Welcome

A few words from the Chair ... Paul Pinet

Time, five years of it, has vanished much too quickly even while I oversaw the department as chair. I was convinced that time would drag because of what I imagined to be onerous administrative responsibilities. A few were burdensome tasks, but most were not at all. Also, five years of "chairing" seems like an impressive accomplishment, but I cheated. In fact, Connie served for a year and Charlie for a semester as acting chairs while I was leading Off Campus Study Groups to Manchester, England and Wollongong, Australia. By the time you read this, Bruce will be firmly implanted as our new chair, a very good appointment for the department.

Much happened during my tenure as chair, largely because of the hard work of our committed faculty and talented students. I basically had to make sure that I, as chair, did not interfere with the ongoing work and vision of our faculty and staff. What follows is a brief overview of some very special achievements.

Connie was promoted to full professor and Amy to associate professor; Karen and William "passed" their third-year reviews. Jodi McNamara is our new administrative assistant, the person whom I most relied on for critical help in executing my duties as chair. Charlie and Bruce were honored by the University by being appointed to the William R. Keenan Jr. Chair and the Harold Orville Whitnall Chair, respectively. Last year, Rich finished two terms as Director of the Natural Science and Mathematics Division and is back with us, teaching and doing research, where he belongs. Art took a year-and-a-half-long leave to direct the Tectonics Division of the National Science Foundation in Washington, D.C. and has just recently rejoined the department. Charlie was recently featured in a Nova special on the fate of Venice as sea level rises. Karen received the Biggs Earth Science Award from the Geological Society of America. Di and Dave continue to be the solid bedrock figures of the department, helping faculty and students alike in countless, invaluable ways. Remarkably, this hodgepodge of people works cooperatively and selflessly for making our geology program the very best that it can be. Having an infusion of fresh ideas and boundless energy from new faculty has helped us immensely in rejuvenating and improving our department.

What else has happened recently? Well, the Environmental Geology concentration is solidly in place, and is beginning to attract more majors, although our classical geology concentration continues to be the department's workhorse. Our seven-weeks-long summer field program is better than ever, beginning with an eastern leg mostly in the Adirondacks and upstate New York, and ending with a popular western leg in Wyoming,
Colorado, Utah, and Arizona. Based on exit interviews with graduating seniors, this off-campus geology program continues to be the stellar academic experience for the vast majority of our majors. Other extended field excursions have been offered as well, including trips to the Bahamas, California, and Washington. Research opportunities for students abound as never before, with many venturing to Antarctica, the Galápagos Islands, Canada, and the Adirondacks with their mentors. Finally, our collection of instruments for research and teaching is unparalleled for institutions like our own. Upgrades and acquisitions during the past five years include a new XRF/XRD, an inductively coupled plasma-mass spectrometer, a stable isotope ratio mass spectrometer (currently being assembled), and a just funded grant for a new SEM. Perhaps the biggest news is the active planning for a new interdisciplinary science building to be shared by geology, physics and astronomy, geography, environmental studies, among others; Charlie (see his enclosed article) is overseeing and "sheparding" the planning stage of the new building project. Last but not least is the citizenship deportment of our faculty who teach numerous First-Year seminars, Core Science Perspective courses, Core Distinction courses, and an assortment of introductory courses that satisfy the science distribution requirement. The future of geology at Colgate looks brighter than ever.

Messages from the Faculty

Rich April

After six years as director of the division of Natural Sciences & Mathematics, I returned to the department full-time last fall. Being division director gave me a chance to see how the University operates at the administrative level, and to get to know the science faculty quite well. From all my experiences I can tell you, without any hesitation, that Colgate has one of the finest science faculty of any liberal arts college in the nation.

The division director job was half-time (so they said!), so I continued to teach mineralogy, geochemistry, and other geology and environmental studies courses over this period of time. The department has had some excellent students come through the concentration program over the past several years, and it has always been my great pleasure to have them in my classes. I am amazed to think that last fall I taught mineralogy for the twenty-fifth time since coming to Colgate back in the seventies. Are students better today than they were a couple of decades ago? I'd say they are just as smart, maybe a bit more savvy about the world at large, but not much different when it comes to academic ability and aspirations for the future. Thankfully, I haven't yet had a cell phone ring during a mineralogy lecture, but I did have a pager go off in class a couple of times last year. The student (a very bright and nice guy) was a member of the EMT rescue squad in town, and the disruption was totally understood. It seems like more and more geology students are getting involved in outreach programs and service to the community, and the department is very proud of this.
This past spring I decided to create a new course called "Gems" for the scientific perspectives (SP) program of the liberal arts core curriculum. The course will look at the geology and chemistry of precious stones, and will examine the origin, history, myths and lore of diamonds, rubies, sapphires and emeralds, as well as a score of other gemstones, including opal, jade, tourmaline, and pearls. To get some background information for the course I visited the mineral and gem collections of several museums, including the Smithsonian and the American Museum of Natural History in NYC, talked to lots of people (including some Colgate alums) in the gem and pearl trade, and read many books on gems and precious stones. For those of you who like to read books about minerals and gems, both fiction and non-fiction, let me recommend the following: "Barren Lands," by Kevin Krajick; "Diamond," by Matthew Hart; "The Last Empire," by Stefan Kanfer; and a beautifully written recent novel by Tobias Hill called "The Love of Stones." The first three books are all about the fascinating history and business of diamonds. I had Kevin Krajick come to talk to my class last fall about his book, which details the search for diamonds in the North American arctic. It is a terrific tale, and I think anyone with an interest in minerals and geology, or who loves stories about explorers, will find it hard to put down, once you start to read it.

