Making dreams come true
The College hopes to raise $10 million for a scholarship and fellowship endowment to help students pay increasing education costs.
Imagine this scenario: A bright, young student is shopping around for an undergraduate biology program. She considers the University of Minnesota, Princeton, and Stanford. After studying program options, quality of faculty, students, and facilities, she decides that the three are comparable, so she chooses the most affordable.

That would be the University of Minnesota, right? Wrong. Her choice would be Princeton. Princeton University now provides full scholarships to all students who meet financial need criteria. The school’s huge scholarship endowment, built up over many years by gifts from alumni and friends, has made this possible.

Unfortunately, this could easily happen in fact, it may already have. While public research universities used to be a bargain, they are being undercut by private universities with large endowments. At the same time, tuition at public universities is going up. The University of Minnesota will increase tuition by about 25 percent over the next two years because of declining state support, which is expected to continue.

The whole picture of funding for public education is changing.

The College of Biological Sciences is at a particular disadvantage because our scholarship endowment is relatively small and because the University has less money to give students. Because of the budget shortfall, the University has been forced to take money out of the scholarship fund and reallocate it for more urgent needs. Consequently, we need to build CBS’s scholarship endowment, which is approximately $1.4 million, up to at least $10 million to continue attracting top students.

Why does it matter if we have top students? If you’ve read this column before, you know that our mantra is “put students first, and the rest will fall into place.” We need to attract the best students to sustain the quality of the school. Students who attend as undergraduates are likely to stay or return later and spend their careers here. The better they are, the better we are, and the more valuable a CBS degree is.

We have a lot to offer to top students. I don’t know of a better place for an undergraduate to go for biology. The breadth and depth of classroom, laboratory and field experiences can hard to match. Trumanbonow provides singular opportunities for first-year students to learn from world-class scientists. And undergraduates often become part of the families of post-doctoral and graduate students who surround these star professors. Added to this, the University of Minnesota was recently ranked third among public research universities in the U.S. (See story on page 17.)

Please consider a gift to our scholarship endowment to assure that the quality of the College of Biological Sciences remains high, and imagine this scenario:

Three biology graduates apply for the same position – one has a degree from Princeton, one has a degree from Stanford, and one has a degree from the University of Minnesota. The U of M graduate gets the job.
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Dean
Robert Rice

Editor
Peggy Rinard

Advisors
Janene Connelly, Director of Development and External Relations.
Judd Sheridan, Associate Dean.
Kathleen Peterson, Director, Office of Student Services.
Paul Germscheid, Alumni Relations Coordinator.

Issue Design and Layout
Sunny Walsh, U of M Printing Services

Original Design
Elizabeth Longhurst

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Address correspondence to:
Frontiers Editor
College of Biological Sciences
123 Snyder Hall, 1475 Gortner Ave.
St. Paul, MN 55108

e-mail: rinar001@tc.umn.edu

For information on College of Biological Sciences programs and services, visit our Web site at www.cbs.umn.edu.

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Evolution of the College of Biological Sciences

The College’s roots reach back to 1851 territorial legislation that created the University. Biology departments sprouted independently, co-evolving with health sciences, agriculture and liberal arts. In 1965, the College of Biological Sciences unified these departments. And in 1998, the U’s biological sciences reorganization gave CBS a boost.

Today, with new department heads in place and new facilities under construction, CBS has its seatbelt fastened for the next part of its evolutionary journey.

CBS timeline

1851 The University of Minnesota was created by territorial legislation and a federal land grant of 10,000 acres. Science was among the original disciplines proposed.
1868 The College of Sciences, Letters, and the Arts (CSLA) was established.
1887 The Animal Science Department was established in CSLA. In 1927, it was renamed Zoology.
1891 The Botany Department was created in CSLA.
1900 Josephine Tilden, the University’s first woman scientist, established the Minnesota Seaside Station on the coast of British Columbia.
1909 Lake Itasca Forestry and Biological Station was established with a forestry training program.
1913 The Agricultural Biochemistry Department was formed within the Institute of Agriculture.
1915 The Zoology Building was constructed on the Minneapolis Campus.
1926 The Botany Building was constructed on the Minneapolis Campus.
1928 Snyder Hall, named for agricultural scientist Harry Snyder, was built to house Agricultural Biochemistry. Snyder Hall is now headquarters for CBS.
1928 The Agronomy and Plant Genetics Department was established in the Institute of Agriculture.
1930 Cedar Creek Natural History Area was discovered and was later preserved for research.
1937 The Botany Department added ecology as a discipline, and an era of interest in conservation began.
1962 The Animal Science Department was re-established within the Institute of Agriculture.
1965 The Agriculture and Human Sciences Department was established in the School of Agriculture.
1967 The Biology and Biological Sciences Department was established.
1970 The Biology Building was constructed on the Minneapolis Campus.
1982 The Agriculture Building was constructed on the Minneapolis Campus.
1984 The Biology and Biological Sciences Department was renamed the College of Biological Sciences.
1998 The College of Biological Sciences was reorganized, giving CBS a boost.

Photos courtesy of U of M Archives

Greenhouses have played an important role in biology research since 1889, when regents approved $500 to build an herbarium.
Agricultural Biochemistry from 1917-42.

named for Ross Gortner, chairman of

1967

were created.

1965

departments, Genetics and Cell Biology.
The last combined the Genetics Center in agriculture with a new

emphasis on cellular biology and biochemistry.

A decade later, zoology was disbanded and

faculty were divided between the two new
departments.

1998

derived from the College of Agriculture.

1868, the College of Sciences, Arts and Let-
ters as one of five original disciplines. In

1891 respectively.

1993

1916, with Josephine Tilden, center.

In 1900, botanist Josephine Tilden led an

country. A genetics program, established with-
in agronomy, was also an acorn of a car-
some CBS department.

