A History of Ocean Salinity and Carbonate Deposition—Strange Goings-On in the Late Precambrian and Paleozoic

Susanna Gross, University of Colorado
Deriving Tectonic Stresses from Aftershocks

Kathy Madsen, USGS
Mine Flood Disaster Near Seville, Spain

Kirk Nordstrom, USGS
Mine Flood Disaster Near Seville, Spain

Alan Lester, University of Colorado
A "New Age" Look at Front Range Kimberlites: Windows Into the Deep Lithosphere

Degrees Awarded

M.S. Candidates Graduating with Degrees Spring 1998

Alfonso Garcia	Weimer	3-D Seismic Stratigraphic Interpretation of Upper Pliocene and Pleistocene Sediments, North Central Green Canyon, Northern Gulf of Mexico
Shannon Hazler	Sheehan	One-dimensional Velocity Structure of Northern Africa as Determined by Rayleigh Wave Group Velocity Dispersion
David Hulslander	Goetz	Nonthesis
Steve Jacobsen	Smyth	Hydrogen in Chain Silicates: Characterization of the Hydrogen Bonding Environment in Serandite ($Mn_2NaHSi_3O_9$) by X-ray and Neutron Diffraction

Ph.D. Candidates Graduating with Degrees Spring 1998

Lysanna Anderson	Markgraf	Quantitative Paleoclimactic Reconstructions for the Late Quaternary of Southern South America Based on Calibration of Madden-Pollen Climate Relationships
Lisa Campbell	Farmer	Isotopic and Geochemical Investigations of Precambrian Continental Crust in the Torngat Orogen, Northeastern Canada: Constraints on the Mechanisms of Precambrian Crust Formation and on the Early Proterozoic Assembly of Northeastern Laurentia
Kevin Hutchins	Jakosky	Coupled Evolution of the Martian Atmosphere and Crust through Geologic Time
Mihaela Ryer	Kraus	Sequence Stratigraphy and Geologic Evolution of Paleogene and Lower Miocene Strata, Eastern Getic Basin, Romania

M.S. Candidates Graduating with Degrees Summer 1998

Worth Cotton	Atkinson	Au-Ag-Az-Pb Mineralization in the Alhué Mining District, Coast Range of Central Chile
Guillermo Fajardo	Rowan	Structural Analysis and Basin Inversion Evolutionary Model of the Arcabuco, Tunja and Sobamoso Regions, Eastern Cordillera, Colombia
Kathryn Woods	Drexler Hernandez	Metal Speciation in a Wetland Receiving Acid Mine Drainage

Ph.D. Candidates Graduating with Degrees Summer 1998

John Foster	Lockle	Aspects of vertebrate paleoecology, taphonomy, and biostratigraphy of the Morrison Formation (Upper Jurassic), Rocky Mountain region, western United States
Mary Gillam	Andrews	Late Cenozoic Geology and Soils of the Lower Animas River Valley, Colorado and New Mexico
David Lubinski	Miller	Deglacial and Holocene paleoenvironments of the Franz Josef Land region, northern Barents Sea, Arctic Russia
Juan Carlos Moya	Stern	The Neotectonics of Western Puerto Rico

M. S. Candidates Graduating with Degrees Fall 1998

Jeff Bails	Ge	Water quality in French Gulch near Breckenridge, CO
Dan Betts	Goetz	Nonthesis
Adam Bielecki	Mueller	Structural and geomorphic analysis of enigmatic terraced hillslopes formed on active folds in the Southern San Jaoquin Valley using high resolution laser altimeter
Sandra Castro	Gupta	Scaling Exponents of Floods from Scale-invariant Spatial Rainfall and River Networks
Jennifer Crews	Weimer	High-Resolution Biostratigraphic Analyses of Pliocene-Pleistocene Sediments, Northern Green Canyon and Ewing Bank Areas, Northern Gulf of Mexico
Chris Holl	Smyth	Compression and Phase Transformations of Witherite, BaCO3, at Pressure to 8 GPa
Josh Turner	Rowan	Salt Wing Emplacement Models and 3-D Fault Restoration, Eugene Island 331 Region, Offshore Louisiana

Ph.D. Candidates Graduating with Degrees Fall 1998

Valerie Sloan	Andrews	The Distribution, Rheology and Origin of Rock Glaciers, Selwyn Mountains, Canada
Paul Vincent	Rundle	Application of SAR Interferometry to Low-Rate Crustal Deformation Fields
Miles Waite	Ge	Fluid Flow in Discrete Fractures; An Experimental and Lattice Gas Automata Modeling Study

BA Geology Majors Graduating Spring 1998

Christopher Ballard—*Honors: With Distinction*
Peter Barrett
Colin Craven
Jason Edwards
Joseph Feinstein
Birgit Krebs
Tyler Masters
Troy Millard
Brian Naess
George Papic
Jason Willcox

