

## SCIENCES LABORATORY BUILDING GETS A STEP UP WITH DINOSAUR DIGITS *Utah man donates casts of footprints for display in future teaching facility*

By Kathleen Holder

**B**iology and chemistry students who enter the halls of the future Sciences Laboratory Building could find themselves walking among the footprints of prehistoric giants.

A Utah man recently donated four castings of dinosaur footprints—made from tracks left 65 million years ago by a Tyrannosaurus rex, Hadrosaurs (duckbilled dinosaurs), and a raptor—to the Division of Biological Sciences to display in the Sciences Laboratory Building.

Biological-sciences officials, collaborating with colleagues in the geology department, are working to develop exhibits about the dinosaurs and their environment during the late Cretaceous period.

Tom Rost, associate dean for the division, hopes the dinosaur tracks and other exhibits featuring an old electron microscope, underwater camera and other scientific equipment will help make the Sciences Laboratory

### WORK BEGINS

The site gets cleared for construction of the new Sciences Laboratory Building.

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Neil Michel/Axiom Photo

Associate Dean Tom Rost, left, looks over castings of dinosaur footprints donated by Robert Rowley Jr. of Price, Utah.

## NEUROSCIENTIST USREY WINS EARLY-CAREER AWARD FROM WHITE HOUSE

By Andy Fell

**M**artin Usrey, an assistant professor at the UC Davis Center for Neuroscience, has won a Presidential Early Career Award in Science and Engineering for his research on vision. He will receive the award at a White House ceremony sometime this year.

“This is fitting recognition of Dr. Usrey, who even at this early stage of his career has proven himself to be a scientist of exceptional talent and one who is destined to make major contributions to neurobiology in the future,” said Edward Jones, director of the Center for Neuroscience.

Instituted in 1996, the award is the highest honor bestowed by the U.S. government on outstanding scientists and engineers in the early stages of establishing independent research careers. Recipients receive research grants for up to five years.

Usrey describes his work as “unraveling the circuitry” of how neuronal responses emerge in the brain.

When light hits a sensitive cell in the eye, it generates an electrical impulse that first travels to the thalamus before reaching the cerebral

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UC Davis Biological Sciences is sent to division alumni, both graduate and undergraduate, and parents of current division students. We welcome news from alumni; please send your news to Debra Cleveland at dccleveland@ucdavis.edu. Or visit the alumni Web site at www.dbs.ucdavis.edu/alumni/postcards/ and send us a postcard!

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## NEWS BRIEFS

### MASTER DEVELOPER CHOSEN FOR CAMPUS RESEARCH PARK

Construction of a UC Davis research park moves a step closer to reality with the selection of a master developer.

UC Davis has entered exclusive negotiations with CarrAmerica Development Inc., a subsidiary of CarrAmerica Realty Corp. to privately develop 38 acres along Interstate 80.

"This project was initiated to promote partnerships that enhance our research activities," said John Meyer, vice chancellor for resource management and planning.

CarrAmerica, a national company with offices in the San Francisco Bay Area, has extensive experience in developing business parks including research space and biotechnology users.

The company will assume all development risk in constructing and leasing facilities to various public and private research entities approved by the campus.

Tenants will be required to have a research relationship with the campus.

Another 40 acres of campus property west of Highway 113 also have been designated for enterprise development. Plans there include facilities for mouse biology.

—UC Davis News Service



Debra Cleveland

Martin Usrey was nominated to receive the presidential award by the National Eye Institute for his research on the circuitry that allows us to see.

### ...USREY

*(continued from page 1)*

cortex. Usrey's laboratory studies how these signals are passed from one structure to another, and how the brain turns these single impulses into a complex picture that allows us to see the outside world.

Usrey has a bachelor's degree from UC San Diego, a master's from San Diego State University and a doctorate from Duke University. He worked at Rockefeller University and Harvard Medical School before joining UC Davis in January 2000.

In addition to the Center for Neuroscience, Usrey also is on the faculty of the Section of Neurobiology.

### CENTERS, DIVISION LOOK TO EXPAND THEIR FACULTY SIZE

UC Davis initiatives in genetics and genomics are coming to life with recruitment of new faculty members.

The Center for Genetics and Development is narrowing down the list of candidates for seven faculty positions, including one that will be shared with the Section of Molecular and Cellular Biology. Center director Steve Kowalczykowski aims to have the new center members on board by the end of next academic year. They will be the first of 15 faculty members to be hired over the next five years.

The UC Davis Genome Center is recruiting for five positions—the director, two faculty members in experimen-

tal Physiology and Behavior.

"This award is a great personal achievement for Marty at an early stage of his career," said section Chair Leo Chalupa. "It also attests to the tremendous strides that have been made on this campus—in a relatively short time period—in attaining worldwide pre-eminence in neuroscience."

Last year two UC Davis faculty members won Presidential Early Career Awards: computer scientist Kwan-Liu Ma and mathematician Naoki Saito. No more than 60 awards are made each year.

*Andy Fell covers biological and other sciences for the UC Davis News Service.*



tal genomics and another two faculty members specializing in bioinformatics.

Meanwhile, the Center for Neuroscience is set to grow with searches for two faculty members under way.

And the division's academic units are completing searches for another five positions—another position in the Section of Molecular and Cellular Biology, one in the Section of Plant Biology, one in the Section of Microbiology, two in the Exercise Biology program. The division's faculty currently numbers 117.



(continued from page 1)

Building a place where people will want to come—whether they study science or not.

“We want people to feel a sense of ownership of the building,” Rost said. “We have an obligation to make it as special a place as we can so people want to identify with it.

“Having these amazing dinosaur footprints, other artifacts and old scientific equipment will give us a once-in-a-lifetime opportunity to create a unique biology teaching environment. Seeing actual dinosaur footprints will be a great experience for our students and visitors as well. I can see the new building as a destination for K-6 children in the area.”

Robert Rowley Jr., who donated the castings, has collected close to 100 of the footprints from the ceiling of a coal mine near Price, Utah, where he worked. For more than 25 years, Rowley has made fiberglass-polyester resin castings of the tracks, donating many of them to museums across the nation.

Rowley learned from his cousin, Marye Wanlass, a campus employee, that Rost was looking for dinosaur and other scientific artifacts. Rowley delivered the four casts to UC Davis in November.

The dinosaurs left their footprints in ancient peat and, in times of flooding, the prints sometimes filled with sand. Over the ages, as the dinosaurs disappeared and mountains formed on top

of the swamps, the sand turned to stone and the peat to coal. When miners dug out the coal, they discovered the footprints on the roof.

Rowley began tracking dinosaur footprints when he was 18. His coal-miner father took him into the Spring Canyon No. 5 Coal Mine and showed him a trail of about a dozen prints on the mine ceiling, with tail marks running down the middle. He later went to work for the coal company himself, in large part to get close to the tracks. Rowley believes his collection is the largest of its kind in the world, and the only one with raptor footprints.

