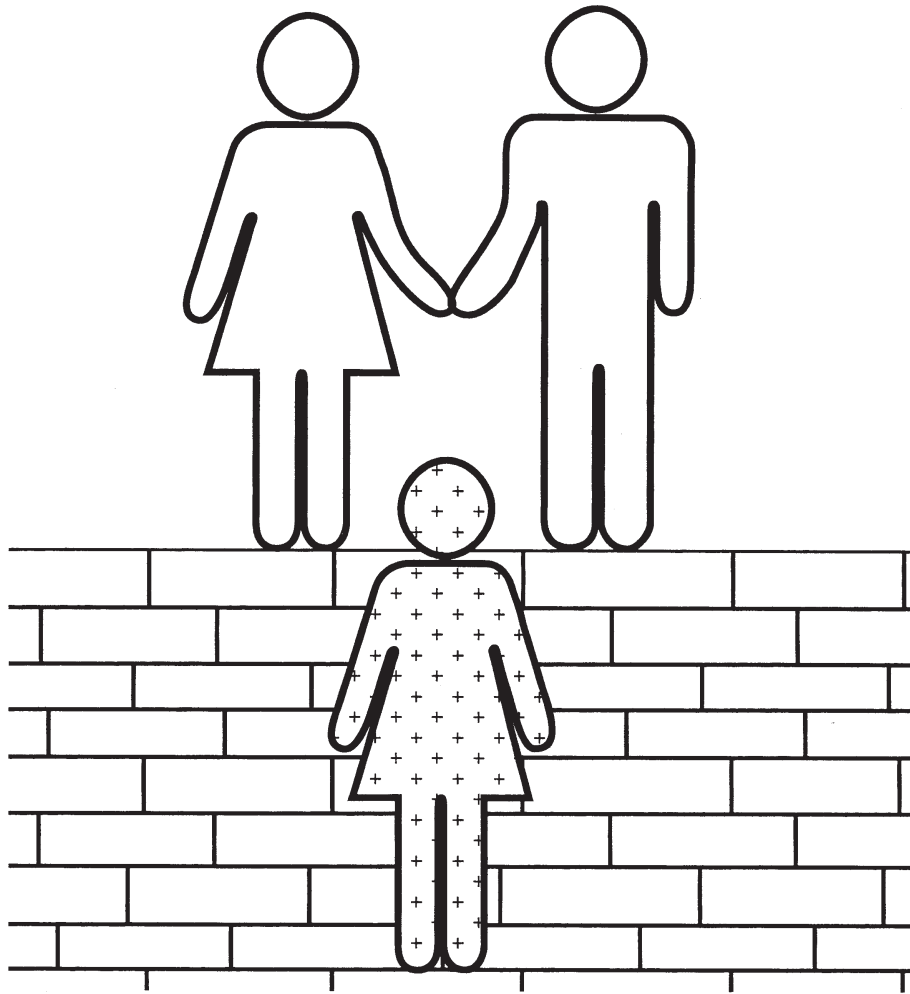


# *Carleton Geology Newsletter*

Volume XXIX

2004

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OH, I'M SORRY...  
AM I INTRUDING?

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The cover design is from this year's Geology T-shirt designed by Leah Morgan, Dave Auerbach and Lyndsey Kleppin, all '04.

The Carleton Geology Newsletter is edited by Timothy Vick.

**Photo Submissions:**

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**Department of Geology**  
**Carleton College**  
**Northfield, Minnesota 55057**

June 14, 2004

Dear Friends,

Greetings from Northfield! As always, it has been a busy, exciting year here, and the geology department is doing very well, though there have been some big changes. We graduated 20 wonderful seniors this year and we are delighted and amazed to see how much they've grown and accomplished during their time here — it is such a pleasure and so stimulating to be surrounded by these students. I encourage you to read the titles of their comps projects; you'll see that they have done some impressive things. We had students doing fieldwork in Italy, Mongolia, Alaska, and Chile, to name a few!

The big news this year is the retirement of Betty Bray, who, as departmental assistant had a tremendous effect on students and faculty alike. Betty's cheerful competence, her amazing organizational skills, her ever-present smile, and her warmth went a long way towards making our department such a fine place to work. She has enriched the lives of hundreds of students, and all of us in the department. While Betty can never really be replaced, we are all pleased to have been able to hire a new departmental assistant, Sarah Rechtizgel, formerly in the Dean of Student's Office.

Mercifully, Tim did not make a retirement pact with Betty — that would have spelled certain ruin. This means that there is even more pressure on Tim to keep things running smoothly, but if anyone can do it, he's the one.

We were very fortunate this year to have Sara Gran Mitchell '98 in residence for the whole year, teaching Geomorphology in the fall and Intro in the spring, and advising a sizeable group of seniors comps projects. Sara did a terrific job for us, teaching two very important classes; she returns to the U. of Washington next year to finish her Ph.D. We also had Ben Harrison '03 with us as the 5<sup>th</sup> year intern. Ben worked on a variety of research projects with Bereket, pursuing work on Tertiary basalts in the Pacific Northwest as an extension of work he and Bereket started during Ben's senior year.

As always, there were many field experiences for students and faculty this year. The fall began with another (and perhaps the final) edition of the Geology of Italy program. Jenn and I, along with Sandro, assisted by Luc Mehl '00 and Tiffany Larsen '03, had a wonderful time with the 25 students. As usual, the students acquired good mapping skills and good pizza-making skills. Clint's fall term Sedimentary Geology class finished off the term with a trip to the Bahamas to study modern carbonates. The fall field trip returned to the Black Hills and Badlands and the spring trip was in southern Missouri. Bereket's winter term Geochemistry class traveled out to the University of Utah to use mass spectrometers and other equipment as part of a class research project on local groundwater ages. In a new development, there were two combined Petrology/Structures field trips this spring, which worked out very nicely.

We had a series of fantastic outside speakers this year, including Richard Alley from Penn State, who spoke about abrupt climate change; Dave Montgomery from Washington who spoke about geomorphology and salmon; and Guy Narbonne from Queen's who spoke about the emergence of complex life. We also had some outstanding talks and satisfying visits from Adam (Snowball) Maloof '98 (just finishing his Ph.D. and Harvard) and Dr. Professor David Barbeau '97, who is taking 3 students (and Jenn and I) to Spain this summer for some fieldwork.

Here are a few more highlights. Clint offered two new classes this year on earth history and modeling and is working on plans for a joint Bio-Geo off-campus program in Australia for winter of 2006. Mary is now director of the Learning and Teaching Center on campus; she is also working on a project with Cathy Manduca at the Carleton Science Education Resource Center and thus did not teach in the department year, but she'll return to action in a half-time role next year. Cathy, by the way, won a prestigious national geoscience education award from AGU — we're lucky to be associated with her and the work at SERC. Bereket continues to develop our water geochemistry capabilities, his ion chromatograph is getting used in many classes; his geochemistry class made some very interesting discoveries on the ages of groundwater that will undoubtedly lead to a publication. Jenn's cave research is taking off — her NSF grant was funded on the first try and her lab is full of busy students from Biology, Chemistry, and Geology. Her Geomicrobiology class has even apparently discovered a new kind of microorganism associated with springs in the nearby Cannon River Wilderness Park. Cam, along with several other faculty, wrote an NSF proposal, which we just learned has been funded, to get an attachment for the Biology department's SEM, which will allow us to make elemental maps of geologic materials.

As many of you already know, Jenn and I spent a good part of this year looking for jobs elsewhere after it became apparent that Carleton could not find a way to offer Jenn a secure, long-term position. As luck would have it, Penn State advertised for two positions that seemed to be a perfect fit for each of us and they ended up offering us very attractive positions. Members of the Carleton Geology Department made a valiant effort to try to come up with a solution, but in the end, the offers from Penn State were just too good to pass up. I will take on the role of undergraduate program head, and Jenn will take a position in Astrobiology; both of us will be in the Geosciences Department, which is filled with some outstanding colleagues. As excited as we are about these new positions, we are very sad to leave Carleton.

As always, thanks to all of you who provide help and support to our students during the course of the year — the network of geology alumni is really important to us.