I've continued my research in the Adirondacks on the impact of acid deposition on forested ecosystems. I was up there just two weeks ago with two biologists and a geology colleague (and former Colgate geology student) to do some preliminary field work for a new, collaborative research project we are hoping to begin, soon. Collaborative research is becoming more and more popular, and necessary, these days in all the sciences, but especially in the field of environmental science. Natural systems are very complicated, and in order to better understand them it is necessary to study them with multidisciplinary and interdisciplinary teams of scientists. The benefit of collaborative research is something I try to impress upon my students in all of the classes I teach. Fruits of some of this collaborative research will be coming out shortly in a co-authored paper (currently in press) in the Journal of Water, Air and Soil Pollution that addresses the fate of lead in forest soils. Much of this lead was derived from atmospheric sources during the middle of the 20th century when automobiles tanked up on leaded gasoline.

Finally, I want to say hello to all of you Colgate geology grads out there who I haven't seen in years. I heard several of you were looking for me during reunion weekend, the same weekend I had to drive my youngest daughter down to NYC to move into an apartment and begin an internship for the summer. Sorry I missed you, and I hope to hear from you. It has been wonderful reading all of your replies to the mailing that went out recently requesting ditties for this newsletter. I think it's safe to say that the vast majority of you are doing very well, are happy, and are enjoying the life that you live. We love to hear from you, so please keep us informed on your whereabouts, and on your successes and accomplishments. Take care, and peace and happiness to you all.

Rich
Allen Dennis '82

I am proud to have been able to return to Colgate Fall '02 as Whitnall Professor of Geology. I am grateful to the University of South Carolina system and the research successes that I have had here with Department of Energy and the National Science Foundation grants and contracts, my teaching successes as a professor as recognized by the Geological Society of America and the SC Commission on Higher Education, and my work as a departmental chair for the past five years that made this appointment an easy one for the department to recommend to the Dean of Faculty. Summer '02 I taught a dozen students on the Off-Campus at Canada Lake with William Peck and at Seminole Reservoir, Wyoming with Dave Baird, Paul Pinet, and the Beloit, Akron, Wyoming field camps (!). In the fall I taught Structure and a CORE: Scientific Perspectives class (no lab) on the History of Life. The Structure class had a great four-day field trip looking at the rift-drift transition on the Iapetan margin in NY-MA, the Taconic slate belt, the Catskill fold-thrust belt, metamorphic rocks of western Mass, and the Deerfield Triassic basin. The only downside to the trip was that I couldn't go to Chris Gage's ('94) wedding the same weekend! I had a great time this past fall semester.

Unless you graduated in the past four years, Colgate Geology has probably changed from what you remember. The faculty continue to be outstanding scholars: creative, exciting, charismatic and devoted to their students. I can't tell you what a pleasure it was to work alongside them. In any given semester, one or more faculty are away from the department either tending significant University administrative responsibilities, leading Off-Campus Study Groups or are on sabbatical. The situation is complicated by important departmental commitments to the CORE curriculum and Environmental Studies. The students are bright and interested, but there are fewer of them. The effects of the addition of the Environmental Geology and other specialty or "hybrid" concentrations, a vital and growing Geography program, increased participation in Study Groups in addition to the OC, and the Outdoor Ed program on Geology enrollments and the geology program are complex. It is clear that the popular menu of CORE: Scientific Perspective courses offered by Geology faculty does not necessarily lead to concentrators or minors; and Colgate's lack of a distribution requirement specifying two lab sciences for all students has hurt science enrollments generally. In this context, the valuable service activities by geology faculty and exceptional development opportunities provided by Colgate for those faculty has resulted in postponing some needed discussions about what this outstanding faculty agree that all students of earth science should know and be able to do, whether at the introductory level or as graduates/concentrators. Sometimes it seemed that the only area of agreement was that devotion to students.

I encourage you to visit and support your alma mater. You will be proud of what the students in Geology are doing and the level of attention they enjoy from great teachers. The defining characteristic of Colgate and its geology program continues to be the
quality of personal relationships between the students, students and faculty and the faculty themselves. It was a pleasure to return to that company.

Art Goldstein

Some of you know that I have spent the past year and a half on a leave of absence from Colgate while working at the National Science Foundation. In the summer of 2001 I was offered a position as Program Director for Tectonics on a visiting basis and I gladly accepted, knowing that this was an opportunity to do some very interesting things, work on a national level and have a positive impact on the tectonics research community. Program Directors are the ones who make the decisions about what proposals will and will not get funded, so it's a position with a lot of responsibility. The Tectonics Program at NSF is the principal source of research funds in this area in the US and distributes approximately $10 million annually. I began work in Dec. 2001 and really walked in to a meat grinder. Normally, two people run NSF programs but, because of some odd internal dynamics, Tectonics had been functioning with only one Program Director and he had retired in October. When I arrived at NSF I found approximately 60 proposals that had been reviewed but for which decisions had not been made. In addition, there were approximately 125 new proposals that had just arrived and these had to be sent out for review. So, there I was, the new guy on the block with no experience and no one else to help share the load. But, the good news was that I had a lot of your tax dollars to give out in grants and complete autonomy in deciding what to fund. This was really a lot of fun in addition to being a remarkable amount of work. Of course, I also had to tell a lot of people "No" and this was not quite so much fun. The Tectonics Program gives grants to about 30% of those who apply. Most people consider this to be a pretty good acceptance rate but it also means that we have a 70% rate of decline and this means that I say "No" a lot more than "Yes". No one likes to receive bad news on a proposal they worked hard on and on which they rely for the resources to keep their research alive. But I must say that I have found the vast majority of people I deal with to be pleasant, although disappointed, and eager to hear what I think can make their proposals more competitive.

