

FALL 2003

BIO

COLLEGE OF BIOLOGICAL SCIENCES

UNIVERSITY OF MINNESOTA

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Thank you, CBS friends

Now that Campaign Minnesota is over, we'd like to thank our friends for their gifts to the College of Biological Sciences. From \$25 to \$10 million, they're all important and very much appreciated. Pictured are Denny and Joan Dvergsten, longtime CBS supporters. [Page 9](#)

FROM THE DEAN



TOM FOLEY

Robert Elde, Dean

UEL incubator: Small biotech fish get a pond of their own

This summer the city of St. Paul bought a warehouse between the Twin Cities campuses to serve as an incubator for biotech companies. The incubator is an anchor for a planned life sciences corridor that city officials hope will make St. Paul a center for biotechnology.

This is extremely good news for the College of Biological Sciences. The proposed corridor will provide internships and jobs for CBS students and give faculty a place to develop their ideas for products.

The incubator was proposed by University Enterprise Laboratories, a nonprofit partnership created by the College of Biological Sciences, Carlson School of Management, and the University of Minnesota Foundation. Campaign Minnesota helped launch UEL by raising corporate and public awareness of the role biology could play in economic development.

I helped to organize UEL because I saw the pressing need for a place where academia and industry could work side by side to develop Minnesota's biotechnology industry. It began with the opening of Biodale, our center for research services, which brought small and large biotech companies to our door and allowed us to become better acquainted with them. As a result, we have provided temporary lab space for several of these companies.

We also learned that in today's market, small fish — start-up companies — develop new products and big fish — companies like 3M, Cargill, and Medtronic — acquire them. And we realized that while many states had created ponds for their small fish, Minnesota had not done so and was rapidly falling behind.

It's important for Minnesota's economic health that we provide Minnesota's large companies with small fish. If not, we could lose them to better feeding grounds on the west or east coasts. We also hope some of these small fish become big fish.

The incubator is a start. It's a pond where small fish can feel at home, and where new ideas can bubble up to the surface. I am very excited to see what develops there and where it will lead us. I hope you are too.

A handwritten signature in blue ink that reads "Robert Elde".

Robert Elde, Dean
College of Biological Sciences
belde@cbs.umn.edu



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DEAN

Robert Elde

EDITOR

Peggy Rinard

ADVISERS

Associate Deans

Judd Sheridan

Research and
International Programs

Robin Wright

Faculty and Academic Affairs

Department Heads

David Bernlohr

Biochemistry, Molecular
Biology, and Biophysics

Robert Sterner

Ecology, Evolution, and Behavior

Kate VandenBosch

Plant Biology

Brian Van Ness

Genetics, Cell Biology, and
Development

CONTRIBUTORS

Emily Johnston

Jean Marie Lindquist

GRAPHIC DESIGN

Shawn Welch

U of M Printing Services

PRINTING

U of M Printing Services

Address correspondence to:

prinard@cbs.umn.edu

Visit our Web site at www.cbs.umn.edu.

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On the Cover Denny Dvergsten and his wife, Joan, are among the many friends of CBS who provide critically needed private support for scholarships and new initiatives. Denny, who spent his career as a high school biology teacher, later directed a high school outreach program at CBS. Read more about them on page 11. Photo by Tim Rummelhoff

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Cargill Building tenants

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Mammalogist Sharon Jansa

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Mervyn de Souza, BSAS President

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Packer elected to Academy of Arts and Sciences

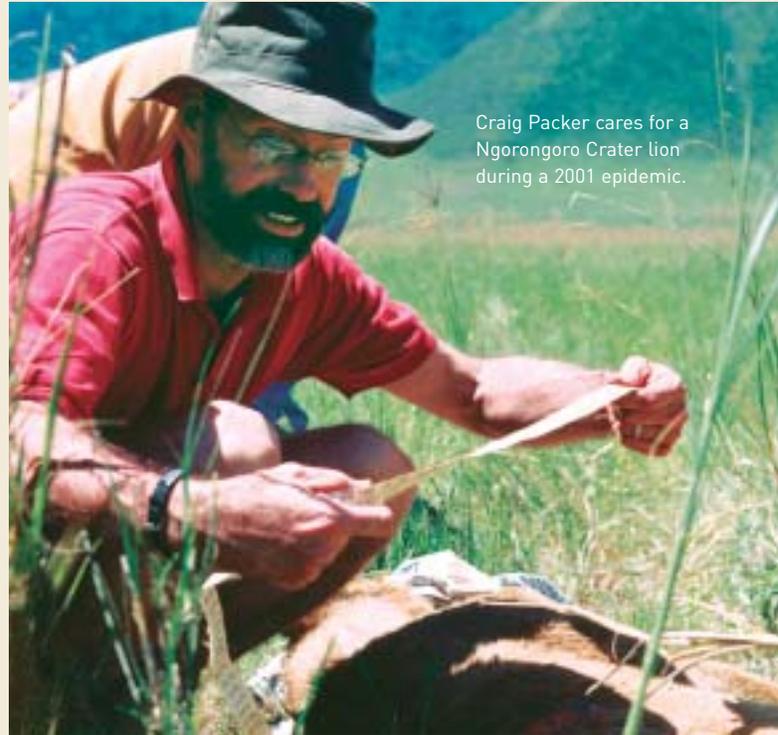
Craig Packer, Distinguished McKnight Professor in the Department of Ecology, Evolution, and Behavior, was elected to the American Academy of Arts and Sciences, joining U.N. Secretary-General Kofi Annan and journalist Walter Cronkite among 216 new members for 2003.

Packer, who joined the CBS faculty in 1983, is known for his studies of African mammals. Working with baboons, he showed that animals have built-in mechanisms to avoid inbreeding. From his observations of animal cooperation, especially among primates and carnivores, he found that it is possible to predict when animals will work together to hunt.

“Animals hunt together when they would be incompetent hunting alone,” Packer says. “When they don’t need to cooperate, they don’t. This pattern has been seen in birds,

lions and other carnivores, and primates.”

Packer has investigated other animal alliances, such as group living among lions. Unlike other cats, lions live together because their open habitat makes them vulnerable to rivals. He led efforts to protect lions on the Serengeti Plain from distemper brought to the area by domestic dogs. And he is now heading a study of the Serengeti’s bio-complexity to learn how the ecosystem—including human residents—functions. Packer received a Guggenheim Fellowship



Craig Packer cares for a Ngorongoro Crater lion during a 2001 epidemic.

in 1990, and in 1995 his book “Into Africa,” a personal account of his journeys to the continent, won the John Burroughs Medal. ■

Anne Pusey named Goodall’s Executive Director of Research



TIM RUMMELHOFF

Anne Pusey, director of the Jane Goodall Institute’s (JGI) Center for Primate Studies at the College of Biological Sciences, has been named executive director of research at JGI. She will oversee all chimpanzee research in Tanzania’s Gombe National Park, while continuing as Distinguished McKnight Professor in the Department of Ecology, Evolution, and Behavior.

Pusey studied the development of young Gombe chimpanzees under Goodall, receiving a doctorate from Stanford University in 1977. She takes the helm at Gombe just as researchers are answering key questions about chimp behavior, such as which males have fathered which infants, whether paternal relatives can recognize each other, and whether kinship is

important in cooperation and altruism. Researchers are also beginning to understand how mothering styles influence infants, causes of lethal inter-community aggression, and the nature of female competition.

She will also work with JGI staff and Tanzanian authorities on issues that threaten the park and chimpanzees, such as deforestation of nearby areas and transmission of human diseases.

The Center for Primate Studies houses Goodall’s data from 40 years of chimpanzee studies. To make an online donation to preserve these records, go to <http://www.giving.umn.edu/index.html>. ■

Anne Pusey has worked with Goodall since she was a graduate student.

Weiblen teaches rainforest residents to identify species

George Weiblen, assistant professor of plant biology, hosted three visiting parataxonomists from Papua-New Guinea this summer. They came to Minnesota to learn how to identify and preserve the wealth of plant and insect species in their native rainforest.

Papua-New Guinea ranks with the Amazon and the central Congo basin among the world's great tropical wildernesses. But it could all disappear if the New Guineans themselves don't take charge of their natural resources and protect the immense number of species there.

Although the people of Papua-New Guinea recognize huge numbers of plants and insects, they need training to document the species diversity that surrounds them and pass their knowledge—and passion for preservation—to the next generation. With 98 percent of land in New Guinea under tribal ownership, it's crucial that native people



George Weiblen, assistant professor of plant biology (second from left), with Richard Kutil, Brus Isua, and John Auga, who came to Minnesota from Papua-New Guinea to learn about preserving rainforest species.

become aware of the value of their natural resources. The New Guineans visiting Weiblen this week are bridges to the population at large, including children.

"As the country develops, the people face limited resources, and we're making them aware of this," Weiblen says. "Traditional knowledge is disappearing. We're documenting the names and uses of plants in a land where 25 percent of the world's languages are spoken. We try to make a big impact with a small amount of money." ■

Grants and Awards

DUNCAN CLARKE, assistant professor of genetics, cell biology, and development, has been awarded a five-year grant from the National Cancer Institute to study "Budding Yeast S-Phase Checkpoint Control." His goal is to identify factors that ensure the genome is fully replicated before cells attempt division. Recommended total for the five-year period is approximately \$1.6 million.

STEPHEN EKKER, associate professor of genetics, cell biology, and development, received \$356,477 from the National Institutes of Health for "Insertional Mutagenesis in Zebrafish by SB Transposons." Perry Hackett, professor of genetics, cell biology, and development, is co-principal investigator. Sleeping Beauty, which was developed by Hackett to transfer DNA, can be used for gene therapy and gene discovery. In this case it will be used to develop zebrafish in which genes have been inactivated by the transposon. Ekker and colleagues are using this system to identify genes involved in communication between cells as a part of understanding vertebrate development.

SUE GIBSON, associate professor of plant biology, received \$330,000 from the Department of Energy to study plant development and metabolism. See the article about her research on page 7.

ARKADY KHODURSKY, assistant professor of biochemistry, molecular biology, and biophysics, has been awarded \$1.4 million over five years from the National Institutes of Health for his research on "Structure and activity of *Escherichia coli* chromosome." Khodursky also has published "Methods in Molecular Biology," volume 224, "Functional Genomics: Methods and Protocols;" Editors: Brownstein, M.J. (NIH) and Khodursky, A.B. (UM), Humana Press. The book, aimed at researchers who use whole-genome microarray technology, is the first comprehensive issue on contemporary methodologies in functional genomes.

GARY NELSESTUEN, holder of the Kirkwood Chair in Biochemistry, has licensed patents for proteins to treat coagulation disorders to Maxygen, Inc., a California biotechnology company that develops and manufactures genes and proteins for therapeutic uses.

