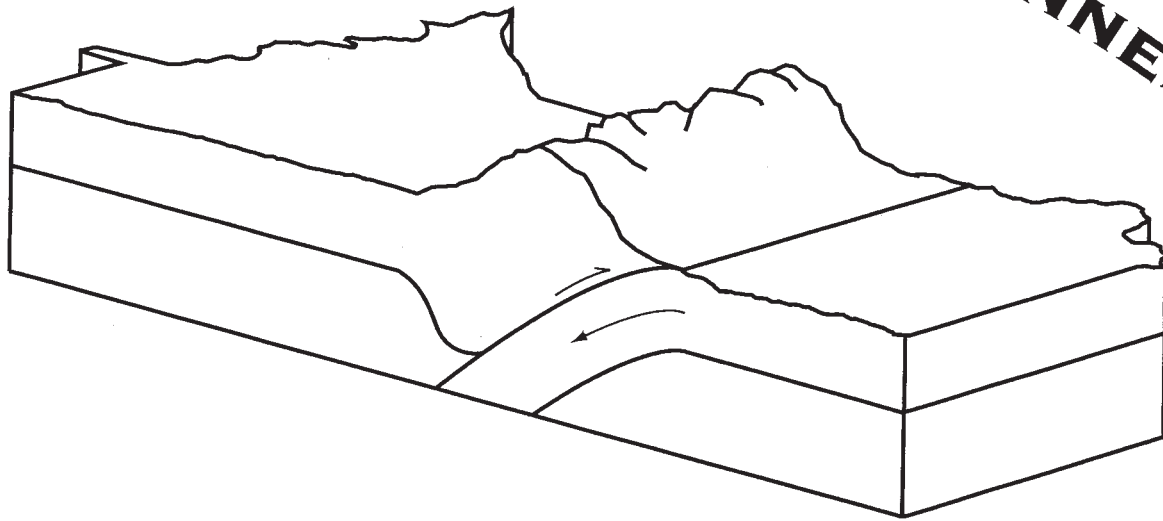


# *Carleton Geology Newsletter*

Volume XXX

2005

**BRING OROGENY BACK TO MINNESOTA**



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The cover design is from this year's Geology  
T-shirt designed by Nick Swanson-Hysell '05.

The Carleton Geology Newsletter is edited by Timothy Vick.

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*Department of Geology  
Carleton College  
Northfield, Minnesota 55057*

June 10, 2005

Dear Alumni, Friends and Parents,

It's been a productive and enjoyable year in Northfield, but spring has certainly come late to Minnesota. Sometimes it felt like the furnace would never stop running. But as commencement approaches, and we prepare to bid farewell to the class of 2005, the temperatures have rebounded near their typical June levels and the sky alternates daily between a high blue and threatening thunderheads. This year's graduating geology class is small, a mere 13 strong (plus a couple off-cycle members who will graduate next fall, fingers crossed). The rising senior class is also small at 11 — but not to fret, a whopping 25 sophomores declared Geology majors this spring so we're back up to our typically high levels in our 200-level courses. This year's senior theses span the broad range in topics and localities that we've come to expect (but are still surprised by) each year. I encourage you to check out the comps titles herein and on the departmental web pages that Tim Vick so diligently and expertly maintains.

Which brings us to discussion of the happenings with the non-student members of the department. Sarah Rechtzigel has settled into the role of Department Administrative Assistant swimmingly, and we now again have both a backbone (Tim) and a nervous system (Sarah) for the department. Speaking of nervous systems, Bereket Haileab was awarded tenure; and yes, he is now running the department openly, rather than secretly. Cam Davidson is up for tenure next year, and we are yet to fully realize his secret agenda (although I suspect it has something to do with “toys of science,” given his addiction to costly analyses for his research). Mary Savina is dividing her time between the Learning and Teaching Center and the Geology Department (and a thousand other duties and interests), and is of suitably high profile in the college at large. Qing Zhang has filled in for us in Structures and Intro this year, and will do so again (plus Tectonics) next year. Qing defends his dissertation up at the University of Minnesota this month, so we all wish him the best of luck with that. Bob Tipping '81 (a history major while at Carleton) from the Minnesota Geological Survey stepped in to teach an amazing Hydrology course this spring (they took a backhoe to a sinkhole!). Oh yeah, and some whippersnapper named Michael Elliot Smith '99, now of the University of Wisconsin Ph.D. program, taught what was reportedly a Seds course this past fall. So, we have been indeed fortunate that Mike, Qing and Bob have been so successful in their courses this year, and we are deeply appreciative of their hard work and collegiality. As for me, I'm still alive, still here, and not yet the subject of a lawsuit - who could ask for anything more?

We are quickly approaching the 75th anniversary of the Geology Department (the sesquicentennial year for us is 2007, seventy-five years after the formal founding of the department in 1932). Stay tuned for plans to formally recognize this important milestone.

Be sure to order a departmental T-shirt this year, the design by senior Nick Swanson-Hysell is most excellent— even if the color is kind of eh...

Plus ça change, plus c'est la meme chose.

Yours in perpetual servitude,

*Clint Cowan*



# DEPARTMENTAL NEWS

## *Carleton Faculty and Staff Speak at Geological Society of America Meeting*

by Nathan Kennedy '07, Carleton College News Bureau

Every fall several Carleton Geology faculty and students give presentations at the Geological Society of America (GSA) annual meeting, and this year was no exception. Last November, the speakers at the GSA convention in Denver included Bereket Haileab, assistant professor of geology; Cathryn Manduca, director of Carleton's Science Education Resource Center; Clint Cowan, Associate Professor of Geology; and Mary Savina, the McBride Professor of Geology and Environmental Science and chair of the geology department. Also, Mary Savina, along with Cameron Davidson, associate professor of geology, and Jacquelyn Lauer-Glebov, assistant director of institutional research, had posters on display. This was the 116th annual meeting of the GSA, and approximately 6,200 geoscientists attended.