In addition to reading about 250 proposals a year, sending proposals out for review, reading the reviews, running panels of experts and making lots of hard decisions, I have also had the opportunity to do a lot of other, very interesting things. I've represented NSF at various meetings and made site visits at several Universities and with several groups working in the field. Perhaps the most interesting of these was a recent visit I made to New Zealand where I spent two weeks in Fiordland, South Island, with Keith Klepeis. Keith (CU '87) is now a professor at the University of Vermont and has been working in New Zealand with a grant from NSF Tectonics (No, I didn't make this award...it would have been a conflict of interest). Keith and his co-workers ran a GSA Field Forum and I took the opportunity to see what they had been up to. I had a remarkable visit, enjoyed spending time with Keith and came away highly impressed with the work he and his group have done. The other activity I've gotten a lot from is my
participation in workshops aimed at advancing what is termed "Geoinformatics". This refers to the marriage of high end computing with very large databases to compile and analyze data in ways not possible until very recently. This looks to be something that will be very big and I'm hoping to become more involved in this after I return to Colgate.

My wife, Melanie, came to DC with me and my daughter, Kate, is now out of college and living in Los Angeles. Melanie found a job with the Alexandria Public Library and found working in a large public library quite a change from the library in Oneida, where she had worked before coming to DC. She and I have REALLY enjoyed the change from what we had been doing and also having museums, restaurants and shops so close by; some things that you will recall are in short supply in Hamilton. We've done a lot here in DC and have mostly loved making repeated visits to the National Gallery of Art and the National Arboretum. As much as we have enjoyed having all the cultural advantages of living in the nation's Capitol, we have also been very frustrated with the crowds and traffic. Coming from central New York, we are just not used to having so many people crammed in to such a small space and having so many cars on the roads. For those of you who have yet to "enjoy" traffic in DC, I suggest that you skip this pleasure, park your car far away and take the Metro in to the city. As I write this we have less than a month left of our adventure here and are looking forward to moving back to the peace and tranquility of the Chenango Valley. We'll miss the excitement of being in a city but DC will still be here and we are already looking forward to coming back for visits. I'm looking forward to returning to Colgate and resuming my life as a Professor. I have lots of ideas for research and teaching and can think of few places better than Colgate to get these done. By the time you receive this newsletter I'll be back in Hamilton and, as always, hope that you will stop by and visit when you are in the area.

Karen Harpp

Karen has just finished her 5th year at Colgate and continues to teach Megageology, Volcanology and Environmental Geochemistry regularly in the department. Karen, working with George Hudson in Colgate's department of English, has developed a very exciting course on the atomic bomb, offered as a Scientific Perspectives core course, and this year included an 'Extended Study' trip to Japan in January, as well as a November trip to Washington, DC. Karen continues as a regular contributor to the Off-campus field program, and has led the development of a new leg in the Seminoe Mountains in south-central Wyoming, where the group does its final major mapping project. Karen just returned from that leg, during which she and the group survived three days of intense thunderstorms, wind, hail and heavy rains. Karen is active in the local community through her science outreach initiatives in local public schools, where she and students present programs illustrating practical examples of science in action to elementary and middle school students. Along with Beth Parks of Colgate's department of Physics, Karen received NSF funding to support a new summer program for enhancement of high school science education for girls. Karen's teaching contributions were recognized nationally this year when she was awarded the Biggs Earth Science award by the Geological Society of America.
Associated with Karen's active research program in the Galápagos and the Cocos and Carnegie Ridges in the Eastern Pacific, a number of Colgate undergraduates have been able to join her on research cruises and in fieldwork on the islands. Her work includes geochemical study of mantle plumes involving trace element and isotopic analysis and modeling. Karen's ICP-MS lab has been an important addition to the department's analytical suite, and her students have been involved in projects of local interest including water quality, sediment analysis and determination of lead contaminant sources using isotopic ratios.

Karen and her partner, Dave Baird (who works in IT but is a geologist who regularly teaches a leg of the Geology Off-campus program) live in Poolville, where they provide regular exercise for a brace of fine hounds through long runs in the Brookfield State Forest.

Di Keller

Hello from 309 Lathrop. Semesters seem to go by quicker and quicker every year. We are already covering interference figures and indicatrices in Mineralogy lab, and the lab practical is only about a month away. (Just thought I would stir up some fond old memories.) Over the past year, in addition to my usual geology labs, I have gotten involved with the Environment Studies program. I taught ENST 200 labs during the spring term alongside Randy Fuller from the biology department who taught the lecture portion of the course. It was interesting to hear a biologist's slant on topics such as water chemistry, with the emphasis placed on organic influences rather than on the weathering of geologic materials. Besides my job related teaching this past year, I have devoted a significant amount of time to outreach activities, running a number of science workshops for local elementary and high school teachers and students on topics such as rocks, minerals and fossils, water chemistry, soils, optical mineralogy and x-ray diffraction. During the summer I also began an extensive update of the geology web pages (departments.colgate.edu/geology). In addition to a new look, the pages now have several new informational links such as a clickable map of research locations around the globe, a photo gallery, and pages describing our facilities. Work is still in progress, but check out the changes if you get a chance.