MICHAEL O'CONNOR, Ordway Professor of Developmental Biology, was promoted to full investigator by the Howard Hughes Medical Institute, which will continue his funding for the next seven years. To read about his research, see the story on page 6.

DAVID STEPHENS, associate professor of ecology, evolution and behavior, received a four-year grant for approximately \$338,000 from the National Science Foundation for "Animal Impulsivity: Discounting or Ecological Rationality."

JOHN WARD, associate professor of plant biology, will receive \$330,000 for three years from the Department of Energy, Energy Biosciences Program, for "Analysis of Arabidopsis Sucrose Transporters." The project will focus on transport properties, regulation, and protein interactions of sucrose transporters, which are membrane proteins important for the long-distance transport of sucrose within the vascular tissue of plants. ■

Cargill Building positions U of M for genomics leadership



Charles Muscoplat, dean of the College of Agricultural, Food, and Environmental Sciences; Claire Fraser, director of The Institute for Genomics Research; Ronald Phillips, director of the Center for Microbial and Plant Genomics; Warren Staley, CEO of Cargill; President Robert Bruininks; Governor Tim Pawlenty and Dean Robert Elde.

The University of Minnesota took a big step towards national leadership in genomics research with the May opening of the Cargill Building for Microbial and Plant Genomics on the St. Paul campus. The \$20 million, 64,000-square-foot facility is the first of its kind at a public research university.

At the opening, Cargill CEO Warren Staley announced a \$1 million gift to the University to fund the Cargill Chair in Systems Biology of Human Metabolism at CBS. President Bruininks announced that the money will be matched with \$500,000 in University funds to support graduate fellowships.

Later that afternoon, more than 130 people attended a lecture by special guest Claire Fraser, president of The Institute for Genomics Research in Washington, D.C., and saw her receive an honorary doctor of science degree from the University. Fraser is the country's leading expert on microbial genomics.

The Cargill Building will house fifteen teams of scientists. Many will focus on pathogenic microbes or beneficial microbes with uses in agriculture, environmental clean-up, and health care. Others will direct their attention to technology for screening biological agents and analyzing data. Their basic research provides a foundation for future applications that could make crops more resistant to disease and draught, reveal new ways to improve animal and human health, and restore the environment. Most already have obtained federal funding.

The Cargill Building is an important component of the University-wide effort in genomics and the cornerstone of the planned University of Minnesota Biotechnology Precinct on the St. Paul campus. Future buildings will provide space for research on biocatalysis, bioenergy, biomaterials, and biosensors. ■

New legislation will benefit CBS

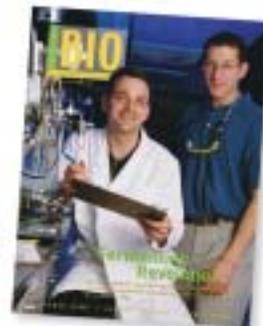
Two initiatives approved by the Legislature in May will give CBS a boost.

The "Prairie Island" bill provides about \$20 million for the University's Initiative for Renewable Energy and the Environment over five years. Funds will be used for research on hydrogen and other renewable energy sources. Dean Elde, Rep. Steve Kelly, and MNBIO led efforts to promote this legislation, which redirects money utility companies set aside for alternative energy development.

The Omnibus Tax Bill allows the state to designate two tax-free zones for development of biosciences businesses. One likely will be located along the transitway between the Minneapolis and St. Paul campuses, where the University Enterprise Laboratories, Inc. incubator will be located. Dean Elde, MNBIO Executive Director Ray Frost, and St. Paul Mayor Randy Kelly, among others, testified at the Legislature to promote creation of the zones.

BIO wins two awards

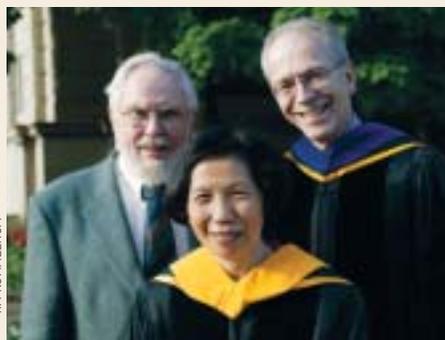
BIO, the College of Biological Sciences magazine, won a Maroon Award from the University of Minnesota and an Award of Merit from Minnesota Government Communicators for 2003. Both awards were for quality of editing, design, writing, and photography as well as effectiveness and prudent use of resources. ■



College of Biological Sciences Commencement 2003

Commencement for the class of 2003 was held in Northrop Auditorium on May 17. Of the 273 seniors who graduated during the year, 175 participated in the year-end ceremony. More than 50 students graduated with honors.

Chris Maziar, Executive Vice President and Provost was guest speaker. Student speakers were Mathew Abdel, biochemistry; Charles Hernick, ecology, evolution and



TIM RUMMELHOFF

Pearl Bergad, (M.S. Botany, '69), winner of the Outstanding Achievement Award, with Dean Elde and Douglas Pratt, professor emeritus of plant biology, who was her adviser.

behavior; and Michelle Gleason, genetics, cell biology, and development. Abdel and

Hernick also received awards for student leadership.

Claudia Neuhauser, assistant professor of ecology, evolution, and behavior, received the Stanley Dagley-Samuel Kirkwood Undergraduate Education Award for developing the course and corresponding textbook "Calculus for Biology and Medicine." Rob Brooker, associate professor of genetics, cell biology, and development, was recognized for winning the Horace T. Morse-University of Minnesota Alumni Association Award for Outstanding Contributions to Undergraduate Education.

Brian Barber, Ian Gilby, and Tanya Smutka, all from ecology, evolution, and behavior, received awards as this year's outstanding teaching assistants.

Alumna Pearl Bergad (M.S. in Botany, '69) received the Outstanding Achievement



Claudia Neuhauser, winner of the Dagley-Kirkwood award.

Award from the University for service to Chinese Americans in Minneapolis and use of music to improve understanding among people of different cultures. Bergad's most notable accomplishment was working with the Chamber Music Society of Minnesota and cellist Yo-Yo Ma, among others, to plan and produce *Hún Qiáo* [Bridge of Souls], a musical program of remembrance and reconciliation

for Asians who died in World War II. Bergad has spent her career as a scientist for the University of Minnesota Medical School. She and her husband, Bob Bergad, also a CBS alumnus, have two sons. ■



Rob Brooker received the Morse-Alumni award for undergraduate education.

St. Paul buys site for biotech incubator

A laboratory "incubator" for fledgling start-up companies will be nested in a Midway district warehouse purchased by the City of St. Paul in July.

The warehouse, formerly used by Target Corp., is located adjacent to the transitway between the Minneapolis and St. Paul campuses, which allows convenient access for University faculty and students.

About a third of the building's 125,000 square feet will be used to house as many as 25 start-up companies. Seven companies now located in University of

Minnesota buildings, primarily Snyder Hall and Gortner Laboratories at CBS, are expected to move in. The building will be ready for its first tenants in February, and construction is expected to be completed next summer.

University Enterprise Laboratories (UEL), a nonprofit organization affiliated with the University, is raising \$10 million in corporate contributions to fund the \$20 million project. CBS Dean Robert Elde, chairman of UEL's board, is leading the fundraising effort. ■

Eloise Newcomb Pittman

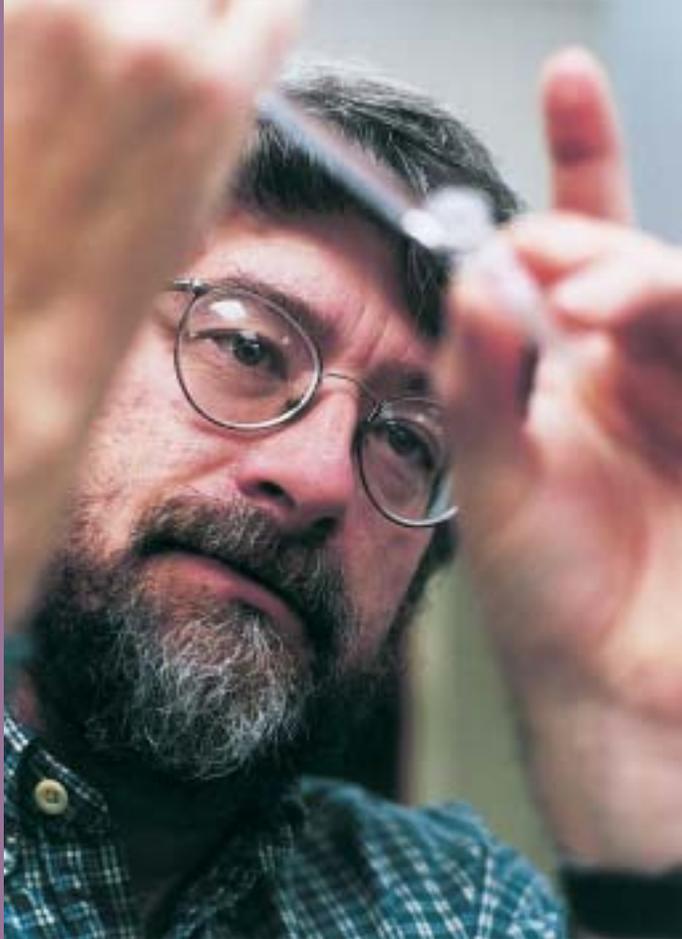
The Eloise Newcomb Pittman Scholarship was established by Pittman's mother, according to Jean McIntosh, who knew Pittman while both were botany students in the late 1930s and early 1940s. Pittman died at a young age from a rare



Eloise Newcomb Pittman

disease. "She was a brilliant student, fun person, and a good friend," McIntosh says. The fund was mentioned in the article about alumnus Mary Kemen in the winter 2003 issue of *BIO*. If you have more memories to share about Pittman, send to prinard@cbs.umn.edu or call 612-624-0774.

How does a fertilized egg develop into a biologist?



RICHARD ANDERSON

Michael O'Connor is the only Minnesota scientist supported by the Howard Hughes Medical Institute. His funding was just renewed for seven years.

It's a good thing Michael O'Connor likes solving

mysteries, because he's

taken on one of nature's most challenging: How does a single fertilized egg manage to develop into an adult fly, fish, or first-rate biologist?

O'Connor, a professor of genetics, cell biology, and development, has identified enough clues to impress his toughest audience. He recently went before a panel of 30 scientists asked to decide if his work

merited renewal of his status as an investigator of the Howard Hughes Medical Institute. An independent institute with an endowment close to \$12 billion, HHMI supports about 350 of the top medical researchers in the country, including a handful of Nobel laureates. O'Connor had just finished a five-year stint as an associate investigator with HHMI, which paid his salary, his lab researchers' salaries, and operating expenses.