Bereket Haileab's presentation focused on the Turkana Basin, located in Southern Ethiopia and Northern Kenya. The basin was formed by a rift in the earth's crust that is still one of the most active in the region, and currently it contains many layers of sediment and volcanic rock from millions of years of volcanic activity. Bereket discussed the many different types of ash found in the basin and compared them with ash found in locations outside the basin, some quite far away. Also, he described how different types of ash found in the same sediment layers, which correspond with different time periods, indicate how multiple volcanoes were active at any given time.

Cathy Manduca gave three talks. In the first, she discussed the Starting Point website, a resource for faculty teaching introductory geoscience courses. It includes strategies for designing lectures, activities and syllabi, and contains methods of teaching that professors have found useful. In the second talk, Cathy outlined four strategies to help students succeed in research: making sure students' preparation matches the project design, creating schedules and intermediate goals within the available time, supporting the emotional, financial, academic and technical challenges of the project, and maintaining strong communication between students and the instructor. These were identified by working with the Keck Geology Consortium, a multi-college collaboration focused on helping undergraduate students make the most of their research. The third talk by Cathy focused on designing a class and discussed some of Carleton's online resources for faculty. These include Starting Point; the Science Education Resource Center,

which provides materials to enhance learning experiences; Teaching with Data, which provides data, examples, and activities; and On the Cutting Edge, with teaching information and resources on a wide range of topics. All of these were developed with the help of faculty from across the country.

Mary Savina also gave three presentations. In her first talk she explained how Howard Gardner's concept of Multiple Intelligences relate to geology. Gardner's theory divides intelligence into many different categories, including spatial, naturalist, logical-mathematical, and both intra- and interpersonal. Mary believes that geoscientists can tap into more of these types of intelligence than many other disciplines through their interaction with nature, tactile materials such as rocks, geologic and topographical maps, as well as themselves and others. Her second talk focused on her Carleton summer program on environmental science that brings Carleton faculty together with community partners and high school teachers and students. The program begins with faculty working with the teachers and community partners to design a research program, and then the students join into small groups to research a topic, hypothesize about possible outcomes, collect and analyze data, and put their work into a presentation at the end. The program allows faculty to explore new avenues for research, helps the teachers design projects for the school year, creates connections with higher learning institutions, helps the students learn field and lab research techniques, and provides information to community partners about environmental problems in their areas. Mary's third presentation was a poster covering Carleton's Starting Point website which provides resources for teachers of introductory geology classes.

Cam Davidson's poster described the autocorrelation function (ACF), a powerful and easy-to-use software tool that allows the user to quantify shape-preferred orientations at various scales in an image. The presentation covered an activity in which students first learn how to use the ACF, and then apply the knowledge to the Quottoon pluton in British Columbia.

Clint Cowan's talk was entitled "Cambrian Chitinophosphatic Brachiopod Shells Yield a Primary Marine  $d^{13}\text{C}$  Carb Signature and Reveal Terrestrial-Marine Paleoceanographic Interaction." Among his co-authors was David Auerbach '04.

Jacquelyn Lauer-Glebov's presentation, co-authored by Beth A. Palmer of the Keck Geology Consortium, centered on the Keck Consortium and the skills it helps students develop. A full year at the consortium mimics a professional research experience, but it also develops skills such as gathering and interpreting data, stimulating intellectual curiosity, understanding how scientific knowledge is created, refined and challenged, and professional self-confidence. Instead of training students for a particular career, the Keck experience helps students to think and act as scientists and to understand the nature of science itself. Jacquelyn also pointed out areas identified by alumni as needing improvement.

### ***Bereket Haileab Awarded Tenure***

We're very pleased to announce that the trustees of Carleton College have awarded Bereket Haileab tenure as a faculty member in the Geology Department and promoted him to Associate Professor.

Bereket has been teaching Mineralogy, Petrology, Low Temperature Geochemistry and Introductory Geology at Carleton since 1994. Before that, while he was a graduate student, he taught introductory geology and field geology at the University of Utah and the Koobi Fora Field School (sponsored by Harvard University and the National Museums of Kenya) in Kenya.

Bereket earned his B.S. in geology at the Addis Ababa University in Ethiopia, and his masters and Ph.D. at the University of Utah.



*Bereket Haileab*

### ***Shelby Boardman Steps Down As Dean Of The College***

Shelby Boardman has decided to step down as Dean Of The College in order to spend time with his wife, Jean, who is battling cancer. The following email was circulated recently to college employees by President Rob Oden:

"With mixed emotions, I write to inform all that Professor Shelby Boardman has decided to step down as Dean of the College, effective at the end of summer, to spend time with his spouse, Jean, who is undergoing treatment for cancer. I'm saddened that Carleton is losing such an outstanding dean, but very gratified that Shelby and Jean will be able to focus their time and energy on Jean's health issues. Shelby will take a year off from the College, after which he and I will work together on his future roles at Carleton.

"After consulting with a number of faculty members, I have asked Associate Dean of the College Scott Bierman to serve as Dean of the College for the coming year.