Construction of the Sciences Laboratory Building is scheduled to begin this spring on Hutchison Drive between the Life Sciences Addition and Haring Hall.

Voter-approved bond financing will cover most of the \$57 million costs to build the two buildings. However, donations from alumni and other supporters will be key to providing “extra” physical components and supporting top-level teaching, research and service in the biological sciences. Campaign goals include new facilities for the UC Davis Herbarium and Botanical Conservatory, a bioinformatics computer lab, office space for undergraduate educational outreach and enrichment programs, and faculty chairs and graduate-student fellowships. For more information on the \$10 million “Opportunities for Distinction” campaign, contact Jackie Schad at 530-752-9254 or [jjschad@ucdavis.edu](mailto:jjschad@ucdavis.edu).



UC DAVIS LEADS THE NATION IN ECOLOGY, ENVIRONMENT PAPERS

During the past five years, UC Davis was the most published university in the areas of ecology and environmental sciences, according to a survey by the private Institute for Scientific Informaiton.

UC Davis researchers published 862 academic papers in the fields, ahead of UC Berkeley and Colorado State University.

From 1996 to 2000, papers published by UC Davis researchers also were referenced in scientific journals covering ecology and environmental sciences more than any other research institution in the nation, the institute found.

Ecological and environmental research at UC Davis takes place across the campus—in the Division of Biological Sciences, College of Agricultural and Environmental Sciences, College of Engineering, the schools of law and veterinary medicine, and elsewhere.

UC Davis also ranked first in the number of academic papers and citations in food science and nutrition, and fifth for the number of papers in entomology and pest control over the same five-year period.

—UC Davis News Service

NAME THE SCIENCES LABORATORY BUILDING COFFEE SHOP

The MU has the Coffee House. The Silo has The Pub. The medical school has Scrubs. The Sciences Laboratory Building will bring another coffee shop to campus, but it needs just the right name.

Send us your ideas. E-mail your suggestion for a coffee house name, along with your name, year you graduated, major, e-mail address, phone number, to [dbs@ucdavis.edu](mailto:dbs@ucdavis.edu).

Or fill in this form and mail it to the Division of Biological Sciences, University of California, One Shields Ave., Davis, CA 95616. But please hurry before someone else beats you to it.

Coffee house name: \_\_\_\_\_

My name: \_\_\_\_\_

My e-mail: \_\_\_\_\_

Phone number: \_\_\_\_\_

Year I graduated: \_\_\_\_\_

Major: \_\_\_\_\_

# GETTING TO THE OCEAN BOTTOM OF A PROPOSED GLOBAL-WARMING FIX

## *Doug Nelson begins research on how a proposal to store carbon dioxide in the ocean could affect deep-sea microbes, biosphere.*

By Kathleen Holder

Physical scientists and engineers came up with the idea of trapping and storing tons of greenhouse gases in the ocean. Federal policymakers are exploring the proposal. Environmentalists are raising red flags

Doug Nelson, chair of the UC Davis Section of Microbiology, is one of the first biologists to actually study how piping carbon dioxide to the ocean floor could affect marine life—and perhaps the first to look at potential impact on deep-sea microorganisms.

Nelson, an expert on marine microbial ecology, has received funds from the Department of Energy to launch a three-year investigation.

Carbon dioxide—released into the atmosphere from the burning of fossil fuels such as coal, natural gas and petroleum—has been identified as a major contributor to global warming.

Most efforts to reduce greenhouse gases focus on developing alternative energy sources that do not produce carbon dioxide, such as solar power, or on reducing energy use through conservation and cleaner-burning cars and appliances.

However, the Department of Energy is also funding a number of research projects on ways to store carbon diox-

ide in the ground or ocean. Last June, President Bush said: “We all believe technology offers great promise to significantly reduce emissions, especially carbon capture, storage and sequestration technologies.”

Nelson was invited last winter to a workshop hosted in Monterey by the Department of Energy and the Monterey Bay Aquarium Research Institute. As one of a handful of biologists at the meeting, Nelson was asked to submit a grant proposal, which he did. By the end of summer, he had funding in hand—an unusually quick turnaround for a federal grant.

### ALTERING THE ACIDITY OF SEAWATER

Adding carbon dioxide to the ocean would make the water more acidic. “That’s the part that’s certainly got the attention of the animal ecologists,” who are concerned about possible harm to fish and other deep-sea creatures, Nelson says. “The pH in the deep ocean normally doesn’t vary more than one or two-tenths of a unit.”

There are two important benchmarks to consider for carbon dioxide sequestration, Nelson says. If liquid carbon dioxide is piped to a depth of at least 1,000 meters, it will form a solid hydrate structure. At 3,000 meters or deeper, the solid carbon dioxide hydrate would become negatively buoyant and sink to the ocean floor.

The Department of Energy is considering both dispersed and concentrated storage strategies, Nelson says. The agency has been given the charge of considering technologies to sequester in the ocean up to one-sixth of human-generated carbon dioxide by the year 2025.

With the strategy of concentrated storage, engineers envision many-kilometers-long “sausages” of solid carbon dioxide at the end of discharge pipelines. Carbon dioxide dissolving at the surface of these structures could easily render surrounding waters two or more pH units more acidic. By contrast, spreading the carbon dioxide more widely could alter ambient pH by

Microbiologist Doug Nelson examines sediment and water samples collected from the bottom of Monterey Canyon. An expert on marine microbial ecology, Nelson will test how piping greenhouse-gas carbon dioxide to the sea floor would affect microorganisms that live in the sediment.



Kathleen Holder

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'By doing the study, we get more information on the basic biology of the deep sea. My view is that it's putting one more tool in the tool box of the people who have to make policy decisions and who may have to make them on very short notice.'

—Doug Nelson

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only 10 percent as much but affect proportionally larger areas.

How sensitive marine microbes are to pH changes is unknown, he says. Bacteria generally are "a lot tougher" and could survive more dramatic environmental change than multicellular animals, Nelson says. "It would be hard to knock them out first."

#### A TOXIC TRADE-OFF?

However, Nelson says acidity changes that harm larger sea creatures could hold much larger ramifications, changing not just the ecology of the ocean floor but also altering chemical cycles critical to our biosphere.

Carbon dioxide-induced kills of marine animals could fertilize the ocean floor, providing more nutrients for bacteria that live there. Moreover, Nelson says, "die-offs of animals could stimulate sulfate-reducing bacteria that live in the sediment to produce more hydrogen sulfide, which is more toxic than carbon dioxide."