The only HHMI investigator in Minnesota, he was carrying a flag for the state, CBS, the University—and children born with holoprosencephaly, the most common defect of the face and cranium.

"Holoprosencephaly occurs in one out of every 5,000 newborns," says O'Connor. "It can be as mild as having a single front tooth or as severe as having a single eye, a condition called cyclopia."

Working with fruit flies and mice, O'Connor and his colleagues have identified several proteins that help the embryo figure out, literally, which side is up. One such protein is called BMP. At the point in development when the body determines which is the top (back) side and which is the bottom (belly) side, cells respond according to the levels of BMP they detect. That is, the amount of BMP tells cells where they fit in the general body plan.

The body also makes proteins that attach to BMP and inhibit its action. The more inhibitors, the

less BMP a cell detects. Together, BMP and its inhibitors act to form a top-to-bottom gradient that guides the formation of tissues. BMP tends to concentrate in a shallow strip along the mid-back. O'Connor found that mouse embryos lacking one of the BMP inhibitors were born with holoprosencephaly.

This finding led to more questions. How many genes are involved in the various degrees of human holoprosencephaly? Does the primary gene (or genes) mutate spontaneously, or are mutations passed down through families? If mutations show a familial pattern, a diagnostic test might be developed to identify parents or early-stage embryos at risk, O'Connor says.

O'Connor also showed that BMP and its inhibitors are involved in nervous system function in fruit flies. If they play similar roles in humans, they may be part of the reason young nerve cells can respond by strengthening or weakening their interconnections—the basis of learning and memory.

"We're going to test whether these factors are involved in postnatal synapse [connections between nerve cells] development in brains of mice, and, later, humans," O'Connor says.

And about that renewal panel. It promoted O'Connor to full investigator, the highest rank of HHMI-supported scientist.

—Deane Morrison

New faculty study how 'green genes' control plant processes

How does a plant know when and where to build a bud? How does it defend itself when attacked by fungi or other foes? The answers to questions like these lie hidden within its genetic material. Understanding the link between specific genes and the processes and products of life is the business of functional genomics—and of several new faculty who have joined the Department of Plant Biology in recent months. Their research not only is enriching our understanding of plant physiology, it's also providing information that could be used to help plants better serve human needs by doing things like make more fruit or resist yield-robbing disease.

Sue Gibson, who came to Minnesota last August, is focusing on the role of sugars in plant development. "Although we know it's highly regulated, we understand very little about how it's regulated," she says. "How does a plant know how much of its resources to allocate to leaves as opposed to roots?"

Colleague Jane Glazebrook is exploring another feature controlled by genes: the internal signals plants send out in the presence of disease organisms such as bacteria or fungi. She, too, is asking her questions at the genetic level—which genes are activated by the enemy, and what kinds of processes does each initiate?

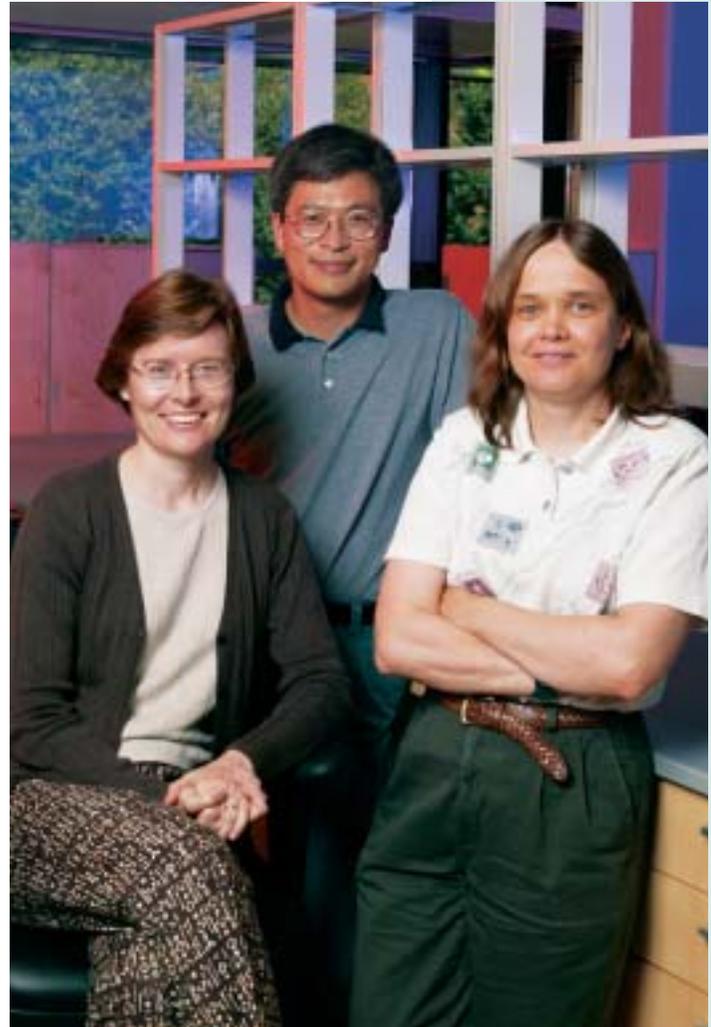
Both Gibson and Glazebrook are looking for answers on DNA

chips—tiny glass slides upon which are arrayed in gridlike form most of the 25,000 or so genes of *Arabidopsis thaliana*, the botanical equivalent of the laboratory rat. To study the role of various genes in a particular event, the researchers expose the slides to RNA derived from the tissue of *Arabidopsis* plants undergoing the event. The derived RNA then "tags" genes on the chips corresponding to those active during the event. By comparing results for normal plants and plants with mutations affecting their ability to carry out the process under study, the researchers can home in on which genes do what.

Sound complicated? Actually, that's the easy part. Far more difficult is figuring out what the various patterns of tagged and untagged genes mean.

Which is where Fumi Katagiri, who arrived with Glazebrook this summer, comes in. Like Glazebrook, Katagiri is studying plants' gene-level response to disease organisms. But he wears another hat, too: that of Data Miner. Like a miner tunneling through the earth in search of coal, Katagiri—with the help of computer programs he writes—digs his way through the reams of results generated by DNA chips in search of relationships between gene activity and physiological change.

"A huge amount of data can be generated—but what information is in there? That's the real challenge," he says.



New faculty Jane Glazebrook, Fumi Katagiri, and Sue Gibson, all members of the plant biology department, will work in the new Cargill Building for Microbial and Plant Genomics.

All three of the new scientists are headquartered in the also-new Cargill Building for Microbial and Plant Genomics. They're enthusiastic about the way the building's open layout allows them and their ideas to bump into each other on a regular basis.

"For scientists, it's always good to interact," Glazebrook says.

—Mary K. Hoff

Like a miner tunneling through the earth in search of coal, Katagiri digs his way through reams of information generated by DNA chips.



Dean Elde with Cargill CEO Warren Staley and Governor Tim Pawlenty at the dedication of the Cargill Building for Microbial and Plant Genomics. Cargill's \$10 million gift for construction of the \$20 million building was matched by the State.



CAMPAIGN MINNESOTA
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Thank you, friends

Now that Campaign Minnesota is over, we'd like to thank our friends for their gifts to the College of Biological Sciences. From those who gave \$25 to those who gave \$10 million, they're all important.

While academic excellence has elevated the College of Biological Sciences into the category of elite public and private colleges, it may be the College's financial vitality that keeps it competitive and affordable for the best and brightest students.

So, as the curtain draws shut on a very successful fundraising campaign at the University of Minnesota, CBS is taking a moment to reflect on the generosity of its many donors and the impact of—and continuing need for—their myriad gifts.

The final tally for Campaign Minnesota, which began in 1996, is truly impressive: more than \$1.6 billion in overall contributions to the University, surpassing the target of \$1.3 billion by about 25 percent. CBS' campaign total is \$12,060,143, which is double the College's goal.

"All ranks of donors, from large corporations to recent graduates, have shown their support in heartwarming fashion," says Bob Elde, dean of CBS.

The largest contributions from area corporations have changed the landscape—quite literally—of CBS. Among the generous gifts bestowed by Cargill, Incorporated was \$10 million toward the recently

opened, \$20 million Cargill Building for Microbial and Plant Genomics on the St. Paul campus, which will house groundbreaking research and world-class faculty. Half of this gift and \$1 million for the Cargill Chair in Systems Biology of Human Metabolism are reflected in CBS' campaign total.

3M has contributed \$15 million toward Campaign Minnesota, which includes \$6.2 million to endow fellowships for students in the life sciences and engineering. The fellowship gift, matched by the University's 21st Century Graduate Fellowship Endowment, will support 48 graduate students a year—many of whom are likely to be CBS graduate students.

These multi-million-dollar gifts "really set the agenda in terms of where we're going to go and how fast we're going to get there," says Dean Elde. But equally important to the health and prosperity of CBS are the many smaller gifts from alumni and friends that support undergraduate student scholarships, special programs, and other needs of the college.

"Sometimes our donors get the message that the only important gifts are the big ones they hear about on TV or read about in the newspaper," says Janene Connelly,

Thank You *continued from page 9*

until recently the director of development and external relations at CBS. "This college depends on the donor who can make a gift each year—whether it's \$25 or \$2,500. They're all important."

They're likely to grow increasingly important. Nationwide, with a majority of states facing budget deficits, public funding for higher education has flattened or, in many cases, declined. The University will be operating in fiscal years 2004–05 with \$196 million less in state funding than the previous biennium, and the percentage of state support for the U has decreased from one-third to approximately 26 percent. This has forced the University to raise tuition by a double-digit percentage for the third straight year, intensifying the burden on students. And it creates a model in which public funding can no longer be relied upon to keep pace with the rising costs of higher education.

"I think private support is absolutely critical for students," adds Elde. "The affordability of coming to the University is being compromised by our need to raise tuition."



Melinda Buck, CBS scholarship recipient

RICHARD ANDERSON

M eet just a few of the people who have helped make Campaign Minnesota a success at the College of Biological Sciences. There are many others whose generosity has made a difference. Although the campaign is over, the need for scholarship support continues.

Jon Ross Undergraduate Scholarships



KEN JEDELOH

Jon Ross, Itasca resident biologist

For Jon Ross, the College of Biological Sciences and the financing of a college education are both highly personal. Ross, who has degrees in zoology (B.S., '75), biology (M.S., '78), and zoology again (Ph.D., '96)—all from the University of Minnesota—is the resident biologist at Itasca Biological Station and Laboratories and has worked there since 1983.