BA Geology Majors Graduating Summer 1998

Charles Boas
Scott Carmichael
Katherine Crandall
Grant Thayer

BA Geology Majors Graduating Fall 1998

Scott Fischer
Diane Fordik—*Cum Laude*
Edmund Frost
Abigail Geary
Kristopher Nuttycombe—*Magna Cum Laude*
Stephen Redak
Stephen Shiner
Aaron Shoolroy—*Honors: With Distinction*
Braden Van Matre
Jennifer Vance

STUDENT NEWS

Student Talk Competition

On October 22, the genteel conference room on the third floor of Benson Earth Sciences served as the site of the 1998 Colorado Scientific Society (CSS) Student Talk Competition semi-finals. The diverse range of subjects covered in the talks, as well as a promise of pizza and carbonated beverages, ensured enhanced attendance and an interested audience. Students from the University of Colorado presented 15 to 20 minute talks that were followed by a rigorous question and answer session. The titles and presenters of winning talks at the semi-final competition were as follows:

Donald Barber: Constraints on Laurentide ice stream dynamics from sediment provenance studies in Hudson Strait and the Labrador Sea

Hersh Gilbert: Teleseismic receiver function imaging of the upper mantle structure below the colorado plateau

John Marler: Effects of the Elkhorn fault on the geohydrology of the South Park basin, Park County Colorado

Vicki Rystrom: Technical aspects of a high resolution, low altitude aeromagnetic survey

Chereé Stover: Integrated approach to three-phase fluid flow modeling: Application to northern Walker Ridge/southern Green Canyon, northern Gulf of Mexico Basin

Each presentation was judged on oration skills and scientific content, with special emphasis placed on concept originality, subject pertinence, and visual aids. Chereé Stover was selected as the first place competitor and received $50 for the first-place award. Hersch Gilbert and Donny Barber tied for second place, each receiving a $25 award, and John Marler and Vicki Rystrom were selected for runners-up honors. As mandated by her first-place finish, Chereé presented her talk at the Student Night Talk Competition Finals, held November 10 at a meeting of the CSS in Golden, Colorado. She received second place honors at the competition, along with $75 and a one-year complimentary membership to the CSS.

The CSS imparts significant effort into hosting and judging these Student Talks, and resultantly, they offer an ideal platform for student exposure to oral presentation in a competitive AGU or GSA-type format. These endeavors are invaluable to the student scientist population in Colorado, and both the CSS and the participating students are to be congratulated on their efforts.

Chereé Stover cutting core samples at the Ocean Drilling Program cruise.

Terry Church—McNair Scholar

Senior Terry Church is the Department's first undergraduate major to participate in the McNair's Scholar Program. The McNair program is a federally-funded scholarship program named after Ronald E. McNair, a space shuttle astronaut who died in the 1986 Challenger explosion. McNair Scholars are either first generation college students from low income families or groups underrepresented in graduate programs. The program helps juniors and seniors like Terry prepare themselves for graduate school and eventually, doctoral programs.

One of the requirements of the McNair program is that each Scholar must work with a faculty mentor to gain first-hand experience with scholarly inquiry and research. In Terry's case, she was mentored by David Budd and Jared Morrow. (Jared finished a Ph.D. at CU in 1997 and was working as an Instructor in the Department. He is now an Assistant Professor at the University of Northern Colorado in Greeley.) The research project looked at sedimentological and geochemical changes associated with the near-extinction of Late Devonian reef-building stromatoporoids. The project provided Terry with an excellent introduction to field techniques including map-reading and orientation, measuring and describing stratigraphic sections and note taking. Subsequent hands-on laboratory experience included petrographic study and preparation of geochemical samples for isotopic and rare-earth elemental analyses. Stratigraphic changes in those geochemical data lead Terry to conclude that the stromatoporoid extinct event was associated with major changes in the chemistry of Late Devonian seawater, although the causes of those changes (and the extinct event?) remained illusive. Terry, Jared, and David culminated the project with a poster at the 1998 GSA meeting in Toronto. That poster was titled, "Distinct Geochemical Signals Within Stepwise Mass Extinction, F-F (Mid-Late Devonian) Boundary, Southern Nevada."

Like many seniors, Terry has spent last fall preparing for the GRE exams and researching prospective graduate schools. She intends to focus her graduate studies on the use of geochemical records to interpret earth history, and is considering numerous Universities in the western U.S. We wish her well and we are delighted at the promising future of our first McNair Scholar.

AWG scientists honored

In April of 1998, the Denver branch of the Association of Women Geoscientists (AWG) honored several female scientists from the Colorado university system. Four students from our department, Becky Brodnick, Terry Church, Jocasta Champion, and Chereé Stover, were selected as AWG Outstanding Young Female Geoscientists. To reward these talented young women for their endeavors, the AWG hosted a banquet in their honor at the Doubletree Hotel in Westminster. We would like to congratulate them on their efforts and wish them the best of luck in their future academic endeavors.