In his research, Nelson will look at how deep-sea nitrogen, carbon and sulfur cycles are affected by large and small-scale changes in acidity. Using sediment and water samples taken from depths of 1,000 to 3,000 meters in Monterey Canyon, he will examine how microorganisms respond to different pH levels. His goals are to identify the transformations that are most sensitive to increased acidity and to give the Department of Energy an estimate of the level of pH change that would have no demonstrable effect on the microbiota.

The technology for deep-sea sequestration of carbon dioxide is not yet fully developed and will, in part, be guided by findings of studies by Nelson and by benthic ecologists from Monterey Bay Aquarium Research Institute. Whether disposal mechanisms can be developed at a reasonable cost remains to be seen.

"It's very pie-in-the-sky stuff, but



David French © 1997 MBARI



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The Tiburon, a remotely operated vehicle at the Monterey Bay Research Institute, above, will collect sediment samples from depths of 3,000 meters for Nelson's study. Left, a Pacific Grenadier fish feeds close to liquid carbon dioxide being released into a corral at 3,600 meters depth in other carbon-sequestration experiments by scientists from the Monterey institute, Lawrence Livermore National Laboratory and the U.S. Geological Survey.

Department of Energy officials believe that they have about 20, 25 years to solve a lot of these [greenhouse-gas emission] problems.

"The engineers have told biologists, 'Tell us the largest pH change that [organisms can handle]. If they can survive a few 10ths change, we'll work out an appropriate dispersal strategy.'"

Nelson acknowledges the criticism of environmentalists who argue that the government should focus on reducing greenhouse gases instead of technological fixes. He does not view deep sequestration as a permanent solution, but he points out, "The ocean already contains 50 times as much carbon dioxide as the atmosphere and may help to 'buy time.'"

However, at the same time, Nelson says, "We live in the real world. By doing the study, we get more information on the basic biology of the deep sea. My view is that it's putting one more tool in the tool box of the people who have to make policy decisions and who may have to make them on very short notice. It's better to know, than not to know, what's going to break first in terms of the deep-sea microbial systems."



## STRENGTHENING THE TIES THAT BIND THE LIFE SCIENCES

By Kathleen Holderk

*As a physiologist, Phyllis Wise has long been fascinated by how the human body works, how the brain, hormones and other biological systems interact and how the body responds to the environment. As new dean of the Division of Biological Sciences, Wise is similarly focused on interconnections—both within the division and with other life scientists across campus.*

*Wise started her new post as dean in January after eight years as chair of the Department of Physiology at the University of Kentucky College of Medicine. She is an expert on the neuroprotective actions of estrogen after injury and during aging.*

*In an interview first published in staff-faculty newspaper Dateline UC Davis, Wise talks about the campus, the community and her goals for the division.*

**Q**: What was most attractive/exciting to you about the post of dean for the Division of Biological Sciences at UC Davis?

**A**: To me the most exciting aspect of this position is to be able to work with issues that are uniquely relevant to the Division of Biological Sciences, as well as to be able to connect the division with people and groups in other schools where there is an interest in biological sciences. That weaving, that building bridges of communication and collaboration is my greatest challenge. There is already a wonderful culture of working together toward common goals across the campus. For example, neuroscience is a strength in the Section of Neurobiology, Physiology and Behavior and in several other departments. It is clearly the focus of the Center for Neuroscience. Aging is a focus of interest in several colleges. And I hope to build that strength in the division. My challenge is to understand the core strengths and the important issues in the Division of Biological Sciences, and yet not be insular. I want to broadcast the strengths in the division to the university community, and I



Kathleen Holderk

Phyllis Wise assumed the dean's position in January.

took this position because I'm anxious to do that.

**Q**: What are the most striking similarities and differences between the University of Kentucky and UC Davis?

**A**: The most striking similarity is that both institutions have the goal and dream of becoming much better than what they are. They see the potential and the challenges. They both want to make dramatic improvements—not just an arithmetic change but an exponential change. The difference is the UC system has many more resources and a longer history of excellence in higher education and research. The state of Kentucky has many more economic challenges. So the difference really is in the breadth and depth of the intellectual and financial resources that can be brought to bear to try to meet the challenges of improving the university.

**Q**: What has surprised you most about the UC Davis campus?

**A**: I'm surprised at the complexity of the channels through which we

have to go to accomplish important and urgent needs, and at the number of acronyms. There's an initial for everything. I'm turning to the person next to me at every meeting, asking, "What does that stand for?"

**Q**: What are your priorities once you've settled in on campus?

**A**: Initially I plan to focus on facilitating the building of a neuroscience building that can bring together in one physical location many of the researchers in neuroscience. We have already begun to plan on this and will bring this in front of the state Legislature for Garamendi funding in 2003.

In addition, I plan to help to

finalize plans for a mouse biology building that will be built together with The Jackson Laboratory. This initiative was begun under the leadership of the division's previous dean, Mark McNamee. It will allow UC Davis to take optimal advantage of the power of transgenic technology and will truly put the university on the map in terms of fruitful interactions between academics and industry. Finally, I hope to establish a Center of the Biology of Aging and a Center for Women's Health Research. UC Davis already has considerable strengths in both of these areas across the campus. My hope is to create centers to coordinate activities in these two focused areas and to accelerate the hiring of additional faculty members with research interests and strengths in these areas.

**Q**: In what areas do you think you can contribute most substantially to UC Davis and biological sciences?

**A**: Clearly my background is in biomedical issues, which will make it easier for me to help marry initiatives that are important to the division with

initiatives that are important to the School of Medicine. I know there is already good communication between the College of Agricultural and Environmental Sciences and the division. Those ties will be maintained and nurtured to go the next step. I'm not going to forget the strengths that already exist and are so healthy and good. But I do feel equivalent communications between the division and the School of Medicine and the Division and the School of Veterinary Medicine could be explored. That's where my background should help.

**Q**: How do you think the division might be further strengthened?

**A**: Clearly we want to have a bigger impact nationally. That to me translates into more research grants, particularly from the National Institutes of Health, the National Science Foundation, the USDA, and possibly the EPA and the Department of Defense, the premier federal funding agencies. We must also pay attention to the quality of teaching at the graduate and undergraduate level, and to attracting the best postdoctoral fellows. I really feel that universities are at the forefront of discovery. Pharmaceutical and biotechnology companies have to be driven by whether they can put a product on the shelf in five years. I think that we have the luxury of searching for its own sake. However, we too must promote research that is relevant to the citizens of California and will help them and the economy. If we are not doing our fair share of discovery then we are not meeting the needs of the country. To me, good students and good faculty will come to places where the research is the best. I have a great respect for high-quality, innovative teaching. This is easier to do when you have excellent students. Excellent students come to excellent institutions. The UC system has such a wonderful reputation. This makes it easier to attract the best faculty. We need to invest in them, give them the resources they need to be successful.