"Shelby's leadership of academic affairs has been a very significant part of what has made my own transition to Carleton over the past three years much less difficult than might otherwise have been the case. He has been, in every way, a model Dean of the College. Shelby speaks and acts with unquestioned integrity. His leadership of the faculty has been the more successful because of his own 34 years of experience at Carleton, as the Charles L. Denison Professor of Geology, as an Associate Dean of the College and as Dean of the College, as the Chair of the Twenty-First Century Committee, and in other positions. Shelby's contributions to what makes Carleton the College it is today are beyond assessment. We are the College we are today in significant measure because of Shelby Boardman."

In his own letter to the faculty, Shelby wrote:

"Jean underwent surgery for breast cancer in April. Since then our oncologist has told us that the cancer has spread, thus changing our options and perspectives dramatically. While we remain hopeful, and Jean is feeling very well at present, we also need to be realistic as we plan for the future. Although we are confident that the path we are taking is the right one, I must say that the decision to step down as Dean of the College has been the most difficult of my professional career.

"After several weeks of discussion with Jean and consultation with Rob, I have concluded that under these circumstances I cannot carry out my responsibilities as Dean of the College in a way that the adequately serves you, the faculty, or the academic



mission of Carleton. As I step down though, I do so with the utmost confidence that the Dean of the College office, under the exceptionally capable leadership of Scott Bierman and the support of Liz Ciner, John Ramsay and the other terrific people here, will carry on with the same commitment and dedication that has characterized the office for many years."

### ***Cam Davidson And Sandro Montanari Co-Directing Italy Program***

We are very pleased to announce that Cam Davidson and Alesandro Montanari have signed on to co-lead the 2005 edition of our Off-Campus Geology Seminar in Coldigioco, Italy next summer.

The schedule will be similar to past years except for an earlier start date of August 1. This will allow Cam to be with the program for five weeks before returning to Northfield to teach Introductory Geology in the fall. The number of students, 15, will be somewhat less than in past years.

Sandro, of course, is a veteran who taught with Dave Bice in all six of the previous Italy programs since 1993, but this will be Cam's first experience with the program.

Cam's family will be with the program for the first couple of weeks, until his children need to return home for school.

Thanks to the success of this program in past years, and because we value having field experiences in the curriculum, we hope to continue offering the Italy program. This summer will allow Cam to see how it works and give it a trial run.

The things Cam says he is looking forward to the most: "Learning the stratigraphy and tectonic history of the Apennine Mountains, and relaxing with good food and wine after a hard day in the field."

### ***Clint Cowan And Phil Camill To Lead Australia Program***

Clint Cowan is teaming up with Associate Professor of Biology Phil Camill to lead the Coastal Biogeoscience Program in Australia next winter term.

Clint is a sedimentary geologist with interests in modern and ancient carbonate sediments and the biogeochemistry of environmental perturbations over geological time scales. He teaches courses in paleobiology, sedimentology-stratigraphy, and earth history.

Phil is a global change ecologist with interests in

how vegetation and nutrient cycles are altered by climate change and anthropogenic disturbances. He teaches courses in ecosystem ecology, plant physiological ecology, global change biology, and paleoecology.

The program will have two primary field sites, the first in the temperate area on the southern coast of Australia and the second on the Great Barrier Reef. The courses taught will include Coastal Studies in Biogeoscience, Natural and Anthropogenic Disturbances of Australian Coastal Environments, and Directed Readings In Coastal Science. SCUBA certification is required.

Thirty-two students have been accepted into the program.

### ***Qing Zhang Teaches Structure And Intro***

We are pleased to have Qing Zhang teaching with us for the 2004-05 and 2005-06 school years as a visiting instructor in the Structural Geology and Introductory Geology classes. Qing taught Structural Geology during winter term, and this term is teaching Introductory Geology.

A native of Inner Mongolia, Qing earned his bachelors and masters degrees at Peking University and last year completed his Ph.D. at the University of Minnesota. His teaching experience includes several years as an Associate Research Fellow at the Chinese Academy of Geological Science in Beijing and several years as Assistant Professor at the Inner Mongolia Normal University at Hohhot, China.

Qing's research interests center on the deformation and exhumation of ductile crust and the ductile-brittle transition zone, the structural style and deformational pattern of ductile and ductile-brittle crust, the development of ductile fabrics and deformation mechanisms on a microscopic scale, and the thermal history of ductile crust material.

Welcome Qing!

### ***Bob Tipping '81 Teaches Hydrology***

We'd like to thank Robert Tipping for joining our department to teach Hydrology this spring term. Bob is a hydrologist for the Minnesota Geological Survey.

Bob graduated from Carleton in 1981 with a major in History and went on to complete his Masters in geology at the University of Minnesota in 1992. He is working on finishing his Ph.D., also at the University of Minnesota.

Bob is a veteran of many classes taught at the University and hydrology projects for state and other governmental agencies around Minnesota. His research interests include the geology and hydrogeology of fractured and karst terrain; ground water-surface water interaction; aquifer characterization; GIS applications and hydrogeology.

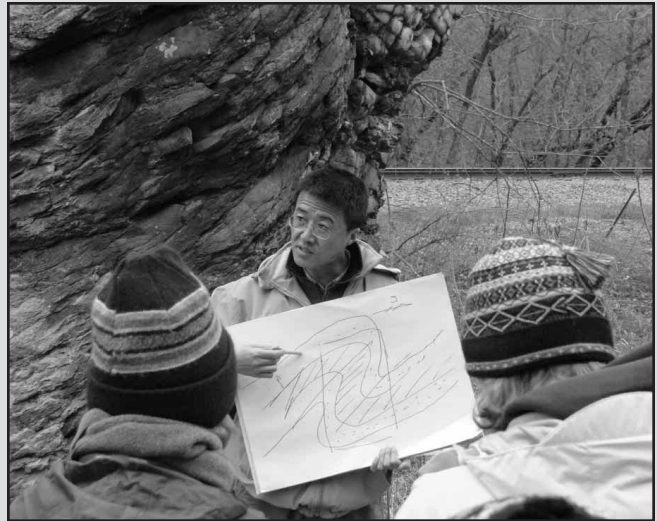
Thanks for helping out, Bob!