Undergraduate Lounge/ Geology Club

By Brian J. Graham

Upon the opening of the Benson Earth Sciences Building, the undergraduates were surprised with their very own undergraduate lounge. It offers a place where students can study, eat lunch, or just relax. The accommodations include a computer, microwave, refrigerator, coffee maker, comfortable couches, and study tables. It serves as a great place to meet for study groups and it provides a refuge from the busy work undertaken in the classrooms and labs upstairs. The undergraduate lockers in the adjacent hallway are extremely convenient for storing field gear, books, and of course, rocks from field trips. The Geology Club conducts meetings and hosts speakers in the lounge as well.

This year, the Geology Club restructured and has some new direction. Besides having only guest lecturers and going on occasional weekend trips, we have tried to integrate a more social aspect. Our goal is to get as many people involved in the club as possible. To achieve this, the club has hosted potluck dinners, ridiculous geology related movies, parties, and slide shows.

We continue to reach out to the lower classmen and inform them of our activities as well as the opportunities possible through the funded Mentor Program and Undergraduate Research Opportunities Program (UROP). Participating in the paid research programs and possibly working for a professor is great material to put on a resume and aids in acceptance into graduate school. As a freshman, I was not aware of these programs and I did not know many undergraduates studying geology. The club solves this problem by enabling people to get to know each other, participate in fun activities off campus, and form study groups where people who have already completed a difficult course can help others currently enrolled. Also, it is simply more fun when everyone knows each other.

Additionally the club aims to help students decide what they would like to do with geology in the future. By hosting numerous guest lecturers from as many different fields as possible, we hope to make students more aware of the many directions they may go and the opportunities that await them. In becoming involved in the Geology Club, students get a better understanding of what they might want to do, or not want to do, in the future. We are continuously trying to find professional geologists from off campus to speak to us about career paths and what they think are, and will be, important fields in the future so that we can prepare and hopefully get an early start.

This semester, a trip to the Colorado Sand Dunes is planned as well as another caving trip with Fred Luiszer. The caving trips have always been the most popular and Fred makes sure they are fun and interesting. Our web page should be reconstructed and updated soon with useful information about meetings, trips, and contact information.

Geology Club
Co-Presidents: Brian J. Graham and Winston Seiler; Committee Heads: Mark Marcoux, Dierck Kersten, and Erika Herreria, Undergraduate Lounge: (303) 735-4761

Geo-Club caving field trip to Cave Creek Caverns. From left to right, Randy Reck, Jason Gerrit, John Garett, Brain Graham, Ryan Skorecki, Angela Myers, Marc Marcoux, Fred Luiszer, Seth Mueller, Dierck Kersten. Photo by Seiler

Geo-Club potluck dinner

Graduate Student Presentations at National Conferences

Our graduate students have made a strong presence in 1998 at numerous national and international conferences. The departmental support has played an important role in making it a success. Following is a partial list of the abstracts that were first authored by the graduate students. * denotes students who received funding from the department for attending the conference.

D.C. Barber,* J.T. Andrews, G.L. Farmer, A.E. Jennings, and M.R. Kaplan, Constraints on Laurentide Ice Stream Dynamics from Sediment Provenance Studies in Hudson Strait and the Labrador Sea, GSA Annual Meeting, Toronto, Ontario, Canada, October.

D.C. Barber,* A.E. Jennings, J.T. Andrews, Did Meltwater Trigger the Cold Event 8,200 yrs ago? Revised 14C Ages for Drainage of Glacial Lake Ojibway, AGU Chapman Conference on Mechanisms of Millennial-Scale Global Climate Change, Snowbird, Utah, June.

P.L. Boni,* A Petrographic and Stratigraphic Profile of Trona Bed 17 in the Solvay Trona Mine, Near Green River, Wyoming, the 34th Forum on Industrial Minerals, Norman, Oklahoma, May.

W. Brunner,* H. Schutt, and H. Spetzler, Measurements of Meniscus Motion on Contaminated Surfaces, AGU fall meeting.

J. Cohn,* R. Krimmel, Tad Pfeffer, Mark Meier, The Surface Strain Rate Field at the Columbia Glacier Calving Margin, AGU fall meeting.

P. R. Furey, V.K. Gupta, Developing a Theoretical Framework for Understanding Space-Time Variability in Low Stream Flows, AGU fall meeting.

H.J. Gilbert,* A.F. Sheehan, K.G. Dueker, D.A. Wiens, S. Webb, and L.M. Dorman, Receiver Function Imaging of Upper Mantle Discontinuity Structure Below the Lau Basin Spreading Center and Tonga Subduction Zone, AGU fall meeting.

S.E. Hazler, A.F. Sheehan, W.R. Walter, M.E. Pasyanos, and D.E. McNamara, Shear Velocity Structure of the African Continent, AGU fall meeting.

C.M. Holl,* J.R. Smyth, H.M. Smith, Orthorhombic-trigonal transformation of witherite at pressure: implications for post-aragonite phase, AGU fall meeting, December.