Outside of Colgate, one great experience I had this past summer was a two-week trip to visit my friend, Sally Rothwell ('84) in Alaska. Some of the highlights included sea kayaking in Prince William Sound, a three-day canoe trip around the Nancy Lakes Recreation Area, hiking along a medial moraine overlooking Worthington Glacier, and paragliding off a mountain in Girdwood.
Amy Leventer

It's hard to believe that I'm finishing my sixth year at Colgate! I'm having a great time, both in the classroom and in the field. I continue to teach Introduction to Oceanography almost every other semester, a great way to meet lots of students and to try to attract new majors. On the other end of the spectrum is Marine Geology, a 400-level class that takes a much more in depth look at the oceans. Despite worries about rain and rough waters, the highlight of the course this year was a weekend trip to Lake Champlain (not quite the ocean) aboard Middlebury's research vessel. Nobody got seasick and we collected cores that went back to the time when Lake Champlain was marine. My other favorite course is Climate Change and Human History, a Core Scientific Perspectives class. Over the years, I have felt an increasingly strong need to teach students something that I feel is of critical importance to society. I hope that this class helps students become more conscious of their responsibility to global issues and their ability to make economic, social and political decisions that are based on scientific realities. I've also started team-teaching Earth and Environmental Processes. The best part of the course is the lab - every Tuesday afternoon we're outside, usually at the Bewkes Center, but also on trips to the Adirondacks and Onondaga Lake. Finally, each year I find myself spending more time on the Geology Off Campus. Bruce Selleck has been very generous in showing me the ropes on the Canyon Loop - I still can't believe I'm paid to do this!

My research on climate change in the Antarctic is progressing well, thanks to lots of help from many, many students. So far I have participated in fourteen scientific field expeditions to the Antarctic and am fortunate to have shared this experience with so many Colgate students, including Athan Barkoukis '03, Kate Clark '99, Emily Constantine '04, Mark Hayes '98, Beth McAndrews '99, Meredith Metcalf '02, Natalie McLenaghan '02, Caroline Olson '02, Allison Ridder '99, Anna Rubin '02 and Eric Williams '01. The cruises have ranged from two weeks to two months, with the longest project approved as a Colgate Study Group, with the students receiving three course credits during the cruise. On every expedition, student efforts have been critical to the scientific success of the cruise; they worked 12-14 hours every day, monitoring geophysical instruments, working on deck to recover coring equipment, and in the lab to describe and sub-sample sediment cores. Of course, the friendships, scenery and memories of our field work are exceptional as well!

Charlie McClennen

Just over a decade ago Albert Ammerman, now a Senior Research Associate in the Colgate Department of Classics, asked if I could possibly use marine and coastal geological techniques to search for and identify archaeological artifacts buried in the submerged sediments of the lagoon of Venice. An upcoming sabbatical enabled me to review the literature and organize an exploratory sonar survey. Published reports made
it clear that sub-bottom seismic-reflection profiling had been limited to the early seventies and consisted of just a few lines in the main channels. Dating of shell material from early cores taken along the barrier islands of the Lagoon showed inconsistent age to depth relationships. Reworking of inlet deposits including robust shells was not appreciated nor was the migration of the several 20 meter deep inlets to the lagoon.

High-resolution equipment has come a long way since then particularly with the utilization of chirp technology, signal correlation filtering and real time computer processing of signal echoes. Radiocarbon dating has similarly been enhanced with the development of the AMS (Atomic Mass Spectrometer) which allows dating of very small amounts of organic material. During a series of field expeditions using sonar equipment and hand auger coring we have sampled the range of depositional environments within the lagoon. Funding has been provided by the Colgate Research Council, Gladys Kriebel Delmas Foundation and the National Geographic Society. Equipment use has been facilitated by Hobart William Smith Colleges and EdgeTech.

Most lagoon sediments are only five to six meters thick and date back to a marine transgression roughly five to six thousand years ago. Mudflat and salt marsh deposits prevail on the surface. However channel bank (meander point-bar) deposits prevail on the subsurface. In most of the lagoon the channels are only a few meters deep so their channel bank deposits are rather restricted in depth. But their deposition rate is one to two orders of magnitude greater than on mudflats. Tidal channel deposits can also be up to twenty or more meters thick around lagoon inlet channels which have scoured into the older and underlying river deposits. Commercial cores taken by Italian government agencies have provided a deeper look into the sediments under Venice, which are mostly composed of river flood plain deposits associated with early-Holocene and Pleistocene deposition of the Po River and other more local rivers. Radiocarbon dating of plant material recovered in cores has enabled the establishment of a consistent time frame for the deposits.

The realization that tidal channel meander migration is an active process (10 to 20 meters/century) and causes major reworking of the older mudflat, salt marsh and channel deposits, brings a whole new view of what we used to describe as the quiet water lagoon depositional environment. Subtleties in grain size from laminated fine sandy to silty channel deposits to silty mudflats help us to recognize the origins of the dipping channel bank deposits and less-stratified units seen on the sub-bottom profile survey records.

