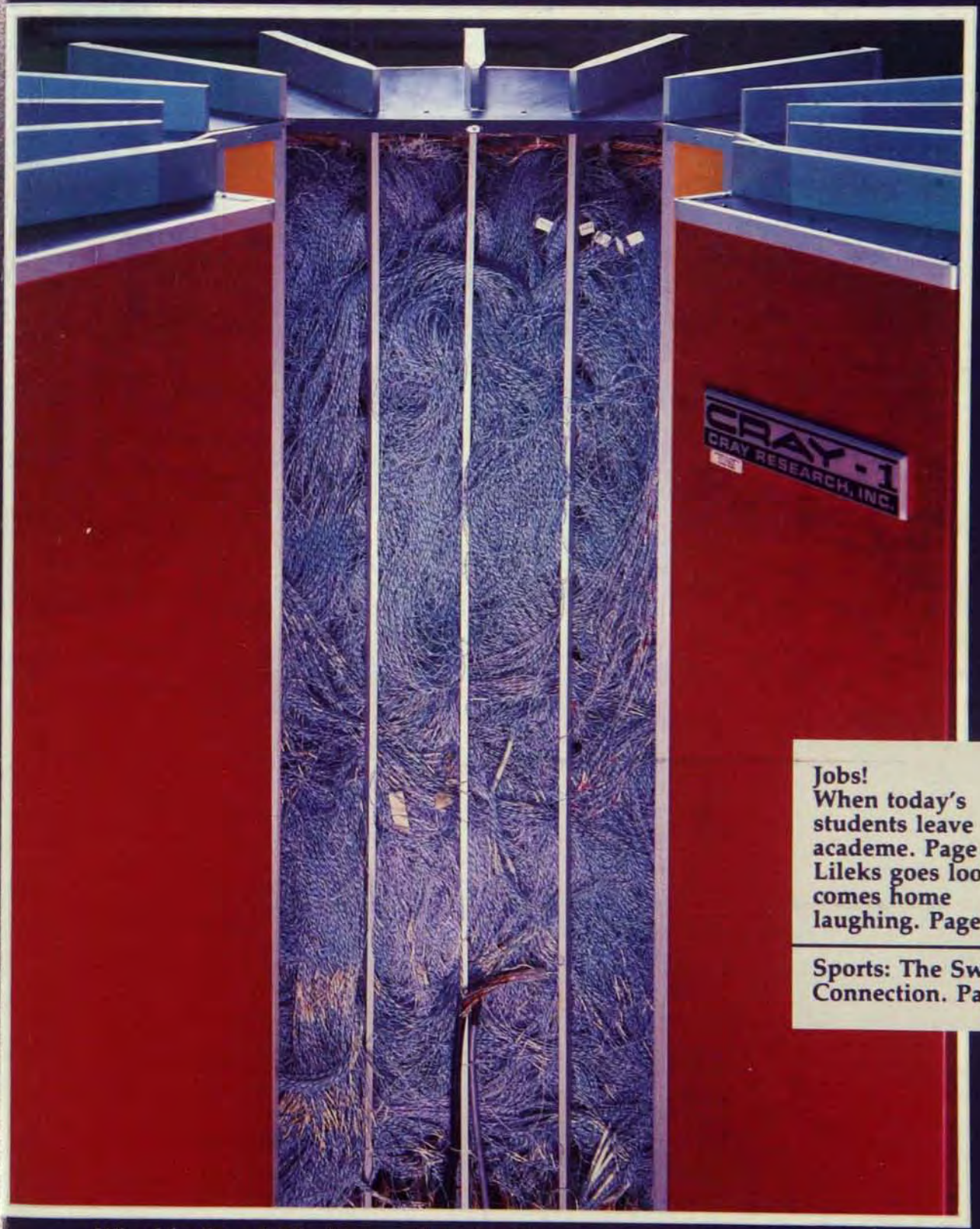
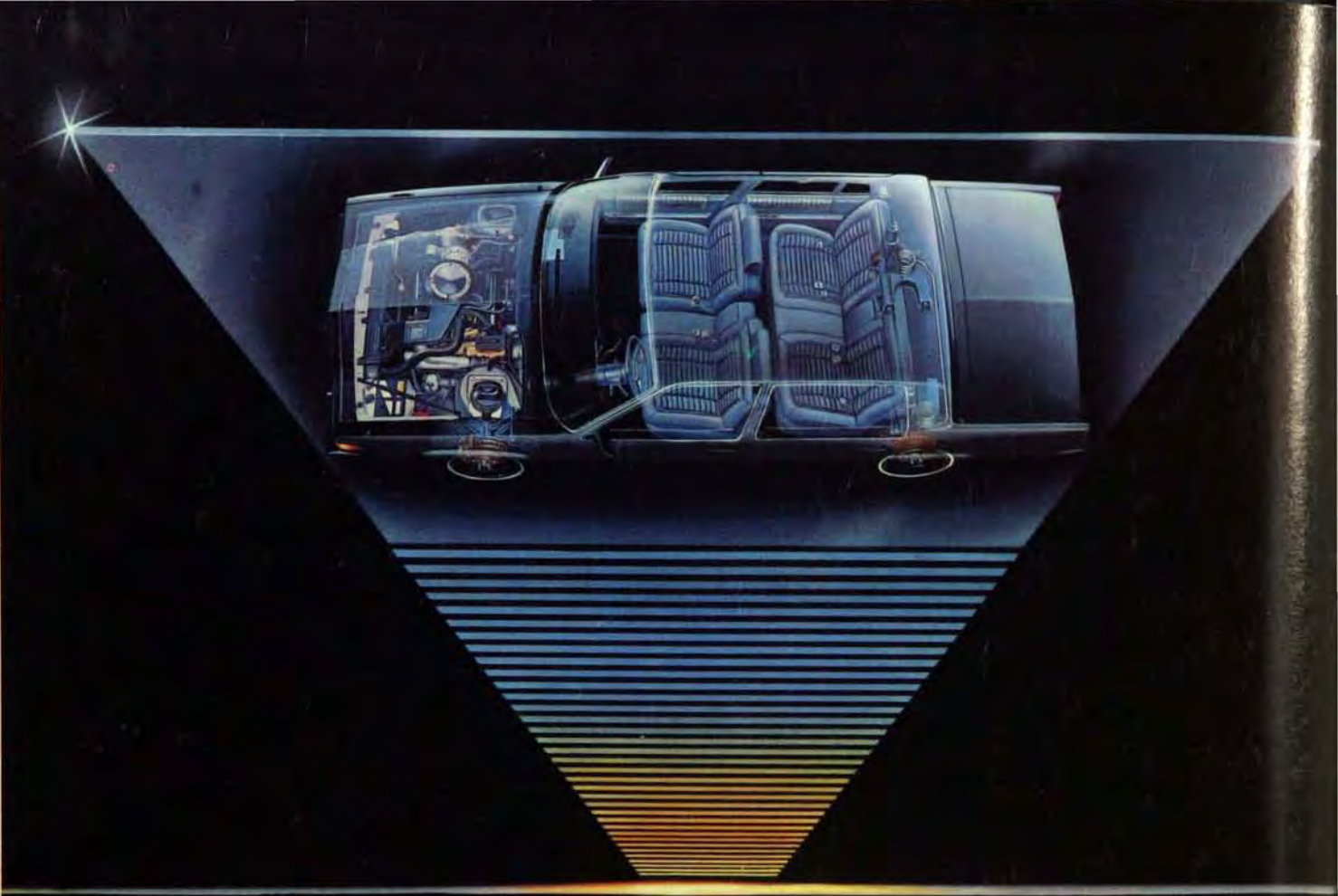
MAY • JUNE 1984

MINNESOTA

University of Minnesota Alumni Association



Wired for Speed: The University joins the supercomputer race. Page 14



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MINNESOTA

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COVER STORY

On the Cover
Wire — 60 miles of it — makes the data go 'round. Weighing in at a touch over eight tons, this Cray I proved an unwieldy subject for a photograph. An eight-foot ladder, a 5-foot tripod perched on three chairs, and a patient staff at the University's computer center, yielded this view of the insides of the computer center's showpiece.
Photograph by Tom Foley