Best Wishes,

*Dave Bice*

# DEPARTMENTAL NEWS

## *Dave Bice And Jenn Macalady Depart For Penn State*

Geology Department Chair Dave Bice '81 and his wife, Jenn Macalady '91, both faculty members in the Geology Department, have accepted new positions at Penn State University at University Park, Pennsylvania.

While technically Dave is still with us until the end of 2004 but on leave, both of them are in the process of making their transitions to Penn State. Dave will lead the undergraduate program in their Geosciences Department and Jenn will join their Astrobiology group, also in the Geosciences Department. These are wonderful opportunities for both Dave and Jenn. At Penn State, Jenn will be working with a large group of researchers and graduate students who are investigating different aspects of geomicrobiology. Dave's appointment shows that Penn State recognizes both his exceptional teaching record and his ability to bring liberal arts ideals and practices to a "big-school" environment.

Jenn graduated from Carleton with a geology major in 1991, and earned her M.S and Ph.D. at the University of California at Davis, followed by post-docs at the University of Wisconsin and UC Berkeley. She has taught Geomicrobiology and Introductory Geology here for two years.

Dave has been a member of the Carleton Geology Department since 1987, rising to the rank of full professor in 1999. He earned a B.A. in geology from Carleton in 1981 and a Ph.D. in geology from the University of California at Berkeley in 1989. He chaired the department for six academic years, 1998 through 2004.

Dave's courses over the years, always very popular, have included Introductory Geology, Geology and Global Change, Structural Geology, Tectonics, Oceans and Atmosphere Dynamics, the Canyonlands Research Seminar, Advanced Structural Geology, Sedimentary Geology, and as part of the Italy program, Field Observational Skills, Geology of Italy, Basin Analysis and Event Stratigraphy. Dave

also has written extensively on the concepts of teaching quantitative modeling and earth systems science in the undergraduate environment.

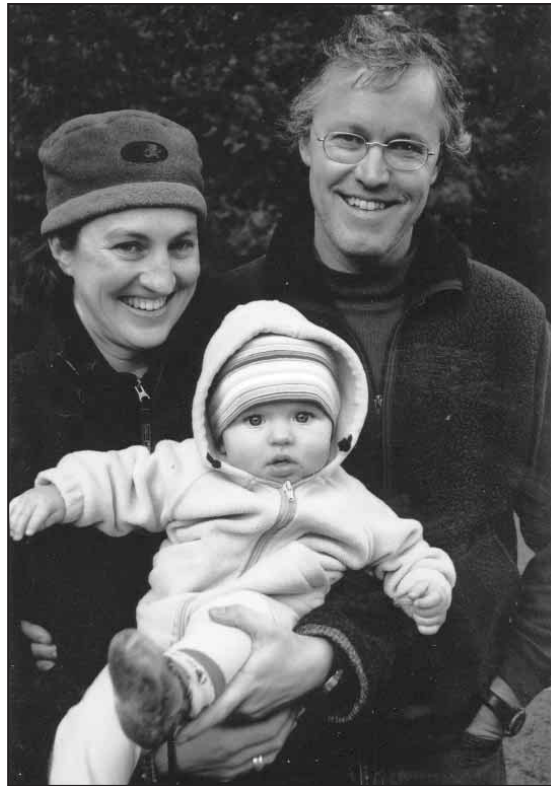
Dave's educational leadership manifested itself immediately upon his arrival as a young professor in the Geology Department when he used his start-up money to purchase several Macintosh computers for the labs. Macintoshes were unfamiliar to the rest of us at the time, and we weren't quite sure what he was up to, but soon he was using them extensively for modeling sedimentation and other geological processes. Our first internal computer network was the Appletalk daisy chain that grew over several years and finally wound through all of Mudd's ground floor. In its final configuration before it was replaced by Ethernet, the Appletalk network included a star hub, about eight computers scattered around the department, and a printer.

Dave also introduced the use of the dynamic modeling program STELLA®, which in the ensuing years has been

extensively used by many of our classes. Dave's online guide to modeling geologic processes with Stella is available on the Carleton Geology website.

Dave founded the Italy program in 1993 in the hamlet of Coldigioco, in the mountains southwest of the port city of Ancona, and he has run it six times on alternate years. The program has been extremely successful and is always oversubscribed. The program has featured extended field trips to the Italian Alps, Tuscany, and other locations around Italy. Students also fell in love with Italian culture and cuisine during the program, and they enjoyed taking excursions to Rome, Pompeii, Florence, Assisi, Gubbio and Sicily among many other places, during vacation days.

In his 17 years teaching at Carleton Dave proved himself to be a master teacher. While we are sorry to see Dave and Jenn leave, and they will be sorely missed, we wish them the best of fortune in their new endeavors!



*Jenn Macalady, Dave Bice and their son Luca*



## Betty Bray Retires

*And We Hope She Has One Heckuva Good Time!*

We have to be both happy and sad that Betty Bray is retiring at the end of this school year. Happy for her that she and Mike will get to do a lot of things they've been waiting to do, and sad that she's leaving us as a colleague and presence in the Geology Department.

Betty has been a supportive constant in the department for longer than any of us can remember: she was already here when each of us arrived!

Many people sort of glide into retirement during the last few years they work. You know the type, putting in their time and finishing out their years. That wouldn't be Betty. Betty didn't decide to retire until just a few months ago. Even then, the prospect of retirement on the horizon didn't dampen her enthusiasm for getting done today what somebody else might put off until tomorrow. Betty is a Now person, and I think she always will be. If something needs doing, get to work on it!

Betty joined the Geology Department as Secretary in 1971 at \$2.31 an hour. Her current salary as Administrative Assistant is confidential, but it's probably gone up a bit. We were in Leighton Hall then, and she had an IBM Selectric typewriter and lots of carbon paper.

"I remember making carbon copies of correspondence and student recommendations; sometimes two and three copies, which of course meant erasing all those copies if I made a mistake. What a big difference from the computer world today!" Betty rates the conversion from typewriters to word processors as one of the biggest challenges and highlights of her career because of the way it changed the way she worked.

One of the memorable moments in Betty's career was our symposium in 1983 commemorating the 50th anniversary of the founding of the Geology Department. Betty did almost all of the organizing. She says, "People came from all over the country, including Larry Gould, and the night before the big symposium we had the biggest snowstorm in 40 years! The airport closed, highways were closed, and nobody could get anywhere without a snowmobile. In spite of the fact that things didn't happen as planned, the symposium was a big success and went off without a glitch. Since Larry Gould was known for his work in Antarctica, we told him we ordered this storm just for him."

Helping create Carleton's Century of Geology, a commemorative book about the Geology Department and its faculty, alumni and students, in 1975, was another milestone. Betty tracked down every single one of the 235 geology graduates, giving us a 100% response rate of all the graduates from 1931 through 1975. Even today students are awed by Betty's persistence as she "encourages" every senior to hand in their final comps papers in duplicate.

Tardy people find themselves getting a phone call at 9 a.m. (dreadfully early for a student), and if the paper doesn't come within a few days the next call comes at 8:30, then 8:00, and... you get the picture. The papers get turned in.

Betty and her husband Mike celebrated their 40th anniversary last summer. Mike retired from teaching health and driver's ed in the Rosemount-Apple Valley school district in 1997. They have two grown children and three grandchildren. Julie and her



*Betty Bray*

husband Ted live in St. Paul so Betty and Mike see their grandsons quite often. Joe is a major in the Army, and he and his wife Susan are stationed in Germany.

Betty was born and raised in Montgomery, a town of about 2,000 mostly Czech descendents west of Northfield. Before she settled into the Geology Department she had another life as a beauty queen. In high school in Montgomery Betty won a medal for playing the leading role in a one-act play competition, and she was runner-up to the Kolacky Queen in the 1958 Montgomery Kolacky Days celebration. (A kolacky is a Czech pastry, often with a poppy seed and/or prune filling.) After graduating from high school, Betty lived for a time in Nevada where she was crowned Miss Pershing County, became a finalist in the 1961 Miss Nevada contest, and was voted Miss Congeniality by the other Miss Nevada contestants. She still turns heads today.