M.R. Kaplan,* E.J. Steig, and G.H. Miller, A new model of the Late Quaternary Laurentide Ice Sheet and local glaciation in the Cumberland Sound region, eastern Canadian Arctic, GSA Annual Meeting, Toronto, Canada.

D. Kinner,* R. Stallard, S. Ge, Applying the Hydrologic Model TOPMODEL to Forested and Deforested, Catchments in Central Panama, AGU fall meeting.

K.J. Licht* and J.L. Fastook, Constraining a Numerical Ice Sheet Model with Geologic Data Over One Ice Sheet Advance/Retreat Cycle in the Ross Sea, AGU Chapman Conference on The West Antarctic Ice Sheet.

S.E. Martinez-Alonso, A. F. H. Goetz, W. W. Atkinson, D. D. Eberl and F. A. Kruse, Remote Sensing Study of Illites from Hydrothermal Mineral Deposits, the 35th Clay Minerals Society Meeting, Cleveland.

M.D. Morehead, J.P. Syvitski, D. Bahr, and T. Mulder. A first step at determining the controls on the Sediment Rating Coefficients, AGU fall meeting.

D. O'Grady, R. Sarg, L. Pratson, and J. Syvitski, Preliminary morphological classification of continental margins and possible links to formational processes, GSA annual meeting, Toronto, Ontario, Canada, October.

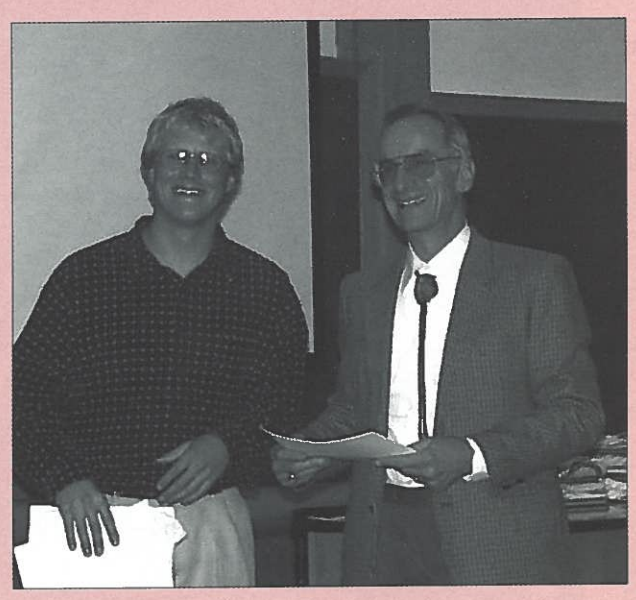
A.D. Robertson, J.T. Overpeck, E. Mosley-Thompson, G.A. Zielinski, J.L. Lean, D. Koch, J.E. Penner, I. Tegen, D. Rind, and R. Healy, Hypothesized Climate Forcing Time Series for the Last 500 Years, AGU meeting, December.

L.M. Smith, Glacial marine sediments in iceberg dominated fjords, Kangerlussuaq region, East Greenland: implications for interpretation of glacial marine records. Sedimentary Processes and Palaeoenvironment in Fjords, International Workshop at the University of Tromso, Norway, April.

L.M. Smith, A.E. Jennings, J.T. Andrews, N. Weiner, and J.P.M. Syvitski, Evidence for glacial ice extent, deglaciation, and Holocene conditions in the Kangerlussuaq Region, East Greenland. North Atlantic Climate Impacts International Workshop on Environmental and Climate Variations and their Impact in the North Atlantic Region, Reykjavik, Iceland, September.

S.C. Stover, S. Ge, B. McBride, and P. Weimer, Effects of sedimentation, salt deformation, and fault propagation in southern Walker Ridge/ northern Ewing Bank, Gulf of Mexico: Implications for historic fluid flow patterns and overpressure development, AGU fall meeting.

S.C. Stover, B. McBride, S. Ge, P. Weimer, and M. Rowan, Effects of Basin Heterogeneities on Historic Fluid Flow Patterns, Northern Green Canyon/ Ewing Bank, Gulf of Mexico, AGU spring meeting.



Aaron Shoolroy and Hartmut Spetzler at the fall graduation ceremony

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Attention Alumni

By completing and mailing in this form, you can help us do a better job of keeping up with you, your whereabouts, and your career or family news. We all enjoy reading about classmates and not-so-close-mates who survived Boulder in whatever era! So send us some news or some recollections—we promise to use them.

Name _____ Date _____

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Degree(s) (years and institutions) _____

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Mail to: *Geology News*, Department of Geological Sciences, Campus Box 399, University of Colorado, Boulder, CO 80309-0399.

The Jerry Crail Johnson Earth Sciences Library—One Year Later

By Suzanne T. Larsen, Librarian

We began moving into the Jerry Crail Johnson Earth Sciences Library at the end of December 1997. We were moving the last of the map cases in as classes began for the 1998 spring semester on January 12, 1998. The year since has been interesting, as we became accustomed to our new surroundings.