FEATURES

DEPARTMENTS

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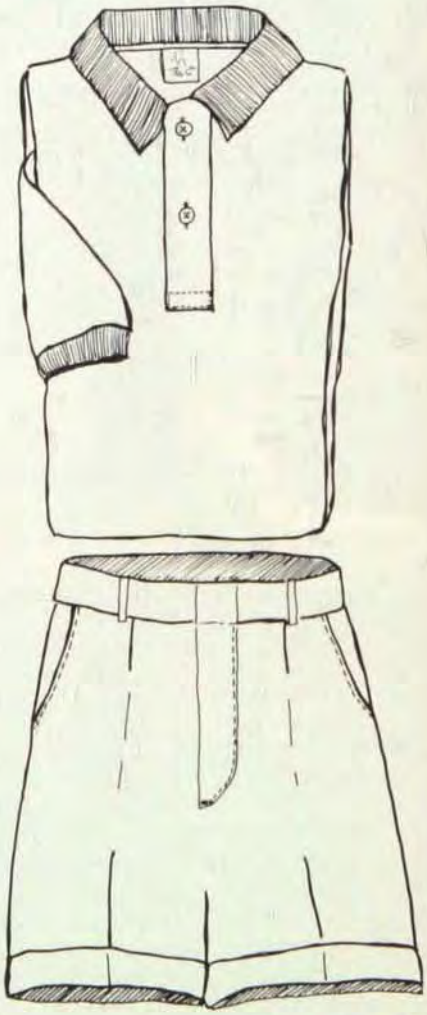

Upper left: Alps 100% cotton argyle sweater, natural with pastel and lavendar with pastel. $29.00 members/$44.00 non-member. Women's sizes. Upper right: Alps 100% cotton polo shirt. Men's and women's sizes in a rainbow of colors. $15.00 member/$21.00 non-member. Bottom right: Duck Head walking shorts. 65% poly/35% cotton for women, 100% cotton for men. Khaki. $12.00 member/$17.00 non-member.

The Outdoor Store is a non-profit buying association with membership open to students, staff, faculty and alumni association members. Annual membership fee is $4.00.

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EDITOR

Chuck Benda

Some years ago, before I settled into the workaday world as most of us know it, I guided two-and-a-half-month canoe trips for teenage boys. The first two weeks of the first trip I guided were hellish: long hours of paddling, cold rain, hot sun, and hordes of hungry mosquitoes.

But after a few weeks and a few hundred miles, we adjusted to the rigorous, spartan lifestyle. In a replica of the 26-foot North canoe used by the voyageurs, the nine of us traveled the old fur trade routes along the Canadian border, down the Rainy River, across Lake of the Woods, and down the Winnipeg River into central Canada. We began to fancy ourselves quite the voyageurs — until we made our acquaintance with the Sturgeon-Weir.

The Sturgeon-Weir is a short river — just 20 miles long — connecting a couple of lakes along our route. But we had to paddle upriver, and for most of those 20 miles, the Sturgeon-Weir poured over the rocks in one nearly continuous rapid.

Half a day of floundering in the water, pulling the canoe upstream with a rope, gained us only a few hundred yards on the feisty little river. After watching our struggles for an hour or so, an old Indian who lived near the river offered to show us how to pole our way upstream. He helped us select and cut the best tamarack poles and, after trying futilely to explain how it should be done, climbed into the canoe and helped us pole up the first half mile of river.

That evening, as we shared a supper of fresh walleye with him, he asked us why we didn't carry an outboard motor. We explained that we wanted to have an adventure, traveling under our own power like the voyageurs. He didn't seem to understand. We tried again to explain. He only shook his head. After a spell, he smiled, then softly said, "You can have adventure with an outboard, too."

We didn't change our plans, and two and a half days later, finally made it up the Sturgeon-Weir. But that old Indian changed forever my notion as to what adventure is all about. It is not about means and methods and old ways of doing things, but rather about spirit and attitude and crossing new horizons.

There is an adventure in the making in basic scientific research. Supercomputers — a fast and powerful new generation of number crunchers — are opening the door to research that would have been impossible 10 years ago, and opening the mind to problems so complex that the solutions will have to wait until the computers get even faster. I thought I knew all I ever wanted to know about computers until I started interviewing the University scientists who are using supercomputers in their research. This issue's cover story, "The Number Crunchers," will let you in on the adventure.

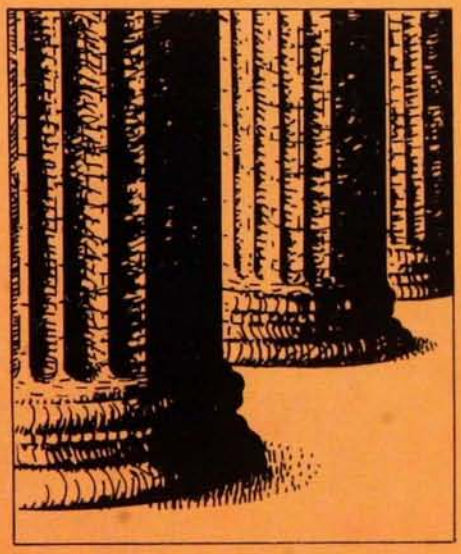
For adventure of another kind, read "In Search of a Job — 1 and 2." The first is a serious look at the plight of University seniors and recent graduates searching for that first job in a tight market. Then, through the eyes of James Lileks, '83, you'll get a humorous view of the adventures and misfortunes of liberal arts majors seeking gainful employment.

Finally, if you prefer the vicarious adventure of reading, you'll want to check out "Favorite Books," a look at some of the all-time and recent favorites of University alumni and faculty members. There you'll find enough intriguing suggestions to make your summer one long, happy adventure — with or without an outboard motor.

EXECUTIVE • DIRECTOR

Steve Roszell

Recently I viewed a slide presentation about the University that began with several closeups of architectural details of Northrop Auditorium. While an evocative solo flute played in the background, a resonant voice said, "A little part of this belongs to you . . . It's your University." We don't actually intend to dismantle Northrop Auditorium brick by brick and pillar by



pillar, distributing the pieces to our alumni and friends. Rather, as the show went on to explain, we would like every alumnus to feel ownership of and a sense of pride in the University. It does indeed belong to you.

Generally, for alumni this sense of belonging develops during their student years. But a recent attitude survey showed that most alumni feel this connection ends when they graduate. The same alumni, however, said that they regularly attend concerts, lectures, and athletic events on campus. This makes their lack of connectedness troublesome and difficult to explain. In their contacts with the University, they apparently think of themselves as members of the general public, rather than as alumni. Think for a minute about yourself. As a University alumnus do you consider yourself part of a special group?

The idea of alumni owning their university is the primary reason for forming alumni organizations. Eighty years ago this spring, several Minnesota alumni, feeling a sense of University ownership, initiated the Minnesota Alumni Association. Today the Association still aims to make you feel part of a special group.

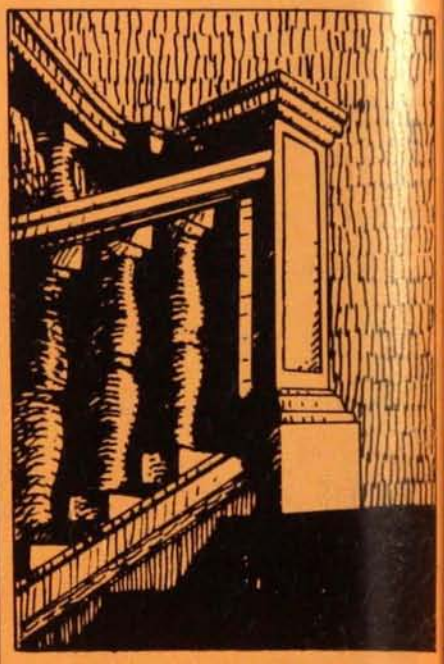
One of the three goals vital to the Association's mission is to provide meaningful University services to our members. Whether it's this magazine, which only members receive, or more than a dozen other benefits the Association offers, our goal is to give you an opportunity to own a little piece of the University.

If you're a graduate who lives outside the state of Minnesota you may find *Minnesota*, Dial M, the Parents Help Packet, or group travel the most useful benefits. If you're a graduate still living

in the Twin Cities metropolitan area, you may find access to the University libraries, the Outdoor Store, the campus unions, the golf course, and aerobic classes most useful.

Now we're introducing a wellness-awareness benefit through Boynton Health Service that extends health assessment, weight reduction, and stop smoking programs to Alumni Association members. (See details on page 55.)

Regardless of which benefits you enjoy most, it's important to remember that the University makes these benefits available because it cares about you. The only others who enjoy most of these benefits are current students; therefore, although you may feel your connection with the University ended when you graduated, it didn't. The University believes that its alumni are so important that it affords Association members many of the same rights and



privileges as current students. The days ahead hold even more promise; we plan to introduce several more new membership benefits.