**Q**: Regarding biological sciences, in what areas do you think UC Davis can contribute most substantially to the

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'The four areas of genomics, proteomics, biotechnology and bioinformatics impinge on every section in the division. And I think the state economy will be enhanced by our ability to contribute to these areas—increased employment as well as products that will help the quality of life for all Californians.'

—Phyllis Wise

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state and beyond?

**A**: Davis hosts the Biotechnology Program, the UC-wide Biotechnology Research and Education Program. We are excited about the new genome building and the focus on genomics. We interact very strongly with the College of Agricultural and Environmental Sciences in the growth of biotechnology. The four areas of genomics, proteomics, biotechnology and bioinformatics impinge on every section in the division. And I think the state economy will be enhanced by our ability to contribute to these areas—increased employment as well as products that will help the quality of life for all Californians.

**Q**: How do you keep your personal work/life scales in balance?

**A**: I don't always succeed at this, but I'm working on it. I really am excited about moving to California because I get to launch a new chapter in my life. My children and my mother, my cousins and my aunts and uncles—almost everybody in my family—are on the East Coast. I want to be able to stay in close touch with them—I have a new grandchild and it is important to me to be able to see him frequently. It should be easier for me to fly from here to New York and Washington than it was from Lexington, Kent. I have two cousins in the Bay Area and they have already visited Davis. I also have three aunts and an uncle in Irvine who I hope to be able to visit. I started taking yoga classes last year, which I really

enjoyed doing and hope to continue. It was wonderful to have that outlet, that way of re-centering myself outside the office and the lab.

**Q**: Have you found a home here yet and, if so, what are some of your observations about the community of Davis thus far?

**A**: Yes, I have found a home in west Davis. Everything that I have seen so far convinces me that Davis is a great community in which to live. I think it welcomes new people. It seems to be a very easy community to live in because traffic isn't a problem and there are so many places close by. I have already discovered the farmers market, the Co-op, the Nugget and Peet's Coffee. It's easy to jog here. I used to live in a place that was amongst beautiful Kentucky horse farms, but there was no lighting on the streets. I can run here even when it is not light out yet because there are streetlights. I have to figure out the bike path from my house to campus because I really want to ride my bicycle to work at least occasionally.

**Q**: You are moving your lab here. Would you talk some about your commitment to continuing your research?

**A**: I believe that my research program is as important, or at least almost as important, as my deanship, in part, because I love it and, in part, because the people in my lab are my extended family. I love facilitating progress for other people, but my own research is still my home for discovery. When I give up teaching and research myself, I don't think I can mentor other faculty and appreciate fully what they're going through. For me to be a complete professional person, I feel that I need to keep my research program active in a meaningful way. Whether it is to the extent that I have now, which involves three grants, I don't know. But the idea of discovery, of putting pieces together, making the whole bigger than the pieces, still excites me.





Kathleen Holder

A cyclist stops to read a new sign about the future teaching facility to be built on the site of Haring Barn, shown above in mid-January before the barn walls came down.

## CLEARING THE WAY FOR THE SCIENCES LABORATORY BUILDING

By Kathleen Holder

**H**aring Barn, one of the original buildings of the School of Veterinary Medicine, came down this winter to make way for construction of a state-of-the-art sciences teaching facility.

Demolition workers, using power shovels and excavators like precision tools, dismantled the half-century-old barn as well as four smaller buildings nearby, and sorted the materials for salvage.

The demolition will enable construction to begin this spring on the Sciences Laboratory Building in the heart of UC Davis' biological-sciences district. The three-story facility will include 34 lab classrooms for undergraduate instruction in biology and chemistry. To the west, near the Life Sciences Addition, will be a 500-seat lecture hall.

"This is an exciting milestone for life-sciences instruction at UC Davis," said Phyllis Wise, new dean of the Division of Biological Sciences. "These buildings will help advance the campus's already strong reputation for life-sciences research and education."

Haring Barn was originally built as a large-animal clinic after the School of Veterinary Medicine was established in 1946. It most recently housed tread-

mills for research on physiology of horses and other animals. However, the big yellow barn was considered obsolete and neither historically nor architecturally significant.

As part of a \$350 million facilities plan, the School of Veterinary Medicine is building the Veterinary Medicine Laboratory Facility/Animal Quarters and expects to break ground later this year on facilities near the Veterinary Medicine Teaching Hospital to house programs that had been located in Haring Barn and nearby buildings.

Before Haring Barn came down, bat biologists spent more than two days in December carefully handpicking more than 1,000 Mexican free-tailed bats from their roosts behind unused barn doors. More than half of the bats were moved to another colony under a bridge in the arboretum. The rest were released after the biologists made sure that each bat could fly, said Sid England, campus



An artist's rendering of the Sciences Laboratory Building environmental planner. The species is not considered threatened.

After receiving a report from the consulting biologists, the campus will evaluate whether to create new roost sites near the construction site for Mexican free-tailed bats, England said.

The Sciences Laboratory Building promises to be the most modern sciences teaching facility in California when it opens in 2004 in the campus' Life Sciences District near the Life Sciences Addition and Briggs and Storer halls. In addition to laboratory classrooms, the project will include student discussion rooms, learning centers, offices and a computer laboratory. The adjacent lecture hall will be the largest of its kind on campus.

The Sciences Laboratory Building will bring together in one place instructional programs that are now housed in six different buildings, ranging from 30 to 50 years old. Co-locating the biology and chemistry programs will allow for better sharing of lab-prep space, staff and equipment. The labs will be highly computer-friendly, modular, and designed for flexibility and team approaches to studying hands-on biology.



The Life Sciences Addition and Briggs Hall rise above the rubble on the site of the future Sciences Laboratory Building



Bruce Myden

Susan Williams, director of UC Davis' Bodega Marine Laboratory, says U.S. policy-makers need to set up clear regulations for the aquaculture industry.

### EXPERTS CALL FOR STRICTER CONTROLS OF AQUACULTURE

**A**quaculture—the farming of fish, shellfish and aquatic plants—is a burgeoning industry that should take greater care not to import and spread invasive species, say ecologists at UC Davis and Stanford University.

In the Nov. 23 issue of the journal *Science*, the researchers write that exotic species of seaweed, fish and mollusks escape frequently from aquaculture facilities, creating “biological pollution” with unpredictable and irreversible effects on native ecosystems.

For example, along the Pacific coast of North America, the farming of Atlantic salmon threatens native fish. In the Pacific Northwest, more than a half-million Atlantic salmon escaped from farm pens between 1987 and 1997, and they and their descendants have been found in 77 British Columbia rivers.