1909, the Lake Itasca Forestry and

Biology Field Station was established. And in

1930, Cedar Creek Natural History Area was

disbanded; faculty joined either Ecolo-
gy and Behavioral Biology or Genetics and Biochemistry.
The first

combined the Genetics Center and Cell Biology and

Behavioral Biology. The last

organized under Dean Richard Caldecott in

1909 to unify existing biology departments.

1976

The Zoology Department was

The Biological Sciences Institute.

other departments, reflects the reorganization. Two

departments, Genetics, Cell Biology, and Development, and

Molecular Biology and Biochemistry, are new

departments with the Medical School.

1989

The department of Ecology and

Behavioral Biology was renamed Ecol-
ogy, Evolution and Behavior.

1993

The name of the Botany Depart-
ment was changed to Plant Biology.

1995

Ground was broken for the Mol-
ercular and Cellular Biology Building in Min-
neapolis, which will house many

CBS researchers.

2001

CBS common structure, with its four
departments, reflects the reorganiza-
tion. Two departments, Genet-
ics, Cell Biology, and Development, and

Molecular Biology and Biochemistry, are new
departments with the Medical School.

Next year, many CBS and Medical

School faculty in these departments

will move into the

new Molecular and Cellular Biology

Building in Min-
neapolis. Shortly after, the new Cargill

Micrornal and Plant Genomics Building, will

be constructed on the St. Paul campus. —Page Rand

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Micrornal and Plant Genomics Building, will

be constructed on the St. Paul campus. —Page Rand
While hanging out in his father’s lab he learned to transfer cultures with a pipette, use a microscope to look at bacteria, and count colonies on plates. But his favorite experiment was melting the glass pipettes over a Bunsen burner.

Bernlohr earned his B.S. in biochemistry from CBS in 1978, and as an undergraduate worked at E. coli, former head of biochemistry, at Currier Laboratory, where his office is now located. He won to graduate school at the University of Illinois, where he received a Ph.D. in biochemistry, and then did postdoctoral research at the Johns Hopkins School of Medicine. In 1985, he came back home to CBS.

Since his post-doc years, Bernlohr has been interested in relationships between obesity, diabetes and insulin resistance. He’s now focused on the metabolic relationship between diabetes and insulin resistance in type 2 diabetes, and lipid metabolism in disease and health.

Bernlohr was interim head of the CBS biochemistry department from 1995-1998.

While hanging out in his father’s lab he learned to transfer cultures with a pipette, use a microscope to look at bacteria, and count colonies on plates. But his favorite experiment was melting the glass pipettes over a Bunsen burner.
His own research is focused on the nutrient content of freshwater organisms, primarily plankton, and how that shapes their ecosystem. Using Lake Superior and other lakes as his laboratory, he addresses basic questions about how chemistry and biology interact in water ecosystems, and about the nutrition of food webs.

A native of Chicago, he earned his B.S. degree at the University of Illinois, Champaign-Urbana. There, he became acquainted with a young assistant professor, Michael Lynch, a University of Minnesota alum. Lynch “more than tolerated” his inquisitiveness about water biology and introduced him to the study of zooplankton. At CBS, David Tilman was his adviser.

Bob Sterner traces his interest in ecology and water to camping trips he took with his family as a child. He vividly recalls a trip to Acadia National Park in Maine, where he was fascinated by intertidal zones, and another to Algonquin Provincial Park in Ontario, when his lifelong interest in lakes began.

When Robert Sterner began to look for a graduate program in freshwater ecology, his mentor suggested the University of Minnesota. The College of Biological Sciences offered just what he was looking for: 10,000 lakes, the headwaters of the Mississippi, and a shore of Lake Superior. Minnesota offered more than enough bodies of water to quench his scientific thirst.

Today, Sterner heads the Department of Ecology, Evolution and Behavior (EEB), where he earned his doctorate in 1986. Created shortly after the College of Biological Sciences was formed, it expanded in 1976 to encompass the Zoology Department. EEB is ranked among the top 15 departments of its kind in the nation. Faculty are frequently cited in scientific literature and featured in The New York Times and other national media.

Some examples of the diversity of research include:
- Social behavior of animals, such as chimpanzees and lions in Africa
- Ecological research on Lake Superior and other large lakes
- Dynamics of novel species and novel genes in a community context
- Use of prehistoric and geologic sources, such as lake sediments, to study the history of ecology
- Freshwater science

Sterner’s goals for the department are to maintain and improve quality as he recruits new faculty—10 percent of the faculty will retire over three to five years. Areas of emphasis include assessing planetary ecosystem changes, animal behavior studies of neural, endocrine and cognitive systems, and evolution, which Sterner calls “the glue that binds all of biology as a discipline.”

W
hat Brian Van Ness likes
about being a department
head is bringing people
with compatible interests
together to form productive working rela-
tionships. “I really enjoy getting person ‘A’
to meet with person ‘B,’ helping them de-
velop a production relationship, then stepping
back and letting it happen,” he says.

That matchmaking ability is particu-
larly valuable in Van Ness’ department
because it is organized around model sys-
tems. “Pragmatically, genetics, cell biology
and development are not three indepen-
dent themes, they’re very interrelated,” Van
Ness says. “It would be a mistake to devel-

op them sepa-

rately.”

Some of the depart-
ment’s research strengths in-
clude cancer biology, gene
therapy, gene regulation, ge-
netic diseases, cell signaling
and innovative microscopy.

When the new Molecular and Cellu-
lar Biology Building opened in
2002, a majority of the depart-
ment’s 50 faculty mem-
bers will move into the facil-
ity. Van Ness looks forward
to the move as an opportunity to further
integrate faculty who are studying common
organisms and develop-
ing common approaches.

Labs are de-
signs with
estar walls to
encourage collaboration,
and equipment
will be shared. “Sharing space and equip-
ment leads to sharing techniques and ideas,” he says.