Our space is quite nice and we aren't the only ones who notice. Gone are the days when almost all those who used the library were geology students. We have become the favorite study space for students from a variety of disciplines. The seating near the windows facing south with views of the Flatirons has become prime study space. The study areas downstairs are alsoused heavily.

Terrie O'Neal, Phyllis Hunt and I continue in our previous roles from the old Earth Sciences Library. We have added Naomi Heiser as the Library Technician III in the Map Library and, at this writing, are interviewing for a map librarian. The addition of the Map Library to the Earth Sciences Library has been a real asset but also has brought with it a whole new set of issues. Most of the collection is not cataloged. This is the case with almost all map collections, but it means that the majority of our collection does not appear in our online catalog, Chinook. Other ways of finding maps are by the use of index maps and by grouping like maps together in drawers. However, the primary way to locate maps remains through contacting map library personnel. The use of the collection is further complicated by the fact that we have traditional paper maps, digital spatial data on CD-ROM, and access to maps on the Internet.

Chinook, the University Libraries' online system, continues to evolve into a stand alone research resource. You can reach it on the World Wide Web at libraries.colorado.edu. Through it you can search our book catalog, as well as find information about the CU library system. Our online article databases are only available to those on campus or with access to campus computing accounts, but the book catalog can be accessed by anyone. One of the most impressive recent additions to the arsenal of article databases available to CU students and faculty is Science Citation Index, 1974 to the present. For the serious researcher, this is one of the most valuable sources in the sciences. Records have full abstracts, their full bibliographies can be accessed online, and there is a link to articles that have cited the original article since its publication. The University Libraries is also subscribing to over 400 full-text journals online.

The world of libraries and research has changed enormously in the last few years. However, even though we are in a new, expanded space with lots of electronic resources, we have tried to maintain our traditional philosophy of exceptional service to the Department of Geological Sciences and all those who use the Jerry Crail Johnson Earth Sciences Library. Please drop by when you are in the area and see our new facility.

1998–99 Mentors, Mentorees, and Proposals

MENTOR	MENTOREE	PROPOSAL TITLE	
W.W. Atkinson	Stephen Redak	Geologic Map of Montezuma Region, Sonora, Mexico	UROP
W.W. Atkinson	Kris Nuttycombe	Investigation of the effects of host rock composition on ore deposition at the Mercur and Jerritt Canyon deposits	
Ken Dueker	Abigail Geary	Analysis of Lodore Array Data Sets on Discontinuity of the Earth	UROP
Mary Kraus	Terry Church	Measurement of stratigraphic sections, collection of paleocurrent data with a Brunton compass, make detailed rock descriptions, and construct facies maps. The student will be assigned a specific paleosol to study.	
Paul Murphey	Sarah Rieboldt	Research in the Bridger Formation of southwestern Wyoming, preparation, curation, and identification of the specimens, use of geographic and stratigraphic databases which relate over 5,000 fossil vertebrate, invertebrate, and plant specimens from over 450 localities to the nearest meter level of the Bridger Formation	
A. Pulham/D. Budd	Tad Frizzell/ Eric Paul	Investigations into what critical components of reservoirs control reservoir performance	
Anne Sheehan	Scott Cook	Analysis of Archeau/Proterozoic Lithosphere difference across the Cheyenne Belt	UROP
Anne Sheehan	Ned Frost	Magnetic Study of Marshall Mesa	
Anne Sheehan	Aaron Schoolroy	A geophysical study of the Green Mountain diatreme	
Mikie Smith	Jessica Kelleher	Generation of a proxy record using ithic grain counts or isotope records from cores from the Denmark Strait between the East Greenland to Western Iceland continental shelves	
Charles R. Stern	Rae L. Hateley	Chemical Fingerprinting of Gray Obsidian Artifacts from Patagonia	UROP
Bruce Trudgill	Ned Frost	Documentation of fault arrays using FAPS software	
Paul Weimer	Brady Van Matre	Stratigraphy of Lio-Pleistocene Deep Water Reservoirs, Green Canyon 254 and Wwing Bank 826 Fields, Northern Deep Gulf of Mexico	UROP
Paul Weimer	Ryan Crow	Integration of different data packages and the running of evaluations.	