In addition, Ross

has two college-aged children—one currently in grad school and the other planning on college after a military stint. Ross is acutely aware of the rising burden on CBS students for tuition, and is doing his best to help by contributing to undergraduate student scholarships as well as the dean's flexible general fund.

"I really hate to see students coming out of college having to pay loans for half of the rest of their lives," says Ross. "It feels like it's time to start giving back."

"It feels like time to start giving back."

David Bernlohr Dean's Strategic Initiatives Fund

David Bernlohr's father was a professor at the University, which meant that the junior Bernlohr—now a Distinguished McKnight Professor and head of the Department of Biochemistry, Molecular Biology, and Biophysics—spent a lot of time at the University "going to Gopher football and basketball games and things like that," he says.

"The best way for the College to respond to new opportunities."

Given Bernlohr's 18 years at the University, he jumped at the chance to be a

participant in Campaign Minnesota and

donate, through payroll deduction, to the dean's fund in CBS.

"I have a good sense of how important unrestricted gifts are to any academic unit, particularly when it's not always possible to see where dollars are needed," says Bernlohr. "We always have to be looking for what's coming around the corner and down the pike" in terms of new initiatives, he adds, "and I felt that unrestricted gifts were the best way for the college to respond to new opportunities."



TIM RUMMELHOFF

David Bernlohr, CBS department head

Jean Parmelee

Undergraduate Scholarships, Breckenridge Chair, Itasca Athletic Field

Talk to Jean Parmelee for a few minutes and you'll get a sense of the deep love she carries for her late husband David and, by extension, the University of Minnesota. They were together for nearly 60 years and lived and worked from the Arctic to the Antarctic in line with David's career as a polar ornithologist. He was director of the Itasca



Jean Parmelee, widow of David Parmelee, CBS professor

PEGGY RINARD

Biological Station from 1970-1986 and served on the Bell Museum of Natural History faculty for several years.

They started giving to the College of Biological Sciences years ago, and Jean is continuing the Parmelee legacy of generosity. She recently

"I give as a memorial to David, who was very attached to the University."

increased her monthly contributions to the David F. and Jean M. Parmelee Memorial Scholarship to elevate the fund to \$10,000. Previously, she donated \$10,000 to renovate and upgrade the recreational fields at Itasca that bear the family name. Prior to that, the Parmelees gave to small scholarship funds at the College and also contributed \$10,000 for the Breckenridge Chair in Ornithology.

"As long as I live, I'll be sending money to the Parmelee Memorial Scholarship fund," Jean says. "I give mostly because it's a memorial to David, who was greatly attached to the University of Minnesota,"

"Once again," she stresses, "to honor my husband, I would do anything."

Denny and Joan Dvergsten Heritage Society Bequest

Denneth (Denny) and Joan Dvergsten consider their gifts to the University a form of voluntary self-taxation. "Individuals have to try to do what they can in small ways to help our students alleviate the burden of tuition," says Denny.

Denny spent his career in the biological sciences helping students, first as a high school biology teacher (he was

selected Minnesota Teacher of the Year in 1975) and as CBS outreach coordinator from 1986-1991.

Now, the Dvergstens are assuring that their assistance to students will carry on well into the future;

"We want to help alleviate the burden of tuition for students...and to leave a legacy."

they've left a generous Heritage Society bequest for the College in their will.

"I think giving is a way of leaving some sort of a footprint," says Denny, "and I think leaving a legacy to a school is leaving some impact of yourself and your life's work after you're gone."



Biology teacher Denny Dvergsten and his wife, Joan Dvergsten

TIM RUMMELHOFF

The quality of students entering CBS, however, remains uncompromised. Elde points out that these students are asking themselves, "'Should I go to Stanford, Princeton, Michigan, or Minnesota?' That's our competition. Our tuition is lower than any of these schools, but they're certainly getting financial aid offers from these institutions. The question is, can they get any financial aid from us?... "We won't be in the market for them to become our students unless we can offer them competitive financial aid packages, including scholarships."

So although Campaign Minnesota is now officially completed, the need for private support continues. CBS remains a relatively young college at the University, and its scholarship and fellowship endowment is still well short of Elde's goal of \$10 million. Increasing this endowment is critical to attracting top students. Currently, CBS is able to offer approximately 70 scholarships and fellowships each year—a number that will have to increase to keep pace with the growing number of applicants in need.

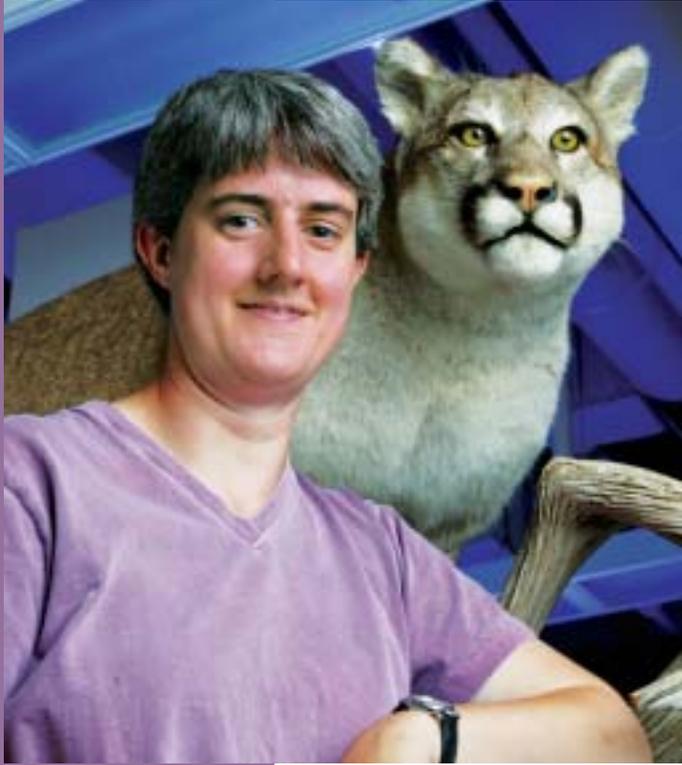
The college is aware of and heartened by the fact that many of its donors are of modest means, yet committed to paving the way for tomorrow's students. Donors have the opportunity to assist first-generation students like Melinda Buck, a graduate in genetics, cell biology, and development, who received the Biological Sciences Alumni Society scholarship and the Paul Morris Scholarship. Donors are invited to meet students at the annual Donor Recognition and Appreciation Dinner.

In addition to Cargill and 3M, "Our gifts come from very modest families and individuals," Connelly notes. "You don't have to be wealthy to be philanthropic."

—Rick Moore



Tracking mammals from Madagascar to Minnesota



TIM RUMMELHOFF

Sharon Jansa, assistant professor of ecology, evolution, and behavior, with a new friend from the Bell Museum, where she is curator of mammals.

“Studying mammals is akin to hunting for hidden treasure. It’s thrilling to discover what’s there.”

—Sharon Jansa

“Mammals,” says Sharon Jansa, “you know they’re out there, but unlike birds they often can’t be seen.” For Jansa, an assistant professor in the Department of Ecology, Evolution, and Behavior (EEB), studying mammals is akin to hunting for hidden treasure. “It’s thrilling to discover what’s there,” she says. Although species are declining worldwide, Jansa points out that it is impossible even to measure the loss of species diversity without first understanding what species are present, where they live, and how they are related.

In her pursuit of such discoveries, Jansa has weathered typhoon sea-

son in Madagascar, climbing trees and lashing traps to branches in order to capture arboreal rats. More recently, she and a group of undergraduate students have stalked the wilds of Itasca State Park to improve their tracking techniques. Jansa has been fascinated by mammals since her undergraduate days at Berkeley, when she thought she would become a vet. Then, an independent study project introduced her to scientific research. “I discovered the morphological complexity of mammals and the adaptations they exhibit, and this really appealed to me,” she says. Today, she studies the evolutionary relationships among rats in Madagascar and marsupials in South America. Most of her work takes place in the laboratory, where she analyzes DNA.

Because her own work depends on specimens collected in the field, Jansa was particularly interested in a job that combines teaching with managing a scientific collection. “There are very few jobs that offer both,” she says. At the University, where she joined the faculty last September, Jansa is also curator of the Bell Museum of Natural History’s extensive mammal collection. “It’s very hard to teach a mammalogy course without a specimen collection,” she says. “It’s like having a good lending library on campus versus having to depend on interlibrary loan.”

Luckily, the museum offers both breadth and depth in its collections. “It’s a fabulous record of

local biodiversity,” says Jansa. “This data is critical to Minnesotans—we can look at the collection to obtain a wide range of information, such as how the distribution of species is changing over time.”

Jansa’s joint commitments to EEB and the Bell Museum are typical of a longstanding partnership between the two units. “When we work with a top flight department like EEB, in a college with a number of specialties, it allows us to see a bigger picture and stay on the cutting edge,” says Bell Museum Director Scott Lanyon. “Other large museums have a strong focus in systematics [the study of the tree of life] but we have the opportunity to interact with experts in ecology, behavior, and many other fields.” In addition, Bell Museum faculty teach courses in whole-organism biology, such as mammalogy and ornithology. “The vast majority of courses that introduce students to different parts of biodiversity are taught by Bell Museum faculty,” says Lanyon.

Jansa will teach her first course, Introduction to Mammalogy, in the fall. Students will learn to identify every mammal species in Minnesota by skull and skin—and along the way, Jansa hopes they will also become inspired by the vast diversity of mammals and the evolutionary forces that have shaped them.

—Jennifer Amie

At the interface between microbiology and biochemical engineering

Today, scientific innovation often occurs at the boundaries between disciplines. As a one-man interdisciplinary team, Michael Flickinger is in an ideal position to capture it. Primarily a microbial biochemist, Flickinger also qualifies as a materials scientist and chemical engineer and has spent his career at the interface between microbiology and biochemical engineering.

Recruited in 1985 from the National Cancer Institute, where he directed the fermentation program, to become founding director of the Biotechnology Institute, Flickinger now devotes his time to his own research program – developing novel ways to use bacteria as industrial catalysts.

Flickinger begins by tapping the ability of bacteria to transform molecules, make essential amino acids and other nutrients, and detect pollutants. Then he combines living bacteria with new composite materials to maximize the potential for desired chemical reactions.

“We really haven’t changed the way we use bacteria in industry in centuries,” he says. “Now, most industrial chemical processes are catalyzed on surfaces, for example, catalytic converters.” Why not, he says, do the same with bacterial catalysts?

With that thought in mind, Flickinger and his colleagues have created several unusual hybrid technologies. For example, he combines bacteria with synthetic

polymers to create paint and ink with biosensing capabilities.

