

resulting from analysis and modeling of **Maddy Schreiber**'s tracer experiments will appear in the March 2002 issue of *Contaminant Hydrology*. **Ingrid Ekstrom**, a new student who joined my group in the fall, has begun a study to monitor the effects of an air sparging system on redox conditions and intrinsic biodegradation in the downgradient portion of the plume. Our extensive monitoring network at the site provides a unique opportunity to quantify the spatial variability of responses in the plume.

In collaboration with **Madeline Gotkowitz** of the WGNHS, PhD student **Tara Root** and I have begun an investigation of hydrogeologic controls on arsenic contamination of groundwater in southeastern Wisconsin. Projects completed in 2001 include MS theses by **Ann Dansart**, on fossil permafrost features as conduits for preferential recharge and contaminant movement through the unsaturated zone, and by **Kurt Zeiler**, exploring the use of inverse models to deduce the input history from a contaminant source at the Badger Army Ammunitions Plant.

I got an interesting dose of media exposure in 2001. In February, the National Research Council Everglades committee on which I am serving (and now chairing) released a report critiquing a plan for pilot studies for a large-scale aquifer storage and recovery system. I was interviewed by a number of Florida and national newspapers, as well as by reporters for *Science* and *Nature*. Later in the year my photovoltaic roof went into production as the first individual power plant in Madison. As part of a Wisconsin media focus on energy, I was interviewed for public radio and several local TV stations. A short article accompanied by a picture of my roof in the fall issue of *On Wisconsin* prompted emails from alumni in a number of states who are interested in following similar paths toward increased use of renewable energy. My hopes for the coming year are lots of sunny days.

#### ❖ Charles W. Byers

This year turned out to be historical. In the spring I was appointed to serve on the internal review committee for the Department of History of Science. I got to see how we are perceived by our brethren in the humanities. I was amazed to find out how much they *think* about things we just *do*. I suspect they believe we are thinking as well, but I didn't correct the notion. Regarding the history of geology, my paper on E.O. Ulrich's work at Baraboo was published. And in the fall I was selected to be an officer of the History of Geology Division of GSA.

I am also continuing our Ordovician stratigraphic project. Norlene Emerson (PhD student), Toni Simo, Dana Geary, and I presented results from Norlene's dissertation on the Decorah Formation at North-Central

GSA (for the upper midwest researchers who want the stratigraphic details) and at GSA in Boston (for the Ordovician arm-wavers). Steve Beyer, a first-year grad, will tackle the Galena sedimentology and bentonites in Iowa for his MS thesis.

I had a hand in the implementation of the new curriculum this year. In the spring I taught the revised Evolution of the Earth, which defers the history of life (covered in the new Geobiology course) and focuses more on tectonics, sedimentology, and global changes in the atmosphere and oceans. In the fall, Nita Sahai and I inaugurated the new Fluids and Sedimentary Processes class, which includes sedimentology, fluid mechanics, water chemistry, groundwater, and diagenesis. We are hoping to turn out well rounded geology majors, ready for the 21st century.

At home we crossed the great divide as Wesley went off to West High School and Jordan to first grade. We are finished with Montessori Children's House preschool after only a decade.

#### ❖ Alan Carroll

2001 was another busy year, during which I juggled several active research projects, extensive travel, and preparations for my tenure review. My principal area of research continues to be the Green River Formation (see "Tectonic and Climatic Record of Eocene Lake Gosiute," page 18). In addition to ongoing work in Wyoming by several graduate students, I am currently supervising undergraduate student thesis projects by Reuben Johnson, Nick Hoel, and Alissa DeV Vaughn. Colin Walling also began his PhD research on the Phosphoria Formation nearby, in Utah and Idaho. His project involves assessing the contribution of windblown silt to organic-rich "shale" units such as the Meade Peak Member, based on a combination of fieldwork and laboratory studies of quartz grain size, texture, and oxygen isotopic composition. In addition to the potential of these deposits to provide a record of Permian wind patterns, wind-blown iron may have been an important nutrient that helped stimulate primary productivity of the Phosphoria shelf. Undergraduate Ben Bymers has been assisting Colin, and is working on his own senior thesis project to date wind-blown zircon grains using U-Pb.