### ***Mike Smith '99 Steps In For Clint Cowan***

We're very pleased to have had Mike Smith '99 on board last fall term to teach the Sedimentology and Stratigraphy class that normally would have been taught by Clint Cowan. Clint was on sabbatical for the term.

After Mike graduated from Carleton he moved on to the University of Wisconsin at Madison, where he completed his Masters and is doing a Ph.D. under the direction of Alan Carroll '80. His research has focused on argon/argon dating of the Green River Formation in Wyoming.

Thanks Mike, and best wishes in your future endeavors!



### ***Baraboo, Wisconsin Field Trip Spring Term, 2005***

We had a cold, rainy spring this year, but even the snowflakes falling on a couple of the days of the Baraboo field trip didn't slow us down.

On this page, (left photo) several students puzzle over the famous Van Hise Rock, and (upper right) Qing Zhang explains how the fabric can reveal your location relative to the overall geologic structure.

Opposite page: (top photo) Clint Cowan leads the discussion in Parfreys Glen, and (lower photo) Willie Guenther '07 checks out the layers of Baraboo Quartzite and phyllite.



## ***Sarah Titus To Join Faculty In '06-'07***

This year the Geology Department conducted a national search for a structural geologist. We are pleased to announce that we have hired Sarah Titus for this tenure-track position. Sarah is expecting to finish her Ph.D. at the University of Wisconsin - Madison soon, and she is deferring her date of starting at Carleton for a year so she can complete some of her research projects. Her research interests center on rock deformation over a wide variety of tectonic conditions.



## ***Intro Class Gathers National Water Collection From Parents And Alumni***

by Colin McLain '07, Carleton New Bureau

Every fall for the past 10 years the students in Professor Bereket Haileab's Introduction to Geology class have conducted tests on water quality in Rice County to learn about the relationship between people and their environment. In the past his students have collected samples from the Cannon River, Wolf Creek and dozens of lakes from across the region.

This fall Bereket altered the process in order to encourage his students to question how people impact their natural surroundings not just in Minnesota but across the country. Most of the class continued to collect samples from local bodies of water so that the students could learn about the immediate effects of agricultural runoff, pollution and the general effect habitation has on the environment. Because chemicals and anions, such as nitrates and phosphates, stay in the water system through many cycles of precipitation and evaporation, Bereket encouraged one group of students to accumulate samples of rain water from as many states as possible.

These students first contacted their parents and parents of other students, but they did not receive nearly enough samples. The students then decided to make use of the hundreds of Carleton alumni who have graduated with degrees in geology. After finding their way into the college's alumni network, the students mailed out dozens of sample bottles asking for help in conducting their study.

The response was even better than they expected. Alumni responded from as far away as Alaska and Hawaii, 31 states in all. The students eventually amassed 51 samples and, thanks to the support of the alumni, finished their project with flying colors.

## ***Peter Otway Is Bernstein Geologist-In-Residence***

Peter Otway, a land surveyor and volcanologist who has spent 30 years monitoring and studying New Zealand's active volcanoes and tectonic zones for the New Zealand Institute of Geological and Nuclear Sciences (formerly the New Zealand Geological Survey), was our Bernstein Geologist-In-Residence for the 2004-2005 school year.

Dr. Otway is currently engaged in monitoring the crater lake of Mt. Ruapehu (where he still climbs and skis) and Lake Taupo for the Department of Conservation and the Institute of Geological and Nuclear Sciences, respectively. Over the past eight

years he has been running his own guiding business around his favorite New Zealand volcanoes, as well as giving lectures and talks on volcanoes and Antarctica. Many of his photos have also been published.

Dr. Otway has spent eight field seasons in Antarctica, as well as wintering over at Scott Base. His first visits, in the early 1960s, were spent mapping in the previously unexplored TransAntarctic Mountains in the Ross Sea region while traveling by dog sled. These were followed in the 1980s by annual surveys studying volcanic deformation on the crater rim of the most active Antarctic volcano, Mt. Erebus. He has also surveyed in Canada, Libya, Iran and the volcanoes of northwestern USA and Hawaii.

His Antarctic experiences range from surviving bone chilling blizzards on the Polar Plateau to dodging molten volcanic bombs from Mt. Erebus but his undoubted highlight was the privilege of being a member of the first expedition, led by Sir Wally Herbert, to survey and map Robert F. Scott's and Sir Ernest Shackleton's route up the Beardmore Glacier to the South Pole and then to follow in Roald Amundsen's tracks down the Axel Heiberg Glacier, exactly 50 years after the early explorers reached for the Pole in 1911.

Dr. Otway's presentations included:

- "Larry Gould, Carleton's Antarctic explorer." Showing of video and commentary by Eric Hilleman, college archivist
- "A Dog's Life In Antarctica-Mapping in the Ross Sea region by Husky Sledge in the 1960s"
- "The Volcanoes behind the Scenery - Keeping watch on New Zealand's Active Volcanoes"
- "Mt. Erebus: Fire and Ice - monitoring Antarctica's most active volcano"
- "Monitoring volcanotectonic deformation - examples of geodetic applications in dynamic geological areas"

During his visit, Mr. Otway participated in geology classes, had lunches with students and had open office hours.