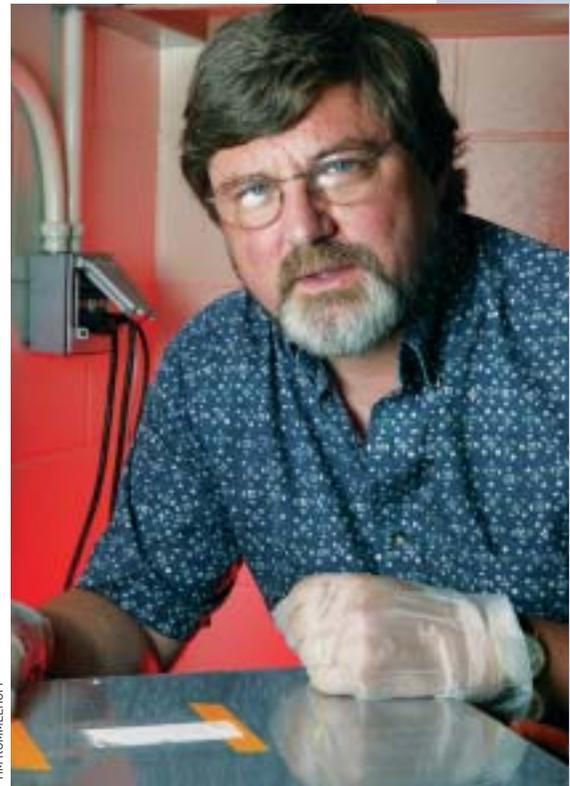
Some bacteria can produce hydrogen and “fix” nitrogen from the air into biologically useful forms. Flickinger has found a way to stabilize the bacteria in a matrix of latex polymers, which form the basis of most paints.

It’s the “world’s worst paint” because it has to be permeable to air and nutrients, Flickinger says. But the biocatalytic coatings technique has great potential for biosensors and industrial biocatalysis.

If he can extend the length of time bacteria live in the paint, bacterial catalysts could be competitive with chemical production of hydrogen and usable nitrogen and “the use of bacteria in the chemical industry would explode,” he says.

In another project, Flickinger and Norwegian scientists are developing a bacterium that has been engineered to produce the essential amino acid L-lysine from methanol (methyl alcohol). Isolated by CBS scientists from Minnesota lake water, the bacterium grows in sea water. L-lysine is currently fermented from sugar and used as a nutrient for humans and livestock. Since 1986, global demand for lysine has more than quintupled. Flickinger’s idea is to make methanol from the natural gas normally burned off at oil wells, then feed it to the bacteria. This could also be a useful source of protein for large-scale remote aquaculture.

“If we can make L-lysine from methanol, we won’t have to clear jungles just to grow crops to get sugar to make lysine,” he says.



TIM RUMMELHOFF

Michael Flickinger embeds bacteria in composite multilayer latex coatings to create biosensors for detecting contaminants in water, soil, and air.

Flickinger and his colleagues have also coated integrated circuits with living bacteria that respond to mercury, producing a sensor that can detect mercury in water or fish tissue. Someday, anglers may use the sensor in a needlelike probe to check a fish’s mercury content before deciding whether to keep it. The technology could also be extended to other pollutants, in gasses and liquids.

—Deane Morrison





New BSAS president wants to know what you want from CBS



TIM RUMMELHOFF

Mervyn de Souza, new BSAS president, is a principal scientist at Cargill, Inc.

As a CBS alumnus, what do you want from the college?

You may get a call from Mervyn de Souza this fall asking you that very question.

As the new president of the Biological Sciences Alumni Association (BSAS), de Souza's priority will be to build alumni engagement. He firmly believes that begins by personally asking alums what they want from CBS. So when the board reconvenes this year, they may be dialing your number.

If you do happen to get de Souza on the phone, you will likely get a dose of the

energy and zeal he brings to his new role.

"Mervyn has a rare combination of creativity, drive, and a sense of wonder about what nature holds in store for us," says Larry Wackett, professor of microbial biochemistry and de Souza's graduate adviser. "He's the kind of person you just like to be around."

Because of the College's limited budget and everyone's limited time, de Souza thinks it makes sense to hold one big alumni event a year rather than several smaller events. He suspects that what alumni really want is an event that keeps them updated on research at the college and beyond, while offering networking opportunities and some fun. He's looking forward to hearing what you think about that.

De Souza also would like to see the board ("an incredible team of diverse and talented people") become more involved in the life of the college and advise the dean on strategic directions. "As biologists in the workforce, we have a lot to contribute," he says.

Working to improve the undergraduate experience will remain a priority, de Souza adds. Board members and volunteers will continue mentoring undergrads and providing career guidance. But he wants to broaden that effort to include graduate students who, he says, are less likely to feel like part of the CBS community and to remain connected to the college as he has.

Born and raised in Bombay, India de Souza came to CBS as a graduate student in the 1990s and spent several years here earning an M.S. in microbiology and a Ph.D. in bio-

"Mervyn has a rare combination of creativity, drive, and a sense of wonder about what nature holds in store for us," says Larry Wackett, professor of microbial biochemistry and de Souza's graduate adviser. "He's the kind of person you just like to be around."

chemistry. He met his wife, Jennifer Seffernick, in Larry Wackett's lab, where she continues as a postdoctoral researcher. The research he did at CBS enabled de Souza to land a job as a principal scientist in Cargill's Biotechnology Development Center, where he works on using microbial biotechnology to develop new products and improved processes for food, feed, and bio-based materials.

"I have had a long and very fruitful relationship with the college and want that to continue," he says. "So it was an obvious choice to me to join BSAS. I'd like to help other students and alumni have that kind of relationship with CBS."

—Peggy Rinard

Homecoming 2003

Join the College of Biological Sciences on November 1 to cheer for the Gophers as they take on the Indiana Hoosiers at the Metrodome. CBS will host tailgating before the game in the parking lot.

Tickets for the game (seats in the upper endzone) and tailgating are \$15; tickets for tailgating alone are \$4. To order, contact Emily Johnston at 612-624-4770 or ejohnsto@cbs.umn.edu, or go to

www.cbs.umn.edu and follow the Alumni & Friends links. Orders must be in by October 10, 2003. Check the Web site in early October to confirm the date.

Class Notes

Gregory Lee (B.S. in Botany, 1975) and his family moved this summer to Salt Lake City, where he had been named executive director of Red Butte Garden and Arboretum at the University of Utah. Lee was formally a development specialist at the University of Minnesota Foundation.

Tom Carlson (Ph.D. in Zoology, 1977) has been at Pacific Lutheran University in Tacoma, Washington since 1975. He was chair of biology for nearly a decade, and is currently the Dean of Natural Sciences.

Linda Eells (B.S. in Biology, 1984, M.S. in Conservation Biology, 2000) was hired as an assistant librarian for social sciences/science in Magrath Library on the University of Minnesota St. Paul campus in January, 2003.

Deanna Harkins, (B.S. in Genetics and Cell Biology, 1986; M.D., 1992; and M.P.H. in Environmental Health, 1999) moved to Bel Air, Maryland this past year, leaving her position at the Centers for Disease Control in Atlanta. Deanna now works with the United States Army Center for Health Promotion and Preventive Medicine in the Occupational and Environmental Medicine Program.

Tammy McIntyre (B.S. in Genetics and Cell Biology, 1988) completed the M.Ed. in Human Resource Development from the College of Education and Human Development this past year. After 12 years in research and development with the Pillsbury Company, she will be transitioning into a role at General Mills that focuses on organization development.

David Simonson (B.S. in Biochemistry and Microbiology, 1988) and **Julie Simonson** (Ph.D. in Food Sciences, 1990) are relocating to Germany for two to three years because of Julie's position in research and development at Kraft Foods. David has been a stay-at-home father for the last six years. They will be living in the Munich area and enjoying the people, travel, and cultural offerings of Europe.

Dave Kettner (B.S. in Genetics, Cell Biology, and Development, 1993) recently took a new position at the Wisconsin Alumni Research Foundation as the Assistant General Counsel in the Patents and Licensing Department.

Satinder Singh (B.S. in Biochemistry, 1995; Ph.D. in Biochemistry, Molecular Biology, and Biophysics, 2002) is a postdoctoral fellow in the laboratory of Dr. J. Eric Gouaux in the Department of Biochemistry and Molecular Biophysics at Columbia University. He started in the lab last October and has been studying the structure/function relationships in ionotropic glutamate receptors.

Curt Henry (B.S. in Biochemistry, 1996) and his wife, Lisa, welcomed their son Alex into the world this past April.

Heidi Thorson (B.S. in Biochemistry and Genetics, Cell Biology, and Development, 1998) recently graduated from the University of South Dakota School of Medicine. She began her OB/GYN residency in St. Louis in June at the Washington University/Barnes Jewish Hospital.

Kyle Ruesch (B.S. in Microbiology, 2000) is an assistant research microbiologist in fermentation process development at Bio-Technical Resources in Manitowoc, Wisconsin.

Travis Moore (B.S. in Biology, 2001) recently accepted a teaching position at Stockbridge High School in Stockbridge, Wisconsin. He will be teaching all areas of science as well as coaching girls' softball. Stockbridge is a small school with only 90 students.

Mark Janzen (Ph.D. in Biochemistry, Molecular Biology, and Biophysics, 2002) left his position as a senior scientific services specialist at the National Marrow Donor Program and is now the Director of Laboratory Medicine at Memorial Blood Centers in Minneapolis.

Adrienne Kari (B.S. in Biochemistry, 2002) will begin the Environmental Epidemiology Program in the School of Public Health at the University of Michigan, Ann Arbor this fall.

Ryan Schultz (B.S. in Biochemistry, 2002) was accepted at the University of Cincinnati Law School and will begin this fall.

Katherine Nicksich (B.S. in Biology, 2003) will begin veterinary school at Michigan State University in East Lansing this fall.

Bobbi Sislo (B.S. in Genetics, Cell Biology, and Development, 2003) has been accepted at the School of Pharmacy at the University of Minnesota and will begin this fall.

Beth Thielen (B.S. in Microbiology, 2003) has joined the Medical Scientist Training Program (M.D./Ph.D. dual degree) at the University of Washington in Seattle.

In Memorium

Wallace R. Roy (Ph.D. in Biochemistry, 1941) a former vice president of technical services for Minute Maid Co., died in June. He helped develop the process for making frozen concentrated orange juice as well as Coca-Cola beverages Fresca and Fanta. He was 97.

If you have a class note, please contact Emily Johnston at 612-624-4770 or alumni@cbs.umn.edu.