Graduate Spring Awards for 1998

AWARD	RECIPIENT NOMINATED	AMOUNT
RMAG	Paul Boni	$1000
AWG	Jocasta Champion—MS Cheree Stover—PhD	honor only
Bruce Curtis Fund	Julia Caldaro-Baird	$500
	Mason Dykstra	$500
W. O. Thompson Award	Peter Hanke	$1000
Waldrop Memorial Scholarship	Jocasta Champion	$800
Longley, Wahlstrom, Warner Memorial Scholarship	Sara Martinez	$500
American Federation of Mineralogical Societies	Sara Martinez	$2000
	Daniel Miggins	$2000
Jeffrey Deen Memorial Scholarship	David Kinner	$2500
Zena Hunter Andrews	Kathy Licht	$2500
	Lisa Doner	$2500
Grad Fellowship in Geological Sciences Funded by Leland B. & Dora F. Culligan	Jacob Waples	$6000
Texaco Minority Scholarship	Laryn Smith	$1300

Undergraduate Spring Awards for 1998

AWARD	RECIPIENT		AMOUNT
Estwing	Winston Seiler	top junior	pick & brunton
Marks Scholarship	Ryan Crow	top junior	$450
RMAG pick	Chris Ballard	top senior	pick & brunton
Johnston Memorial Scholarship	Aaron Shoolroy	top senior	$750
Bass Award	Terry Church	top female undergrad	$400

Visitors to the Department

The Department of Geological Sciences was pleased to host a number of prestigious visitors during the past year.

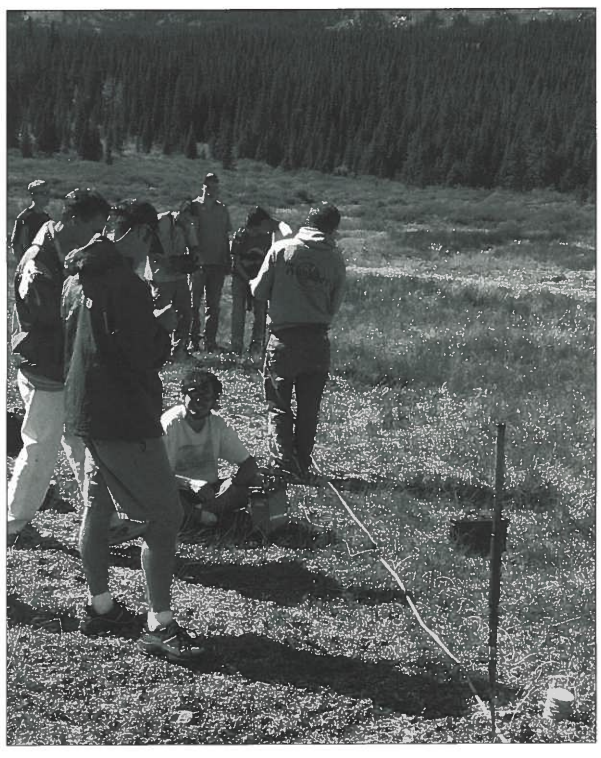
Professor Stephen Wesnousky, Director of the Center for Neotectonic Studies at the University of Nevada at Reno, spent February through July 1998 on sabbatical in the department as a CIRES Visiting Fellow. While here, Prof. Wesnousky interacted with the geophysics, tectonics, and structure groups in the department, and worked on a variety of projects including a paper on thrust faulting in the Dehra Dun sub-Himalaya.

Professor Peter Molnar from MIT visited the geophysics group as a CIRES Visiting Fellow, and was housed in Roger Bilham's laboratory complex in the Benson Earth Sciences Building. Molnar work on meterological monsoon related problems, interacting with PAOS and NCAR researchers, and on New Zealand and Eurasian tectonics, with the geophysics group.

Dr. John Paul from the Center for Mathematical Modeling and Computer Science, in Bangalore, India, visited for three months and worked with Roger Bilham's group on unifying measurements of Indian plate motion and processing of GPS data from the ElPilar 1997 earthquake.

Jens Koehler from the University of Bonn in Germany visited Prof. Hartmut Spetzler's rock physics group for three months and participated in research on the remote detection of contaminants in ground water.

Professor Randall Marrett from the University of Texas at Austin visited as a Big 12 Faculty Fellow to work with Mark Rowan and the structure group on detachment faults. The Big 12 Faculty Fellowship program is a new program designed to promote interaction between faculty at the Big 12 Athletic conference universities (Colorado, Kansas, Missouri, Nebraska, Iowa State, Kansas State, Oklahoma, Oklahoma State, Texas, Texas A&M, Baylor, and Texas Tech).



Field geophysics course, fall 1998: an electrical resistivity experiment near Nederland, CO

ALUMNI NEWS

Terry Bailey (MS, '77) has recently been promoted to Senior Staff Geologist. This exciting new position includes a transfer from Chevron Production Company of Lafayette, Louisiana. Effective July 1, 1998 you can find Terry working overseas for CalTex Petroleum, Duri, Indonesia.

Benjamin F. Bailar (BA, '55) has just retired as Dean of the Graduate School of Administration at Rice University in Houston. He continues to be active as a Corporate Director including work with two oil patch companies. The first, Smith International, is a major drill bit producer and the other, Trico Marine Operators, has over 100 serving offshore rigs worldwide. Ben hopes to do some pro bono consulting for third world postal administrations, which could grow from his service as Postmaster General of the United States during the Ford and Carter administrations.