Aquaculture now supplies one-third of the seafood consumed worldwide; U.S. facilities alone are expected to increase their output five-fold by 2025, says the report. The authors are Susan Williams, director of the UC Davis Bodega Marine Laboratory, professor of environmental science and policy and an authority on shallow-water marine systems; Donald Strong, a UC Davis professor of evolution and ecology and an authority on invasive species; and Rosamond Naylor, a senior fellow at the Center for Environmental



An oyster farm near Tomales Bay, above. To protect native species, the aquaculture industry needs to take measures that prevent the spread of invasive species, say researchers from UC Davis and Stanford University.

Science and Policy at Stanford University.

The authors call for U.S. policy-makers to enact clear, effective regulations to replace the current “regulatory quagmire” that now governs the aquaculture industry and government conservation agencies. They point to two models: New Zealand’s Hazardous Substances and New Organisms Act of 1996 and the global Convention on Biological Diversity. In particular, those models suggest raising native species in aquaculture, rather than introduced species.



Exotic species frequently escape from aquaculture facilities, like the one shown above, creating “biological pollution.”



### STUDY SHOWS HOW PLANT CELLS SPIN COTTON

**C**otton, paper and wood—they’re all made of the cellulose that plants use for strength and flexibility. But surprisingly, scientists do not know a lot about how plants actually make cellulose. Now research at UC Davis has shed light on a key step: how fibers get started.

Sitosterol, a fatty substance similar to cholesterol, combines with glucose to form a “primer” that gets the process started, according to research by Langcai Peng and colleagues in the Section of Plant Biology.

“This adds a key step in understanding cellulose synthesis,” says plant biologist Deborah Delmer, who is senior author on the paper.

Cellulose is made of chains of glucose molecules joined together. Researchers have identified a family of enzymes, called Cesa, each of which can add new glucose blocks to existing chains of cellulose. But the Cesa enzymes cannot take the first glucose molecule and begin a chain, Delmer says. They can only make an existing chain longer.

The sterol may help keep the first glucose unit near the cellulose-making machinery in the cell membrane. After the first step, the enzymes can make the chain longer by adding extra glucose units to the end away from the sterol.

The growing chain is pushed

*(continued on page 10)*

## ...RESEARCH NEWS

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through the cell membrane to the outside of the cell. In some plants, such as cotton, extra cellulose provides the strength and other properties that make cotton fibers so valuable to the textile industry.

To study cellulose production, the researchers grew fibers from cotton plants in the laboratory. They also transferred genes into yeast, to find the minimum requirements for making cellulose.

The paper was published in the Jan. 4 issue of *Science*.



Researchers in the Section of Plant Biology have discovered how cotton plants, above, start spinning the cellulose fibers that make up cotton as well as paper and wood.



## OPPORTUNITIES FOR DISTINCTION



A gift from Professor Emeritus Eric Conn, above in 1993, and his wife, Louise, to the Division of Biological Sciences will help to ensure that the UC Davis Herbarium has a home in the new Sciences Laboratory Building.

### LATE HERBARIUM CURATOR INSPIRATION FOR \$25,000 GIFT

A \$25,000 gift to the *Opportunities for Distinction* campaign from Professor Emeritus Eric Conn and his wife, Louise, will help ensure that the John M. Tucker Herbarium has a new home within the Sciences Laboratory Building, scheduled to open in 2004. "This gift is a reflection of our admiration for June McCaskill [the late curator of the herbarium]," says Conn. "Early in my career I needed herbarium specimens, and June's cooperation and knowledge were of great assistance. When I heard that a plant identification room was to be named after her, I felt it was something I wanted to contribute to. Also, the herbarium has many useful books that I used," he says.

Conn, an internationally known plant biochemist, was a member of the UC Davis faculty from 1959 to 1993 and played an instrumental role in the development of the campus's biochemistry and biophysics department. Conn received numerous awards in recognition of his teaching and research, including the 1990 UC Davis Prize for Teaching and Scholarly Achievement. He coauthored the widely used introductory textbook *Outlines of Biochemistry*.

This is not the Conns' first major gift to the Division of Biological Sciences. In 1994, they established the *Louise and Eric Conn Undergraduate Scholarship in Biochemistry*. Through their membership in several of UC Davis' support groups, the couple actively assists the campus in many areas. Conn also serves on the advisory committee for the *Opportunities for Distinction* campaign.

### JACK MAJOR FUND REACHES ENDOWMENT THRESHOLD

A year after the death, in February 2001, of Professor Emeritus Jack Major, gifts in his memory reached the \$10,000 threshold necessary to establish an endowment.

Gifts have been received from Major's family, friends, former students and colleagues, as well as from corporations. The largest contribution received to date came from a friend who wished to remain anonymous but wanted to pay tribute to the late plant ecologist.

The Jack Major Memorial Endowment Fund will support grants for student field research in botany. The Davis Botanical Society is collaborating with Major's widow, Mary Major, on fundraising efforts to increase the size of the endowment, thus making more generous student support possible.

For those wishing to contribute, checks should be made payable to the UC Davis Foundation, with the name of the fund noted on the check memo line. Gifts may be sent to:

Jacqueline J. Schad  
Director of Development and External Relations  
Division of Biological Sciences  
UC Davis  
One Shields Avenue  
Davis, CA 95616-8536

## WITH DISTINCTION

### GRADUATE TRAVEL AWARD RECIPIENTS

This year's recipients of the *Bossuyt/Bristol Myers Award* are Eric Lansdon, graduate student in chemistry, and Kate Kavanagh, a student in the Biochemistry and Molecular Biology Graduate Group. The award supports international travel to scientific meetings for students studying structural biology.

Lansdon and Kavanagh will present the results of their respective research projects at the 19th Congress and General Assembly of the International Union of Crystallography, Aug. 6-15, in Geneva. This international meeting of x-ray crystallographers takes place every three years.

Kavanagh has recently determined the structure of sylose reductase, and Lansdon will present the significant results of his work on the enzyme APS kinase, derived from the fungi *Penicillium chrysogenum*.

The Bossuyt family and Bristol-Myers Squibb corporation established the fund in memory of Luc Bossuyt, who worked for Bristol-Myers. He was killed in 1996 when Paris-bound TWA flight 800 exploded off the coast of Long Island.



### PENGELEY AWARD FOR EVOLUTIONARY BIOLOGY

Daniel Bolnick, James Fordyce and Grant Yamashita each received a *Daphne and Ted Pengeley Endowment Award for Research in Evolutionary Biology*. Upon establishing the endowment in 1997, Pengeley said, "Even though Darwin's principle of evolution by natural selection is the 'backbone,' so to speak, of all modern biology, there is precious little money available for research in the field, and it is desperately needed...it has been enormously satisfying for me, knowing that it [the endowment] will last and help others in perpetuity."