Van Ness adds that his goals are to
build on the department’s strong founda-

tions in model organisms and under-

etary connections, emphasize basic and
applied research, and promote awareness of
the department’s strengths in the national
scientific community.

“We have expertise in genetics and
developmental biology, we want to be on
the leading edge,” he says.

Named department head in May, Van
Ness had served as interim head since
August 2000, and was closely involved with
the reorganization of the department in
1998, which was initiated by faculty from
several department and disciplines.

“People started meeting in the halls
and talking about the need to form new
collaborative relationships,” Van Ness says.
“I remember having many hallway conver-
sations with colleagues in cell biology and
neuroanatomy, genetics, biochemistry, and
medicine. Pretty soon, there were enough
of us to sit down in a room and we began
to schedule meetings.” Van Ness adds that
Tony Faras, the first head of GCD, brought
people together and promoted GCD as an
important part of the reorganization.

Originally from Pennsylvania, Van
Ness earned his doctorate in biochemistry
at the University of Minnesota. He did
postdoctoral research at Fox Chase Cancer
Center in Philadelphia, and returned
to the Univer-

Rene Van Ness is professor and head of the Department of Genetics,
Cell Biology and Development.

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I really enjoy getting person ‘A’
to meet with person ‘B,’ helping
them develop a production rela-
tionship, then stepping back and
letting it happen,” Van Ness says.
After 12 years at Texas A&M University, Kate VandenBosch is glad to be back home in the Midwest, where the climate is generally kinder to green growing things from legumes—her research interest—to flowers in the garden.

"In Texas, you have either droughts or floods, so what gardening I did was mostly pulling up and replanting things that had died," she says.

While at Texas A&M, VandenBosch cultivated collaborations with University of Minnesota faculty, including plant biology colleagues Hero Gantt and Nevin Young. So when she arrived here in January, 2000, she was ready to go to work. Her first task was to recruit new faculty. The department, which had not added faculty for several years, was poised for growth because of advances in the field and the University's commitment to expanding molecular biology and genomics research. Thus far, six new faculty have arrived or will be arriving over the next year. Recruitments are being made in key growth areas—development, evolution, and genomics.

"Plant Biology is vertically structured, cutting through all levels of biology from molecules to ecosystems. Co-located, plant biologists often mentor faculty in other CBS departments, which tend to be horizontally structured. Many also work with faculty in the College of Agricultural, Food and Environmental Sciences. Dominant research themes are evolution and biodiversity, interactions among plants and other organisms, regulating and developing responses of plants to environmental cues, such as light and temperature. Goals include applying research to preserve biodiversity and identifying molecular targets for making crops more nutrient- and water-efficient, resistant to diseases, insects, and drought, and less dependent on pesticide, fertilizer, and irrigation."

The richness of prairie soil can be attributed in part to nitrogen fixation in native legumes. VandenBosch and her colleagues hope to improve nitrogen assimilation in other plants, which would reduce pollution from nitrogen fertilizers.

Growing up in a farming area of Michigan's Lower Peninsula, with summers spent on the western shores of Lake Michigan, VandenBosch developed an interest in agriculture, forests, native plants, and their communities. As an undergraduate at Kalamazoo College, VandenBosch abandoned pre-med studies for plant physiology, ecology, and evolution. She earned her doctorate in plant biology at the University of Massachusetts, ultimately focusing on form and function at the cellular level.

—Peggy Rinard
Ill Ennen wants to educate Hispanic cultures about the value of preserving precious ecosystems such as coral reefs. Jeannette Martinez hopes to conserve endangered insects that play important roles in ecosystems. And after a summer internship at a hospital in rural India, Sanaya Bharucha knows she wants to be a doctor.

These three CBS students are fortunate. Thanks in part to the generosity of CBS alumni and other donors, they are on the way to realizing their dreams. But in the future, talented students like these may not be so lucky. Tuition is way up, University scholarship resources are increasingly inadequate, and the cost of a biology education is becoming less affordable for more students. At the same time, applications are pouring in, thanks to the College's reputation and a growing interest in the biological sciences.

While CBS has a number of endowed scholarships and an annual scholarship fund, in the past the bulk of student support, about $1 million a year, has come from scholarships provided through the University's operating fund. But there is much less operating money available for scholarships because the state didn't fully fund the University's budget request. Consequently, money thatused to go to scholarships is being used to pay for essentials.

Added to that, the endowment at CBS, which is a relatively young college, is much smaller than the endowments of most other University of Minnesota schools and colleges. A scholarship endowment is built up over many years with contributions and bequests from alumni, friends and foundations. Only the interest is used, so the principal remains and grows as contributions are added. Since the first CBS class graduated in 1969, the college just hasn't had the time to build a substantial endowed fund. So now, with the need to catch up driven by the tuition increase and other factors, Bob Elde, CBS dean, has identified building the scholarship endowment as one of the school's top priorities.

"The bottom line is that we need to increase our endowed scholarship and fellowship endowment from $1.4 million to $10 million," says Bob Elde, CBS dean. "If we aren't able to do that, we won't be able to attract the kind of students we need to ensure a strong future for CBS. It's ambitious, but I'm very optimistic about our success, because I believe that we have many alumni and friends who want to keep the college strong and watch it grow."
Florence Rothman Fellowship Fund

Some people show appreciation to their mothers with flowers. Russell Rothman (M.S., ’77) did much more than that. He gave his mother a bouquet of bright futures by endowing the Florence Rothman Fellowship Fund in her honor.

Rothman made the gift in 1996 to thank his mother, who died of Alzheimer’s disease the following year, for the role she played in nurturing his lifelong passion for biology. “My interest in nature really came from her,” he says. “She encouraged my love of the outdoors.”

That love eventually led Rothman to study wolves here at CBS under Professor David Mech. He was close to completing his Ph.D. when other obligations intervened, and Rothman went to work for his family’s electronics distribution business instead.