Biological Sciences Alumni Society 2003-2004 Board of Directors

Mervyn de Souza, President
M.S. Microbial Engineering, 1997
Ph.D. Biochemistry, Molecular Biology, and Biophysics, 1998

Jane Johnson, President-Elect
B.S. Biology, 1976

Phill Lawonn, Past-President
B.S. Microbiology, 1984

Kip Thacker, National Board Representative
B.S. Microbiology, 1976
Ph.D. Microbiology, 1984

Carolyn Bagne
B.S. Biology, 1997

Jeff Carpenter
Ph.D. Cell and Developmental Biology, 1991

Bill Diekman
B.S. Biology, 1987

Jennea Dow
B.S. Biology, 1999

Curt Henry
B.S. Biochemistry, 1996

Rebecca Marrs Eide
B.S. Biochemistry, 2001

Douglas Pratt
B.S. Natural Science, 1952
M.A. Botany, 1959
Ph.D. Botany, 1960

Jennifer Seffernick
Ph.D. Biochemistry, Molecular Biology, and Biophysics, 2001

Tim Voller
B.S. Biology, 1984

Meet Kipling Thacker

CBS rep to the UMAA National Board



Kip Thacker is Director of New Business and Development for Lifecore, Inc., which makes biological products used in health care.

Kip Thacker credits the education he got at CBS for launching his successful career in biotechnology.

So when Dean Elde asked him to share his experience as a member of UMAA's national board, he readily agreed.

"The University is very important to me personally and to the state of Minnesota," says Thacker, who is Director of New Business Development for Lifecore, Inc. in Chaska. "I'm willing to pitch in

and help support it in any way I can."

Thacker has a long history of involvement with CBS. Just after receiving his Ph.D., he helped Denny Dvergsten with an outreach program for high school students. He was president of the Biological Sciences Alumni Society for a year. And he served on the CBS Advisory Board when Pete McGee was dean.

"I was delighted that Kip accepted," Elde says. "His biotechnology career, involvement with alumni activities, and leadership skills made him our number one candidate."

One of Thacker's goals will be to promote the University's efforts to expand the biotechnology industry in Minnesota. As a board member, he hopes to have opportunities to speak with legislators and to increase public awareness of potential benefits for Minnesota.

Thacker earned a B.S. degree in microbiology from CBS in 1976 and a Ph.D. in 1984. He joined Lifecore in 1981, when it was called Diagnostic, because he knew Jim Bracke, now Lifecore's president. At the time, Diagnostic was a small company in Roseville that produced culture media for clinical laboratories. Bracke and Thacker invented a way to produce medical grade hyaluronan, a viscous substance now widely used in cataract surgery, by fermentation of microbes. Thacker is now working with customers to

develop new applications for hyaluronan, which is Lifecore's top-selling product. It's also used to treat symptoms of osteoarthritis, as a component in bone-graft

One of Thacker's goals will be to promote the University's efforts to expand the biotechnology industry in Minnesota.

pastes, and coatings of catheters. The company has an Oral Restorative division, which sells a line of dental implants.

"Lifecore is a cross between a biotech company and a medical device company because hyaluronan is made using biotech processes but is regulated as a device. In the future it's likely to be used as a drug. The growth of biotechnology in Minnesota is important to me because biotech companies need a critical mass of other biotech companies to thrive," Thacker says.

"I want to help the University thrive by ensuring that it has the public support and resources to attract top quality students and faculty. A strong University will provide innovative new ideas as well as qualified employees for Minnesota's growing biotech community."

—Peggy Rinard

Planting the next generation of K-12 biology teachers

Holly Koslowski loves biology. She also loves working with youth. This fall the CBS undergraduate will get her fill of both as a participant in Science Education Partnership for Greater Minnesota (SEPGM), a new mentorship program that gives students a chance to spend a semester one-on-one with middle and high school science teachers in northwestern Minnesota.

SEPGM has its roots in a conversation between CBS dean Robert Elde and Steven Yussen, dean of the College of Education and Human Development. Observing that many Minnesota science teachers are approaching retirement, the two began brainstorming ways to encourage a new generation to take up the torch. Need led to vision, vision—with input from educators and school administrators—led to plan, and plan led to a \$1.7 million grant from the Howard Hughes Medical Institute to carry it out.

Coordinator Ken Jeddelloh, who has 38 years' experience in K-12 science education, notes the program benefits all involved. "For our undergraduate students, there's an opportunity to investigate a career option. For the teachers, the ability to attend workshops is a real payoff. For the school district, there's the opportunity to entice a student to be a teacher in their district. The community wins as well. And it also helps the U by showing that

we are extending ourselves in the K-12 curriculum," he says.

"As biologists, we look at this program as tending the garden: planting new seeds, providing a good environment for these seeds to germinate and grow, and providing nourishment for the perennial plants already in the garden. As educators, we view this program as a means to create a new partnership that brings post-secondary science teaching and learning directly into rural classroom settings. . . . And as both biologists and educators, we expect to learn more about the 'ways of knowing' through the collaborations set up here," Elde noted in the grant proposal.

This year's SEPGM students began working on directed research projects in the Twin Cities in June to gain research experience. In July, a half dozen student-mentor pairs spent a week at the Itasca Biological Station and Laboratories getting to know each other and preparing for the semester ahead. Teachers also received lessons in mentoring and were introduced to technologies, including gel electrophoresis and fluorescence microscopy.



KEN JEDDELOH

CBS student Holly Koslowski, right, with her mentor Candida Braun, a biology teacher at Grand Rapids High School, at Itasca this summer.

Koslowski's mentor, Candida Braun of Grand Rapids High School, says she's looking forward to the perspective Koslowski will give her on her current classroom practices.

"I think it's going to be a good learning experience for me," she says. "This will be a means to help me grow professionally."

The high school students will benefit from special educational opportunities at Itasca and in the Twin Cities.

Program developers hope to have twice as many student/mentor pairs on board next year. The goal is to be self-sustaining by the time the grant runs out in 2006.

—Mary K. Hoff

"As biologists, we look at this program as tending the garden: planting new seeds, and providing a good environment for these seeds to germinate and grow."

—Dean Elde

Our sincere appreciation to all of our donors and corporate/organizational partners. Your contribution to the College of Biological Sciences during fiscal year 2003 will have a long-lasting effect. Together we can ensure that current and future generations of students will experience high quality education. Every gift makes a difference.

If your name is missing or incorrectly listed, please notify us by calling 612-625-7705 or email jmlindqu@cbs.umn.edu.

1930s

Claude H. Hills **M**
 Max A. and Erika E. Lauffer **M**
 Edward B. and Pamela H. Lewis
 Paul E. Ramstad



Kenji Takamura, Sarah Endrizzi, and Chuck Hernick were among 273 students who graduated from CBS last year. Sarah graduated *magna cum laude*. Chuck was a graduation speaker.

1940s

Carrell and Grenaviere Kucera
 Richard W. Luecke **M**
 Bernard O. and Jean S. Phinney **M**
 Frank W. Putnam
 Nathan Sperber

1950s

Aaron W. Burchell
 Milton H. Fischer **M**
 William H. Harrison **M**

Robert C. Hodson **M**
 Marjorie H. and Bruce L. Larson **M**
 Orlando and Gloria Ruschmeyer **M**
 Kingsley R. Stern
 Dorothy B. and Melvin P. Stulberg
 C. Ivar Tollefson **M**
 Janice M. and Curtis M. Wilson **M**

1960s

Arlene M. and Gary A. Averbeck **M**
 Margaret Johnson Barch
 Linn and Margaret P. Bogle
 William C. Bui
 Kathleen G. Fahey **M**
 Mikul and Aparna Ganguli **M**
 Norman R. Gould
 Susan A. and Roy H. Hammerstedt
 Gordon L. Houk
 Miles F. Johnson
 Susan C. and John R. Jungck **M**
 Richard J. and Patricia L. Kirschner
 John A. Mayo **M**
 Richard H. Northrup
 Amy Oganeku
 James B. and Joan C. Peter
 Douglas C. and Beverly A. Pratt **M**
 H. Gerritt Rosenthal
 Larry J. and Sharyn M. Salmen **M**
 Marcia M. Tholen **M**
 Jeanette A. Wiltse

1970-1974

Lynda and Gary Ackert **M**
 Philip A. Balazs **M**
 Cindy J. Brunner **M**
 Monika and Keith Burau
 Susan M. and John T. Capecchi
 Robert W. Christensen, Jr.
 Koo H. Chung
 Michael F. Coyle **M**
 Constance F. Danielson
 Jeffrey T. De Zellar **M**
 Shayne E. Dizard and William H. Kojola **M**
 Bruce L. Drake
 Allen E. Eckhardt
 Roger H. Erickson
 Susan J. and Gunnar J. Erickson **M**
 Carl E. Frasch
 Jeffrey D. Gabe **M**
 John P. and Nancy K. Harvat
 Mark and Joanne Hauge **M**
 John W. Hiemenz **M**
 James Martin Hogle **M**

John D. Jackson
 Daniel V. and Karen P. Johnson
 Terrance J. Kaase
 Edwin J. Ketola
 Steven Kirkhorn and Mary Jo Siebenader **M**
 David B. and Maureen J. Kispert
 Todd R. and Amy E. Klaenhammer **M**
 Arlo S. Knoll **M**
 Gaylord J. Knutson
 Richard V. Kowles **M**
 Bryan K. Lee **M**
 Juliet C. Lilgaroth **M**
 May So-Ying and Alec Yen Lui
 Gary L. and Mary Nelsestuen **M**
 Glenn M. Nelson
 Timothy Nelson **M**
 Randi Nordstrom and James Walker **M**
 Mary T. and Douglas J. Olson **M**
 Jeffrey E. Pearce
 James J. Pearson **M**
 William and Suzanne Peglow **M**
 Dale W. Perman
 Larry Puckett
 Charlotte M. and William P. Ridley III
 Nanette M. Rogier
 Michael D. Rohwer
 Leonard L. Saari **M**
 Carl K. Samaroo
 Susan V. Schauer
 Lolly J. Schiffman
 Steven J. Schuur **M**
 Sandra H. Seilheimer
 Duane C. and Carmel M. Skar
 Jeffrey and Mary Smith
 Craig and Dolores Solberg **M**
 John T. Stout
 Larry B. Sundberg
 Paul N. Swenson
 Paul and Beverly Tavernier
 Dennis N. Thaden
 Tingchung and Nancy T. Wang
 Jane I. Wenger **M**
 David A. Winegar **M**
 Judith L. Wulff
 Thomas H. Zytovicz

1975-1979

Kent J. and Susan H. Anderson **M**
 Robert A. Arntsen
 Marcia J. Bains-Grebner
 Allan and Marilyn Baumgarten **M**
 Carl E. Bauer
 Donald and Mary Bennett
 David and Suzanne Bernlohr **M**
 Paul C. Billings
 Maclean R. Brown, Jr. **M**
 Diane E. Bundlie

Steven E. Clemants
 Henry M. and Claudia B. Colvin **M**
 Kevin W. Custer
 Douglas N. Day **M**
 Carole N. and James F. Drake, Jr. **M**



Many students take advantage of summer classes at Itasca Biological Station and Laboratories.