In late summer I conducted fieldwork in the eastern Java basin with Toni Simo and PhD students Martin Shields and Essam Sharaf. This project aims in part at delineating the structural and stratigraphic evolution of the basin, which has experienced a complex tectonic history related to subduction of the Australian-Indian plate. We are also examining the development of the Miocene/Pliocene unconformity that controls local petroleum accumulations. Java is a very interesting place to conduct geological research, but presents logistical challenges that are similar in many respects to those I

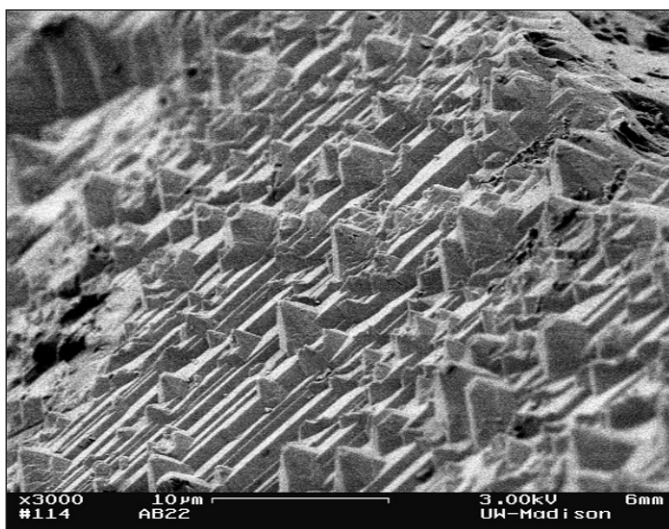
encountered while working in western China.

At the other end of the cultural and climatic scale is the Brooks Range of northern Alaska, where Marwan Wartes is working on his PhD. His project, generously supported by Anadarko Petroleum Co., involves the Lower Cretaceous Fortress Mountain Formation in the Brooks Range foothills. This unit contains chert-pebble conglomerate facies that represent the earliest coherent record of coarse-grained clastic sediments to be shed from the Brookian orogen, and is also a potential petroleum reservoir. Marwan is working its sedimentology and reservoir properties, as well as trying to link chert clasts to specific “allochthons” in order to better understand the structural evolution of the Brooks Range. During the time I spent with him in the field I was impressed by the greatly increased level of exploration activity in the Brooks Range foothills, which apparently was being driven in part by talk of building a gas pipeline. We shared a camp with Anadarko, the Alaska Division of Geological and Geophysical Surveys, and the U.S.G.S., which altogether totaled about 25 people and three helicopters.

#### ❖ Chuck DeMets

The past year was wonderful across the board for my family and professional life. My family and I enjoyed several relaxing vacations, mostly to northern Wisconsin for assorted skiing and fishing and to Massachusetts for family visits. Our three kids are wonderful travelers and a joy. We also added a new family member, one who is furry, enthusiastic, and very energetic: Pandora, a golden retriever. Although managing chaos is a contradiction in terms, it seems to be how my wife and I spend much of our time.

My research efforts in 2001 were considerable and far-flung. I spent two weeks in March working in Jalisco, Mexico with staff member Bill Unger. I sent another staff member Neal Lord to Jamaica in February to work with my Jamaican colleagues on a multi-year seismotectonic study and to Oaxaca, Mexico in June to work with my Mexican colleagues on a new multi-year earthquake hazards project. I bought four new GPS receivers and sent these to Jamaica and Mexico for permanent, continuous observations in the field areas where I’m working. The goal in each of these field areas is to study and model zones of active faulting, with a goal of better understanding the mechanics and kinematics of active crustal deformation. In June, Raytheon Corporation enticed my talented post-doctoral fellow Tim Masterlark to move to South Dakota, leaving



*Micron scale pyramids of anhydrite deposited upon anhydrite phenocrysts within the Pinatubo magma chamber prior to eruption. Photo by John Fournelle.*

me searching hard for a bright new graduate student with an interest in faulting, earthquakes, and field work in warm sunny tropical locations.

#### ❖ John Fournelle

2001 saw the fruition of three projects I have been working on with others here in Weeks Hall. First, a new project with Ilya Bindeman and John Valley, focusing on a suite of samples I collected in 1989 at Fisher Caldera in the Aleutians. These are the first low  $\delta^{18}\text{O}$  samples from the Aleutians, and a paper on this project appeared in late 2001 in *JVGR*. Second, the senior thesis manuscript of Ryan Jakubowski—reporting on our discovery of magmatic vapor deposition of anhydrite was submitted to *American Mineralogist*. I had wrapped up one major loose thread in July,



*Postcard-perfect to a geologist—one of Chuck DeMets’ high-precision GPS positioning antennae seems to be enjoying a day at the beach near Oaxaca, Mexico. Photo by Neal Lord.*