Despite the career path he followed, Rothman remains immersed in the biological sciences. He’s active in international conservation, gives talks on biology in schools, and contributed to Mech’s recent book, The Wolves of Minnesota.

Based on his own experience as a grad student, Rothman targeted the fellowship to support graduate students conducting exploratory, field studies. He hopes it will help them do what he was not able to—complete a formal education in the face of financial pressures.

“It would have been nice if I had finished,” he says, “but this way I’m able to help more students who find themselves in the same situation that I was. It’s money well spent to help encourage other students at a time when they need it the most.”

—Russell Rothman

A jewel among insects

What will it take to save the Hine’s Emerald dragonfly? Jeannette Martinez, this year’s Florence Rothman Fellowship Fund recipient, intends to find out. She’s using population genetics to learn whether the few remaining clusters of the endangered insect intermingle or are genetically isolated—information that could help in its recovery.

Martinez’ long-term goal is to be an academic researcher focusing on conservation of insects, which she says deserve more respect than they get.

“When people talk about insects, they usually think of pests, but that’s really a minority,” she says. “Some pollinate plants, some eat other insects, and they are a food source for so many animals at different trophic levels . . . I think of them as the glue that holds the ecosystem together.”
Leon Snyder Fellowship

To Leon Snyder, excellence meant much more than a 4.0 GPA. So it was very fitting that after the longtime professor of genetics and cell biology died in 1989, family and friends honored his memory by endowing an award for exceptional undergraduates whose interests venture beyond biology.

“The goal of the award is to provide financial assistance to students who are excellent as judged by the usual academic measures but who also show some multidimensional qualities,” says Snyder’s former colleague Michael Simmons, professor of genetics, cell biology and development. “It isn’t just that they’ve made good grades in organic chemistry, but there’s some substance there.”

Since it was established more than a decade ago, the Leon A. Snyder Memorial Fund has supported students with diverse blends of interests, including neuroscience and public health, genetics and ethics, and Spanish and ecology.

Rachel Mason, the 2000 recipient, says she liked the affirmation of her multiple interests.

“My academic career is peppered with poetry workshops, photography classes, things like that,” she says. “It really excited me to get this award because it’s between science and art.”

Mason, who majored in ecology, evolution and behavior, focused on animal behavior and behavioral ecology as an undergraduate. She plans to remain at CBS teaching biology labs for a couple of years before beginning graduate studies, probably in psychology. She’s particularly interested in studying connections between evolution and psychology.

BSAS Alumni

Since 1983, BSAS Alumni Merit Scholarships have been awarded annually to students with top grades and extracurricular field or laboratory experience. The money in this fund, made up of gifts from $10 to $5,000 from alumni and friends, is collected and dispersed annually. Currently, such awards are for $1,000. In 1999, seven Alumni Merit Scholarships were awarded. In 2000, there were 12, and in 2001 there were 18. The awards help students offset the cost of their education and provide valuable encouragement to top-performing undergraduates.

Sanaya Bharucha, Khaled Dajani, and Bill Ennen are all 2001 recipients of these scholarships.

Epiphany in India

Alumni Merit Scholar Sanaya Bharucha always loved biology, she just didn’t know what she wanted to do with it. “I was debating between research and medical school,” she says. “I had been working in a lab for awhile; I wasn’t sure that’s what I wanted to do.”

“Epiphany in India”

Alumni Merit Scholar Sanaya Bharucha always loved biology, she just didn’t know what she wanted to do with it. “I was debating between research and medical school,” she says. “I had been working in a lab for awhile; I wasn’t sure that’s what I wanted to do.”
Merit Scholarships

A year studying the practice of medicine in rural India settled the issue. She learned a lot from the experience, perhaps most importantly that she wanted to be a physician.

She says her award means she has to work less, and thus has more time to round out her science coursework with classes on social issues.

Tuition and validation

A BSAS Merit Award is helping Khaled Dajani save his money for a really big investment he hopes to make before too long: medical school.

Dajani has always had an interest in medicine. His CBS coursework prepared him well for the medical school entrance exam. Now the scholarship is helping him cut back on work so he can focus on the arduous application process.

In addition to financial help, Dajani says he appreciates the award’s acknowledgment of his efforts to juggle academics, research (most recently on proteins in spermatozoa), and extracurricular activities, including representing CBS in the University of Minnesota student senate.

“It not only helps with tuition but validates what you’re doing,” he explains.

More time to give

For senior Bill Ennen, winning a BSAS Merit Award means having more time to give.

Ennen is weaving his interests in biology, Latino culture, and the outdoors into a career focused on improving the environment and human health in developing nations. To build the many skills and connections needed to do so, he’s been involved in an abundance of volunteer activities: leading outdoors programs, organizing an environmental lecture series, helping the Twin Cities Latino community—in addition holding down paying jobs as a teaching assistant, hospital worker, museum guide, and waiter.

He has also managed field research trips to Venezuela and Honduras to learn about their ecosystems and practice his Spanish.

With the scholarship in place, Ennen hopes to have to spend less time earning money and more time volunteering.

—profiles by Mary K. Hoff

How can you help make a student’s dream come true?

Many CBS undergraduate students work at least part-time to cover their education costs. Students who work extensively in college often earn lower grades and are unable to participate in activities that enrich their classroom work. Working students also take a lighter course load than their peers, making graduation in four years nearly impossible. And longer work hours are a necessity for more and more students.

Gifts can be made with cash, stocks, bonds, treasuries, mutual funds, real estate, or personal property. Some donors choose to include the College in their wills, or name the University as an owner and beneficiary of a life insurance policy.

Following are some of the ways to support scholarships and fellowships at the College of Biological Sciences:

• make an annual contribution and designate it to the CBS Annual Scholarship fund;
• establish a scholarship or fellowship endowment in your name or the name of an individual you would like to recognize;
• include CBS in your estate plans;
• name CBS in your will.