You are a part of the University and the University is a part of you — for life. We want you to continue learning and growing, improving your mind and body, and prospering from active participation in the joys of education. I hope, no matter where you are or what stage of life you are in, we can rekindle and keep aflame your sense of connection to the University of Minnesota. A part of it will always belong to you.

Steve Roszell has been Executive Director of the Minnesota Alumni Association since 1979.

Roger Jones

The Subtle Threats of Modern Science

Modern science has come under fire, its products and accomplishments no longer accepted without question. We view with suspicion the expansion of computer technology, and we condemn the ominous proliferation of nuclear weapons. Yet no matter how menacing technology may be to us physically, its effects on the mind are even more sinister. I believe that the deeper threat today is posed, not by the products of applied science, but by the imagery of pure science.

When I teach introductory physics to liberal arts majors, I often observe in students a negative reaction to scientific ideas, which in some cases has developed into a full-blown alienation toward physics. I have learned to bring up this problem explicitly on the first day of my classes. On one occasion, this mention prompted a student to express great relief that she wasn't the only person intimidated by science. By drawing out such students, by studying the problems of science anxiety, and by contemplating my own concerns about science, I have come to believe such fear responses are anything but irrational and idiosyncratic.

These fears fall into three categories. The first is our instinctive dread of the products of technology. The problems of pollution — chemical and nuclear wastes, acid rain, food additives — and the menace of nuclear technology — atomic reactors, weapons, missiles, and the bomb — need no elaboration to justify our fears about them.

The second fear is "math anxiety," a kind of generalized fear and feeling of inadequacy associated with mathematics. Unfortunately, math anxiety is connected with two very serious problems in American education: sexism and anti-intellectualism. We still have higher expectations for boys in science than for girls, and we still harbor a certain disdain for formal intellectual subjects like mathematics. The situation is beginning to improve, but it will demand our continued vigilance.

There is one aspect of math anxiety, however, that does relate directly to the fear of science. It is the tendency, especially in the physical sciences, to treat the world primarily in quantitative terms. Venus may have an orbit and a velocity, but not beauty and harmony. Time may be clocked and recorded, but not fleeting or "out of joint."

Now, the great glory of physics is that it has succeeded in quantifying nature. And to blame physics for the misapplication of its methods is not fair. But the highly influential, almost hypnotic success of the quantitative approach in physics has mistakenly convinced people to devalue what cannot be treated quantitatively. We are more concerned today with statistics than with the meaning of history.

More alarming is that the quantitative approach intimidates many people whose natural bent is to view the world in qualitative, intuitive terms and who have come to feel inferior because of it. Emotions, dreams, and imagination are difficult to measure or substantiate. They have trouble competing with space, energy, and matter. This subtly implied superiority of the quantitative scientific view contributes significantly to the continuing friction between science and the humanities.

But it is the third kind of fear and anxiety that I believe presents the deepest threat. This is the alienation we feel before the modern scientific view of an inhospitable universe without meaning or sense. Contemplate the picture for a moment.

Daniel Corrigan

Roger Jones is an associate professor of physics at the University. His book, *Physics As Metaphor*, was published by University of Minnesota Press.

First we see a cosmic realm of enormous scale — possibly infinite, but even if finite, then vast beyond imagining. Light, which can travel more than seven times around the equator in one second, would take 30 billion years to cross the span of the known universe. Outer space is frigid — hundreds of degrees below freezing, incapable of supporting life. It contains vast regions of almost total emptiness and pitch blackness. Here and there hangs an exceptional star or gas cloud, but the typical neighborhood is devoid of any substantial form of matter or spark of light.

In some remote corner of this hostile universe, on a tiny speck of dust called earth, orbiting what astronomers refer to as a second-rate star, the laws of physics and chemistry have notably but meaninglessly conspired to bring about an odd form of matter that breathes and thinks. For all we know (Carl Sagan and his fanciful extrapolations notwith-

Got an Opinion?

Let's hear it! *Minnesota* will consider printing opinion essays from readers on the Opinion Page. Submissions should be approximately 800 words and cover a topic pertinent to the University and its alumni. Send your manuscript, along with a self-addressed, stamped envelope to: Opinion Page, *Minnesota* Magazine, 100 Morrill Hall, 100 Church Street S.E., Minneapolis, MN 55455.

standing), we are completely alone in this vastness.

It is hard to imagine a more alienating picture, for all its austere beauty. Yet this image colors our every thought about the world and our role in it, and denies us sustenance and validity. With this bleak conception of the cosmos also comes the stoic message that we must face up to reality, make the best of our meaningless destiny, and stop our childish, anthropomorphic, wishful thinking.

In earlier times one might have taken refuge from this foreboding vision in religion and theology. Today though, science plays religion's role of giving us an ordered conception of the universe. Even the scientist who retains some religious belief must keep religion and science in separate, airtight compartments. And what modern theologian would dare to publish ideas about the universe that contradict the prevailing scientific world view?

Even the renowned entry of consciousness into 20th-century physics is much exaggerated. Relativity states that measuring space and time depends on the observer's point of view, and according to quantum theory, any observation has a random and uncontrollable effect on what is observed. But none of this implies anything about consciousness, for the "observer" of modern physics need not even be a living, sentient creature: a computerized TV camera will do. The supposed quantum interaction of observer and phenomenon requires no higher conscious functions of imagination, thought, or creativity — only a dumb, slavish recording of information. In modern physics consciousness has no independent, fundamental status. It is an epiphenomenon — a product of atoms and molecules. It is ultimately reduced to mere matter.

Unquestioning acceptance and literal interpretation of modern conceptions of the physical world have had a debilitating, dehumanizing effect on the human spirit. Because we conceive of the natural environment as inert and unconnected to us, we find it easy to pollute and destroy it.

But we can no longer tolerate a world without heart and soul. Qualitative experience deserves a central, respected, and meaningful role in human endeavor — in harmony with objective thought, not in opposition to it. It is time to recognize the vital presence of the human spirit and imagination in physical reality, which, after all, provides only one metaphor for our world.

LETTERS

A Nostalgic Metamorphosis?

As a veteran of the University of Minnesota Choir during the late '60s and early '70s, I was surprised to read Dwayne Jorgenson's recollection of choir members in those years as "a bunch of hippies." "They wore sandals and long hair and were put down by a lot of 'gray box' people," he says.

Frankly, with the possible exception of the band, I don't remember there being a more consistently "straight-arrow" group on campus during that period than the choir. I understand that it's now considered fashionable in some circles to have been a '60s campus radical in those halcyon years of the Age of Aquarius. But Mr. Jorgenson's nostalgic revisionism is reminiscent of how, two years after one of the most lopsided electoral victories in American history, no one could recall having voted for Richard Nixon.

John F. Korsmo, '72
Fargo

Comments? Questions?

Drop us a line. We're always eager to know what you think. Tell us what you like, what you don't like, and what you would like to see more of in *Minnesota*. Address your comments to: Editor, *Minnesota* Magazine, 100 Morrill Hall, 100 Church Street S.E., Minneapolis, MN 55455.

Objects to *Daily* Settlement

I think it is only proper that University of Minnesota alumni throughout the world should be informed of the newest achievement of one of our campus institutions, the *Minnesota Daily*, which in turn gets its academic advice from our prestigious School of Journalism.

In June 1979, the *Daily* published an absolutely despicable "Humor" edition. It was loaded with insults towards religion; it was immoral, filthy, and deplorable. Thousands of "Humor" editions went out all over the campus as a regular edition of the *Daily*. This issue, partially paid for by mandatory student fees, was not at all appreciated by a large batch of legislators, regents, parents, citizens, and of course students.

Legal efforts were made to give students a chance to refuse to pay for future publications of similarly insulting editions of the *Daily*.

These legal efforts eventually failed when President Magrath surrendered to *Daily* attorneys; Kate Stanley, a *Daily* editor, who thought that that "Humor" edition was really fun; and a three-judge panel of the 8th U.S. Circuit Court of Appeals. Our timid president not only surrendered by pledging not to carry the case to the Supreme Court but he also agreed to pay all the *Daily's* legal expenses ($182,000), and he also agreed to authorize the expenditure of $20,000 to set up a fund to sponsor programs and workshops that will, in effect, educate future campus journalists how to get away with publishing racial, religious, and ethnic insults using money from unwilling donors in the form of mandatory student service fees.

Our U of M journalism professors are all thrilled. The *Daily* lawyers are thrilled. Kate Stanley, who is now on the editorial staff of the *Minneapolis Star and Tribune*, is thrilled. Academic freedom has been preserved. The freedom to insult in any manner has been preserved. The Minnesota Civil Liberties Union is thrilled.