While the initial archaeological motivation for exploring the lagoon deposits has not been fulfilled, we have also been able to determine the rise of sea level in the lagoon and in considerable detail over the last two thousand years. The relative rise of sea level is critical because of the fact that the city buildings have been built on pilings driven through the salt marshes down to the underlying sands and have floors that stand only about a meter above normal high tide. Global sea level rise combined with regional subsidence, caused by dewatering of the thick (one to two kilometer) of Pleistocene flood plain deposits, place Venice in great danger of flooding when storms
drive Adriatic Sea waters north into the Lagoon. We used this new information in our note of caution published in Science (August 25, 2000) to explain that the proposed MOSE gates for the Venice Inlets could well have serious environmental consequences. With a higher and more rapid rise of sea level the flood control gates would have to be closed more frequently and for greater duration during progressively less violent storms in the effort to protect the many historic treasures seen by so many tourists. The city of Venice, without an integrated municipal sewage system, would obviously suffer serious environmental consequences without the twice daily tidal flushing of the canals when the gates were closed. Italian government action on this issue has continued with more than two decades of study and demonstration modeling. The recent decision to proceed reported in the news media is somewhat ambiguous in that the source of the funding for this three to four billion dollar project has not been identified and an "environmental review" may also prevent final installation. Some of these issues and Colgate research were highlighted in the WGBH - NOVA program entitled "Sinking City of Venice" which was initially aired in November 2002 and recently rebroadcast. It was satisfying to see that the research done at Colgate with the help of numerous geology students enriched this well received program.

I have also been active in a study of eastern Lake Ontario barrier beaches and lake-bottom sand deposits funded by The Nature Conservancy and the New York Department of State. The collaboration with Don Woodrow of Hobart William Smith Colleges (now retired) and others has provide an assessment of the magnitude of shifts in shorelines based on GIS plotting of aerial photographs over a six decade time span. Sub-bottom profiling and side scan sonar of the lake bed provided a basis for selecting coring sites. One of the most interesting findings was the evidence for a reduced lake level of 20 meters or more dating from around five thousand years ago. Submerged wetland peat and beach deposits were the key evidence.

Work on Antarctica data collected during the cruise 0101 of the R/V N. B. Palmer with Amy Leventer (Chief Scientist) has been distracted by my efforts to move the new Interdisciplinary Science Building project along. Planning for a new home for Environmental Studies, Geography, Geology, Physics and Astronomy and a part of Biology, as well as other offices important to the sciences, includes constructive links with Olin and Wynn so as to encourage interdisciplinary collaborations in teaching and research. My chemotherapy for lung cancer over the spring semester produced welcome reduction in the tumors but not total elimination.

William Peck

Hello from Hamilton! I joined the department in the Fall of 2000, a month after completing my Ph.D. at the University of Wisconsin. Upon my arrival I inherited the Chief's office, the petrology course, and I even rented his house for the year! Now I live just outside of the village with my wife, Myongsun Kong, who is the new GIS specialist working with the Environmental Studies program.

I'm now in my third year at Colgate, and I've taught Environmental Geology, Megageology, Petrology, Environmental Economic Geology, the Senior Seminar (440),
and parts of the off-campus. I've also developed a first-year seminar on energy and mineral resources as well as a senior-level seminar course on isotope geochemistry.

I am nominally a metamorphic petrologist, and my major interests lie in the once-deep crust of Precambrian terranes. Currently I'm working on a geothermometry project in the Irving Pond Quartzite of the southern Adirondacks, and two senior Geology majors are also working with me on the Franklin Marble of the New Jersey Highlands. I also am continuing some aspects of my Ph.D. research on the Morin Anorthosite Massif in Quebec with another Geology senior. On the funding front I just received approval for a grant proposal to the National Science Foundation to acquire a stable isotope ratio mass spectrometer for Colgate. This instrument will be used both for student research projects and for laboratory exercises in courses. I'm really thrilled to be part of a department where both teaching and undergraduate research are taken so seriously.

Bruce Selleck

Bruce led the 2002 Australia Study Group to University of Wollongong, accompanied by wife Nancy and daughter Beth. The program included a 10-day trip to the interior and north, with such highlights as Uluru (Ayer's Rock), Alice Springs, King's Canyon, Darwin, Kakadu National Park and Cairns including the Great Barrier Reef. The Permian and Triassic rocks of the Sydney Basin provided a great local area for geological excursions and opportunities for new research projects with colleagues at Wollongong. Bruce continues to teach Stratigraphy and Sedimentation, Hydrology and Surficial Geology (which now includes a healthy dose of GIS techniques), Marine Environments and Hydrogeology. He also is involved in the Environmental Studies program, teaching regularly in the senior seminar course.

Bruce’s research on local water and carbonate sediment geochemistry continues, using Woodman Pond and other area watersheds as study sites for projects with students. Bruce has also worked with Jim McLelland on a series of papers on Adirondack hydrothermal systems in the younger granites which host magnetite ore deposits. Other research projects include study of the geochemistry and sedimentology of late Tertiary basins in south-central Alaska, basinal brine fluids and dolomitization of Proterozoic marbles in the Adirondack Lowlands, and modeling of groundwater flow in local aquifers.

Bruce will begin a three-year term as department chair this summer, and is busy chairing the search for a new athletic director and overseeing the purchase of a new Scanning Electron Microscope system for the department using funds from a NSF-Major Research Instrumentation grant. He continues his work with the Patriot League as chair of the Policy Committee, and recently completed a two-year stint on the Task Force on Campus Culture, which studied a range of issues regarding social and residential life at Colgate. Bruce was named H.O. Whitnall Professor of Geology in May
of 2003. His daughter Caity will be a senior at Bucknell University this fall, and daughter Beth will begin her senior year at Hamilton High School.