For more information about supporting the College of Biological Sciences, please contact Janene Connelly, (connelly@cbs.umn.edu) or 612-624-7496.

Note: Your gift to endow a fellowship may be eligible for a match through the 21st Century Graduate Fellowship Endowment, effectively doubling the impact of your gift.
Challenging a scientific dogma is like striking at a king: If you do it, you’d better win. No one knows this better than Gary Nelsestuen, who bucked the scientific establishment over how to modulate blood clotting.

A professor of biochemistry, Nelsestuen has worked for 30 years with proteins that cause or prevent blood clotting. One was protein C, a natural anticoagulant that should soon be approved by the Food and Drug Administration to be marketed by Eli Lilly as the first sepsis drug. Sepsis occurs when the immune system overreacts to bacterial antigens in the bloodstream, causing widespread clotting and reduction of blood flow to organs.

Worldwide, sepsis kills at least a third of the 1.5 million people it strikes each year.

“My dad had sepsis and nearly died,” Nelsestuen says. “He got a shot of cortisone in the shoulder, and that may have introduced E. coli.”

In the mid-90s, Nelsestuen was trying to understand how protein C and related clotting and anti-clotting proteins attach to membranes because those that attach best would make the best candidates for drugs. Based on protein C’s three-dimensional structure and the properties of protein C variants made by inducing specific mutations, virtually all other laboratories working in this area supported a common idea of membrane attachment. But Nelsestuen suggested that both the 3-D structure and the mutation studies had shortcomings. He had other ideas about membrane attachment. Based on his work, Nelsestuen suggested that protein C attaches to membranes in a way that is not reflected by the protein’s three-dimensional structure.

As he pursued his unpopular ideas, neither of his grants from the National Institutes of Health was renewed. The Graduate School provided a small grant, but the number of laboratory students and staff rapidly approached zero.

In March 1998, a series of collaborations resulted in a modified protein that reflected Nelsestuen’s ideas. With his remaining students, Nelsestuen showed that the mutant protein attached to membranes much more powerfully than the natural protein and had 10- to 20-times higher activity.

Suddenly, the tide turned. Nelsestuen’s NIH funding was restored, and the NIH also funded a program project grant called “Novel Therapies for Hemophilia” involving Nelsestuen and colleagues Nigel Key and Bianca Conti-Fine. Eli Lilly licensed the modified protein C as a possible successor to the first sepsis drug, and income from Eli Lilly has helped underwrite the Dagley-Kirkwood award for outstanding teaching in CBS. Finally, Nelsestuen has been instrumental in acquiring new mass spectrometry instruments necessary for work in this area and in the new field of proteomics.

What was it like to work for two years virtually unfunded, faced with a popular opinion that he was on the wrong track? Nelsestuen won’t say it was scary, but “it took a lot of confidence to proceed.”

Rebel with a cause
Gary Nelsestuen followed an unpopular hunch that led to a breakthrough drug for treating sepsis. The U of M has licensed the technology to Eli Lilly, which plans to launch the drug soon.

Gary Nelsestuen, professor of biochemistry, molecular biology and biophysics.

What was it like to work for two years virtually unfunded, faced with a popular opinion that he was on the wrong track? Nelsestuen won’t say it was scary, but “it took a lot of confidence to proceed.”

—Deane Morrison
New role for RNA

Researchers discover that RNA as well as DNA plays a role in genetic disorders such as myotonic dystrophy.

Nine years ago, University neurologist John Day noticed something strange about a condition affecting several members of one large family. They showed all of the symptoms of myotonic dystrophy (DM), the most common form of muscular dystrophy in adults, yet none carried DM's characteristic flaw on chromosome 19.

Two years later, after having examined several more family members, Day told University molecular geneticist Laura Ranum about the family. The two collaborated and in 1998 showed that the milder form of DM in Day's patients (DM type 2, or DM2) was caused by a mutation on chromosome 3. In August of this year, Day and Ranum announced in the pages of *Science* that “rogue” RNA—not a defective protein—was the culprit in both forms of DM.

“Up until now, most researchers have focused on protein abnormalities as the ultimate cause of genetic disorders,” says Ranum, associate professor of genetics, cell biology and development. “Now we have reason to examine the role of RNA.”

In addition to causing muscle deterioration, and an odd inability of muscle to relax (myotonia), both DM1 and DM2 cause heart problems, diabetes, male infertility, a particular pattern of balding, and, perhaps most striking, cataracts that appear red and green through an ophthalmologist’s slit lamp.

DM2 is never as severe as DM1 can be, however, because it lacks a congenital form and severe central nervous system involvement.

“Identification of the unusual mutation in DM2 opens the door to finding ways to stop both DM1 and DM2,” says Day, associate professor of neurology. “Both types of DM result from a mutation in which a sequence of DNA is repeated over and over in tandem. In DM1, a triplet of nucleotides occurs between 100 and 3,000 times; in DM2, a quartet of nucleotides is repeated an average of 5,000 times.

The irony of a larger genetic flaw producing a milder form of the disease is not lost on Ranum and Day. But even more intriguing is RNA's central role in causing the damage. In most genetic diseases, DNA defects are reproduced in RNA, which exits the nucleus and directs the manufacture of defective protein. But in DM1 and DM2, RNA apparently does its mischief inside the nucleus. To top things off, the defect occurs in an RNA segment that’s ordinarily snipped out before the RNA molecule leaves the nucleus.

Ranum and Day's work paves the way for a genetic test for a form of myotonic dystrophy and better treatments for the disease. Whatever the outcome, their demonstration of RNA's ability to cause disease all by itself stands out as a scientific accomplishment.