But guess what? Students who do not want to pay for gross insults to their religion or race were disregarded. Then again, how could they possibly expect to win against all those lawyers, the courts, and Kate Stanley?

Our huge U of M can chalk up another huge victory?

John R. Hed, '48
Duluth

Editor's Note: The $20,000 Mr. Hed mentioned was a fund set up to address First Amendment issues *and* press responsibility. Only $5,000 of that amount is to come from the administration. The *Daily* will contribute $10,000 to the fund and the *Daily's* attorneys will contribute $5,000. The University administration decided to settle the *Daily* lawsuit rather than continue the appeals process. The following is President C. Peter Magrath's official statement.

"Well-intentioned men and women often disagree on deeply held convictions. Such was the case with the optional fee policy that I recommended in 1980, that the Board of Regents adopted and that the plaintiffs found objectionable. The regents and I believed, and continue to believe, that no wrong was committed; the plaintiffs, of course, believed and, presumably, continue to believe otherwise.

"Resolving these different convictions proved to be no easy matter. The first court reached one conclusion; a second court reached another; and a third court was evenly split on a petition to review the case.

"Still, there comes a time when such matters should be put to rest. The regents and I have decided that now is that time and instructed the University's attorney not to pursue any further judicial review. Accordingly, we will carry out the decision of the federal appellate court.

"In reaching this conclusion, I wish to make it clear that neither the regents nor I harbor ill feelings or adverse sentiments, but only the desire to put behind us what, unfortunately, has become a lengthy and divisive issue. As the Daily noted in its October 13, 1983, editorial, 'There is too much at stake for this university and its newspaper to continue a battle over a principle (the First Amendment) that both hold so dear.' I agree."

Social Psychology — in 55 Flavors —Keeps His Students Clapping

By Mikki Morrissette

Class members, about 200 of them, applauded when Mark Snyder finished his last winter quarter lecture for Introduction to Social Psychology.

He sees his role as that of "tour guide," Snyder had just explained. And every quarter he teaches the course, he himself learns something more about social psychology because of students who volunteer their own stories after class or bring in magazine and newspaper clippings about course topics.

Snyder's Elliot Hall office is neat and orderly, all the leading personality and social psychology journals stacked precisely on shelves against one wall, class handouts piled orderly against another. His lectures are equally as well organized, perhaps one reason why response to Snyder and his Psychology 3201 course has been overwhelmingly favorable, according to course evaluations.

"I never teach the class exactly the same," said Snyder, who has taught the course almost every quarter since 1972 when he started at Minnesota as an assistant professor. He compares his series of lecture topics to an ice cream store with 55 flavors but room to advertise only 20. "Like the ice cream flavors, some of my lectures go on vacation for awhile."

Social adjustment problems, developmental aspects of childhood, and intimate relationships are among the "hot" research topics today, he said. To choose from the many other "flavors" he could introduce in Psych 3201, Snyder said he relies on "following his nose" and delving into the topics that pique his own curiosity.

"I think there's enough similarity between me and my students that what I'm curious about will interest the class," he said. "I can assume that students come to the class with a natural curiosity. It's my job to awaken that curiosity."

Snyder, a skillful speaker, encourages student interest through sheer preparation. During his winter quarter course, for example, he presented case histories, films about specific research

Mark Snyder

projects, do-it-yourself experiment ideas, and a smooth monologue to fill the 1½-hour lecture periods.

While Snyder is personally curious about the impact of television violence and the roots of prejudice (among other topics he covers in the introductory course), his pet projects concern self-monitoring and the effects of stereotypes. Although a self-monitoring test he developed 12 years ago has brought him international recognition, his recent research into the nature of stereotypes is spotlighted in the course textbook. (Snyder is one of 23 social psychologists featured in it.)

"When people have faith in their stereotypes, they may treat other people in ways that naturally elicit behaviors that support their stereotypes," he explained.

To test this "belief creates reality" hypothesis, Snyder developed what the text describes as a "clever series of experiments." One half of 51 male student subjects were shown pictures of beautiful young women; the other half, pictures of unattractive women. (A separate student panel made attractiveness decisions.)

With only the photographs to go by, the students prejudged the attractive women as generally sociable, poised, humorous. The average-looking women were described as awkward, introverted, and serious.

The men then spoke by phone with one of 51 female subjects involved in the project, believing she was the woman whose photo they were shown. In actuality, the female phone partners were different from the women in the photographs. Another separate panel of judges listened to the taped phone conversations.

According to the judges, the women whom the male students thought to be unattractive, and therefore less socially adept, *were* more stilted in their conversation. The women thought to be attractive were warmer during the talk.

Snyder said the men who thought they were talking to an unattractive woman tended to formally ask impersonal questions, such as where the woman was from or what classes she was taking. The men talking to a presumed attractive woman asked more personal questions in a friendlier tone, such as what movies or books she was interested in and what kinds of hobbies she had.

In an interview after these findings were published, Snyder said the men "acting on beliefs they thought to be true, caused them to be true. The world is, in some sense, a reflection of what we expect it to be."

The research project Snyder is most proud of, however, is the self-monitoring scale he developed in 1972 while completing doctoral studies at Stanford University. "I'm as curious today about self-monitoring as when I began. It's become a part of my life."

Basically, Snyder's theory is that high self-monitoring people — actors, politicians, and others — are more sensitive than others about the way they appear to the public. In a July 1982 article written for *Psychology Today*, Snyder

said high self-monitors probably could never give a party for all of their friends at once because it would create too much conflict. Low self-monitors, on the other hand, show more consistency between their attitudes, their behavior, and their choice of friends.

His test, which has generated several research projects in the last decade (such as what type of person is most likely to initiate interactions with strangers), asks the open-ended question: "I am _____." High self-monitors are likely to paint a personal portrait in terms of their role, such as student or postal worker. Low self-monitors are likely to use adjectives, such as happy or ambitious.

For developing the self-monitoring test, Snyder earned the 1973 Annual Award of the Society of Experimental Social Psychology, plus honorable mention in competition for the American Institute for Research's 12th Annual Creative Talent Award. Since then, his research ideas and strategies have merited Snyder a place among the Fellows of the Center for Advanced Studies in the Behavior Sciences (1980-81) and several other distinguished organizations.

Snyder, 37, developed an interest in social psychology "gradually and slowly." As an undergraduate student at McGill University in his native Montreal, he was fascinated with the nature of creating and maintaining appearances, as depicted in literature and theater courses. "I had a long-standing interest in understanding the way things look, and then trying to get below the surface layer."

His enthusiasm for psychology research was tapped when he took a psychology course his sophomore year and was assigned a class adviser who specialized in social psychology. "Before I knew it I was going to graduate school in psychology. One thing led to another, and the next thing I knew I was teaching psychology here."

In addition to the introductory course, Snyder teaches Advanced Social Psychology: Theory, and Self and Social Behavior, plus a research seminar for graduate and undergraduate students about current social psychology research.

But it's Psych 3201 where Snyder plays ice cream man and tour guide, all in one.

The Grads of Cell Block D

Not many people would care to return to prison, but for one former inmate, the return to Stillwater State Prison was the happiest day of his life. He was returning to receive his college diploma from the University of Minnesota.

During a quiet ceremony in February, four inmates and two former inmates received degrees from the University through a program called Insight.

Operated by inmates, Insight offers bachelor degrees in applied studies or general studies through General College and the Twin Cities' Metropolitan State University.

Two courses each quarter are taught by professors who visit the prison. The rest of the instruction is through correspondence and video courses.

For corrections officials, the success of Insight is readily apparent in the recidivism rate for inmates who have spent a year or more taking classes. Only 10 percent wind up back in prison, compared with 40 percent for the overall inmate population.

But for the graduates, Insight means much more than a better bottom-line figure on a report to prison officials.

"They give you a chance to be a man again," one graduate said. "It's the only sanity you're going to find in here."

Though critical of current U.S. defense and economic programs, former President Jimmy Carter presented an optimistic prognosis for the nation when he visited the University in March as a Distinguished Carlson Lecturer. A capacity crowd filled Northrop Auditorium for his speech, which was free and open to the public. The Humphrey Institute's Carlson Lecture Series, funded by a $1 million gift from Minneapolis businessman Curtis Carlson, bringing world leaders to campus to discuss current affairs. Former Secretary of State Henry Kissinger is scheduled to speak in May.