**Connie Soja**

In Fall'02, I completed my first international academic endeavor by directing Colgate's study group to the University of Manchester, England. It was a fabulous experience! Ten Colgate students representing six different concentrations, ranging from geology to art history to political science, were enthusiastic participants in my course on Darwin and the Victorian age and in the companion course on the Industrial Revolution (plus each student took two additional electives). We enjoyed life in Manchester (a GREAT city) and a field trip to Yorkshire's Heritage Coast, where we searched the Jurassic section for ammonite fossils. We also ventured to London to visit the Natural History Museum, Darwin's grave at Westminster Abbey, and Randal Keynes, Darwin's great-great-grandson. He showed us the family estate in Kent, including Darwin's "thinking path" and the study where Darwin penned his famous books. That day will certainly be one of the most memorable of my life.

While in England, I was fortunate to have Boyce research funds to begin an investigation of the Old Red Sandstone, which may represent a once contiguous facies with the Karheen Formation exposed in my field area in southeastern Alaska - some of you may remember this beautiful but mysterious sequence of Devonian redbeds that overlies the Heceta Formation near Prince of Wales Island. Thanks to many of you - Leah Kittredge '93; Katrina Gobetz '94; Nikki Bazie '94; Jen Thibeau '95; Erika Zavala '95; Colleen Brogenski '97; Lena Krutikov '97; Brian Flynn '98; Allison Gleason '98; Stacey Joyce '00; Lisa Mayhew '00; Jann Vendetti '01; Luke Dwyer '02; Alicia Newton '02; and Christy Visaggi '02 - my research in Alaska, Russia, and Australia has moved forward on many interesting fronts. Last fall, I also spent time with my husband in Provence investigating Cretaceous dinosaur eggs, particularly those with so-called "hatching windows". These large, spheroidal eggs are quite different from Colgate's Oviraptor egg in size, shape and eggshell features. Based on previous research by David Goldsmith '93, Dave Sunderlin '99, Steve Close '99, and Christopher Maslanka '02, it's still not clear if the "hatching windows" represent exits for the juvenile dinosaurs or if they formed through non-organic processes - stay tuned for future updates!

I continue to enjoy teaching a range of paleo courses to enthusiastic students, including a group from the Reefs Seminar who ventured to San Salvador Island, Bahamas, to study reefs up-close-and-personal over spring break in March '02. Sadly, the reefs there are not quite as healthy as they were just a few years ago, but we did see many beautiful examples of Acropora corals, turtles, and reef fish, including of course the BARRACUDA (barra-schwuba)! It's nice to know how many of you are now pursuing careers in paleo and related fields or are in grad school preparing for more great geo-discoveries. Before you become part of the fossil record, don't forget to stop by for a visit the next time you're back on campus!
Happenings

New Displays Around the Department

Over the past year there have been some exciting additions to the department's collections. Already on display in the museum is a 16' x 4' mural by local artist, Rachel Amann, depicting life in the Devonian (i.e., 'life at Colgate' ~360-410 million years ago when the sediments that compose the local bedrock were deposited). The mural presents both a time and geographic sequence, beginning with Lower into Middle Devonian deep sea and reef communities and grading laterally into Upper Devonian terrestrial and fluvial settings. In addition to these living communities, the lower portion of the mural slices down into the sedimentary stratigraphy below, in order to show how these organisms and depositional conditions might look when preserved in the rock record. Future plans for the mural exhibit include devoting a display case below the mural to rock and fossil specimens that correlate with features seen in the mural, and preparing information pamphlets (that will be available in the museum) on where similar fossils can be found in central New York.

![Mural Image]

Other recent acquisitions that have yet to be displayed include various items from the estate of G. Arthur Cooper, who is the only person ever to receive both a BS ('24) and a MS ('26) in geology from Colgate University. After completing a doctoral degree at Yale, Cooper spent his career at the Smithsonian Institute, during which time he was considered to be a leading expert in brachiopods, publishing more on the subject that any other person in the 20th century. In recognition of his achievements, Cooper received many awards including the GSA's Penrose Medal and an Honorary Fellowship in the Paleontological Society. After his death in October of 2000, his family generously donated a collection of his publications, academic hoods, diplomas and awards to the geology department. Plans are currently underway to set up a new display case outside of the G. Arthur Cooper classroom (the 'Paleo Lab' - 403 Lathrop) that will include many of these items along with biographical information and anecdotes.

Lastly, a unique addition to our collections is a tuft of hair from the Zarkov woolly mammoth that was graciously donated by Dr. Howard Amann of Hamilton, NY. You may have seen the excavation of this mammoth chronicled on a Discovery Channel special that aired in 2000. The Zharkov mammoth was discovered in 1997 in Siberia by a nomadic reindeer herder. It is believed to be 23,000 years old. We are hoping to develop a small display on mammoths for the museum that would include not only the Zharkov hair, but also the mammoth tusk from the back wall of 305 Lathrop, a few
mammoth teeth, an adult thighbone, and the skull of a baby mammoth. This skull is actually special in its own right because it comes from a site in which man-made weapons were found interspersed with the bones, an extremely rare occurrence.

OC '02 - by Adam Skarke '03

As the late spring sun sets across the Chenango valley, it is hard to believe that the 2003 off campus group is preparing to set out for the Adirondacks. A year has already passed since the members of OCO2 took part in the geology department's annual field course. OCO2 began in the humble confines of Gatehouse where we lived for the first days of orientation. We learned the finer points of compass navigation and got a refresher on a little structural geology. Campus safety made sure we got up bright and early each morning and we even got to see the introduction of President Chopp before we left for the Adirondacks.