—Deane Morrison
Regents have had their first glimpse of plans for a St. Paul campus biotechnology precinct. Bob Elde, CBS dean, and Orlyn Miller, Facilities Management, presented the plans at the board’s July meeting. The proposed precinct, to be located on the northeast quadrant of the campus, grew out of planning for the Microbial and Plant Genomics Building. Other components include an incubator building, where industry partners and faculty could work together to develop biotechnology of mutual interest, renovation of the cattle barn on Gortner and Buford to provide meeting space, offices, and dining services, a building dedicated to biocatalysis and biomaterials development, and another to biosensors. Regents will vote on the proposal, which is part of the University’s six-year capital plan, this fall.

CBS students to benefit from 3M $6.2 million gift

University graduate students in health, technology, and biology will benefit from a $6.2 endowment established by a gift from 3M, Inc. The endowment, part of a $15 million donation from 3M, will be used to pay expenses each year for 48 graduate students. The gift, announced in March, is among the largest the University has ever received.

“It’s exciting that the University’s priorities coincide with 3M’s priorities,” said Bob Elde, Dean of CBS. “This is a great opportunity for a new synergy between the University and 3M. 3M provides support that enables us to attract high caliber graduate students in genetics, biotechnology, bioinformatics, and nanotechnology. We mean them to be the kind of scientists 3M needs to develop new products that ultimately strengthen Minnesota economy and provide jobs. Everyone benefits.”

Dr. Gregg Vandesteeg, executive director of research and development in 3M’s Corporate Technology and Health Care Market, said that “providing financial support through scholarships and fellowships is a sound investment in both organizations. We are very pleased to provide this support to the University.”

The Richard C. Nelson Endowed Scholarship for Biochemistry has grown by $600,000 through a bequest by his daughter, Sarah Nelson Cook, who passed away in January, 2001. The scholarship was established by Cook to honor her father, who earned a Ph.D. in biochemistry from the University in 1937 and went on to a distinguished career in academia and industry. The scholarship supports students in the Department of Biochemistry, Molecular Biology and Biophysics.

Peggy Rinard joined CBS in July as Communications Coordinator. Rinard comes to the college from the Academic Health Center, where she was publications manager in the Office of Communications. She welcomes you to contact her at 624-0774 or rinar001@tc.umn.edu with news for internal and external publications, or if you have any suggestions about communications.

Frank McKinney, Curator Emeritus of the Bell Museum, passed away suddenly on June 12, 2001. McKinney was an internationally renowned scientist and leading expert on waterfowl behavior. Born in Ballymena, Northern Ireland in 1928, he studied zoology at Oxford and earned a Ph.D. from the University of Bristol. He taught at the University of Minnesota for 33 years, and was curator of animal behavior from 1973 until his retirement in 1999. A fund has been set up to support graduate students. Donations can be made in care of the Bell Museum, 10 Church Street SE, Minneapolis, MN 55455.

Former Professor David Parmelee will be remembered at the annual alumni weekend at Lake Itasca Forestry and Biological Station, Sept. 28-30, when a remodeled recreational field will be dedicated in his name. Parmelee’s widow, Jean, recently made a generous donation to upgrade the recreational facilities. Improvements include a new baseball diamond, basketball court, play equipment for children, and landscaping. Parmelee, who died in December 1998, was a station director from 1971 to 1986. All former station directors have been invited to participate in the dedication program. For more information, call Paul Germscheid at 624-3752.
Several CBS faculty received McKnight Foundation awards for 2001. Among the University’s highest honors, the McKnight awards identify and recognize the most promising junior faculty and most distinguished senior faculty.

David Tilman, professor of ecology, was one of only three professors University-wide selected for the McKnight Presidential Endowed Chair. Tilman is internationally known for his work elucidating the effects of biodiversity on ecosystems. Author of five books and 150 scientific papers, he is the most cited environmental author of the past decade, according to Essential Science Indicators. The endowed chairs were created with a $15 million gift from the McKnight Foundation made to the University in 1999.

Larry Wacket, biochemistry, molecular biology, and biophysics, was named a Distinguished McKnight Professor, which carries an award of $100,000 over five years. A 2001 McKnight Land-Grand Professorship went to Claudia Schmidt-Dannert, biochemistry, molecular biology, and biophysics. Schmidt-Dannert combines metabolic engineering and molecular evolution techniques to create biosynthetic pathways. Schmidt-Dannert will hold the title of McKnight Land-Grant Professor for two years and receive a $25,000 research grant for each year.

Female lions are “equal opportunity breeders,” according to Craig Packer, ecology, evolution, and behavior, who published a study in the July 27 issue of Science on the breeding habits of female lions.

The study showed no trace of any hierarchy in which certain animals were more likely than others to produce cubs. Such egalitarian breeding sets female lions apart from reproductive patterns of some other social species, including chimpanzees, wolves, and hyenas, in which there are one or more dominant reproductive females. Breeding hierarchies are even found among male lions. “In some years, only one or two females manage to raise a litter of cubs, but over time, all the females have the opportunity to breed,” says Packer.

Packer and his colleagues studied lifetime reproductive variation in females from 31 prides (social groups) of Tanzania’s Serengeti National Park and Ngorongoro Crater. He also observed that while female lions are competitive at kills, they respect the rights of the first female to arrive at the kill, whereas in male lions and many other carnivores the larger animal usually supplants the smaller.

The University of Minnesota came in third among U.S. public research universities in a recent report of “Top Research Universities” from the University of Florida.

The Florida study used nine measures of performance, including research dollars, private support, faculty honors, the amount of advanced training provided, and the quality of undergraduates. The only category in which the University of Minnesota fell short was qualifications of entering undergraduates. The school was ranked 7th among public institutions and 102nd among all institutions in this area. If not for that, UM would have been at the top of the merged public-private rankings, an elite group including Harvard and Stanford.

The Florida report was developed in part as a response to such popular rankings as the U.S. News and World Report annual college issue. Larger universities have long been unhappy with the magazine’s rankings, which tend to recognize small private universities.

Peter Zetterberg, director of Institutional Research and Reporting for the University, said he liked the Florida rankings, not just because the University did well, but because he believes the process is the fairest and looks at the broadest range of measures.