Betty says, "I have two pages of things written down that I would like to accomplish after I retire, and then I want to write a book. Mike and I are looking forward to making up our own calendar of events from now on!"

Take it away, Betty!! Have a great time.

## ***Jenn Macalady Receives National Science Foundation Grant***

Carleton College News Bureau

Jenn Macalady, assistant professor of geology at Carleton College, has received a National Science Foundation Grant for her proposal titled "Microbial Community Controls on Sulfide Oxidation Rates and Cave Formation in a Subsurface Biogeochemical System." The total award is \$179,935 for three years.

Microorganisms shape the chemistry of the earth's surface and atmosphere in ways that are important for climate change, elemental cycling, agriculture, and human and environmental health. Most microbial communities in nature are too complex to predict their behavior, but those below the earth's surface are among the simplest.

Macalady will carry out her research at a cave called Grotta di Frasassi in Italy. "Because the cave microbial communities are simple enough to study in great detail, we can ask very basic ecological questions like 'What controls the diversity of microorganisms in a specific place?' and 'How does microbial diversity affect the geochemistry of the environment?'" she said. "We are after general rules that will help us predict how microorganisms assemble themselves in response to geochemical conditions."

Macalady says that formulating such rules would help future efforts by other researchers to design microbial communities to do jobs like pollutant biodegradation or methane production. "Studying microbially-dominated communities like those in the cave may also shed light on the behavior of the earth's surface biogeochemistry and evolution during the three billion years when microorganisms were the only biota," she said.

Macalady has had the assistance of several Carleton students while working on this project, including Laura Cleaveland '01, Katja Meyer '03 and Bess Koffman '04. She also hopes to have four chemistry, geology and biology students working on various aspects of the project each year. Most of her work is done in her lab on campus, though some of the work will also be carried out in the cave and in a mini-laboratory she set up this fall at the Osservatorio Geologico di Coldigioco near the cave. Students in her geomicrobiology classes also will look at the microorganisms and minerals from the cave as examples of the intimate link between microbial activity and geological processes.

"One of the best things about doing this project at a place like Carleton is seeing students with different backgrounds collaborate," Macalady said. "It

brings their expertise as geologists, chemists, or biologists into focus. At the same time, they are reaching across disciplinary boundaries in pursuit of finding out something new. For me, these are some of the best moments in the lab."

## ***Carleton Geology Faculty, Students And Staff Present Research At GSA***

By Kelen Tuttle '04

Carleton College News Bureau

Fourteen Carleton professors, students and staff members presented their research at the 115th annual meeting of the Geological Society of America in Seattle on Nov. 2-5. With over 7,200 attendees, this was the largest annual meeting in the Society's history. Topics presented ranged from new theories in geoscience education to detailed scientific research and discoveries.

Cathryn Manduca, Director of Carleton's Science Education Resource Center, presented "Sharing Teaching Materials and More: New Opportunities for Placing DLESE Resources in Context," which described possible applications of the Digital Library for Earth System Education. Also, in collaboration with Professor David Mogk of Montana State University, Manduca presented a poster session titled "Using Science to Teach Science: Motivations, Methods and Tools." In this session, Manduca described several current projects of Carleton's Science Education Resource Center that supports effective science education nationwide, including the development of an online community center for the Digital Library for Earth System Education, professional development workshops and on-line resources for geoscience faculty, and an interdisciplinary effort to understand how faculty engage students with data in their courses.

With similar goals, Elizabeth Clark '03 and Mary Savina, the McBride Professor of Geology and Environmental Studies, presented a poster session titled "Analyzing Historical Climatology Records in Introductory Geoscience." This poster discussed the opportunity for introductory geology classes to utilize preexisting data sets in a classroom setting, building students' confidence in their data analysis skills while improving the depth of their geological knowledge.

Savina presented "Using Nineteenth Century Literature in Geoscience Classrooms." This talk discussed the feasibility of using non-fictional accounts of earth scientists such as Henrik Ibsen's "An Enemy of the People" and Mark Twain's "Life on the Mississippi" in the classroom. In collaboration with assistant professor of geology Bereket Haileab, Savina

also presented a poster session titled "Building Community through Group Projects," which discussed civic engagement projects in geology and environmental studies that were recently completed by Carleton students.

In collaboration with Savina, Charles Priore, research and instruction and science librarian, Colleen McFarland, former research and instruction librarian, and Cameron Davidson, associate professor of geology, presented "Information Literacy in the Geosciences at Carleton College: Strategies and Assessment," a poster session describing how students build competency in using data and library resources through their geology courses at Carleton.

Davidson presented a poster session titled "A Proposal to Build Data-Rich Rock Suites for Learning Petrology," a call to the geoscience community to help develop resources for learning important geologic concepts in discovery-based environments. In addition, Davidson is co-author on research papers presented by Devin McPhillips '03 and Elizabeth Cassel '03, respectively titled "Geochronology From a Contact Metamorphic Assemblage Near the Edge of the Wrangellia Composite Terrane, Talkeetna Mountains, Alaska," and "Crystallization Depths of Cretaceous Plutons Along the Wrangell Transect, Southeast Alaska."

Also working with data from Alaska, George Tangalos '03 and Haileab presented a poster session titled "Genesis and Contamination of the Kodiak Batholith, Kodiak Island, Alaska," which probes the effects of regional plate tectonics in Alaska.

Sara Gran Mitchell '96, visiting instructor in geology, presented a talk titled "Polygenetic Topography of the Washington Cascades and Topographic Signature of a Glacial Buzz Saw." This project is part of a collaboration to study the rise of the Washington Cascade Range, and includes Peter Reiners '91.

Benjamin Harrison '03, educational associate in geology, presented "Geochemical Tracing of Basalt Provinces in the Early History of the Yellowstone Hot Spot," a poster session describing his recent research data.

Clint Cowan, associate professor of geology, presented a paper titled "The Effect on Paleo-Productivity of the First Major Delivery of Mid-Laurentian Sapolite-Derived Material to Phanerozoic Oceans," with co-authors Anthony C. Runkel of the Minnesota Geological Survey and Matthew Saltzman of Ohio State University. This research paper investigates the effects of the submergence and subsequent emergence of late Cambrian North America and the Upper Cambrian global carbon isotope, or SPICE, event.

## *Richard Alley Presents Chesley Lectures On Global Climate Change*

This year's Chesley Lecture, titled "Back to our future: A paleoclimatic view of what may happen" was delivered by Richard B. Alley, Evan Pugh Professor of Geosciences and Associate of the EMS Environment Institute at Pennsylvania State University. Professor Alley's research focuses on deciphering and understanding the record of recent climate change contained in large ice sheets as well as the role of large ice sheets in effecting climate change. The lessons learned from his research into the past behavior of our climate system have important and surprising implications for the future of our climate. Dr. Alley recently chaired a National Research Council study on Abrupt Climate Change, and has served on many other advisory panels and steering committees. He has also testified before the U.S. Senate and advised Vice President Al Gore.

Dr. Alley also presented a technical talk to the Geology Department on the mechanics of glacial erosion and spoke on climate change in Jenn Macalady's section of Introductory Geology.

Dr. Alley is a Fellow of the American Geophysical Union, and has been awarded a Packard Fellowship, a Presidential Young Investigator Award from the National Science Foundation, the Horton Award of the American Geophysical Union Hydrology Section, the Easterbrook Award of the Quaternary Geology and Geomorphology section of Geological Society of America, the Wilson Teaching Award of the College of Earth and Mineral Sciences and the Faculty Scholar Medal of the Pennsylvania State University. He is the author or coauthor of more than 135 refereed publications and several books, including "The Two-Mile Time Machine," which won the Phi Beta Kappa Science Award in 2001.

Dr. Alley received his Ph.D. in geology, with a minor in materials science, from the University of Wisconsin-Madison in 1987, and earned an M.Sc. degree (1983) and B.Sc. degree (1980) in Geology from Ohio State University in Columbus, Ohio, U.S.A.