### ***Kip Solomon Speaks On Ground Water Science***

by Karen Lee '07, Carleton News Bureau

Kip Solomon, Associate Professor of Geology and Geophysics at the University of Utah, gave the 2005 Darcy Lecture titled "Inert Gas Traces in Ground Water." Solomon's presentation focused on the basic concepts and case studies of using inert gas tracers as they apply to real ground water flow problems.

Solomon is the director of the Noble Gas Laboratory at the University of Utah. From 1997 to

2001, Solomon was on the editorial board for "Ground Water," a leading technical publication focused on crucial ground water subjects for ground water hydrogeologists. He was the joint technical program chair for the Geological Society of America's (GSA) annual meeting in 1997. He has been on the National Research Council's Committee on Improving Practices for Regulating and Managing Low-Activity Radioactive Waste and is currently the vice-president elect of the hydrology division of the GSA. He has published articles in the Journal of Hydrology and for Kluwer Academic Press.

Solomon received his B.S. in geological engineering from the University of Utah, his M.S. in geology from the University of Utah and his Ph.D. in earth sciences from the University of Waterloo in Canada.

The Henry Darcy Distinguished Lecture Series in Ground Water Science is a national lectureship established in 1986 to promote interest and excellence in ground water science and technology. The National Ground Water Research and Educational Foundation (NGWREF) sponsors the series, annually inviting an outstanding ground water professional to present his or her work to professors and students at colleges across the nation.

### ***Geoscience Workshop Focuses On Assessment Of Teaching***

by Dr. Cathryn Manduca, Director, Science Education Resource Center

Understanding what our students are learning is fundamental to good teaching. Within a class, this understanding guides our next steps with each student. On the scale of a course, it allows us to assess where our methods and materials are achieving the desired outcome and when they need revision. On the one hand, assessing student understanding lies at the heart of grading. However, on a larger scale, understanding what students are learning is fundamental to researching how students learn in the geosciences.

This spring a workshop on the Carleton campus brought 30 leaders in education and geoscience education together to improve our ability to design and use effective assessments in the geosciences, observe our students learning, and contribute to research on teaching and learning.

The conveners and planning team included Cathryn Manduca (Carleton College), David Mogk (Montana State University), Steve Reynolds (Arizona State University), Janice Gobert (Concord Consortium), and Priscilla Laws (Dickinson College).

This workshop was part of the On the Cutting Edge professional development program for current and future geoscience faculty, supported by the National Association of Geoscience Teachers with

funding provided by a grant from the National Science Foundation -Division of Undergraduate Education. We are part of the Digital Library for Earth System Education (DLESE).

### *Talks In Our Department This Year*

We had quite a number of talks presented in the department this year in addition to the distinguished lecturers listed in separate articles on the preceding pages. The additional talks included:

- Mike Smith '99, "Eocene paleohydrology of the Rocky Mountains"
- Lauren Chetel '02, "40Ar/39Ar geochronology and provenance of detrital K-feldspar in Ordovician rocks of the Upper Mississippi Valley"
- Nick Harris, Colorado School of Mines, "Congo Basin: Lacustrine sources of hydrocarbons"
- Qing Zhang, University of Minnesota, "Oblique collision between North and South China recorded in Zhangbaling and Fucha Shan (Dabie-Sulu transfer zone)"
- Mark Francek, Eastern Michigan University and the Science Education Resource Center, Carleton College, "Transforming our teaching with exemplary Web resources"
- Liz Hajek and Alex McKiernan, University of Wyoming, "Using LIDAR imaging to determine stacking patterns in the Castlegate Sandstone (Campaian), Helper, UT," and "Numerical modeling of pore-fluid evolution in the Nankain Trough, Japan"
- Kate Scharer, University of Oregon, "Structure and evolution of the Chinese Tian Shan"
- Sarah Titus, University of Wisconsin - Madison, "Comparing geodetic and geologic data from the creeping segment of the San Andreas Fault, California"
- Jordan Muller, NASA Goddard Space Flight Center, "Mechanical interaction of earthquake faults in northwest Turkey"
- Kelsey Jordahl, Fairleigh Dickinson University, "Heat and fluid flow on the Hawaiian Swell: revisiting the thermal origin of hotspot swells and the nature of hotspots"
- Christian Teyssier, University of Minnesota, "Aren't the mountains high enough? Paleoelevation of eroded orogens"
- Francois Morel, Princeton University, "Trace metals and ocean productivity: Biogeochemistry of trace metals and phytoplankton ecology"

- Steve Robertson '83, a hydrologist for the State of Minnesota, spoke in Hydrology class.
- Matthew Saltzman, Ohio State, and Dr. David Fox, University of Minnesota, spoke in Paleobiology class.
- Brian Klawiter, U.S. Forest Service, "Archaeology in Superior National Forest" in the Archaeology Capstone Seminar.
- Yang Wang, Florida State University at Tallahassee, "Mammalian diet, climate and tectonic change: Isotopic evidence from the northeast margin of the Tibetan Plateau"
- Emi Ito, University of Minnesota, "Application of stable isotope techniques to inorganic and biogenic carbonates. in tracking environmental change using lake sediments"
- David L. Fox, "Stable isotope ecology of a Late Miocene North America and studying the ecology of Late Pleistocene in North America"
- Francois Morel, Princeton University, "The carbonate systems and pH control"
- Kevin Theissen '96, University of St. Thomas (St. Paul, MN), "Record of Redox Status in Sediment Laminations from Lake Titicaca"
- Bill Slattery, SERC Faculty Fellow and Professor of Geological Sciences at Wright State University, "Negotiating the science education seas"

### *New Duncan Stewart Fellows Named*

Each spring, the geology faculty faces the difficult task of selecting a few students to be Duncan Stewart Fellows. The Duncan Stewart Fellowship was established in 1976 by Daniel Gainey, class of 1949, in honor of Duncan Stewart, professor of geology at Carleton for nearly 25 years.