### FOUR ELECTED AAAS FELLOWS

The following division faculty members were elected fellows of the American Association for the Advancement of Science (AAAS):

Carol A. Erickson, associate dean and professor, Section of Molecular and Cellular Biology  
Edward G. Jones, director, Center for Neuroscience  
Stephen C. Kowalczykowski, professor, Section of Microbiology  
Diana G. Myles, professor, Section of Molecular and Cellular Biology

Fellowship recognizes "efforts toward advancing science or fostering applications that are deemed scientifically or socially distinguished," according to the association. With more than 138,000 members, the AAAS is the world's largest general science organization. Founded in 1848, it publishes the journal *Science* and has been naming fellows since 1874.



### BIOCHEMISTRY STANDOUT

Sarah Jean Thompson received the 2001 *Louise and Eric Conn Undergraduate Scholarship in Biochemistry*. A biochemistry major in her junior year, Thompson has been on the dean's list every quarter since enrolling as a freshman. She was inspired by an introductory biology class to set a goal of becoming a medical doctor and working towards a cure for AIDS.

In addition to being an outstanding scholar, Thompson is an enthusiastic athlete and dancer, and has volunteered on the pediatrics floor at the UC Davis Medical Center. She also informally tutors fellow undergraduate students.

Professor emeritus Eric Conn and his wife, Louise, established the award in 1994 for the support of undergraduate scholarship in biochemistry.



### SOPHOMORE RECEIVES HORWITZ SCHOLARSHIP

Sophomore Eon Rios (right) received the 2001 *Barbara A. Horwitz and John M. Horowitz Undergraduate Scholarship in Physiology*. Professor Barbara Horwitz and husband Professor Emeritus John Horowitz, both of the Section of Neurobiology, Physiology, and Behavior, established the award in 1995 for the support of undergraduate scholarship in physiology.



During his first two years at UC Davis, Rios, a UC Regents Scholar, conducted an independent research project in professor of microbiology Kazuhiro Shiozaki's laboratory, trained and worked as a phlebotomist in the Sonora Community Hospital, and volunteered in the physical therapy and pediatric emergency departments at the UC Davis Medical Center. He plans to attend medical school and says the process of choosing his career "has been an adventurous one."



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#### ASHTON SCHOLARSHIP AWARDED TO ANIMAL BEHAVIOR STUDENT

**L**ena Berg (above), doctoral student in the Animal Behavior Graduate Group, is the recipient of the *Sherley Ashton Fellowship* for 2001-2002.

Berg studies magpie reproduction biology in Costa Rica using DNA analysis technology. Her work focuses on patterns of reproductive cooperation and conflict in the white-throated magpie-jay, a species she describes as “a highly social—and endlessly entertaining—bird living in the tropical dry forests of Costa Rica.” Work conducted by Berg at her field site, in the Santa Rosa sector of the Guanacaste Conservation Area, includes trapping and banding both adult birds and nestlings, monitoring nests, collecting behavioral data at nest sites, and tracking group nesting activity and social interactions.

The fellowship was established in 1999 with a gift that is to be fully disbursed within five years. Grants from this fund are among the largest awarded by the Division of Biological Sciences. Recipients are selected based on financial need and scholastic achievement.



#### BIO SCI JUNIOR RECEIVES MILAUSKAUS SCHOLARSHIP

**T**he 2001 *Milauskas Family Scholarship* was awarded to Sara DeLeon (above), a biological sciences major in her junior year. DeLeon is also minoring in mathematics and history. She is a fourth-year rower for the UC Davis Women’s Crew team and works for the Learning Skills Center as a chemistry tutor.

She also works for the mathematics department as a teaching assistant in the Emerging Scholars Program, an intensive problem-solving course that students take concurrently with the advanced calculus class series.

DeLeon has also worked and volun-

teered at the UC Davis Botanical Conservatory. Her duties included maintaining and repairing the conservatory as well as taking care of the plants.

Dr. Albert Milauskas, an ophthalmologist, and his wife, Dorothy, a nurse, established the Milauskas scholarship in 1994. They own and operate the Milauskas Eye Institute in Palm Springs. Dr. Milauskas holds an adjunct teaching appointment at UCLA. The Milauskas’ daughter, Elizabeth, graduated from UC Davis in 1994 with a B.S. in biological sciences.



#### RUSSELL PLANT BIOLOGY FELLOWSHIP

**N**athan Alder received the 2001-2002 *Walter R. and Roselinde H. Russell Plant Biology Graduate Fellowship*. The fellowship supports outstanding graduate scholarship in plant biology.

Alder is studying how proteins synthesized in a plant cell’s cytoplasm are transported across chloroplasts’ thylakoid membrane.



Luis Galvea/Axiom

Martina Newell-McGloughlin, right, director of UC Davis’ Biotechnology Program and the UC-wide Biotechnology Research and Education Program, received the James H. Meyer Distinguished Achievement Award from the UC Davis Academic Federation during a reception held on Jan. 8 at the Buehler Alumni and Visitors Center. Here, she talks with colleague Cathy Miller, left, and Julia Munsch. Newell-McGloughlin has been lauded as the “driving force” behind the biotechnology program, which developed an undergraduate major and a graduate emphasis. She was nominated by several colleagues for the award, which includes a \$1,000 stipend.

# Thomas Hahn Knows Where The Birds Are

By Debra Cleveland

Spend a few moments outdoors with behavioral ecophysiological Thomas Hahn, assistant professor in the Section of Neurobiology, Physiology and Behavior, and he'll reveal an aural landscape hidden to many. "I just heard a house finch and a golden-crowned sparrow," he says while I'm standing with him outside the Zoology Field House, where his office is located west of Highway 113. He pauses to listen for a repetition of the songs. A distinctive series of descending notes, with a flashy trill for a coda, is clearly audible. "That's the golden-crowned sparrow," he says for my benefit.

## FOOD IS THEIR CUE

Each summer, Hahn travels to his field site in the Inyo National Forest, east of Tioga Pass. From a base camp, he ventures out to collect data on various avian species. One Sierra Nevada avian resident that Hahn studies is a particularly daunting research subject: the red crossbill (*Loxia curvirostra*).

A member of the finch family found across the northern U.S., the red crossbill is not only nomadic, but also inconspicuous, living well-hidden in the uppermost branches of conifers.

However, Hahn has managed to collect unprecedented data on the crossbill. His novel research, which incorporated data from captive crossbills as well as laboratory studies, elucidated unknown aspects of the birds' breeding cycle and reproductive behavior.

"When I began studying red crossbills," says Hahn, "most work had been done on seasonal breeders, species that breed at approximately the same time every year. Red crossbills were considered unusual in that they appeared ready to breed any time of the year."

Hahn explains that seasonally breeding birds are photoperiodic, i.e., they come into breeding condition in response to day length. "Birds try to time reproduction with seasons when food is abundant and environmental conditions are favorable," he says. "In seasonally breeding species, long days stimulate the reproductive system."