The Chesley Visiting Lectureship in the fields of the natural and physical sciences, mathematics, and anthropology is made possible by a gift to Carleton College from Jean M. Chesley '37 of Red Wing, Minnesota, and the late Dr. Frank G. Chesley '36. The Chesley Lectureship brings an outstanding scholar and teacher to Carleton each year for a series of classes, public lectures, faculty seminars, and student meetings.





## ***Seds Class Studies Modern Carbonate Deposition***

*Clint Cowan's Sedimentology and Stratigraphy class spent a week studying carbonate sedimentation on San Salvadore Island in the Bahamas in December. Above, the class looks at excavation burrows left behind by ancient wasps. The sediments that today are sea cliffs were deposited as migrating sand dunes and could have housed a variety of burrowing creatures. At left, Jeff Dorr '04, Mike Bagley '05 and Dan Jones '06 begin their underwater mapping project at Singer Point. They mapped the active deposition in the nearshore zone that is affected by waves and tidal currents.*

## *Guy Narbonne Speaks On Precambrian Paleontology*

This year we welcomed Dr. Guy Narbonne, Professor of Geological Sciences at Queen's University in Kingston, Ontario, as our Bernstein Geologist In Residence for this year.

Dr. Narbonne is a leading expert on the paleontology of Earth's earliest complex life forms, including the famed Ediacara fauna. His work has taken him and his graduate students around the world, from Namibia to the Arctic, but perhaps the most spectacular recent result of his research has been the discovery of extraordinarily-preserved Ediacaran fossils at Mistaken Point, on the Avalon Peninsula of eastern Newfoundland, Canada. Here, amazing "Pompeii"-like fossil beds (animals buried rapidly by volcanic ash), have allowed Guy and his team to analyze the ecosystem structure of these earliest complex animals. Intriguingly, the Ediacaran at Mistaken Point make their appearance immediately following a postulated "Snowball Earth" event, when the globe may have been entombed in ice for millions of years.

Dr. Narbonne has also been active in research on Precambrian stromatolite reefs that crop out in the Canadian Arctic. Most of the research crosses the borders of paleontology, biology, sedimentology and geochemistry. Guy is widely published in the scientific literature, and his work has appeared on CBC television and radio, and recently as the cover story in Canadian Geographic Magazine.

During his visit, Dr. Narbonne presented talks entitled "In the Aftermath of Snowball Earth: Fossils of the Oldest Complex Animal Life" and "Precambrian Microbial Reefs: Templates for Modern Reef Ecosystems?" He also participated in geology classes, including Paleobiology, had lunches with students, and open office hours.

The Bernstein Geologist In Residence series is supported by the Parnassus Foundation, founded by Raphael and Jane Bernstein, parents of John Bernstein '86.

## *David Montgomery Is Allensworth Geologist In Residence*

Dr. David Montgomery visited as our second annual Allensworth Geologist in Residence. Established by Georgina (Gina) Michl '96 in memory of her grandparents, Frances and Rol Allensworth, the Allensworth Distinguished Lecturer Endowment supports scholarly work and a distinguished lecture series in the Carleton Geology Department.

Dr. David Montgomery is a Professor in the Department of Earth and Space Sciences at the University of Washington where he teaches geomorphology, fluvial geomorphology and runs numerous graduate-level seminars. He is also currently the Director of UW's Quaternary Research Center.

Dave's research emphasizes an understanding of the linkages between the physical processes that generate and redistribute sediments in natural landscapes, which is necessary to provide a basis for understanding impacts of human activity and climate change on both geomorphic and biologic systems. Dave is currently leading a research program in Mountain Drainage Basin Geomorphology to develop methods for analyzing and predicting geomorphic response to both natural processes and anthropogenic disturbance. A major goal of this program is to develop models of the physical environment necessary for understanding landscape development and ecological response to disturbance. This program involves field studies of geomorphic processes and development of digital terrain models for predicting the spatial distribution of erosional processes, channel morphology, and sediment production and routing. Parallel research efforts focus on slope instability, fluvial processes in mountain drainage basins, and the uplift and sculpting of mountain ranges using a combination of field experiments, field observations, and modeling. For more information, visit Mountain Drainage Basin Geomorphology Research at <http://duff.geology.washington.edu/index.html>.

Dave's many publications, appearing in journals such as Science, Nature, Geology and GSA Bulletin, focus on the linkages between the physical processes that move sediment around and the impacts of humans and climate change on geomorphic and biologic systems. He has worked in locations like the Washington Olympics, the Oregon Coast Range, the Philippines, and Tibet. In 2003 he published a book entitled "King of Fish: The 1,000 Year Fall of Salmon," that discusses the ways humans have facilitated the destruction of wild salmon stocks worldwide. He currently advises or co-advises no fewer than four Carleton geology alums at the University of Washington.

Dave presented two talks during his residency: "King of fish: the thousand-year run of salmon," Thursday, April 1 at 4:30 p.m. and "A fluvial tour through eastern Tibet," on Friday, April 2 at 1:30 p.m.

During his visit, Dr. Montgomery also participated in geology classes, had lunches with students and open office hours.

## ***Cathy Manduca Honored For Excellence In Education***

Congratulations to Dr. Cathryn Manduca, Research Associate in the Carleton Geology Department, who has been named the 2004 winner of The American Geophysical Union's Excellence in Geophysical Education Award.

The award recognizes a sustained commitment to excellence in geophysical education by a team, individual, or group. It is given to educators who have had a major impact on geophysical education at any level (kindergarten through post-graduate), who have been outstanding teachers and trainers for a number of years, or who have made a long-lasting, positive impact on geophysical education through professional service. The presentation ceremony was at the AGU's spring meeting in Montreal in May.

Cathy is the director of the Science Education Resource Center at Carleton where she is involved in a variety of projects that support improvements in geoscience and science education (see SERC). She also is a Research Associate in the Carleton College Geology Department.

Cathy is a leader in the geoscience community, organizing workshops and other activities for faculty and educators of all types and developing Internet resources that link teaching resources, pedagogy and discussion. Much of her work is in support of the programs of the National Association of Geoscience Teachers (NAGT), the Digital Library for Earth System Education (DLESE), and the National SMETE Digital Library (NSDL).

The letter of nomination by two other professors of geology, Heather Macdonald '76 of the College of William and Mary and David Mogk of Montana State University, cited Cathy as "a leader and visionary who has demonstrated a deep and sustained commitment to excellence in geophysical education and has had a major impact at the national scale." Of her many accomplishments, they highlighted her work as Coordinator of the Keck Geology Consortium, her contributions to national digital libraries, and her involvement in bringing important issues to the attention of the geophysical education community through community-wide conferences and workshops, sessions at professional meetings, and leadership within professional societies. The nominators also underscored Cathy's interest in collaboration and her initiative, energy, enthusiasm, and good humor.

## ***Cathy Manduca Elected President Of NAGT***

Congratulations (again) to Cathy Manduca on her election to the presidency of the National Association Of Geoscience Teachers!

The NAGT, established in 1938, fosters improvement in the teaching of earth sciences at all levels of formal and informal instruction, emphasizes the cultural significance of the earth sciences, and disseminates geological knowledge to the public.

The NAGT is probably most well known for its journal, "The Journal Of Geoscience Education," but it also organizes the technical program in geoscience education each year at the annual meeting of the Geological Society Of America and sponsors technical sessions, workshops, and field trips. The organization fosters advances in the teaching and learning of geoscience through scholarship aid to summer field camp students, professional workshops for geoscience faculty, a distinguished speaker series and a partnership with the National Association for Black Geologists and Geophysicists.

Cathy served as the organization's Second Vice President in 2001 and as a Distinguished Lecturer in 2000-2001. Her term as president runs from November 2003 to November 2004.