We select the Stewart Fellows based on a combination of excellence in scholarship, a high level of intellectual curiosity, potential for scientific growth, and involvement in departmental activities. As we make this selection, we realize how fortunate we are to have so many talented, interesting, and impressive students within the department.

We are pleased to announce that Rachel Brown, Kelsey Dyck, Daniel Jones and Rebekah Lundquist, all class of '06, will be the 2005-06 Duncan Stewart Fellows. Rachel, Kelsey, Dan and Rebekah will extend the number of Stewart Fellows to 83. Congratulations and best wishes to you!



### *Six Nominated To Sigma Xi*

We congratulate the following senior Geology Majors who were recently invited to be Associate Members in Sigma Xi, the Scientific Research Society: Callen Hyland, Karla Knudsen, Cristina Robins, Ellen Schaal, Kate Stalker, and Nick Swanson-Hysell.

Sigma Xi is an honor society for scientists. Each year a few students are nominated as associate members based on their promise as scientific researchers and demonstrated research ability on comps projects and other independent research. Sigma Xi has over 100,000 members. Members and associate members receive American Scientist, a bimonthly journal. Nationally, Sigma Xi sponsors research awards and

conferences. The Carleton chapter of Sigma Xi sponsors a visiting lecturer each year and other occasional events.

### *Carleton Network For Lesbian, Gay, Bisexual And Transgender Geology and Natural History Alums*

The Network For Lesbian, Gay, Bisexual and Transgender Geology And Natural History Alums provides students and alums with career information, fellowship and support. The network was founded in 1990 and now has 36 members from coast to coast.

The network has the twin objectives of helping

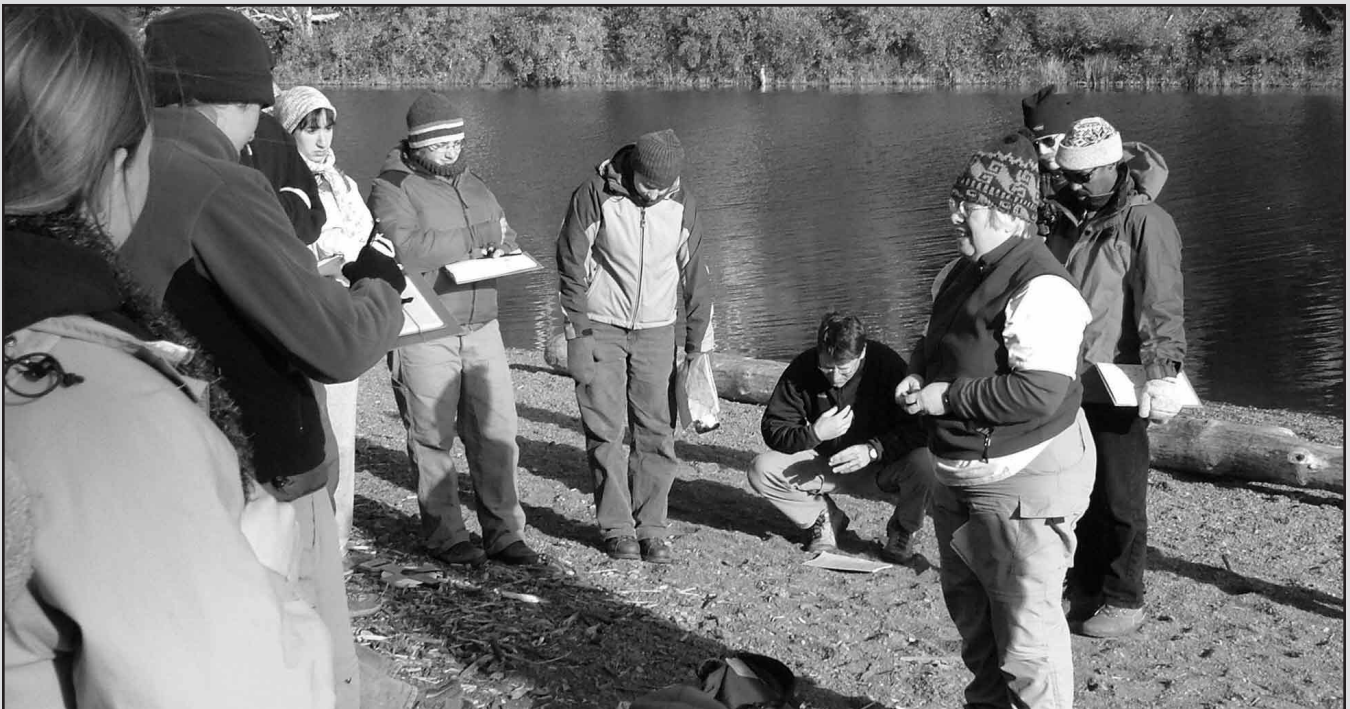


### *Northern Minnesota Field Trip, Fall Term, 2004*

*During Fall Term we took 34 students to the North Shore of Lake Superior and the Iron Range so they could experience geology in the cold rain first hand.*

*Upper left on this page, Cam Davidson explains structures on the beach of Lake Superior. Below, Mary Savina gets people started on a beach analysis problem at Gooseberry Falls.*

*Opposite page: (top photo) Megan Rohrsen '07 consults with Bereket Haileab in the Hibbing Taconite iron mine. It rained the whole day but the rocks didn't care. In the lower photo, Sarina Yospin and Kendra Murray, both '07, check out the deformed iron formation at the Tower-Sudan Mine State Park.*



reduce isolation among alums and helping to provide a more open, accepting and informative environment on campus for students in geology and related fields.