Newell Campell (BA, '61; MS, '66) recently retired after 30 years of teaching at Yakima Valley College in Washington. Newell continues to do consulting work in the Northwest. Last year he completed the 3rd edition of "Geology of the Yakima Area" along with a three year United States Geological Survey sponsored earthquake hazards study (NEHRP) of the Yakima area.

Mary-Margaret Coates (MS, '66) is working as Associate Editor of the Journal of the American Water Works Association. She also finds time to do freelance manuscript editing. Mary-Margaret lives in Wheat Ridge, Colorado, and is about to get her third and final child off to college. She looks forward to possibly relaxing at the end of four more years of hard work.

Charles S. Content (BA, '34) has retired from his career as a consultant in hydro development. He previously worked as Manager of Geotechnical Services for Bechtel Corporation from 1956-1976, and served as an engineering geologist for the U.S. Bureau of Reclamation from 1935-56. Charles looks back fondly on the time he spent at CU under the instruction of Professors Warren O. Thompson and R.D. Crawford. He would enjoy hearing from some of his fellow graduates of the 1930s era. Charles has fully recovered, and is back playing golf (with a handicap of 23), after he suffered a stroke in January 1998. He and wife, Nancy, have taken up traveling the world on cruise ships and have found themselves in many exciting places. The couple is proud of their large family of eight children and twelve grandchildren, and look forward to more grandchildren on the way.

Claire B. Davidson (MA, '49) is now living in Reston,Virginia. As a member of the Geological Society of America Foundation Trustees, Claire visited Boulder in May 1998, for meetings. During her visit she took time to tour the Benson Earth Sciences building which she feels "really stands out in a very beautiful campus."

O. W. Hampton (BA, '50; MA, '57) was awarded his Ph.D. in anthropology, from Texas A & M University in May 1997. Two years prior to earning his master's in geology from CU, "Bud" also studied business and was awarded an M.S. After completion of his studies in Texas, he has returned to Colorado and now lives in Estes Park.

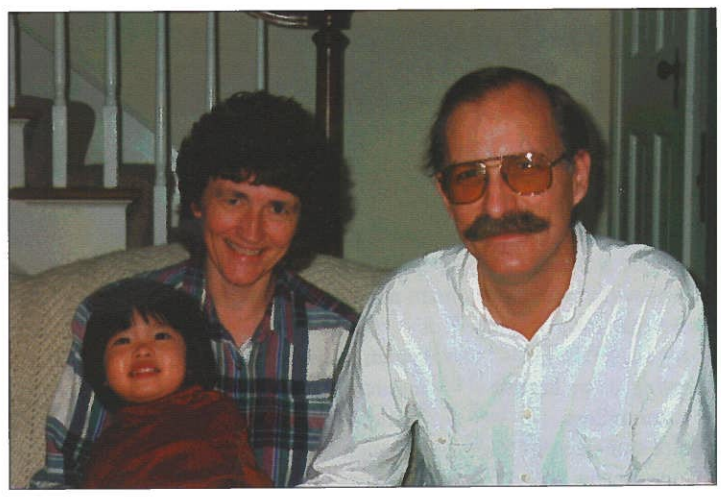
Charles O. Hile ('38) passed away May 21, 1998, at the age of 84. He was a Warren O. Thompson student and earned his degree in geology and geophysics. Charles went on to work as a petroleum geologist in the Rocky Mountain area, and owned and operated Hile Exploration Co. for many years. Charles and his wife, Kathryn, raised two daughters, have four grandchildren and two great-grandchildren. The Department of Geological Sciences is thankful to his family for identifying it as a recipient of donations in Charles' memory.

Bruce A. Geller (Ph.D., '93) was very busy this past year as a self-employed geologist. He has done a record amount of mineralogic consulting, studying samples from five continents. He also worked on mining related projects including a gold property in west Africa with Tellurides. Many other jobs he completed involved archaeology and forensic gemology. Additionally, Bruce operates music and jewelry businesses which also "glimmered" in the past year.

Doug Geller (BS, '82) is working as a Senior Hydrogeologist in water resources for Squier Associates, Inc., in Lake Oswego, OR. He and wife, Ann, are the proud parents of a one-year-old son named Ethan. Doug remains in good contact with his classmates Charlie Lee and Curt Welty to keep up on alumni happenings.

Sarah C. Gray (BA, '83) received her Ph.D. in Earth Science from the University of California, Santa Cruz, in 1991. She has since worked her way up to Associate Professor of Marine and Environmental Studies at the University of San Diego. A favorite new hobby of Sarah's is rafting. She and her family have already completed two thrilling trips down the Grand Canyon.

Mary R. Hill (BA, '44) is currently spending her retirement in Santa Fe, New Mexico. She worked very hard writing a new book that came out in January of 1999. You can find her book, *Gold: The California Story,* as published by the University of California Press.



Cora, Diane, and Vance Holliday

Sumner B. Hixon (BA, '52) went on to earn a Ph.D. from the University of Michigan in 1964 and is now volunteering at the United States Geological Survey in Houston, Texas. "Dave" lends his volunteer services in the Water Resources Division in the Houston sub-district working on ground water projects, compaction, UNIX programs and data entry.