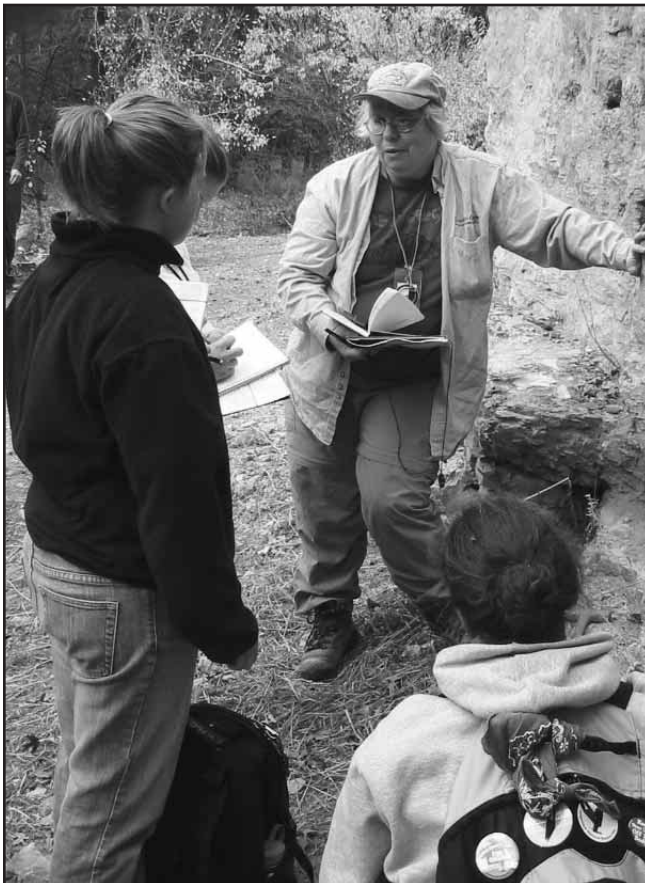
## ***Sarah Rehtzigel Is New Administrative Assistant***

We'd like to extend a warm welcome to Sarah Rehtzigel, who will be replacing Betty Bray as the Administrative Assistant in the Geology Department office.

Sarah comes to us from the Dean of Students Office where she was Secretary to the Associate Deans of Students for seven years. Prior to that she worked in the college Wellness Center and as a lab receptionist at the Allina Clinic in Northfield.

Sarah lives in Kenyon with her husband, Joel, and children, Luke, 6, and Emily, 4. Her favorite hobby is flower gardening.



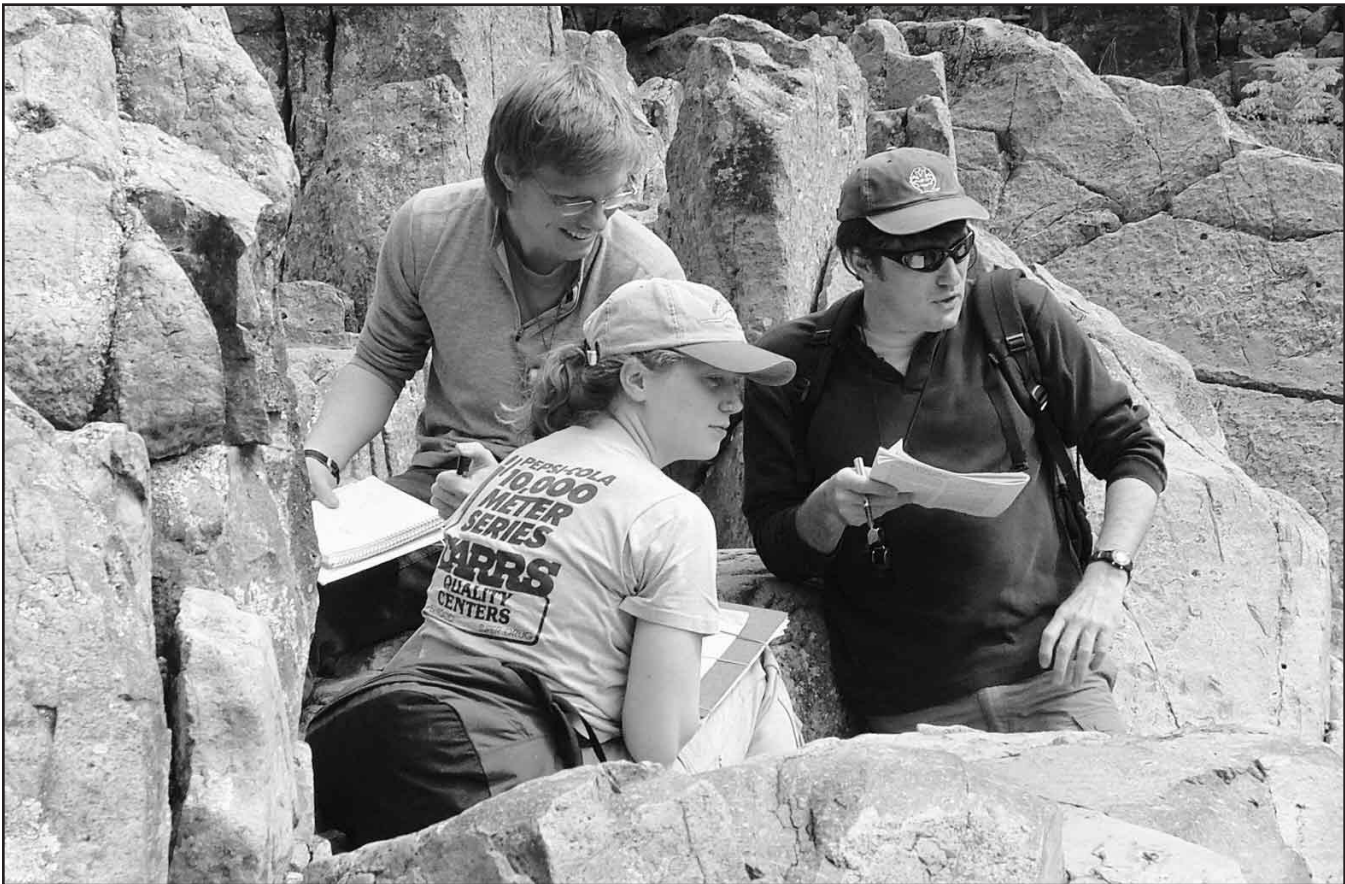


## ***Black Hills And Missouri Field Trips***

*The Departmental field trips this year went to the Black Hills last fall and Missouri this spring. Twenty eight students went on the South Dakota trip and 35 on the Missouri trip. Clockwise from left:*

- *Mary Savina coaches one of the small mapping groups working in Little Elk Creek Canyon.*
- *Bereket Haileab leads the discussion at the summit overlook of Bear Butte, just east of the Black Hills;*
- *On the Missouri trip, Cam Davidson led a discussion of the petrology and structure of the dike atop Knob Lick;*
- *Clint Cowan worked with Lyndsey Kleppin '04 and Nick Riordan '07 as they worked on a mapping challenge in Johnson Shut-Ins.*







## ***NATURE* Articles Co-authored By Carleton Grads Take Opposite Sides In Debate Over The Role Of Rainfall In Mountain Building**

*The following story is excerpted from an article in the Dec. 11, 2003 issue of NATURE, "Geomorphology: Nature, nurture and landscape" by Peter Molnar, Department of Geological Sciences, and the Cooperative Institute for Research in Environmental Science (CIRES), University of Colorado at Boulder, Boulder, Colorado.*

The endless debate over the relative importance of nature and nurture in child development has its equivalent in geomorphology. In this case, the argument is about the roles of tectonics and climate in mountain erosion. Tectonics (nature) sets the initial conditions by raising Earth's surface and, where active, renewing topography. Climate (nurture) shapes the surface into its various forms through its effect on glaciers and rivers. Three papers in the December 11 issue of the prestigious journal NATURE take the argument forward by isolating and evaluating the importance of certain climatic and tectonic factors in erosion.

Although there is a long tradition of measuring sediment transport by rivers, only infrequently will that record include the full range of floods that have shaped the landscape. Flooding obeys a power-law distribution, and the largest floods have the largest effect on landscape. But only in rare regions are we likely to have witnessed them - hence the need for an approach that will produce a record that includes several such extreme events.