The network consists of a confidential list of names and addresses, circulated only to members of the network, maintained by Marilyn Yohe '88, Dan Spencer '79, and Tim Vick (Geology Department staff member). Inquiries about joining may be addressed to any of them.

LGBT folks might also be interested in the general alumni group called Out After Carleton. We are happy to provide contact information for them as well.



## *Greenhouse - Not Really So Green!*

by Susan Schnur '07

Earlier this term two lab sections of students from Chemistry 128 - Environmental Chemistry visited the land surrounding Chaney House (also known as Greenhouse) at 115 Maple St. and collected soil samples for analysis in the lab. They were looking for traces of lead in the soil surrounding the house. Lead is a natural component of soils at low levels, usually averaging 100 ppm. However, high levels are often found surrounding old houses that still retain their original lead paint coating. The lab sections did find lead at Greenhouse - plenty of it!

Results indicated a clear gradient of lead surrounding the house, with lead concentration decreasing quickly with distance from the house. Samples were taken from locations directly next to the south wall of the house to as far as 60 feet from the wall. The highest concentrations were found within 10 feet of the house, starting at about 3,500 ppm directly next to the house and decreasing to about 500 ppm at 10 feet from the house. The paint itself contained an enormous amount of lead; concentrations were measured at 366,000 ppm!

What does it mean? The important thing to know about lead is that it is most often found as a solid and it is not easily soluble in water. Thus it does not travel far from its source and is difficult to accidentally ingest. Although Greenhouse seems to be a center for high soil lead concentrations, this doesn't mean the entire area should be marked as a geohazard. The lead is very unlikely to be ingested by greenhouse residents unless they choose to plant fruits and vegetables directly next to the house.

(Disclaimer: These results are not conclusive; they are simply the result of a day's labwork from an introductory chemistry class. Actual lead concentrations may be somewhat different from reported values. This article is meant simply as an interesting note about the presence of lead surrounding old buildings on campus; it isn't an attack on Greenhouse or its residents.)

## *Geology Department T-shirts Available By Mail*

We have a supply of geology T-shirts available that can be purchased by mail. The cost is \$10 plus \$3 postage payable to Carleton College.

The 2005 shirt has a diagram on the back showing a mountain range being built in southern Minnesota thanks to Iowa being subducted under our southern



border. The picture says, "Bring Orogeny Back To Minnesota." The front diagram is a range of mountains saying, "Carleton Geology 2005." It is sage green, and at this time all sizes are available.

The 2004 shirt is an exciting "OSHA" orange with blue ink, the same as we have been painting our rock hammers. The front patch has a take-off on a hammer and sickle shaped from a hand lens and hammer, and the back design is "Oh I'm sorry... am I intruding?" It is 100% cotton, with S and XL available.

The 2003 shirt is sold out.

The 2002 shirt is light blue with black ink, with a picture of a hand pointing to a trilobite and saying in Latin, "This is my favorite animal." All sizes are available.

Email Tim Vick at tvick@carleton.edu or give him a phone call to find out whether your size is in stock.

### *2005 Awards*

**Phi Beta Kappa**

Callen Hyland  
Ellen Schaal  
Nick Swanson-Hysell

**Sigma Xi**

Callen Hyland  
Karla Knudsen  
Cristina Robins  
Ellen Schaal  
Kate Stalker  
Nick Swanson-Hysell

**Environmental and Technology Studies Summer Internship**

Jacob Gold

**Laurence Gould Prize in Natural Science**

Ellen Schaal

**Larson International Fellowship**

Lee Finley-Blasi

**Duncan Stewart Fellowship**

Rachel Brown  
Kelsey Dyck  
Daniel Jones  
Rebekah Lundquist

### *Senior Projects – 2005*

Graduating senior geology majors, their hometowns and titles of integrative exercise ("comps") projects:

**Michael Bagley**, Sitka, AK, "Geologic Mapping in the Afar with Landsat 7 ETM+ Data"

**Timothy Beaster**, Grand Marais, MN, "Agates: a literature review and Electron Backscatter Diffraction study of Lake Superior agates"

**William Gallin**, New York, NY, "Cosmogenic <sup>3</sup>He Exposure age dating of glacial and landslide deposits on Boulder Mountain, Utah"

**Sarah Greene**, Montgomery, MN, "An Investigation of El Niño-Southern Oscillation Cycles in the Mexxavalle Gesosso Solfifera: A Cyclostratigraphic Analysis of Messinian Laminated Evaporites in Portonovo, Italy"

**Callen Hyland**, Glenville, NY, "Incidence and diversity of iron mineral-colonizing microorganisms in seven hydrothermal environments, Yellowstone National Park, USA"

**Karla Knudson**, Decorah, IA, "Groundwater Geochemistry above and below the Decorah Aquitard"

**Emily LeVine**, Reisterstown, MD, "An Investigation of Resettlement Issues related to the Three Gorges Dam Project, People's Republic of China"

**Louise Miltich**, Cohasset, MN, "Low Temperature Cooling History of Archean Gneisses and Paleoproterozoic Granites of Southwestern Minnesota"