William K. and Suzanne M. Drehmel **M**
 Roger F. Drong
 Bruce R. and Lisa K. Dumke **M**
 Susan M. and Mark E. Edstrom **M**
 Mary Kay Elnes
 Kathleen A. Ferkul **M**
 Colleen Fitzpatrick and John Griswold
 Dennis Garin and Mary Connolly **M**
 Karl A. Geidans
 Maryann E. Green
 Myrna M. Halbach **M**
 Karen A. Hansen
 James M. Haynes
 William C. and Nancy J. Henke
 Jeffrey P. Houchins **M**
 Stephen D. Johannsen **M**
 Jane E. Johnson
 Gary D. Johnson **M**
 Sandra L. Johnson and Steven Longbotham
 Thomas A. Jones **M**
 Mary Kemen and Brian Randall **M**
 Mary M. and Daniel S. Knudsen **M**
 Jeffrey A. Kohen **M**
 Barbara J. Koziol *
 Timothy Kratz

M membership in the University of Minnesota Alumni Association/Biological Sciences Alumni Society

Annamarie Beckel
 Rodney and Beth Kuehn
 Roberta K. Lammers-Campbell
 Richard P. Lampe
 Leo G. Lehmicke
 Jane S. Levy
 Nancy G. Lillehei
 Nancy O. and Daniel H. Lussenhop
 Daniel O. Lynch **M**
 Roxanne V. Maki
 Karen A. Malatesta
 Steven C. Matson
 Jill Meilahn and Randy Lueth **M**
 Gail and Stephen Meyer
 Joseph B. Miller
 Mary J. Milroy **M**
 Bruce A. Monson and Sara L. Langer
 Bradly J. and Terry L. Narr **M**
 Patricia J. Neal
 Deborah A. Nelson **M**
 Douglas A. Nelson
 David R. Noreen
 Ronn D. Olson **M**
 Deborah J. and Dick A. Osgood **M**
 Thomas G. Osimitz
 Jean G. Parodi
 Barbara A. Roach
 Calvin and Barbara Roff
 Bruce A. and Carol S. Rorem
 Russell J. and Nina M. Rothman
 Gerald A. and Joyce O. Roust **M**
 Scott C. and Kathleen A. Rowe **M**
 Gary N. Saxrud
 Michael J. Scantlan
 Peter M. Schmitt **M**
 Allen V. Seilheimer
 Gary Seim and Lee Pfannmuller
 Michelle and Dale Setterholm
 Sarah J. Settles
 Robert A. Sharrock
 Arnold W. Sodergren
 Jon P. Springsted
 Bret M. Steiner
 Shelley A. Steva **M**
 Jay A. Stoerker
 Andrew J. and Barbara J. Streifel **M**
 Jean E. Takekawa
 Jeffrey E. Tam
 Michael G. and Joan E. Thomas
 Paul C. Thompson
 David and Mary Tosteson
 Michael A. Turner **M**
 Martin G. Vick
 Brigitte L. and Scott Q. Vidas **M**
 Thomas A. Vogelpohl **M**
 Terence C. Wagenknecht

Kenneth F. Walz
 Edward M. Welch
 Bruce A. Werness **M**
 Linda L. Williams
 Jimmy D. Winter **M**
 Kam and Lo Wong
 J. Michael and Angela R. Zylka **M**

1980-1984

Katherine A. and James R. Ackerman **M**
 Christine M. Ambrose
 Jeffrey J. Anderson
 Patrick J. Antonelli
 Barbara A. Barzen
 Vernon and Virginia Berglund
 Suzanne Marie Bissonnette
 Susan E. M. Block
 Janet S. Boe and Thomson P. Soule **M**
 Michael R. Bourne **M**
 Terrie L. and John E. Brandt **M**
 Rebecca A. Brenner
 Eric W. Burton
 David G. Butler
 John E. and Ting L. Carlson
 Paul L. Cisek
 Sheila M. Close
 Maria S. Dlott
 Mark I. Donnelly
 Priso H. Epale **M**
 Mark K. Erickson
 Mark L. and Tory M. Ferrey
 Reginald A. Flynn
 Claudia A. and James R. Gaasedelen **M**
 Jane M. Gillette
 Frederick E. Goetz
 Margaret S. Gorbatenko
 Eric W. Green, Jr.
 Donald R. Hickman **M**
 Theodore A. and Jean M. Hoffman, Jr. **M**
 Jennifer W. Humphrey **M**
 Thomas R. Jacques
 Marc K. and Karen E. Jenkins **M**
 Margaret K. Juckett
 Larry M. Karnitz **M**
 James F. Kelley
 Kari B. Kenefick
 Daniel Y. Kim
 Angela Marie Kissinger **M**
 Michael P. Kowski
 Paul D. Lampe
 David A. and Elizabeth H. Lee **M**
 Erik J. Linck **M**
 Lisa A. Lund
 John and Yvonne Lyrenmann
 Madeleine and Rodney Marquardt **M**
 Terrance D. Mc Laughlin

Haile Mehansho **M**
 J. William Munger
 Thomas D. Nelson **M**
 Thomas M. Pattison
 Indre J. Pemberton
 James and Nancy Pinckaers **M**
 Sandra G. Porter
 Scott Saunders
 Frederick and Linda Schendel **M**
 Christine A. Schousboe
 Ralph W. and Julie A. Seelke
 Susan E. Senogles
 Val and Marilyn Smith **M**
 Lindsay and Don Sovil
 Linda K. Stevenson
 May T. Stewart
 Charles R. Strancke
 Jeffrey Tate and Tracey J. Benson **M**
 Kipling Thacker and Kevyn K. Riley **M**
 Steven J. Thompson
 Scott R. Thulien
 John D. Trawick
 Mark J. Vellek
 Gregory A. Viglianti
 Joseph S. Villa **M**
 Patricia Walsh and Dallas Hoover
 Mary Jo Zidwick and Gerald Arneson **M**

1985-1989

Mary Jo Baarsch
 Roxann D. Barnes
 Jon D. Benson **M**
 Jeffrey and Cynthia Bergsbaken
 Daniel D. Billadeau
 Ross A. Bjella
 Julie A. Bjoraker
 Patricia L. Bourgoin
 Gail M. Buhl
 Thomas G. Cafarella
 Robert G. Currie
 David R. Datt and Vicki L. Johnson Datt **M**
 Michael and Patricia Decker **M**
 Stephanie Jo Decker and Jeffrey S. Johnson **M**
 Charyl M. Dutton
 Bruce B. Edinger
 Jonathan D. Erickson **M**
 Barbara J. Fealy **M**
 William R. Fraser **M**
 Preston S. and Renetta J. Gable **M**
 Joel W. Gaslin **M**
 Nancy J. Gassman
 Sabiha A. Gokcen **M**
 James P. Grover
 Mary and Eric Gunderson

David A. Hanych **M**
 Barry A. Hart
 Ellen M. Heath
 John and Dee Hollerud **M**
 Todd H. Holm
 Colleen M. Jacks **M**
 Douglas B. Jacoby
 Paul A. Kettler
 Jeffrey D. Killion
 Julie A. Knott
 Justine A. Malinski **M**
 Paula E. Marquardt
 Gabrielle J. Melin **M**
 Bradley L. Olson **M**
 Jennifer Horn Ommen
 Parag V. Patel **M**
 Robert B. Petersen **M**
 Nancy J. Poindexter
 James R. and Patricia M. Pray **M**
 Anne L. Raich **M**
 Moira L. M. Richards **M**
 Michael B. Robinson **M**
 Brian Quebbemann and Tracy Siegfried
 Julie A. and David R. Simonson



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Goldy Gopher leads a parade to celebrate faculty and staff contributions to Campaign Minnesota.

John G. Steiert **M**
 Diane R. Storvick
 Gary A. Strand
 Douglas and Selene Swanson
 Randall M. Thompson
 Mark A. Tomai **M**
 Margaret M. Walker
 Katherine M. Walstrom
 David A. Walters
 Shye-Ren Yeh **M**
 Joann L. Young
 James J. Youngblom
 Laurie Zempel Forsythe
 Jill L. Zullo

1990-1994

Michelle L. Bierma Anderson and Grant D. Anderson
 Nathan J. Arthur
 Carl V. Barnes
 David Scott Blehert
 Derek R. Brandt
 D. Gordon Brown
 Cherrie T. Carapetyan
 Jeffrey Lee Carpenter M
 Paulina M. Chiu
 Lisa A. and Jeffrey J. Coombe
 Manuel R. Cortinas
 Deanna L. Croes M
 Paul E. Cunnien
 Marc B. and Susan Daniels M
 Anthony G. Dodge M
 Mary K. and Mark H. Durfee
 David G. Einzig



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 James B. Ferrari
 Rebecca J. Fishel
 Jennifer M. and Craig R. Flor M
 Richard W. Frazee
 David B. Gremmels
 Amy R. Groszbach M
 Jo Ellen M. Gundeck-Fahey
 Robert J. Haight M
 Jennifer J. Hymes M
 Edie M. Jacobs
 Paul Petty and Patti Jokich
 Todd L. Juneau M
 Jacki R. Just M
 Joseph A. Kubiatowicz
 Mara M. La Rock M

Scott R. Larson M
 Zhangiang Liu and Donya Gao M
 Mary Jo Lockbaum M
 Chad M. Lund
 Bradley D. Luthi
 Kristefor R. Lysne
 Elizabeth A. Matzke
 John E. Mazuski
 Andrew J. Mc Cullough M
 Chris L. McLain
 Christopher D. Mentz
 Melissa A. O'Donnell
 Dawn M. Olson
 Trudy L. and Lance D. Olson M
 Christine and David Ostendorf M
 Eric R. and Suzette E. Overby M
 Saliya A. De Silva and Marie S. Pathirana M
 Martha M. Phillips and Thomas K. Skelly
 Helen Jo and Robert Pierce M
 Diane C. Pietig
 Tracy A. and Jon M. Saarela M
 Marcy C. Salzer
 Paul B. Saveriede
 Alison E. Schini
 Christine C. Schoenbauer
 Ted and Julie Ann Sherman
 Victoria E. Smith
 Jennifer L. St. Sauver
 Linda Stenzel
 Steven M. Stone
 Jami R. Stromberg
 Wendy N. Taylor
 Lee and Stacy Unowsky M
 Todd M. Vannelli
 Ann E. Vellek
 Carolyn R. Vitek
 Brian E. Weckwerth M
 Ellen Wendt and Karen Brown
 Bianca Williamson Shaw and Joe Shaw M
 Daniel S. Wovcha
 Brent L. Wyrick
 Jeffrey Y. Yung M