To quantify erosion rates, the research groups apply thermochronometric methods to rock now exposed at the surface. Temperature increases with depth in the Earth and, at high temperatures, noble gases emitted in radioactive decay diffuse away; defects (tracks) in crystals, produced by the charged particles expelled in nuclear fission, anneal. By measuring the concentrations of such gases or tracks, one can date when the sample cooled below a temperature at which diffusion or annealing is slow. With an assumed temperature gradient in the Earth, the upshot is an estimate of the average exhumation rate, which in these cases equals the rate that material above the sampled rock has been eroded. Such estimates apply to periods as short as 500,000 years to as long as several million years. But in all cases they span several glacial and interglacial cycles, and so smooth the effects of large climatic changes.

Peter Reiners '91, Sara Gran Mitchell '96 et al. present the simplest result: erosion rates averaged

over the past few million years in the North Cascade Mountains of Washington state correlate with the present-day distribution of rainfall. Precipitation and erosion rates vary by an order of magnitude across the range, with rapid erosion having occurred where rain falls most today. As virtually all of the rock exposed in the mountains must have lain below sea level a few million years ago, they deduce that rock moved up relative to sea level despite the absence of any tectonic process. Because of isostasy (Archimedes' principle applied to the Earth's crust immersed in its more dense mantle), removal of a mass of rock from the Earth's surface will be compensated by the rise above sea level of approximately 80-85% of that mass.

By contrast, D.W. Burbank, Beth Pratt-Sitaula '93 et al. deny that precipitation has a major role in erosion in their study area, the Himalaya. They measured rainfall along a profile across a segment of the Himalaya, and they compare that rainfall with estimates of erosion rates along a valley floor from the Lesser Himalaya into the Greater Himalaya. A narrow zone separates the Lesser Himalaya (where wide rivers, bounded by sediment-filled terraces, flow through relatively gentle, deeply weathered hill slopes) from the snow-capped Greater Himalaya (where slopes are steep, valleys deep, and weathering and terraces sparse).

Burbank et al. measured much more rapid erosion in the Greater than the Lesser Himalaya. More importantly, they detected no measurable difference in erosion rates across the Greater Himalaya despite a five-fold decrease in precipitation there. They infer that precipitation does not exert a first-order control on erosion. Noting that all of the rapidly eroding terrain moves rapidly upward with respect to the lower, gentler region to the south, and leaving open the question of what physical processes cause erosion, Burbank et al. suggest that tectonically forced upward movement is the most important factor affecting erosion across a region of such different rainfall.

### ***A Note From Ed Buchwald***

Retirement seems to suit us just fine. Cynn timer and I have divided our time among family, travel, and good deeds. Adam and Nancy live in Boston, Julie and Chris in New Orleans, and Charles and Amy on Salt Spring Island in British Columbia, so we have great places to visit while enjoying the company of some terrific people. Last fall we combined a train trip to Boston for Adam's wedding with a chance to visit some of the great natural history museums in America.

Cynn timer and I have been volunteering as educators at Agate Fossil Beds National Monument in

Nebraska, and we thought it would be fun to see where some of those Miocene mammal fossils were on display. We were able to see great exhibits at the Field Museum in Chicago, the Peabody at Yale, the American Museum of Natural History in New York, and the Smithsonian Museum of Natural History. We are hoping to see the Carnegie collection in Pittsburgh in the fall. Working in the Volunteers in Parks program has been terrific. I especially enjoy helping rangers update their knowledge of geology and paleontology and also working with local school children, all of who attend one-room schools.

Cynn timer continues to volunteer at the Northfield Hospital and I am still the Scoutmaster of Troop 337, having celebrated 35 years in that job last December.

I have enjoyed attending alumni weekend at Carleton and hope to see many of you. It is such great fun for me to catch up on your lives!

Ed Buchwald

## ***Carleton Geology Graduates Score!***

By now everyone has probably heard that Carleton has ranked well in the U.S. News and World Report rankings, but here is a little supplemental info that is more specific to geology.

Carleton's Office of Institutional Research monitors statistics for the college and they recently circulated some findings regarding the success of our graduates in earning advanced degrees.

Between 1991 and 2000, a total of 46 Carleton graduates earned Ph.D. degrees in geology, placing our graduates second (behind UC-Berkeley) in absolute number of geology Ph.D. degrees earned among graduates of all four-year colleges and universities. All the other schools in the top 20 in the listing were much larger with 10,000 to 60,000 graduates compared to the 4402 Carleton graduates who would have been in the age group likely to have earned advanced degrees during the decade.

In the same years Carleton graduates earned 58 Ph.D. degrees in all areas of earth science, placing us seventh behind the graduates of larger schools such as UC-Berkeley, UW-Madison, Penn State, and so on. All the other schools in the top 25 in the ranking had more than 10,000 alumni in the appropriate age group.

In terms of the proportion of graduates earning geology and earth science Ph.D. degrees, Carleton ranks first among liberal arts colleges. The only schools ranking higher on a proportional basis are technology universities.

## ***Steve Ingebritsen '78 Given GSA Hydrogeology Award***

We are pleased to report that the Hydrogeology Division of the Geological Society of America chose Steven Ingebritsen '78 as the 2003 year's recipient of the O.E. Meinzer Award.

The Meinzer award is given annually to the author or authors of a published paper or body of papers of distinction that have advanced the science of hydrogeology or a closely related field, and was published during the five calendar years prior to the year of its selection. In addition to Steve's outstanding contributions to hydrogeology, the 2003 O.E. Meinzer Committee recommended the award be based on six of his more recent papers. The presentation of the award occurred in November 2003, at the annual meeting of the Geological Society of America in Seattle.

Steve received a BA degree in Geology from Carleton College (1978) and MS (1983) and PhD (1986) degrees in Hydrogeology from Stanford University. He has been a member of the USGS since 1980 and currently serves as Branch Chief for the Water Resources Division research group in the western US. Steve received the John Hem Excellence in Science and Engineering Award from the NGWA in 2000 and served as the Birdsall-Dreiss Distinguished Lecturer in 2001. He and Ward Sanford are co-authors of the textbook "Groundwater in Geologic Processes" (Cambridge University Press, 1998). His research interests include volcanic and hydrothermal systems, crustal permeability, and land subsidence.

The papers upon which the award was based are:

- \* Hayba, D.O., and Ingebritsen, S.E., 1997, Multiphase groundwater flow near cooling plutons: *Journal of Geophysical Research*, v. 102, p. 12,235-12,252.
- \* Ingebritsen, S.E., and Jones, D.R., 1999, Santa Clara Valley, California - A case of arrested subsidence in Galloway, D. L., Jones, D. R., and Ingebritsen, S. E., eds., *Land subsidence in the United States*: U.S. Geological Survey Circular 1182, p. 15-22.
- \* Ingebritsen, S.E., and Manning, C.E., 1999, Geological implications of a permeability depth curve for the continental crust: *Geology*, v. 27, p. 1,107-1,110.
- \* Ingebritsen, S.E., and Manning, C.E., 2002, Diffuse fluid flux through orogenic belts: Implications for the world ocean: *Proceedings of the National Academy of Sciences, USA*, v. 99, p. 9,113-9,116.
- \* Ingebritsen S.E., and Sanford, W.E., 1998, *Groundwater in Geologic Processes*: New York, Cambridge University Press, 341 p.

\* Manning, C.E., and Ingebritsen, S.E., 1999, Permeability of the continental crust: Implications of geothermal data and metamorphic systems: Reviews of Geophysics, v. 37, 127-150.  
Way to go, Steve!

### ***Talks In Our Department This Year***

Talks given during the 2003-04 school year included:

Butch Dooley '91, "The geology and paleontology of the Carmel Church Quarry, Virginia;"

Richard Alley speaking on the Frank G. and Jean M. Chesley Lectureship, "Back to our future: a paleoclimatic view of what may happen," "Why the mating behavior of crayfish matters to climate change," and "How glaciers erode."

Dave Montgomery, University of Washington, speaking as an Allensworth Geologist in Residence, "The king of fish: the thousand-year run of salmon," and "A fluvial tour through eastern Tibet."

Jean Chu '73, "Community awareness and action for natural disasters."

Russell Shapiro, Gustavus Aldophus College, "The history of life."

Adam Maloof '98, "Snowball Earth."

Dave Barbeau '97, "Linking tectonics and sedimentation: application of growth structures to kinematic history analysis."