Metropolitan Opera Returns for 40th Annual Engagement at Northrop

By Deane Morrison

Imagine a week-long birthday party with operatic greats Placido Domingo, Marilyn Horne, Renata Scotto, and Sherrill Milnes all singing "Happy Birthday."

That's a fair description of what will transpire in the University of Minnesota's Northrop Auditorium during May when the Metropolitan Opera visits Minneapolis. The stars of "Met Week," May 21 to 26, may not actually sing the well-known birthday tune, but their vocal pyrotechnics in seven lavish productions certainly will be a magnificent tribute to America's foremost opera company, which observed its 100th birthday in October.

The Twin Cities campus is the only university stop on the Met's 1984 centennial tour, which coincides with the 40th anniversary of the opera company's first visit to Northrop. Given this dual occasion, "They particularly wanted to put on a a big show this year," said Ross Smith, Northrop's director of concerts and lectures.

"Big" may be an understatement.

For starters, the Met will bring back Wagner's epic "Die Walkure," the second opera in his famous Ring cycle, for the first time since the Met's inaugural visit to Northrop in 1945. Metropolitan Opera music director James Levine will conduct the work, which includes the stirring "Ride of the Valkyries" and some of the most beautiful vocal passages in the entire Ring cycle.

Levine also will take the podium for the first tour production of Mozart's comic masterpiece "Abduction from the Seraglio," and two lesser-known works, Verdi's romantic opera "Ernani" and Riccardo Zandonai's tragic "Francesca da Rimini." Two other operas will have their tour debuts, Benjamin Britten's "Peter Grimes" and Handel's baroque tour-de-force "Rinaldo." Completing the Met Week schedule will be Puccini's classic melodrama "Tosca."

"They're doing 'Rinaldo' because they have Marilyn Horne," Smith said. Mezzo-soprano Horne will tackle the role of Rinaldo, chief general of the Christian Crusaders, who must defeat the Saracens to win the hand of his beloved. The role, created for a baroque-era *castrato* singer, demands a strength and suppleness of voice that only a virtuoso like Horne can deliver. A centennial gift from the Canadian government, "Rinaldo" marks the first production of a Handel opera in the Met's history.

Smith said the "Peter Grimes" production may well be a tribute to tenor Jon Vickers, who will star as the lonely and reckless Grimes, a character with which he has long been identified. The late Sir Tyrone Guthrie created the Met production in collaboration with Tanya Moiseiwitsch, whose set designs resemble a series of 19th-century paintings. The opera — the only Met Week offering sung in English — has been credited with putting England on the international operatic map.

Based in New York City's Lincoln Center, the Met has toured since its first year. Recent tours have brought such luminaries as Richard Tucker, Robert Merrill, Joan Sutherland, and Beverly Sills to the Twin Cities. Opera buffs still thrill to memories of Sutherland as

Lucia di Lammermoor in 1964 and Sills as Zamira in "Siege of Corinth" in 1975.

Met Week is sponsored by the University, the Minnesota Orchestral Association, and the Metropolitan Opera in the Upper Midwest, a nonprofit corporation. Any remaining tickets can be purchased at Orchestra Hall, Northrop, or Dayton's.

Six Faculty Members Get Presidential Awards

Six University faculty members were among 200 American scientists and engineers to receive the first Presidential Young Investigator Awards. Administered through the National Science Foundation, the awards are designed to help universities retain promising young scientists and engineers who might otherwise choose work in private industry.

Each award carries an annual grant of $25,000 which may be renewed for five years, and an offer to match any grants from industrial sources, up to $37,000 annually.

The six award winners, all members of the Institute of Technology faculty, and their specialties are:

Paul Barbara, assistant professor of chemistry, laser spectroscopy; **Max Donath,** assistant professor of mechanical engineering, robotics and bioengineering; **Klavs Jensen,** assistant professor of chemical engineering and materials science, chemical process design and control; **Mitchell Luskin,** associate professor of mathematics, numerical analysis; **Serge Rudaz,** assistant professor of physics, high-energy theoretical physics; **Matthew Tirrell,** associate professor of chemical engineering and materials science, polymer engineering.

The University had more award winners than any other school in the Upper Midwest. Kenneth Keller, vice president for academic affairs, cited the awards as an example of the quality of the University's young faculty members.

"These awards will allow them to take risks in their research, to explore new ideas without the need for producing immediate results," Keller said. "That is the situation in which great advances occur."

IN BRIEF

The Twin Cities campus is still the largest in the nation, according to a survey conducted by the National Association of State Universities and Land-Grant Colleges. The University, with a 1983-84 total enrollment of 64,179 (including evening students), led second-place Ohio State University (53,757) and third-place University of Texas at Austin (47,631).

Lawrence Weaver, college of pharmacy dean, is resigning effective July 1. Weaver will become vice president for professional relations with the Pharmaceutical Manufacturers Association.

Norman A. Brown resigned as dean and director of the Agricultural Extension Service, effective July 1. Brown, who is leaving to become program director with the W.K. Kellogg Foundation in Battle Creek, Michigan, had been dean for four years. Beginning July 1, Patrick Borich will be acting director and dean.

Undergraduate programs on the Twin Cities campus were ranked among the top 15 in the nation, according to the Gourman Report published in *Forbes* magazine. This report ranked the University 11th, giving it a 4.79 out of a possible 4.99.

THE NUMBER CRUNCHERS

Supercomputers – ultrafast cousins to the personal computers invading our homes – are changing the way science is done and leading the University in new directions.

By Chuck Benda
Photos By Tom Foley

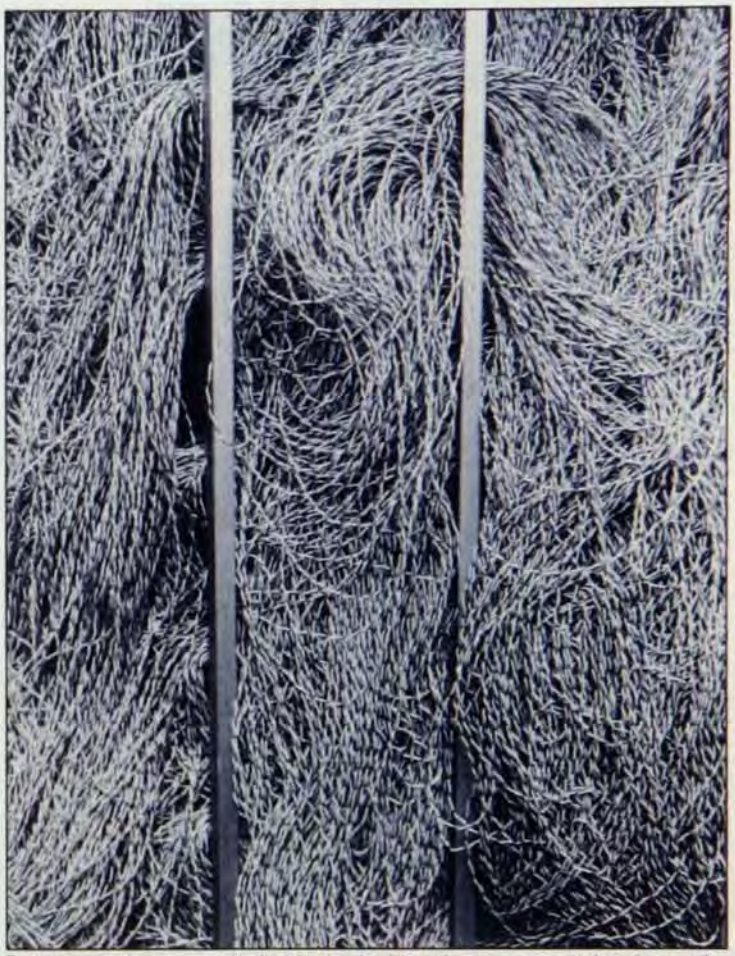
They are the slaves inspiring the revolution. Once quiet, obedient tools, they now stretch the limit of the mathematics needed to guide them — and the imaginations of those who work with them.

"They" are the supercomputers — 16,000 pounds of chips and circuit boards, 60 miles of wire, and 625,000 electronic resistors packed into a frame not much bigger (or more awe-inspiring) than three or four refrigerators huddled in a circle. Behind their bland exteriors lurk speed and power almost beyond comprehension.

According to Kenneth Wilson, a Nobel laureate physicist from Cornell University and outspoken advocate of supercomputing, supercomputers are going to change human life as drastically as the invention of the wheel or the industrial revolution.

The University of Minnesota became a leading force in this revolution in 1981 when it purchased a Cray I supercomputer. It was the first university and today is one of only three universities in the country to have a supercomputer. And, if the University realizes its plans over the next few years, it may become the world leader in supercomputing.