**Pamela Moeller**, Lincoln, NE, "Hydrothermal Structure of Newberry Volcano, Central Cascade Range"

**Cristina Robins**, Pratt, KS, "The Geology of the New Richmond Sandstone, Prairie du Chien Group, Southeastern Minnesota"

**Ellen Schaal**, Saint Paul, MN, "Sandstone Petrography and Evidence for Provenance Change in a Foreland Basin Succession, Southeastern Ebro Basin, Spain"

**Kathryn Stalker**, Seattle, WA, "Paleoenvironment reconstruction through paleosols in the Ebro Foreland Basin System, Spain: Evidence of global climate change"

**Nicholas Swanson-Hysell**, Saint Paul, MN, "Magnetic Reversal Stratigraphy in the Ebro Basin, near Horta de Sant Joen, Spain"

*Class of 2006*

Michael Bagley	Sitka, AK
Rachel Brown	Northfield, MN
Margaret Doheny-Skubic	Oak Park, IL
Kelsey Dyck	Bluffton, OH
Lee Finley-Blasi	Littleton, CO
Daniel Jones	Corvallis, OR
Rebekah Lundquist	Pelican Rapids, MN
Pamela Moeller	Lincoln, NE
Grant Rozier	Alma, MI
Emily Schwing	Salt Lake City, UT
Marisa Sowles	North Yarmouth, ME

*Class of 2007*

Lauren Andrews	Bella Vista, CA
Sarah Bergman	St. Paul, MN
Keith Christianson	Beverly Hills, MI
Mark Dyson	Cannon Falls, MN
Margaret English	Friday Harbor, WA
John Gibbons	Hurley, WI
Jacob Gold	West Chester, PA
William Guenther	Oak Park, IL
Jennifer Heathcote	Whitefish Bay, WI
Kelly Hereid	Wildwood, MO
Gloria Jimenez	St. Paul, MN
John Kracum	Winnetka, IL
Ross Mitchell	New Fairfield, CT
Kendra Murray	Fly Creek, NY
Selena Pang	Wailuku, HI
Donald Penman	New York, NY
Nicholas Riordan	Anchorage, AK
Megan Rohrssen	Marengo, IA
Ellen Root	Minneapolis, MN
Susan Schnur	Switzerland
Daniel Shapiro	Bronx, NY
Christina Spence	Tacoma, WA
Cliff Swanson	Los Alamitos, CA
Carl Ulberg	Seattle, WA
Sarina Yospin	Newton, MA

## *Lost & Found*

by *Timothy Vick*

It was cold, but not bitter, and the ground was wet because it was still in the process of thawing on May 7, 1984, when we stopped at the road cut near the "suicide hill" ski jump Eiler (Henrickson '43) liked to tell stories about. An overcast day, one of those days when the temperature at noon (about 48° F) was exactly the same as it had been at breakfast time. As the day wore on it began raining. The Upper Peninsula was treating us to another one of its dreary days.

We pulled up to the outcrop and began our bleary-viewed examination of this, another of the dark gray dimly bedded metamorphic rocks the area around Negaunee, Michigan, is so well known for. Pulling on your rain suit and closing up the cracks in the protection against the drizzle after you get out of the van takes several minutes under such conditions; when you climb into the vehicle it's never certain how long you will be in there so you tend to shed a few layers.

Soon it was clear this stop would be unusual. Eiler had not more than gotten out of his van and started walking around than he saw, and reached down to pick up, a brown leather wallet which had been hiding in the sandy mud by the side of the pavement. A quick look inside revealed an impressive sheaf of dollar bills. How does Eiler manage these finds? It looked like hundreds of dollars in there!

Well, it was. \$834 to be precise. Also, there was a driver's license, social security card and some other wallet type items. The outcrop slid to the rear of our collective consciousness.

After some consultation among the group we decided to check with the authorities and see if anyone had reported it lost or stolen (no one had), and then see if we could find the owner to return it. We knew nothing about the owner except that it was a man whose address was a place not too far from the town of Gwinn, where we were staying at the Girl Scout Camp Pow-Low.

If you don't know where you are going, the woods in that part of Michigan are deep and dark.

They are riddled with small jeep trails and other distractions which are the landlubber's counterpart to the hazards and distractions Odysseus encountered while he was trying to get back home to Penelope. So we thrashed around the woods for a while, here and there stopping to ask if anyone knew this man or where he might live.

Finally, at the end of the smallest dirt track in the deepest part of the woods, we crept into his, well, yard. I can hardly remember the house, but the image that comes to mind is that of a dark-colored two story structure, so it may have been covered with tar paper. At any rate, the yard was an incomprehensible jungle of old appliances and machines through which the driveway threaded in a sort of circle. There must have been as many machines in the yard as there were dollars in the wallet. Our two vans timidly crept in and stopped near the house.

We called the man out of his house and Eiler made the presentation. We must have been somewhat shocked by the scene, because no one felt like getting out of the vans. A quick-thinking person thought of asking the passenger in the front of Eiler's van to hold the microphone of the CB radio up so the conversation could be broadcast to the other van; it was one of the most bald faced cases of group eavesdropping ever.

The man couldn't believe his eyes. Here was his wallet with all that money inside. He told us that months ago he had taken the money out of his bank to go Christmas shopping, and had lost it that night when he "stopped by the road to take a pee." He said he'd gone back the next day to look for it without success, and that he had written off ever seeing it again.

"I didn't think there were people like you left anymore," he stammered as he tried to collect himself, partly beside himself with amazement and partly intimidated by the 20 or more people in the two large vans filling his normally uninhabited driveway. He blessed us and thanked us, and without questioning his story we departed.

The outcrops Eiler led us to were always of great value, but this time he had outdone himself.