Bret Berglund '85, Environmental geology consulting projects and opportunities in Alaska."

Guy Narbonne, Queen's University (Canada), speaking as a Bernstein geologist in residence, "In the aftermath of snowball Earth: fossils of the oldest complex animal life," and "Precambrian microbial reefs: templates for modern reef ecosystems?"

### ***Carleton Senior Sean Bryan Presents At North-Central GSA***

by Kelen Tuttle '04, Carleton College News Bureau

Sean Bryan, a Carleton senior geology major from Cincinnati, Ohio, presented research at the 38th annual meeting of the North-Central Section of the Geological Society of America in St. Louis, Ill., in April, 2004. Approximately 400 geoscientists attended the event hosted by the Department of Earth and Atmospheric Sciences of St. Louis University.

Bryan presented a poster session titled "Basin Morphology, Sedimentology, and History of a Small Proglacial Lake, Matanuska Glacier, Alaska." The study examines the morphology, sedimentology and geologic evolution of a small lake, located less than a kilometer from the Matanuska Glacier in Alaska that is now almost completely drained. Using data collect-

ed during the summer of 2003, Bryan determined that, at its peak, the lake was approximately 120 meters long by 85 meters wide and had a maximum depth of eight meters. Analysis of aerial photography indicates that the lake was drained of most of its water sometime after 1949.

Bryan's study contributes to a general wealth of knowledge of the processes that take place around glacier margins, and will assist the interpretations of glacial sedimentary deposits.

"Conducting original research at the undergraduate level is invaluable experience and enforces the knowledge received in the classroom," says Bryan. Building upon this experience, Bryan plans to work in geology related employment in Colorado for two years before continuing his education in graduate school. "This experience has better prepared me for both future employment and graduate school," says Bryan.

### ***Duncan Stewart Fellows***

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 Ellen Schaal '05, Nick Swanson-Hysell '05 and Lisa Kanner '04 will be the recipients of this years Duncan Stewart Fellowship in Geology. Ellen, Nick and Lisa will extend the number of Stewart Fellows to 79. Fellows for this past year were Kristin Bergmann and Breanyn MacInnes, both '04.

Our congratulations to Ellen, Nick and Lisa!

### ***Network For Lesbian, Bisexual, Gay And Transgender 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 reduce isolation among alums and helping to provide a more open, accepting and informative environ-



ment 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. 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.

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

We have some geology T-shirts available that we can mail out. The cost is \$10 plus \$3 postage payable to Carleton College.

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 "Pardon me, am I intruding" as seen on the cover of this year's Newsletter. 100% cotton, all sizes available.

The 2003 shirt is dark "hunter" green with white lettering. On the front it has a small patch that says "Carleton Geology 2003," and on the back it has the timeless drawing by S.T. McWhinnie '85 saying, "Meet me behind the outcrop, baby... I'm a little boulder there." It's 100% cotton.

The 2002 shirt is light blue with black ink with a picture of a trilobite and a hand pointing to it and saying "Hoc animal maxime placet," Latin for "this is my favorite animal." 100% cotton.

Email Tim Vick at [tvick@carleton.edu](mailto:tvick@carleton.edu) or call to find out whether your size is in stock.

## *2004 Awards*

### **Phi Beta Kappa**

Kristin Bergman

### **Sigma Xi**

David Auerbach

Kristin Bergman

Annaliese Eipert

Lisa Kanner

Bess Koffman

Breanyn MacInnes

Leah Morgan

Brandon Murphy

Kristin O'Connell

### **Duncan Stewart Fellows**

Lisa Kanner '04

Ellen Schaal '05

Nicholas Swanson-Hysell '05

### **Environmental and Technology Studies Summer Internship**

Emily Schwing

## *Senior Papers - 2004*

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

**David J. Auerbach**, Salem, OR, "The Steptoean

Positive Isotopic Carbon Excursion (SPICE) in siliciclastic facies of the Upper Mississippi Valley:

Implications for mass extinction and sea level change in the Upper Cambrian"

**Kristin Bergmann**, Gaithersburg, MD, "Stream incision and sagebrush expansion on the Kern Plateau, California: A hydrologic perspective"

**Sean Bryan**, Cincinnati, OH, "Basin morphology, sedimentology, and history of a small proglacial lake, Matanuska Glacier, Alaska"

**Jeff Dorr**, Storrs, CT, "Desertification of the Gobi"

**Annaliese Eipert**, Seattle, WA, "Optically stimulated luminescence (OSL) dating of sand deposited by the 1960 tsunami in south-central Chile"

**Joseph Graly**, Berkeley, CA, "An Intrusive Complex in the Khovsgol-Ulaanbadrakhin Terrane, southeastern Mongolia"

**Heather Hilchey**, Minnetonka, MN, "A signal of abrupt climate change in Alaska"

**Kristen James**, Alexandria, VA, "Determining the source for the magmas of Monte Amiata (Central Italy) using strontium, neodymium, and lead isotopes"

**Lisa Kanner**, Amherst, MA, "Geomorphic evidence for Martian climate change"

**Lyndsey Kleppin**, Anchorage, AK, "Petrography and characterization of alteration in concrete containing aggregates from the Umbria Marche Sequence, Italy"

**Bess Koffman**, Yelm, WA, "Molecular phylogenetic analysis of a bacterial mat community, Le Grotte di Frasassi, Italy"

**Sarah A. Leibson**, Rochester, NY, "Uplift of marine terraces along the San Andreas Fault: Fort Bragg region, northern California"

**Breanyn MacInnes**, Greensboro, NC, "Uplift and deformation of marine terraces along the San Andreas Fault: Duncan's Landing to Fort Ross, California"

**Sarah Margoles**, St. Louis Park, MN, "Terrestrial carbon storage and sedimentation in the Coon Creek Watershed, Wisconsin"

**Leah Morgan**, Essex Junction, VT, "Molecular evidence for microbially-mediated sulfur cycling in the deep subsurface of the Witwatersrand Basin, South Africa"

**Brandon H. Murphy**, St. Louis, MO,  
 "Cyclostratigraphic analysis of pelagic carbonates and  
 astronomical correlation in the Early Oligocene at  
 Monte Cagnero (Piobbico, Italy)"

**Gabriel J. Nelson**, Lake Nebagamon, WI,  
 "Microstructures associated with deep crustal subduc-  
 tion deformation in the Cycladic Blueschist belt,  
 Syros, Greece"

**Kristin O'Connell**, Minneapolis, MN, "Ages, geo-  
 chemistry, and field relationships of mafic dikes along  
 the Wrangell Transect, Southeast Alaska"

### *Class Of 2005*

Timothy Beaster	Grand Marais, MN
William Gallin	New York, NY
Sarah Greene	Montgomery, MN
Brenden Hughes	Springfield, IL
Callen Hyland	Glenville, NY
Karla Knudson	Decorah, IA
Emily Levine	Reisterstown, MD
Andrew Lorenz	Birmingham, MI
Louise Miltich	Cohasset, MN
Cristina Robins	Pratt, KS
Ellen Schaal	St. Paul, MN
Marisa Sowles	North Yarmouth, ME
Kathryn Stalker	Seattle, WA
Nicholas Swanson-Hysell	St. Paul, MN

### *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
Lianne Hilbert	Ann Arbor, MI
Daniel Jones	Corvallis, OR
Andrew Lorenz	Birmingham, MI
Rebekah Lundquist	Pelican Rapids, MN

### *Poetry From The Intro Exam*

This spring Sara Mitchell's class in Introductory  
 Geology was given the challenge of earning extra  
 credit on their final exam by writing a haiku or limer-  
 ick. Here are a few of the best ones:

Rocks broken apart  
 Deposited together  
 Lithification

\* \* \* \* \*

Basaltic lavas  
 at divergent boundaries  
 form new ocean crusts

\* \* \* \* \*

Vans outside of Mudd.  
 Where are we going today?  
 Much learning awaits.

\* \* \* \* \*

I see formations  
 It's all sedimentary  
 My tummy rumbles

\* \* \* \* \*

*The Little Chicago Haiku*  
 Where's the granite from?  
 Proof of extensive glaciers:  
 Laurentide ice sheet.