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“The female lion is one of nature’s few true democrats,” he said. Anne Pusey, ecology, evolution, and behavior and Lynn Eberly, School of Public Health, biostatistics, were co-authors.
As I step into the role of the President of the Biological Sciences Alumni Society, my main message to CBS alumni is to look for ways to give back. I’d like all of us to think about giving back to the college, students, other alumni and our communities. And I hope BSAS will continue making strides to facilitate and encourage our members to give back. We have an opportunity, indeed an obligation, to give back. Here are some ways:

• Make a contribution to the annual merit scholarship.
• Make a donation to the college.
• Be a mentor. You can also offer workplace tours, job shadowing or internships.
• Help recruit talented students.
• Help with one of our committees or participate in an event: Legislative Network, Speaker Bureau, Alumni Dinner, etc.
• Consider joining the BSAS Board, or at least join the UMAA.
• Donate a building (it doesn’t hurt to think big).

BSAS has a hand in all of these programs and activities. We welcome and encourage your participation and contributions.

I hope all CBS alumni look for ways to give back. If you have other ideas or would like further information, I am happy to chat with you at any time. You may call me at 952-470-4449 or contact me by e-mail at DickOsgood@aol.com. You may also contact Paul Germscheid, Coordinator of Alumni Relations and Annual Giving at CBS (612-624-6725 or pgermsch@cbs.umn.edu).

In my experience, the more we give, the more we get.

Dick Osgood,
President, BSAS

The 2001-2002 Biological Sciences Alumni Society Board

President
Dick Osgood (B.S. Biology 1977, M.S. Biology 1979)

Dr. Joel M. Barnett (B.S. Biology 1976, M.D. 1983)
Carol Patchett (Ph.D. Biochemistry 1973)
Carmen de la Garza (B.S. Microbial Engineering 1997, Ph.D. 2000)
Laura Eberwine (B.S. Zoology 1977, M.D. 1982)
Scott Emberson (Biology 1977)
Carli Henry (B.S. Biochemistry 1998)
Kendra Keppel (B.S. Biochemistry 1996, M.S. Food Science 1997)
Kristopher Kehner (B.S. BMBB 2000)
Phil Latooze (B.S. Microbiology 1987)
Rachel Maren (B.S. Biology, Evolution, & Behavior 2000)
Paddy Jones (B.S. Genetic and Cell Biology 1999)
Tara Skalbeck (Ph.D. Biophysics 1997)
Laura Erickson (B.S. Zoology 1977, M.D. 1981)
Kendra Kauppi (B.S. Biochemistry 1994, M.S. Food Science 1997)
Mervyn de Souza (M.S. Microbial Engineering 1997, Ph.D. Biology 1998)
Laura Erickson (B.S. Zoology 1977, M.D. 1981)

Please join us for the First Annual CBS Homecoming Picnic on Friday, October 19, 2001 from 4:30 to 7:30 p.m. All CBS alumni, faculty, staff, friends, and students are invited to gather on the front lawn of Snyder Hall for fun and festivities. Enjoy food, games, tours, and prizes provided by our hosts, the College of Biological Sciences and the Biological Sciences Alumni Society. The picnic costs $10 for adults and $8 for children six to 12.

Advance tickets for the Homecoming football game, versus Michigan State on Saturday, October 20, are available for $23 each. A section is reserved for CBS Gopher fans. Contact Julie Ulrich at 612-624-4770 or julrich@cbs.umn.edu to reserve your spot at the picnic and at the game. Come and have some fun!

The Annual Biological Sciences Alumni College Weekend at Itasca will be held Friday, September 28 through Sunday, September 30 at the University of Minnesota Itasca Forestry and Biological Station. The weekend will include a guided nature tour, a forest picnic, and speakers on such topics as wildlife, land management, and environmental science. Contact Paul Germscheid at 612-624-6725 or pgermsch@cbs.umn.edu for more information. Come and have some fun!
and provides an opportunity for CBS alumni and friends to gather and reconnect through activities and social events in the relaxing atmosphere of the Stone Station. Programs will include speakers from the College of Biological Sciences, the U of MN Reproductive Biology, the National Reproduction Institute, Center for Women and the Environment in Duluth, and the National Pub Service.

Please accept our invitation to participate in this fall’s Alumni Weekend. If you have any questions, contact Paul Germscheid at 612-624-3752 or pgermsch@cbs.umn.edu.

New members of the Biological Sciences Alumni Society Board

Marvin Alphonse is a senior scientist in biotechnology research at Genetiq, Inc. in Minnesota. He is very involved in working with CBS, and looks forward to working on networking events and with the mentor program.

Phil Lasser is a manager of analytical and regulatory services at Colburn Technologies, LLC in St. Paul. He is interested in helping students with career development and being involved in the mentor program and networking.

Kevin Wolfsch recently was hired as a staff scientist at the Parker Hughes Institute in Roseville, and is starting his first fall at St. Thomas University. Kevin feels much loyalty toward the University and the College and is looking forward to helping out with board activities.

RAF Mason began working as a TA for the College’s Genetiq Biologics Program this fall. He has been immersed with the breadth of opportunities available through CBS, and would like to help students and alumni through mentoring and career development.

Carolyn Riggs is a biology and chemistry teacher at Lakeville High School. She has a wide range of interests and is looking forward to working with the board.

Curt Henry is a marketing specialist at Genetiq, Inc. in Eden Prairie. He is working toward his MBA at the University of St. Thomas. As a board member, Curt is hoping to help increase the visibility of the Alumni Association.

Class notes

Patrick Calabrese (B.S. 1999) is director of research for Intelligent Biocides, Technologies, Inc. He was employed for 22 years by Minnesota in a number of research and technical positions. He relocated to California in 1998 at the California University Student Research, Inc. He is a mentor with the board.

Mervyn deSouza (B.S. 1973) is a manager of analytical and scientific positions available through CBS, and helps with career development.