Part of the excitement over supercomputers comes from the all-out battle now being waged between American supercomputer manufacturers — primarily Cray Research and Control Data's spinoff, ETA Systems, both companies with headquarters in the Twin Cities — and their Japanese counterparts. Part of the University plan to stay in the middle of this



Each wire must be connected by hand to the circuit boards—one reason it takes nine months, 24 hours a day, to build a supercomputer.

rapidly changing arena of high technology is to establish a supercomputing institute at the University.

Minnesota is the birthplace of supercomputers. Of the 80 some supercomputers in existence, about 50 were built by Cray; Control Data built most of the rest.

The Japanese, however, have made superiority in supercomputing design and manufacture into something that borders on a national obsession. The Japanese government is subsidizing private supercomputer manufacturers to the tune of nearly half a billion dollars over the next few years. Private American businesses have responded in part by establishing the Microelectronics and Computer Technology Corporation, a supercomputing consortium in Austin, Texas. Until this consortium gets off the ground, Cray and ETA Systems are America's primary powers in supercomputer development. If the Japanese should win the battle to build the world's most powerful supercomputers, the American supercomputer industry will go the way of the American television industry and Cray and ETA Systems will be also-rans in a field dominated by the Japanese. Thousands of jobs, millions of dollars, and a decided edge in research and development will be lost.

In essence, it is speed — flat-out, number-crunching, mind-boggling speed — that makes a supercomputer super. In one second, a current-generation supercomputer could perform more mathematical calculations — upwards of 200 million —than a small army of mathematicians armed with calculators could perform in a lifetime.

Researchers at the University and elsewhere are using that speed to do research that was impossible five or 10 years ago. The added speed doesn't mean the computers do the same old thing, only faster. The difference is ethereal, like the difference between the sounds of a violin student practicing scales and the sounds of a concert master performing a solo. Somehow, for the successful violin student, increased speed and dexterity reveal a new dimension and noise becomes music.

With increased speed and memory, supercomputers have created a whole new dimension of science which, compared to the old, is like music to noise. Witness the work of two University researchers and supercomputer users, Skip Scriven, professor of chemical engineering and materials science, and Christopher Sims, professor of economics.

Supercomputers and University Research

In simple terms, Scriven is trying to figure out how to get more oil out of the ground.

"Of the oil that is in the world's known petroleum reservoirs, only one third is recoverable by present technology," Scriven said. "That means there's twice as much left behind. The numbers are astronomical. Any improvement in the recovery rate — half a percent, one percent — means millions of dollars."

To extract that extra half percent, Scriven is studying the use of detergents that reduce the surface tension (the force that tends to pull oil drops up and make them round) between oil and water. Before oil comes out of the ground, it must flow through the sandstone, or lime-stone, or whatever material traps it.

"This gets to be very, very complicated business," Scriven said. "No two fragments of sandstone are the same. No two kinds of petroleum are the same.

"Instead of saying as a first approximation that I'll consider a petroleum reservoir to be a sphere — which is the classical way to begin — we describe it as it is."

Using complex mathematical formulas, Scriven and his colleagues "build" a piece of sandstone into the supercomputer. This three-dimensional model will react in much the same way a real piece of sandstone would. Since gas and water are usually present in oil reservoirs, the way these fluids will flow through the sandstone also is important.

"The gas, the oil, and the water fight a violet, vigorous, three-way battle for

the possession of individual pores. It's a very complicated battle," Scriven said. "To arrive at the theory that we're just now publishing has taken 10 years of research in which we've had to understand how the irregularity and chaotic nature of the sandstone enters the story. We've also had to understand how all the pores are hooked together. There's more than one way of getting from one place to another, but we've had to come to appreciate that one of the fluids in that battle has no chance to get to a given pore unless it's already gotten next door. The water can't do a science fiction number, disappear in the fourth dimension and come back someplace else."

Using formulas with as many as 5,000 variables and 5,000 unknowns, Scriven and his colleagues can simulate what happens at a molecular level inside of a piece of sandstone when water, oil, and gas interact. The simulation is so complex that it takes into account what happens when, say, a water molecule battles it out with an oil molecule to move into a tiny part of a sandstone pore that is occupied by a natural gas molecule.

Yet, Scriven said, "The real world is far beyond the ability of mathematics and scientists and engineers to describe. We commit horrible approximations, we make educated guesses."

To improve the accuracy of their educated guesses,they use what is known as a Monte Carlo simulation. Like spinning a roulette wheel 100 times to test the probability of the ball stopping on number three, Scriven and other scientists may have to run their simulations hundreds of times. If you make the wrong move in an oil well, you can lose the oil forever.

For Arco Petroleum, the gamble paid off. According to John Rollwagen, president of Cray Research, Arco used a Cray supercomputer to figure out how to maximize oil recovery in Prudhoe Bay, Alaska. "They learned how to get two perent more oil out of Prudhoe Bay," Rollwagen said. "Two percent isn't much, but it's a $100 billion reservoir, so that's $2 billion. I asked them for two percent of their two percent," Rollwagen added with a smile, "but I didn't get anywhere."

If it works, we'll be so far ahead of any other university in supercomputing that we clearly will be a world leader.

The payoff must be considerable. A supercomputer — which can take nine months of 24-hour days to build — can have a price tag ranging from $5 to $15 million.

In research, the speed itself is the payoff. Not only does a supercomputer enable a researcher to do calculations of a complexity that could never before be attempted, it can do other, less demanding calculations for less money than smaller computers. In economics research, Christopher Sims uses the time- and money-saving features of the supercomputer to develop methods of economic forecasting that could, in turn, save businesses and local and state governments even more money.

Speaking of the final years of former Minnesota governor Quie's administration, Sims said, "The big deficit that the state government ran obviously had lots of effects on the cuts in school aid which affected children and teachers being laid off.

"If it had been known ahead of time that there was going to be such a constriction, the tax system might have been changed so that the cuts could have been made in a more orderly way. In fact, they could have run a surplus for a couple of years and kept the whole thing smooth."

Sims' models incorporate thousands of pieces of data collected at one-month intervals since the end of World War II. Using formulas that can be adjusted to account for gradual changes in the way certain factors affect the economy, Sims can formulate forecasts on a par with those of the best private forecasting firms. In addition, he can assess the probability of his forecasts coming true — something private forecasters can't do. The Federal Reserve Bank currently uses a model based on Sims' research to develop forecasts that help determine federal money policies.

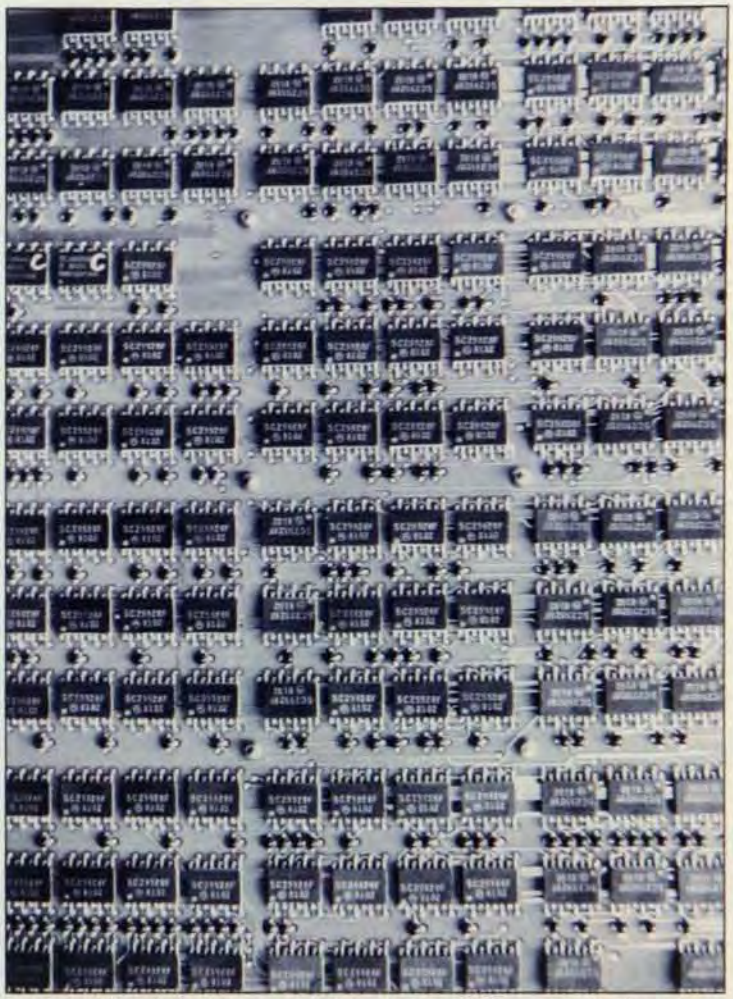
Money-saving Applications for Supercomputers

The speed that is revolutionizing basic research is finding dozens of money-saving applications in applied research. Seventeen European nations currently use supercomputing to generate extremely accurate 10-day weather forecasts. From thousands of locations around the world researchers collect eight pieces of information — such as temperature, humidity, and wind speed — at five different altitudes.