Vance Holliday ('82) was the recipient of two international awards presented at the 1998 national GSA meeting in Toronto. Vance published two books between 1995 and 1997, so he surely deserved something. One award was the Rip Rapp Archaeological Geology Award. This is a career award from the Archaeological Geology Division of the GSA, and we hope this does not signal the end of his career! The second award is the Kirk Bryan Award of the Quaternary Geology and Geomorphology Division of the GSA. This award is for his book *Stratigraphy and Paleoenvironments of Late Quaternary Valley Fills on the Southern High Plains* (1995, GSA Memoir 186). Few people are so honored by an award, and fewer still garner two awards. Some of the work in both books was part of Vance's Ph.D. research at this department.

Vance is a professor in the Department of Geography, University of Wisconsin-Madison, and he and his wife, Dianne, recently adopted a baby daughter from China named Cora (see photo). This is very appropriate as Vance's father served in the U.S. Army in China in the 1920s, and an outstanding photograph of his father on the Great Wall of China made it into several editions of Putnam's Geology, that money-maker of Larsen and Birkeland.

Vance joins other CU faculty and former students (undergrads and grads) in receiving the Kirk Bryan Award. In chronological order, these are: Gerry Richmond ('65), Hal Malde ('70), John Andrews ('73), Jim Benedict ('75), Jim Clark ('80), Steve Colman ('84), Pete Birkeland ('88), Art Dyke ('90), and Bill Bull ('93). In addition, another GSA award is Bill Bradley's Quaternary Geology and Geomorphology Division Career Award ('94). Finally, former student Vic Baker continues to make an impressive presence in international geomorphological matters, and just finished a stint as the president of the GSA.

Myron Horn (BA, '52) is retired and still contributing to the field of Petroleum Geology. He does consulting work and owns BXK Graphics. "Mike" also serves as the editor of the 1990's Giant Field Volume for AAPG. In 1997, he was awarded honorary membership in the American Association of Petroleum Geologists. The following year he presented a paper on linking oil generation with fracture detection at the 1998 AAPG meeting in Salt Lake City. His also writes the annual "Petroleum Industry" review for *Geotimes*. Additionally, the Department of Geological Sciences is thankful to Mike for his donation of BXK Graphics Geological Software in 1997.

Gary Peterson (BA, '59, MS, Univ. Washington, '61, PhD, Univ. Washington, '63).) is a professor in the Department of Geological Sciences of San Diego State University since 1963. Congratulations on the new building. It looks just terrific. He plans to visit it the next time he gets back to Boulder. He will probably have another five years to go before retirement and he doesn't think about it much because he prefers geology to golfing. His interests have switched to planetary geology in recent years. Check out his personal page for additional information at http://www.geology.sdsu.edu/people/faculty/peterson/index.html>. It's now been almost 40 years since graduating from CU and he has still never run into another 1959 BA graduate.

James E. Ross (BA, '79; MBA, '88) did his master's thesis on the paleoecology of Cytheracean ostracides in a couple of formations in Texas. Jim is now working as Senior Credit Analyst for Matsco Financial Corporation, a leading nationwide lender to the dental industry. Jim worked for both Phillips Petroleum and later Gulf Oil until 1985, when he was forced out of the petroleum industry by Chevron's purchase of Gulf. He has not worked as a geologist since that time but considers himself an enthusiastic "rock-banging hobbyist." Jim now lives in San Francisco where he is active in choral groups and supports gay and lesbian activism in his spare time. He has fond memories of the cramped conditions in the Old Geology building where he first became interested in ostracides after Emmett Evanoff called them "neat."

Don Runnells (Ph.D., '64, Harvard) is professor emeritus in the Department of Geological Sciences at the University of Colorado. On June 23, 1998, President Bill Clinton appointed Don to serve on the Nuclear Waste Technical Review Board. The 11-member board is charged with reviewing technical and scientific information related to the U.S. Department of Energy's proposal to build a repository for high-level radioactive waste at Yucca Mountain, Nevada. He also serves as vice-president of Shepherd Miller, Inc., a firm providing environmental and engineering consultation primarily for the mining industry, and to government agencies and other concerns. He has over 27 years of teaching experience and numerous journal publications to his credit. Dr. Runnells is a Fellow of the Geological Society of America and a member of the Geochemical Society, the Society of Economic Paleontologists and Mineralogists, the Association of Exploration Geochemists, the Association of Ground Water Scientists and Engineers, and the American Chemical Society. His awards include selection as a National Science Foundation Graduate Fellow, election to Phi Kappa Phi Honorary Scholastic Fraternity, and selection as a Fellow of the Cooperative Institute for Research in the Environmental Sciences at the University of Colorado. In addition, throughout his career, Don has been very important to his field by serving as a member of numerous councils and boards.

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