Cassandra Moe (B.S. 1994) is a marketing specialist at Genetiq, Inc. in Eden Prairie. She has been impressed with the breadth of opportunities available through CBS, and would like to help current and incoming students through mentoring and networking.

Rachel Mason (B.S. 1999) is working in the biotech team at Apex Partners, working on the team at Merck, and recently was hired as a staff scientist at the Parker Hughes Institute in Roseville, and is starting his first fall at St. Thomas University. Kevin feels much loyalty toward the University and the College and is looking forward to helping out with board activities.

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Honor Roll

We are extremely grateful to the following alumni, individuals, and organizations who have provided financial support to the College of Biological Sciences during Fiscal Year 2001 (July 1, 2000 to June 30, 2001). Your efforts were made to list all names accurately. If you detect a mistake, please notify the CBS Development Office at 624-655-7705.

1950s
- Mr. Kenneth L. Tannehill
- Mr. Max L. Schuster
- Drs. Bernard O. & Jean S.
- Dr. Richard W. Luecke
- Mrs. Elaine Lifson
- Carrell & Grenaviere Kucera

1940s
- Dr. Edgar & Ruth Painter

1930s
- Dr. Robert C. Wong
- Curtis M. & Janice M. Wilson

1960s
- Ms. Karen Z. Buggs*
- Mr. Thomas E. Boelter*
- Mr. James D. Anderson
- Mr. Robert L. Anderson
- Gary A. & Lynda J. Ackert
- Dr. Cindy J. Brunner*
- Ms. Paula Brunetti Imai*
- Dr. Robert C. Wong
- Curtis M. & Janice M. Wilson

1970-1974
- Gary A. & Linda J. Ashman
- Dr. James E. Bandy
- W. W. Carly & C. J. Mac Kay
- Dr. Allen K. Carter
- Mr. Jeffrey J. Dr. Zoller
- Daniel & Wendy Devra
- Dr. Terry G. & Barbara J. Shuman
- Dr. Allen K. Laskawi
- Mr. Mark A. Emmons
- Dr. Roger H. Erickson
- Douglas & Mary Olson
- Dr. Nancy H. Hanson
- Dr. Thomas J. Fischbach
- Dr. William C. Buhi
- Dr. A. Linn & Margaret P. Bogle
- Mrs. Elaine Lifson
- Carrell & Grenaviere Kucera

1975-1979
- Dr. Larry B. Sundberg
- Dr. Gerald L. Storm
- Mr. Michael K. Stock
- Gary B. & Jane M. Silberstein
- Sandra H. & Allen V. Seilheimer
- Dr. Paul W. Schultz
- Ms. Susan V. Schauer
- Dr. Michael D. Rohwer
- Dr. John J. Reiners, Jr.
- Dr. John H. & Bonnie Rappole
- Mr. Dale W. Perman
- Dr. William & Suzanne Peglow
- Mr. James J. Pearson
- J. Quast Paulu & G. R. Paulu
- Mr. Patrick E. O'Regan
- Dr. Alan E. Comer
- W. W. Carley & C. J. Mac Key
- Dr. James E. Bandy
- W. W. Carly & C. J. Mac Kay
- Dr. Allen K. Carter
- Mr. Jeffrey J. Dr. Zoller
- Daniel & Wendy Devra
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College of Biological Sciences Revenue Sources

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<tbody>
<tr>
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<td>30%</td>
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<tr>
<td>Tuition and Fees</td>
<td>19%</td>
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<tr>
<td>Other (Indirect Cost Recovery)</td>
<td>4%</td>
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<tr>
<td>Grants and Contracts</td>
<td>44%</td>
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<td>Gifts, Endowments, and Other</td>
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<tr>
<td><strong>Total Revenues</strong></td>
<td><strong>100%</strong></td>
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CBS Freshman Class, 2001-2002

Number of applications: 1,397
Number of students enrolled: 294

Class statistics:
125 male, 101 female
average age, 18
average ACT composite, 26.7
average high school rank, 90%
60 students of color
123 male, 191 female
Number of freshmen enrolled: 314

1995-2001
Dr. Susan M. Atwood
Jane & James Babcock
Dr. Daniel L. Bonv\nMs. J. M. Beas
Kellie L. Beckman
Leslie B. & William D. Cagliostro
Dr. Charles W. Dahlke*\nMs. Lise. L. Hak\nMr. Michael D. Novak
Bob M. Gates*
Ms. James A. Gansneh
Mr. Robert M. Gottschalk
Ms. Rebecca J. Gustafson
Ms. Leif K. Hembre*
Ms. Sara C. Hotchkiss*
Ms. Christine L. Hickey*
Dr. Christopher Howman
* As per information available in August.

208 are from Minnesota
57 are from Wisconsin
135 from the Twin Cities metro
Many students have the opportunity to study at Lake Itasca Forestry and Biological Station, one of the College’s many resources.
Jane Goodall speaks at CBS commencement.

After engaging graduates, family members and faculty with her own impression of a chimpanzee welcoming call, Jane Goodall proceeded to uplift them with her commencement address "Reason for Hope," which shares the title of her recent autobiography.

In her talk, Goodall encouraged graduates to recognize and act upon their ability as individuals to help protect the global environment and the creatures who share the earth with humans. In spite of the destructive impact of humans on the planet, she remains very optimistic about our capacity to protect and conserve the environment. "When you join the world," she said in her address and "try to make a difference."

Goodall, who is renowned for her groundbreaking research on chimpanzee behavior, donated all of her field notes and slides to the University of Minnesota, which created the Jane Goodall Center for Primate Studies in her honor. While visiting the University this spring, she signed books at a reception in her honor and spoke with many students and others who have been influenced by her work.

In addition to the appearance of Goodall, the commencement ceremony was notable because the class of 2001 was the first admitted to the College of Biological Sciences as freshmen.