Using these data from the previous 24 hours, they calculate a global weather forecast for the next 10 days in increments of 15 minutes. The data are run through the computer once and new data come out for what the weather will be like in 15 minutes. The new data are run through and the computer spits out predictions for 15 minutes after that. Repeating the process nearly a thousand times, researchers generate a precise, 10-day weather forecast that saves participating countries about a billion dollars annually. Without a supercomputer, processing the data would take so long that the scientists would soon find themselves predicting yesterday's weather.

Automotive engineers can optimize designs in a matter of months, rather than years. Where once they built prototypes and tested their safety by crashing them into walls, they now can use supercomputers. They can build prototypes out of mathematical formulas and crash them into walls built out of other mathematical formulas and observe the results of the crash at intervals measured in billionths of seconds.

Fewer than 100 supercomputers are currently used for basic and applied research. Yet Cornell's Wilson maintains that the demand for these computers will soon outstrip the current production capacity of supercomputer manufacturers.



1,152 circuit boards like this one — each worth about $2,000 — are packed into the upright segments of the C-shaped Cray I.

Putting the Slaves to Work Demands More Research

As applications expand and computing power increases even more, the demand for a better understanding of these "slaves" increases. Someone has to write the software — tell the slaves how to do their work — and explore new areas in which supercomputers can be put to use. To keep up with the fast technological advances, universities need to be involved, which is another reason for a proposed supercomputing institute at the University.

"It's terribly important that universities have supercomputers," Scriven said. "One reason, which we share with everyone else, is that they are cost effective. It's the cheapest way of doing large-scale computing.

"But for a University, there's another, very special reason. The supercomputer helps keep the university on the cutting edge of a fast-evolving intellectual field. It's not just being able to compute. These large computational abilities bring with them new ideas, new thinking, new concepts, advances and breakthroughs.

"When I started out as a young engineer in 1956, the machine we worked on, which was the largest commercially available computer of the day, was roughly equivalent to what you can hold in your hand from Texas Instruments or Hewlett-Packard today.

"What we're able to do today with the Cray I and the CDC Cyber 205 (current-generation supercomputers), every practicing scientist and engineer will have at his disposal in the future."

Federal funding for computers and computing at universities fell sharply in the 1970s, leaving researchers in academia priced out of the market. At the same time, rapid technological advances were producing the current generation of supercomputers. As a result, researchers were cut off from large-scale computing and the kind of research it makes possible.

When reviewing research proposals, agencies such as the National Science Foundation typically take computer costs into consideration. Other factors being equal, researchers who can demonstrate low-cost computer time are more likely to get funding than researchers who must include high computer costs that make up a large percentage of their total funding request.

Use of the University's supercomputer is not now subsidized. The computer center operates as a separate, for-profit business that sells time on its computers at a rate that will cover amortization of the equipment.

Time on the University's supercomputer costs about $2,000 an hour as compared to a few hundred dollars an hour on smaller computers. But because of its great speed, the supercomputer is actually cheaper, sometimes by a factor of ten.

The primary motivation behind establishing a supercomputer institute at the University is to provide University researchers with relatively unlimited amounts of supercomputing time at no charge to them, according to Kenneth Keller, vice president for academic affairs.

"There are several physicists at the University who buy their time at Los Alamos because they can't afford to buy it at Minnesota," Keller said. Los Alamos, a national research laboratory for nuclear physics and weapons design, subsidizes computer time for scientists whose research benefits work being done at the Los Alamos laboratories. "There are others at the University not using the supercomputer to the extent that they would like to because they simply cannot afford to pay the price," Keller said.

All of this leaves the Cray I the University currently owns operating somewhat below capacity, according to John Sell, director of the University's computing center. Current use generates enough income to keep the Cray I operating in the black, but computer costs for University users are still high.

Developing a Supercomputing Institute

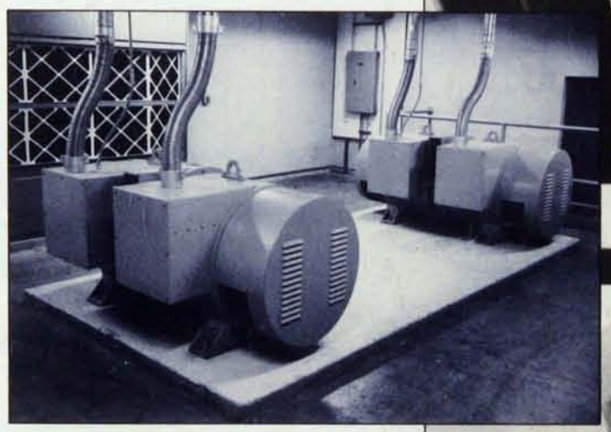
Although the exact nature of the institute is yet to be formed, both Keller and Peter Roll, a special assistant to Keller in charge of laying groundwork for the institute, agree that it will happen at the University, either as a full-blown institute, funded by the legislature and subsidized by Cray, ETA Systems, and other high-tech industries, or as a smaller consortium without state involvement and with funding at lower levels.

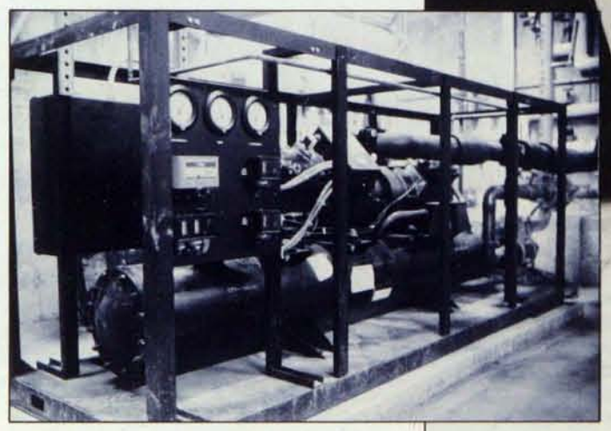
The move to secure legislative funds for a proposed supercomputing institute began when Control Data developed its plans to establish ETA Systems as an independent operation wholly devoted to supercomputer development. Governor Rudy Perpich was intent on keeping ETA Systems' headquarters in Minnesota. As part of an arrangement worked out with Control Data, Perpich agreed to back a supercomputer institute at the University.

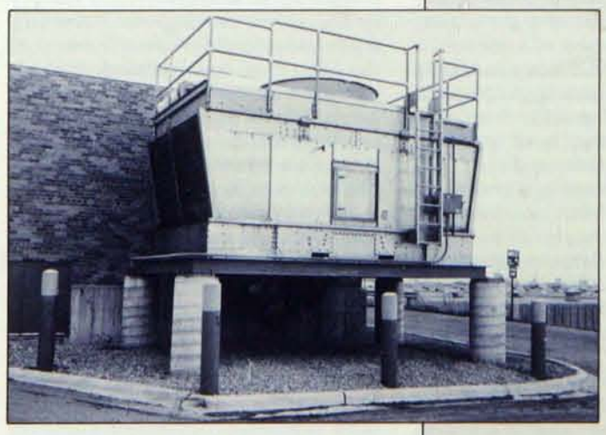
Fortuitously, the Governor's plans meshed well with the University's long-range plans to develop the computer science and electrical engineering programs.