In contrast to seasonal breeders, crossbills can breed virtually anytime, even when days are short and conditions daunting. "Crossbills can breed



The crossbill's beak is built for opening pine cones and crushing seeds.

when it's as cold as minus 30 Fahrenheit," says Hahn.

Since crossbills apparently weren't using day length as a cue to reproduce, Hahn thought the next logical cue was food availability—a hypothesis his research confirmed.

"Unlike migratory birds that return each year to a relatively reliable food source, crossbills feed on pine cone seeds—their crossed bills are built for opening pine cones and crushing seeds—which are produced by conifers on a vast spatial scale," says Hahn. "This means cones may be abundant one year in a particular place, and the next year the same trees may yield nothing. So crossbills are nomadic, settling wherever they find food."

He continues, "As a consequence of an unreliable food supply, crossbills can't anticipate when or where they'll find enough to eat. Therefore, they need to be ready to breed at any time. As soon as they find enough to eat, they begin to nest. This means food is what behaviorists call the proximate cue for breeding."

## CYCLE SUBTLETIES

In determining the reproductive state of crossbills, Hahn measured physical attributes and hormone levels in blood samples. The results were unexpected.

"It turns out," says Hahn, "that the cycle seen in seasonal breeders is present in crossbills—crossbills are simply a variation on a theme. Crossbills do stop, or nearly stop, breeding in the fall, which is what seasonal birds do, and crossbills are responsive to increasing day length. What makes crossbills different is their ability to respond to another environmental cue—food sup-

ply. So a lot more similarities exist than was originally thought."

At some point birds enter what is termed a *photorefractory period*—even if days remain long, breeding ceases. "Something readjusts in the brain and long days are no longer a stimulatory cue for reproduction," says Hahn. Some birds need to experience short days before they become photosensitive again, he says.

In photorefractory birds, the level of a peptide hormone produced in the brain, called gonadotropin releasing hormone (GnRH), drops precipitously. "A few hundred neurons in the hypothalamic region of the brain make GnRH," explains Hahn. "The neurons secrete it into a small portal system of blood vessels, which carry it to the pituitary gland. In the pituitary gland, GnRH regulates production of gonadotropic hormones, which enter the general blood circulation, affecting gonad function, sex steroid hormone production and gamete maturation. Sex steroids in turn affect behavior. So it's a giant cascading system that all depends on GnRH," he says.

Hahn and colleagues have found that



Thomas Hahn was able to collect data on the red crossbill, above, that revealed a surprising aspect of the birds' breeding cycle.

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## ...FOCUS ON FACULTY

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GnRH levels fluctuate in crossbills, but the fluctuation isn't nearly as dramatic as in seasonal breeders.

"It's unclear whether crossbills experience a true photorefractory period, but they seem to have some form of it," says Hahn.

However, the crossbill's ostensible photorefractory period ceases in November or December. And while seasonal breeders may need to wait for days to lengthen to breed, crossbills don't. "If enough food is available and some birds display courtship behavior," says Hahn, "a synergism happens. Put food and appropriate behavior together and crossbills can be in breeding condition and nesting again by late December or January."

Colleagues use adjectives such as *creative*, *remarkable*, *definitive* and *classic* to describe Hahn's crossbill research, which he began as a graduate student at the University of Washington. Gregory Ball, Hahn's post-doctoral mentor at Johns Hopkins, comments, "Hahn's Ph.D project required an extraordinary level of perseverance and independent thinking. Field projects that require capturing and collecting blood samples from wild animals throughout the year are always challenging. When the species under investigation breeds at unpredictable times of the year and at unpredictable sites, you have a nearly impossible project! However, Hahn produced an outstanding and unprecedented data set on both free-living and captive crossbills."

Although the crossbill is not an endangered species, Hahn sees his work as adding to a foundation of knowledge that is essential for making critical decisions about conservation. "When questions about habitat preservation, etc., arise, it's important to have people around who have studied the specie or species in question," he says.

An ample beard gives Hahn, who has bachelor's and master's degrees in biology from Stanford University, the rugged appearance you might expect of someone who spends significant time in the mountains. He came to UC Davis in July from the Institute of Arctic Biology at the University of Alaska. He is pleased about the campus's proximity to the Sierra Nevada because the next phase of the crossbill



Behavioral ecologist Thomas Hahn, above, studies avian reproductive behavior as well as how events that occur early in a bird's life affect its behavior later on.

project is a comparative study that involves several species of related finches present in the Sierra.

"The crossbill is part of a sub-family called the cardueline finches," says Hahn, "which includes familiar species such as the canary, gold finch and house finch. Within this group are birds, like the crossbill, that can breed just about any time. At the other extreme are birds that are very constrained and can breed only a few months out of the year. The latter includes Cassin's finch—a common species in the Tioga Pass area—that breeds only in May, June and July. Also in this constrained group is the gray-crowned rosy-finch, the bird that, in North America, breeds at the highest elevation. In comparison the crossbill is freewheeling."

Hahn hopes to determine if the cardueline finches are all photoperiodic, with variations in breeding caused by specific environmental cues, or if variations are more fundamental, perhaps inherited from a common ancestor. "We have decent phylogenies, or evolutionary histories, for the cardueline finches, so we know which ones are close relatives. The evening grosbeak, which commonly breeds in the Sierra, is clearly an old lineage in the cardueline group and a seasonal breeder. Right now no one has any data on its physiology."

## ALUMNI NOTES

1976

### Susan Elizabeth McNamara, B.S., Zoology, 1976

"Since completing my master's degree in 1978, I've returned to school to earn, first, a clinical laboratory scientist license and then my teaching credential in life sciences. In addition, I've married and created a family of five—three sons! The second and third sons arrived together and all three have been a joy and a challenge. I currently share the running of the laboratory at the UC Santa Cruz Student Health Center, work at the lab at Dominican Hospital, and am on the faculty at a new program for medical laboratory technicians at Hartnell Community College.

"I enjoyed my time at UC Davis, both academically and socially. Probably what I remember most are the people. I've stayed in touch with some, but would very much like to hear from those I've not heard from."

1982

### Greg Carter, B.S., Animal Physiology, 1981; M.S., Physiology, 1982.

"I greatly enjoyed reading the article 'A Fine Energy Balance' on Dr. Barbara Horwitz in vol. 9, no. 4 of the biological sciences newsletter. I first encountered Dr. Horwitz as an undergraduate at Davis in 1979. After taking a class with her I promptly changed my major to physiology and started working in her lab. Dr. Horwitz literally taught me how to think and analyze. In all my years of schooling I have never met a finer educator and likely never will. She is the epitome of what a college professor should be: brilliant intellect but willing to listen and exchange ideas with everyone, including lowly undergrads taking introductory courses. I am profoundly grateful for the knowledge I gained from her teaching and mentorship as well as the skills to critically analyze data and construct hypotheses that she imparted to me. I continue to use these tools she gave me everyday in my practice of medicine and research. I



wish her continued success and hope that many more students will be fortunate enough to have her as a teacher. Thank you Barbara!