\* \* \* \* \*

There once was a lab ass named Dave  
 Who always on Thursdays would slave  
 To get us to explain  
 The strikes, slips and planes  
 Before to us the answers he gave.

## *Mary Savina's Students Work With City Government*

by Carol Roecklein, The Northfield News

A warm smile forms on Mary Savina's face as she describes how her experience as a geology professor, coupled with her understanding of local government, led her to discover the vital link between academic work and community involvement.

"Teaching students about the local landscape and history gives them a sense of place. It's not just an inward look, but a look at where they're situated in geology and history," she said. "It also teaches them to question: 'What do the things we find tell us about the people?'"

Savina is the McBride Professor of Geology and Environmental Studies and Humphrey Doermann Professor of Liberal Learning at Carleton College. She is also the coordinator at the Perlman Center for Learning and Teaching. She earned her bachelor's degree at Carleton, and her master's and Ph.D. degrees at the University of California, Berkeley. Savina joined the Carleton faculty in 1978.

In addition to her work as a teacher, Savina is active in local government. A few times a month, on Monday nights, Savina can be found at City Hall observing Northfield City Council meetings for the Northfield League of Women Voters.

Because of her role as observer for the past eight years, Savina has been privy to city government discussions, which ultimately led her to an important realization.

"It occurred to me that the city will never have enough staff or money to complete everything," she said. Therefore, Savina began to engage her students through community projects, such as creating a preliminary natural resources inventory for the city. Other projects include creating city development flow charts and compiling inventories and questionnaires related to local issues, such as open space and affordable housing.

Savina's sense of community runs deep and she's working to teach her students a sense of place by linking their academic work with the Northfield community.

"The students and the community both gain by these projects," she said. "Their work is never a substitute, but it can help educate people in city government and lead them to ask consultants better questions and provide them with preliminary questions."

Savina said the majority of Carleton students are from urban landscapes and are unfamiliar with the Minnesota prairies and soils. She said community projects teach students about the local landscape in addition to life-long lessons in civic engagement.

"I hope these students will go into other com-

munities and have the same habits," she said. "I can see students making connections and I hope they use what they learn to become informed, active citizens later in their lives."

Savina was born and raised in Stamford, Conn. Her father was a chemical engineer and her mother taught junior high math and science. Julia Savina moved to Northfield seven years ago to be near her eldest daughter. Her younger daughter Jean is an occupational therapist in Baltimore. Julia described Savina as a brilliant student who was active in Girl Scouts.

"By the time she went to school, she had already learned to read," she said.

Since Savina was a young girl, Julia said her daughter has always been drawn to music and played in the youth orchestra. Today, Savina is an active member of the United Church of Christ, where she sings alto in the church choir. She also sings in the New Prague vocal group, Hymnus, and plays the cello in a quartet.

"She's an opera buff and she goes to the opera all over the world," she said. "I think music is her recreation." As a teenager in the 1960s, Savina said her participation in the National Science Foundation programs was particularly influential. She said her hands-on experience in Northwest Louisiana and Missoula, Mont. solidified her interest in science.

Savina also taught for three years in Wellington, New Zealand and designed and led a 10-week class to Death Valley in the mid-1980s. She also spent time in Grevena, Greece, working on an archaeological dig with Nancy Wilke, where roughly 8,000 years of archaeological information was collected.

Combining her years of teaching with civic engagement has been a natural progression for Savina.

Whether it's a Midwestern river or the California Mojave Desert, each year Savina leads many students through various terrains teaching them about the landscape, the people and community involvement.

"If you see a student in a local river, exploring, he or she probably belongs to me," she said.

## Northfield native brings message of hope

By Carol Roecklein, The Northfield News

In response to a series of books known as the "Left Behind" novels that describe explicit end-of-the-world scenarios where an avenging warrior Jesus kills non-believers and saves the moral righteous minority, Barbara Rossing offers a hopeful and healing interpretation in her book, "The Rapture Exposed: The Message of Hope in the Book of Revelation."

The Left Behind novels have sold roughly 50 million copies and continue to gain in popularity. The series was written by Tim LaHaye and Jerry Jenkins, cofounders of the Moral Majority with Jerry Falwell in 1979.

Last month, Rossing, a Northfield native, appeared on 60 Minutes II to debunk the series and its message and was interviewed by Morley Safer for a segment entitled: "The Greatest Story Ever Sold."

Rossing is scheduled to speak at 8 p.m. May 19 at St. John's Lutheran Church and will offer a model for viewing Scripture in the power of Jesus' nonviolent, self-giving love for the world. Northfield roots.

In addition to growing up in Northfield, Rossing is a 1976 Carleton College graduate with a major in geology. She is the daughter of Dorothy and Tom Rossing, a former St. Olaf College physics professor. She is the sister of Mary Rossing, a Northfield resident and owner of Present Perfect, a store on Division Street.

Rossing is an ordained minister in the Evangelical Lutheran Church of America and earned a doctorate from Harvard University Divinity School and a masters of divinity degree from Yale University Divinity School. She teaches at the Lutheran School of Theology in Chicago. Rossing said she was compelled to write the book after delving into the Left Behind novels herself.

"As I went out speaking at Lutheran churches and around the country, more and more people were asking me questions about these novels: 'What do you say about the fictional scenarios of the end of the world in the Left Behind novels?'" she said. "I needed to answer that question. After I started reading them, I was so alarmed by them that I decided to apply for a grant to give me the time to write a book responding to the novels."



Barb Rossing with Morley Safer on the 60 Minutes set

Rossing received a Lilly Endowment grant and spent a year writing the book.

"It took me the full year to research it," she said. "First, I read all the novels and then I went on a trip to the Middle East, where so many of the novels are set in Israel, Palestine and Jordan."

### Research and strength

As a result of her research, Rossing said she gained an inner strength and knowledge.

"It was really empowering because I've always been a little intimidated by fundamentalists," she said. "The more I studied the whole origin of this fundamentalist theology, the more I realized this isn't biblical. It was empowering to realize I could stand up to this. There are holes in their system and I need to expose their assumptions. Some of the things they write are not justifiable biblically. Now I feel a lot more confident about critiquing their theology, and I think that's an important kind of confidence."

Rossing explores the image of Jesus as a lamb in Chapter Six, entitled, "Lamb Power."

"I went out in the country where a family was raising lambs and spent some time with the lambs reflecting on what the Bible means if it is casting Jesus in the role of the lamb," she said. "What does that teach us and what does lambness look like in our world? I believe that lamb power is a powerful way of living in the world."

Rossing stressed the importance of hope, particularly in the aftermath of the Sept. 11, 2001 tragedy, the war in Iraq and recent events.



“It’s hard to live with a sense of hope sometimes, but I do believe that is the bible’s message and that God is with us,” she said. “More and more, I understand it to be a different set of lenses that can see the hope in the midst of despair.”

**A message of hope**

In the last two chapters of Rossing’s book, “Rapture in Reverse” and “The Journey Outward,” she uses examples from the natural world to illustrate hope.

She said using the natural world to portray a message of hope was a result, in part, from her connection to nature.

“How the rivers of our world can remind us of the river of life and how we’re supposed to see glimpses of God’s river of life in the Cannon River, or the trees of our world, like in the Arboretum,” she said. “We really are supposed to live with that vision for a world that is renewing and healing and not destructive.”

Rossing earned an undergraduate degree in geology at Carleton.

“The Carleton geology department field trips were formative,” she said. “We would go on week-long field trips to the Black Hills and to the Ozarks. You really get this great appreciation for the incredible diversity and wonder of God’s creation.”

Rossing lives eight blocks from Lake Michigan in Chicago and connects to nature each day.

“Canoeing down a river and glimpsing a Great Blue Heron taking off is the idea of wonder that I want to talk about at St. John’s and of the renewal of the world,” she said. “The book of Revelation is not God’s nightmare for our world, it’s God’s dream for our world and we see glimpses of that dream of hope for our world. God wants to bring about the healing not the destruction of the world.”

Barbara’s book is available from many book-sellers including Amazon.com.