We started the first leg of the OC at the Canada Lake Store cabins in the southern Adirondacks. Bruce Selleck, William Peck, and Allen Dennis introduced us to the various rock units in the region and soon we were mapping a large fold in the forest north of Canada Lake. After enduring the black flies for a week we completed mapping the area and celebrated with a party at Chief's house on Canada Lake. Chief offered his famous hospitality and reminded us all that Œthere are no bugs in the Adirondacks.Ó The following day we visited road cuts across the eastern Adirondacks and even located the famous monument with giant garnets in Indian Lake. Next, Rich April and Di Keller led the OC, teaching us about the soil, sediment, and groundwater of the region. Finally, Connie Soja led us across the Adirondacks to various road cuts and dams, pointing out the interesting fossils that make up the paleontology of the region. I'm sure all members of the OCO2 group look back fondly on Connie's paleo quiz.

After our first leg in the Adirondacks, we returned to Colgate for a few days to prepare for the western leg. With the lead of professor Amy Leventer we set out for Colorado in three vans. Two days later we arrived at Denver and the Chief Hosa campground. We soon were mapping the sedimentary units around the red rocks theater in our first project of the western leg. Next we traveled south to Moab Utah where we completed a mapping project near the entrance to Arches National Park. During our day off at Moab some of the group rafted down the Colorado River while others hiked in the nearby La Sal Mountains. After Moab we visited the Bryce Canyon and Zion National Parks as well as the Canyonlands National Monument, where we discovered the Lathrop trail. Next we traveled north to Salt Lake City where Amy Leventer departed and Dave Baird joined us for the drive to Wyoming. After we reached the Seminoe reservoir in southeast Wyoming we were joined by professors Paul Pinet and Allen Dennis. At the Seminoe reservoir we completed the largest and most complex mapping project of the OC. We also found some time to enjoy the cool water of the lake and compare our OC experiences with the Beloit OC group who was there.

In the closing days of OCO2 we drove from Wyoming to Colgate in two days. We spent a few days completing our write-ups and enjoying the 4th of July in Hamilton. We all left with a better understanding of field geology and treasured memories.
CHAOS (Coring Holocene Antarctic Ocean Sediments)

From January 30 to March 29 2001, a team of 25 scientists, including Charlie McClennen and Amy Leventer (Chief Scientist), and Colgate undergraduate geology majors Natalie McLenaghan, Meredith Metcalf, and Caroline Olson, explored the East Antarctic Margin on cruise NBP0101 of the RVIB Nathaniel B. Palmer. The Palmer is one of two icebreakers leased by the National Science Foundation and is dedicated almost entirely to conducting scientific research in the Southern Ocean. This 58-day cruise left from Hobart Tasmania and returned to port in Capetown South Africa, after transiting nearly a quarter of the way around the perimeter of Antarctica. Along the way, nearly a quarter mile of sediment core was recovered from seven deep shelf basins, with the goal of developing a record of climate and oceanographic change during the Quaternary. Although the pace of recent climate change appears to be more rapid and of a larger scale in Antarctica compared to other areas of the globe, the factors forcing climate change in Antarctica are not well understood, due to the relative inaccessibility of the southernmost continent and the inhospitable working conditions. In order to address this scarcity of samples, particularly from the eastern side of the continent, we devoted our two months of ship time to acquiring as much data as possible. Most of the sediment core material was recovered with the "Jumbo Piston Corer," a 90-foot long, 5" diameter, assembly of steel barrels, plastic core liner, and lead weights. Core sites were selected based on a combination of sub-bottom profiling and seafloor bathymetric mapping of well stratified and undisturbed acoustic reflectors. Back in the lab, our group has been responsible for two lines of investigation. First, we develop paleoenvironmental reconstructions based on microscopic analysis of diatoms, single celled algae with a hard silica skeleton that serves as a permanent record of past climate. Second, we work with the sea floor maps to decipher the geologic processes that have shaped the seabed. Natalie, Caroline and Meredith worked with both Charlie and Amy as well as with our colleagues from other institutions, on senior projects based on the data collected during the cruise. Their contribution to the success of this cruise has been invaluable. Geology undergrads will continue the detailed analysis for the next few years as we extract the clearest indicators of Antarctic margin climate change from the core samples.
Recent Alumni Speakers in Departmental or University-wide Seminars

Dan Gibson (92), "Deformation-Induced Inverted Metamorphic Field Gradients: an Example from the Southeastern Canadian Cordillera"

Laura Moore (93), "Quantitative Assessment of Shoreline Change and Identification of Erosion Hot Spots in Santa Cruz County, California"

Jeff Frederick (95), "Employment in Environmental Geology"

Charlie Tiller (93), "Etched in Mud: The Life and Times of Yellowstone Lake"

Lisa Mayhew (00), "Tropical Carbonates, and Other Great Stuff, in Glacier Bay, Alaska"

Lisa Mayhew (00), "Sampling the Cocos Ridge-Preliminary Results from the Galápagos Research Cruise"

Paul Myrow (80), "Cambrian of Antarctica: Depositional Record of Gondwanan Assembly"

Larry Lessard (85), "Informal Discussions with Students about Employment Opportunities in Environmental Consulting"

Chris Olson (97), "Career Perspectives from the Petroleum Industry"

Ron Schott (91), "Using Isotopes to Track Exotic Terrains"

Joan Berhard (82), "Life in the Most Extensive Ecosystem on Earth"