"After graduating from UC Davis, I went to medical school at Loyola University of Chicago. I remain close with many of my UCD colleagues and am very close friends with Jock Hamilton, who works in Dr. Horwitz's lab. I now live near Seattle, WA where I have a clinical practice in physical medicine and rehabilitation and an academic appointment at the University of Washington School of Medicine."

## 1983

### **Byron Solberg, B.S., Genetics, 1983.**

"I graduated with 'highest honors' and then attended the UCSD School of Medicine, graduating in 1987. I completed an internship at Mercy Hospital of San Diego and then an anesthesia residency at Virginia Mason Hospital, Seattle, WA.

"I am board certified in anesthesia, and I've been in group anesthesia practice in Oregon for 10 years.

"My science training at UCD was outstanding. I was so well prepared for medical school that I had studied most of the first two years of medical school material in college as an undergraduate. I scored in the top 1percent in the nation on the medical boards of 1985, and I attribute my UCD undergraduate studies for helping me succeed.

"I am blessed with a wonderful family: wife Bernadette, and sons Joshua (8) and Garrett (5). My wife and I were fortunate enough to travel, climb and backpack through Nepal, Europe and Equador B.C. ("Before Children!").

"Now we snowshoe in Oregon, hike in the Sierras, and comb the beaches of San Diego."

## 1986

### **Kerry Levin, B.S., Genetics, 1981; D.V.M., 1986.**

"I'm one of those lucky souls that heard my calling as a young child, about the age of 5! My undergrad experience was one of intense competition with other pre-vet and pre-med students all vying for select seats at the institutes of our choice. I received an excellent undergrad education, not only at UC Davis but enhanced by spending my junior year studying with the Education Abroad Program in Edinburgh, Scotland. That is probably the most memorable part of my undergrad experience, with courses in developmental and molecular genetics at UCD a close second.

"Following graduation with highest honors in genetics, I had the opportunity to pursue a Ph.D. program in genetics or attend vet school. It was an easy choice: I went to UC Davis' School of Vet Med, graduated in 1986 and have been working as a solo private practitioner since that time. I own North State Animal Hospital in Ukiah, CA, where I treat large and small animals. I am divorced, no children, enjoy whitewater rafting, scuba diving, trail riding horses, walking my dogs, gardening, vegetarian cooking, yoga, traveling etc. when I am not busy running my business!!"

## 1988

**Joel McComb, B.S., Genetics, 1988,** is CEO and president of Innovadyne Technologies, Inc., in Santa Rosa, CA. He joined the company as president in January 2001 and will now assume full responsibility for all aspects of Innovadyne's worldwide strategy and operations. Prior to joining Innovadyne, McComb spent approximately six years at Beckman Coulter, where, as general manager he ran the organization's \$100 million primary care division. According to the press release announcing McComb's appointment as CEO, Innovadyne Technologies "is a rapidly-growing, privately-held company that provides robust fluidics solutions to life science researchers in HTS, genomics and proteomics markets...."

### **Sharon R. Roberts, Ph.D., Microbiology, 1988.**

"After completing postdoctoral research at the University of Pennsylvania and at University of Alabama, Birmingham, I am an associate professor at Auburn University, Alabama. The primary research project in my laboratory focuses on mycoplasma conjunctivitis in house finches. This is a new host-parasite relationship first observed in 1994. My colleagues and I are interested in the evolution of this new host-parasite relationship. Here at Auburn we are able to study the infection as it occurs naturally in the wild population and we have the facilities to study the infection in captive birds. It has proven to be a fascinating interdisciplinary project, involving epidemiology, microbiology, ornithology, ecology and evolution. It certainly provides a broad training opportunity for both graduate and undergraduate students. Best of all, for me, it is exactly the kind of work I have always wanted to do and the broad experience I gained while a Ph.D. student at UC Davis certainly positioned me to pursue it when the opportunity arose.

"One of the great features of Davis is that it is a small college town, so I felt I lived in a community of scholars. I went out after work with my colleagues and had a great time. The conversations were wide-ranging and stimulating. Having done a postdoc in a large city where we all scattered after work, I found that I missed this community so much. Luckily for me, Auburn is very much like Davis in that regard and I socialize with my colleagues very happily again!"

## 1993

### **Christine A. Armer, B.S., Biological Sciences, 1993.**

Armer received an M.S. in entomology from the University of Illinois at Urbana-Champaign in 1996. Currently a graduate student at Oregon State University, Armer expects to complete her Ph.D. in entomology next year. She is studying the biological control of the

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## DIVISION OF BIOLOGICAL SCIENCES

### UNDERGRADUATE MAJORS

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Evolution and Ecology  
Exercise Biology  
Genetics  
Microbiology  
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Plant Biology

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## ...ALUMNI NOTES

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Colorado potato beetle. Armer explains how she became interested in biological control. "I was a biology major," she says, "and I had taken one general entomology course in which the professors had discussed biological control, and it struck me as an amazing concept—using beneficial insects to fight off the pest insects, instead of having to use pesticides. As a child of the '70s, living near Berkeley, I was very strongly against pesticides, and any viable alternative seemed worth pursuing. Not long after taking that course, I decided I needed a job to help cover some bills, and Dr. Jay Rosenheim, who was a new faculty member in entomology at the time, had posted a job listing for an undergrad worker in biocontrol. I applied, and during the interview, I mentioned that I was studying entomology for a minor. I had actually only been considering entomology as a minor and therefore hadn't registered as an entomology minor. I had to sprint to Mrak right after the interview to sign up, just in case Jay did decide to verify the

minor. I evidently got the minor registered quickly enough, because I got the job, and ended up working two and a half years in Jay's lab. I learned directly from grad students and post-docs in the lab about pear, cotton and grape biocontrol. Besides being a great learning experience, that job was what made me decide to go on to grad school to pursue a career in entomology. I keep enjoying my research and teaching, and continue finding new things I want to study. I imagine that by the time I retire, my interest in learning about insects still won't be satiated." Armer has received several fellowships, grants and scholarships, including the Environmental Protection Agency's *Science to Achieve Results Graduate Fellowship* (2000-02), the *National Potato Council Auxiliary Graduate Scholarship* (1999-2000), and the *Applied Insect Ecologists' Foundation Graduate Fellowship* (1999). As a graduate teaching assistant, she teaches an undergraduate course on insect pest management, and has received a rating of 3.6 out of 4.0 from her students.



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