1995-1999

Lorraine B. Anderson M
 Robert Ascenzi
 David Babcock
 Carolyn L. Bagne M
 Janice A. Baker
 Kalli-Ann L. Binkowski
 Tara R. Bratland
 Paul C. Burkhouse M
 Andy W. Collins
 Leslie D. De Rouin M
 Mervyn L. de Souza M
 Jennea Dow and Steven Botts M

Daniel Elko and Jennifer McCauley M
 Joseph C. Fong
 Molly Freeman M
 Michael D. Frenchik
 Elizabeth M. Frieders
 Robb M. Garni M
 Luca Gunther
 David C. Hanson
 Curtis P. Henry M
 Katherine E. Himes and Mark W. Lescher M
 Jane M. Fischer Johnson M
 Karin L. Larson
 Phillip A. Lawonn M
 Daniel M. Liedl M
 Helen C. Margellos M
 Carolyn E. McLachlan
 Joanna L. Miller
 Amy and Olaf Minge M
 Derek A. Moline
 Steven F. Mullen
 Michael C. Murray
 Doan M. Ngo M
 Kristine A. Nichols
 Gretchen L. Oswald
 Henry W. Park
 Corbett M. Peterson
 William J. Prem
 Mark Reichert and Melissa Atwood-Reichert M
 Meegan M Schaeffer
 Clint S. Schmidt
 Mark A. Schoenbeck M
 Joan M. Schroeder Dale M
 Lisa M Schweizer M
 Tina Seeland M
 Paul J. Sheldon
 Lynda K. Smith
 Brian J. Sorbel M
 Kenneth L. Stein M
 Paul J. and Brenda J. Talarico
 Brett M. Tanntu
 Heidi Thorson
 Jill M. Vannelli
 David C. Watrous-Mc Cabe
 Robert C. Wild M
 Jessica Jane Wormley

2000-2003

Simba L. Blood
 Heidi K. Flashinski
 Jennifer M. Hockenberry M
 Brian L. La Plante
 Chungui Li
 Daniel G. Mareck
 Michael S. Morton
 Jay R. Parlet
 Lyndsey S. Rear M
 Chris and Brittany Sabol M
 Jennifer Seffernick M

Jennifer L. Steele M
 Sara J. Tauer
 Elizabeth J. Tuohy

Friends

James G. Aagaard
 Pamela J. Albin
 Amy R. Alpine
 Carl G. and Barbara K. Anderson
 John S. and Rebecca H. Anderson
 V. Elving and Carol R. Anderson M
 Paula and Thomas Andrzejewski
 Chris and Michele Armstrong M
 Carolyn W. Arndt
 James R. Azarski and Nancy Werner-Azarski
 Franklin H. and Adrienne K. Barnwell
 Stephen D. and Jill M. Barry
 Judith G. and Michael Berman M
 Susan F. Bieniek
 Marcia F. Birney
 Victor Bloomfield and Elsa Shapiro
 Martin Blumenfeld and Amanda Horton M
 Joanne J. Brooks
 Kirk M. and Ione V. Brown
 Debbie Buckner
 Bob Burgett and Clete Strak M
 Nancy Quattlebaum Burke
 Ronald F. Burton
 Richard S. and Lucille P. Caldecott M
 John T. Carlson
 Iris D. Charvat
 Jiann-Chin Chen
 Stephana A. Choong
 Janene M. Connelly M
 David E. Culley
 Edward J. and Carolyn Cushing
 Peter Dardi and Bridgett Barry
 Anath and Archana Das
 Andrew M. and Kaari B. Davies
 Margaret B. Davis
 Robert R. and Barbara L. De La Vega M
 Jo Anne De Pauw
 Louis S. Diamond M
 Joan L. and Denneth C. Dvergsten M
 Robert Elde M
 Mark S. and Patricia J. Ellinger M
 Maxine A. Enfield M
 Sharon and Ronald Faanes M
 Beth and Jerome Fahrman
 Bruce A. and Susan H. Fall
 Kin C. Fong
 Carroll G. Forester
 John and Janet M. Fredell M

M membership in the University of Minnesota Alumni Association/Biological Sciences Alumni Society

RICHARD ANDERSON



Professor Richard Poppele leads a neuroscience lab class at Itasca this summer.

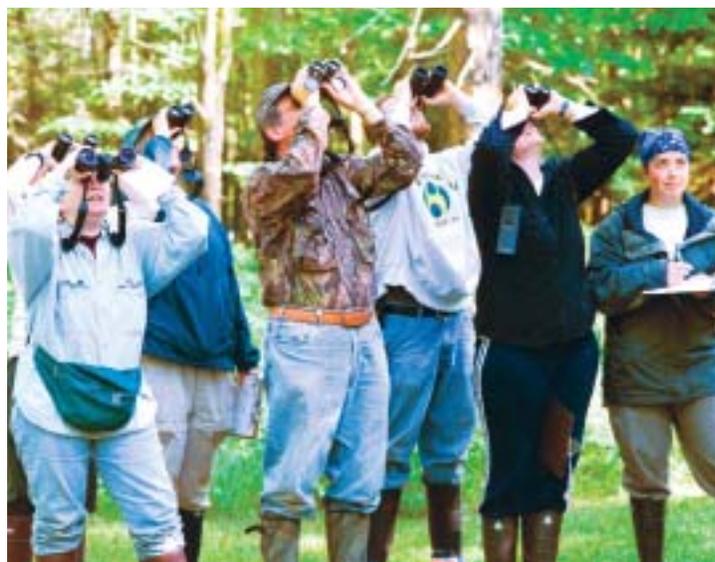
Nicole Putnam Frenchik
 James A. and Sandra K. Fuchs **M**
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 Kathryn L. Hanna
 Margherita Gale Harris
 Edward F. Haskins
 Barbara J. and Gary L. Hegarty
 Amy S. Hentges **M**
 Sarah Hobbie and Jacques C. Finlay
 Bruce W. and Alison S. Jarvis
 Karen E. and Stephen F. Jensen
 Henry A. Johnsen
 Martha K. and Arthur A. Johnson
 Emily Johnston **M**
 Mary J. Kelly
 David T. and Catherine A. Kirkpatrick
 Carol F. Kirkwood
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 Pamela J. Lachowitz
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 Ralph O. Morgenweck **M**
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 Donna R. Onstott
 Jean M. Parmelee **M**
 G. R. Paulu and J. Quast Paulu
 Richard W. and Lisa S. Peifer
 Elaine E. and Richard E. Phillips
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 Kathleen F. and Gerald W. Probst
 Anne E. Pusey **M**
 Peggy Rinard
 Robert D. and Lori G. Roettger
 Louise A. Rollins-Smith
 Sandra K. Rosenberg and James E. Liston, Jr. **M**
 Doris S. Rubenstein **M**
 Tamara J. and Paul D. Saunders **M**
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 Mark T. and Jean E. Schroeffer
 Rhoda J. and Martin W. Schularick
 Michael Scullin
 Jocelyn Shaw and J. Stephen Gantt
 Glenn W. Shifflet and Sue Wick
 Donald B. and Alaine L. Siniff **M**
 Thomas C. Skalbeck **M**
 Jeanne M. and Steven W. Tanamachi
 Ben and Louise Thoma
 Peter Tiffin
 Genevieve M. Tvrdik
 Robert S. Veit **M**
 Kimberly J. and Jonathan L. Vennerstrom
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 Winnebago United Fund



RICHARD ANDERSON

Bob Zink, professor of ecology, evolution, and behavior, leads a bird-watching class at Itasca Biological Station and Laboratories.

CBS Calendar

Campaign Minnesota Celebration

Celebration of the successful completion of Campaign Minnesota, September 13, 5:30 to 10:30 p.m., Coffman Union and Northrop Auditorium. Visit www.campaign.umn.edu for details.

CBS Awards and Recognition Dinner

Annual event to recognize scholarship recipients and their benefactors, Thursday, October 2, 5:30 to 8:30 p.m., Memorial Hall, McNamara Alumni Center.

Homecoming 2003

Gophers will play the Indiana Hoosiers at the Metrodome on Saturday, November 1. Join fellow alumni for tailgating before the game. To order tailgating and/or football tickets, contact Emily Johnston at alumni@cbs.umn.edu or 612-624-4770.

After the Harvest Pumpkin Festival

Fall event for alumni and families, Saturday, October 25, noon to 3 p.m., Minnesota Landscape Arboretum. Features nature activities for children of all ages, a pumpkin carving contest, face painting, snacks, and self-guided tours of the arboretum. Cost is \$5 at the gate.

Mentor Program Kick-off

November 5, 5:30 p.m., Mississippi Room, Coffman. Mentors and students meet and discuss goals. Alumni who want to be mentors can still sign up at www.alumni.umn.edu/cbsmentor.

Contact Emily Johnston at alumni@cbs.umn.edu or (612) 624-4770 for more information about any of the events listed above.

Continuing Education

Master's in Biological Sciences offers flexibility for working adults

Stacey Olson discovered the Master's in Biological Sciences (MBS) program while looking for a graduate program to advance her career at Cargill Dow, where she is a molecular biologist in the Biocatalyst Development Center.

After a search of offerings, she didn't find what she was looking for, but learned that the U's MBS degree would allow her to design a program that met her needs. And it would allow her to do so on her own time and at her own pace.

The MBS is a professional degree program intended to help working adults expand their knowledge of biology and acquire new skills to advance their careers. It requires completion of 30 semester credits at the 4000 level or above, including a two-credit capstone project. Several courses are offered online and participants are encouraged to do self-directed projects.

Olson, who has a B.S. in biotechnology and microbiology from St. Cloud State University, is specializing in biochemistry and bioinformatics. Last year she took a course in microbial genomics and bioinformatics and another in enzyme mechanisms. This summer she completed an independent project in bioinformatics. In the fall she plans to take a biochemistry course.

"I love the flexibility of this program," she says. "In a traditional graduate program you learn things you hope to have the opportunity to use. In the MBS program, you choose to learn things that you can use in your work."

Many employers pay tuition costs for this program. For more information, go to <http://www.cbs.umn.edu/biolink/mbs> or call Carol Gross at 612-625-3133.



Stacey Olson, molecular biologist at Cargill Dow, is an MBS student.

PEGGY RINARD