Ami Parekh (00), "Post-Colgate Employment Perspectives from an Environmental Engineering Consulting Firm"

Robert Ylagan (90), "Where a Geology Concentrator Lands after Colgate: Champaign, Italy, Exxon and an MBA"

Tara Curtain (94), "Evidence of a Seasonal Climate in the Triassic Ischigualasto Rift Basin, Northwest Argentina"

Allen Dennis (82), "Message in a Boudin: Eclogite and High Pressure Metamorphism in the Piedmont of the Southern Appalachians: Implications for Pre-Alleghanian Collisional Tectonics"

Lee Gray (74), "The Rise and Fall of a Devonian Sea: A Cycle of Sedimentation in the Hamilton Group"

Rebecca Newhall (99), "From Snorkeling with Connie in the Bahamas to Mapping Coral Reefs for NOAA: A Career Path in Coastal Management"

Jeff Trembly, (78), "The San Pedro River, Arizona: The Conflict Between Groundwater Science & Property Rights"
In Memoriam - Bob Goldhammer '79

It is my sad duty to add an epilogue to this issue of the Alumni Newsletter. Many Colgate Geology alumni have already heard of the tragic and untimely death of Bob Goldhammer, Colgate class of 1979. Bob was killed in a car accident this past May while leading the first leg of the University of Texas at Austin field camp. After his graduation from Colgate, Bob received his PHD from Johns Hopkins University, and went on to fashion an outstanding research career at Exxon Production Research and the Texas Bureau of Economic Geology. Most recently Bob was an assistant professor of Geology at UT, and was recognized as outstanding young teacher/researcher. For those of us who knew Bob, we will miss his energy and enthusiasm, and all of us have lost a valued colleague who would have continued to contribute to the field of geology. Bob is survived by his wife Ursula Hammes and two children.

Bruce Selleck

Contributions in Bob's memory can be made to:

Robert K. Goldhammer Memorial Grant
AAPG Foundation
Attn: Diane Keim
P.O. Box 979
Tulsa, OK 74101
(Make checks payable to: AAPG Foundation)

Contributions to Geology

We all want to thank those who have donated to the geology department over the last three years. If you are planning to give money to Colgate, you can specify that your contribution go directly to the Geology Department. The department's discretionary fund pays for the publication and distribution of this newsletter and other departmental projects. If you wish, you can specify that your donation goes into one of our endowed funds for students: The Norma Vergo Fund or the Bob Linsley/James McLelland Fund. The following have contributed to the department since the last newsletter (our sincere apologies if we have missed anyone!).

Jay Ach    Gerald Jasco
Linda Besse    Maureen Jordan
Russell Billings    William Kier
Malcolm Boyce    George Kingsley III
Chapin Brackett    Karen Kleinspehn
James Brooks    Kelly Knotts
Edward Cazier III    Andrea Kretchmer
Edward Cifu    Charles Mason
Betsy Cunningham    Wendi Mayerson
Janet Cushing          Susan McCarthy McCotter
Pamela Tiezzi Darwin  Bruce McLelland
Laurie DeArmond        Sharon McLelland
Allen Dennis III      Ellen Mecray
Theresa Minchin Dennis Raymond Mitchell
Barry Doolan           Susanna Mitchell
Neal Durant            Amy Tobin Morales
F. Donald Eckelmann, Jr. Rebecca Newhall
Douglas Erwin          Robert Otto
Richard Fahey          Bruce Panuska
Jason Francis          Kristen Olson Ramsey
Daniel Gaudiano        Patrick Ramsey
Lisha Gaudiano         Daniel Riker
Clifford Gill          Shannon Jones Ritter
Allison Gleason        S. Andrew Sandberg
Amy Bonzales           Samuel Savin
Adam Greenhut          Erik Scherer
William Hakes          Kenneth Schopf
David Haymes           Ronald Schott
J. Christopher Hepburn  Rebecca Tobin Schrader
Janet Hickey           Maximillian Schroeder
John Hoffman           Bruce Selleck
Ryan Hoffman           Nancy Selleck
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Holly Hoyt             Suzanne Shelley
James Hutton           Michael Snyder
Walter Steinmann Jr.   Wendy Meyere Trimble
Richard Stickle        Denise Waite
Paul Stout              Jonathan Waite
Molly DeMark Sunderlin  Charles Weiss
David Sunderlin         Kenneth Wenz, Jr.
William Sweeney III    Roger Wiggin
Bethany Tietz          William Willis
Richard Tobin          Sean Young

The Norma Vergo Fund

The Norma Vergo Fund is used to give a prize to an outstanding graduating senior who significantly contributes to the spirit of excellence among fellow students. Past contributors include:

   Stephen P. Altaner          Mobil Foundation, Inc.
   Amy M. Baldwin-Gove          Ronald L. Parker
   Ed Cazier                      Andrew S. Sandberg
   Conoco, Inc.                  Bruce W. Selleck
   Pamela Tiezzi Darwin          Nancy B. Selleck
   David E. Haymes               Michael R. Snyder
The Robert Linsley / James McLelland Endowment

The Robert Linsley/James McLelland Endowment was established upon the retirement of Bob Linsley, Harold Orville Whitnall Professor of Geology, and the subsequent retirement of Jim McLelland (a.k.a. "The Chief"), Charles A. Dana Professor of Geology. This endowment is used to fund a deserving student for summer research. Past contributors include:

Jay A. Ach  Ronald G. Holly
Ronald P. Bertasi  William M. Kier
Craig M. Butterworth  Karen L. Kleinspehn
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