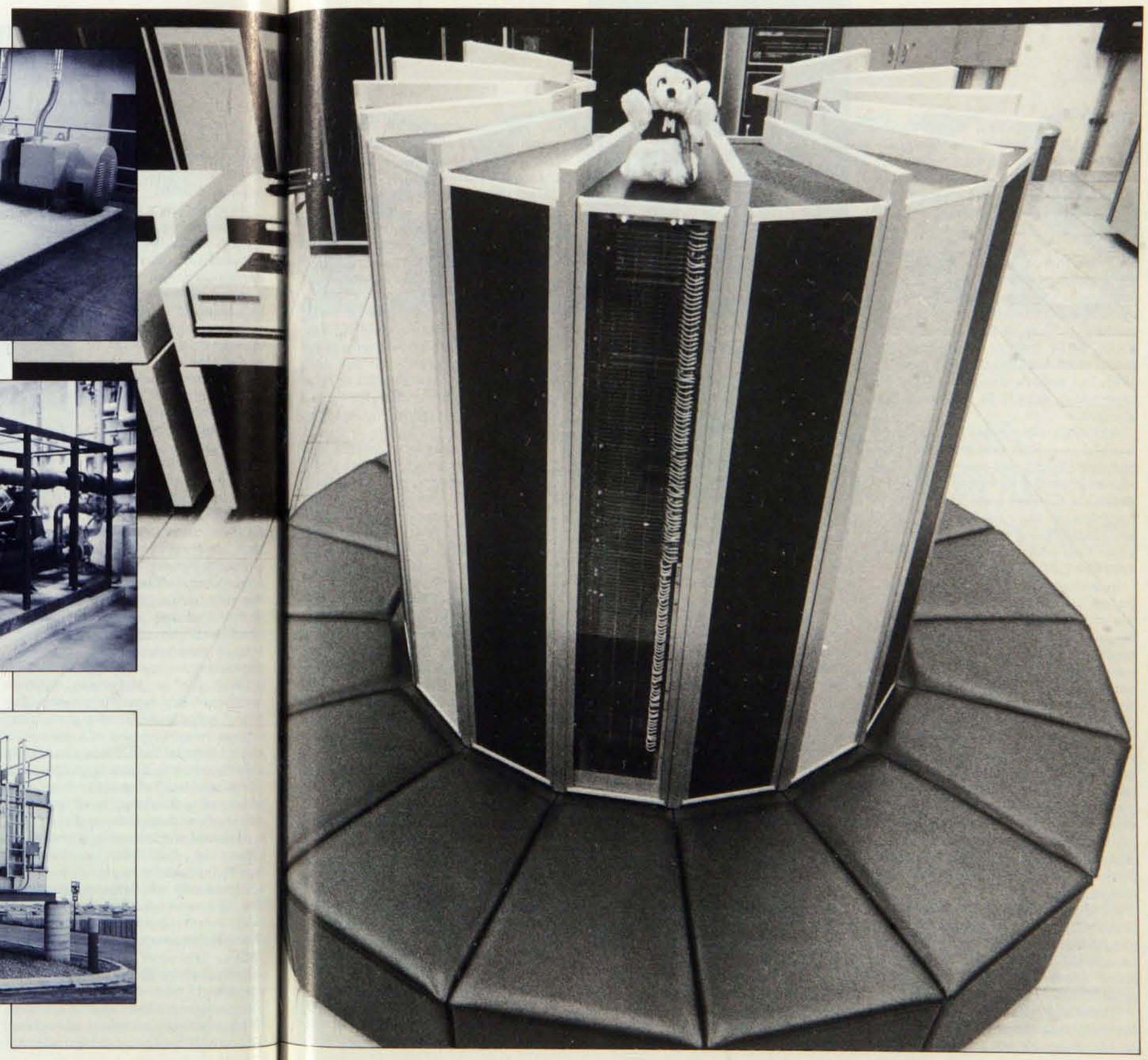
"The Governor's interest matched the plans of the University in a way that was close to perfect," Keller said, "although there was a good deal of discussion later on to bring his views closer to ours."

In many ways the University was predisposed to support a supercomputing institute. Already housing the Microelectronics and Information Sciences Center and the National Institute of Mathematics and its Applications, and planning to beef up the









Minnesota's supercomputer, a Cray I (far right), stands out in a room full of computers and peripheral equipment at the University's computer center. A false floor hides a nightmarish maze of pipes, wires, cables, and reinforcements that cool, talk to, electrify, and support the Cray.

Bench-like segments surrounding the main frame contain transformers that change the voltage coming from a generator — and back-up — in a separate room (top left).

A compressor-condenser unit (middle left) cools the freon needed to dissipate the tremendous heat — in excess of 600,000 BTUs per hour — generated by the Cray. The freon is circulated through plates in the main frame.

The water supply to the compressor-condenser is circulated through a cooling tower (bottom left) to complete the heat exchange.

computer science and electrical engineering departments, the University has the peripheral support needed for a supercomputing institute. The city of St. Paul has even gotten involved, pledging to raise $1 million over 10 years to fund a chair in computer science.

Under the proposal considered by the legislature this session, the institute would be funded at a level of $3.24 million dollars for the first year. According to Roll, it will actually cost about $4.24 million to operate the center from fall 1984 through June 30, 1985, but outside use of the Cray I is expected to supply $1 million of that amount.

Although many details remain to be worked out, Roll said the basic plan includes hiring a full-time director and administrative and technical staff, installing a Control Data Cyber 205 to complement the University's Cray I, and subsidizing computer time to allow University researchers access to supercomputing free of charge.

In addition to using the supercomputers as tools in other areas of research, University scientists and students will be doing computer science research. Investigating new ways of using the computers begins with studying their various architectures, or designs, since these dictate how a complex problem is solved. Because of the way they are configured, some supercomputers outperform their counterparts on certain kinds of problems and lag behind on others. Computer science research also involves developing new software packages capable of fully utilizing a supercomputer's potential, and developing the mathematics needed to operate supercomputers.

All this new research activity and availability of supercomputing time should have a ripple effect that will benefit the University by drawing in some of the best scientists from around the country, Keller said.

"If the legislature says no, it will be a tremendous setback," Roll said. But development of the institute would continue, albeit at a reduced level, he added.

If the Japanese win the race to build the world's fastest supercomputers, the American supercomputer industry will go the way of the American television industry.

The University hopes to land a National Science Foundation grant that would be used to buy about $2 million worth of time on the University's Cray I for researchers from around the country. This grant would, in effect, subsidize University researchers' use of the Cray I by allowing the computer center to lower its hourly rate for computing.

Both Cray and CDC are convinced of the need to develop computer sciences programs at the University and are willing to carry on with or without the legislative funding.

The difference between the two possibilities — between a full-fledged supercomputer institute funded by the legislature and a bootstrap consortium underwritten by the collaborating companies and whatever grants the University can patch together — may be the difference between hanging in there, just trying to keep up with the developments at other universities, and breaking away into the front-runner's role.

"If it works, we'll be so far ahead of any other university in this that we clearly will be a world leader," Keller said.

The Future?

As the current generation of supercomputers began to catch on and science and industry became convinced of their importance, competition to design and build them heated up. The Japanese, openly vowed to catch up to and surpass the American leaders in the supercomputer industry, primarily Cray Research and Control Data. To that end, the Japanese government is pouring nearly half a billion dollars into supercomputer research and development.

Both Cray Research and Control Data have taken the Japanese threat seriously, although they seem to have different opinions of the Japanese success thus far. The Japanese claim to have test models that are twice as fast as a Cray I but John Rollwagen, president of Cray Research, thinks these claims are exaggerated. At any rate, the new Cray II — estimated to be at least five times faster than the Cray I — will be on the market in less than a year.

Control Data has formulated a plan that Tom Miller, executive vice president for marketing, calls an end run. Committed to remaining a world leader in supercomputing, Control Data spun off ETA Systems, an independent subsidiary that intends to market a supercomputer 100 times faster than current models by 1987.

Supercomputers have become so efficiently designed that engineers are reaching the physical limits of the current architectures. Essentially they are working with the speed of light as a parameter. The trick to developing faster computers thus far has been to reduce the distance electrical impulses have to travel by packing circuits more densely.

The next step appears to be a move in the direction of parallel processing in which problems are broken down into thousands, even millions, of separate steps that can be solved simultaneously.

One way or another, the University, the state of Minnesota, and local industries are making a bid to keep Minnesota the world capital of supercomputing. According to Control Data's Miller, we may wake up one day and discover that Minnesota has become a "silicon prairie" of supercomputing that rivals California's Silicon Valley of microcomputing — with the University smack-dab in the middle.

FAVORITE BOOKS

Need a Summertime Reading List? Check Out These All-Time Favorites of University Alumni and Faculty Members.

By Pamela LaVigne

My memories of schoolgirl summers in International Falls hold the usual social pleasures — hanging out with my buddies, working on a tan (hoping for a few curves to go with it), swimming and waterskiing in lakes that never lost their glacial grip — plus the private pleasure of joining the summer reading club at the children's library.

The goal was to read 10 books by the end of vacation. For each one completed, a little paper fish was added to the reader's fishing pole on the club poster. A short book report to the librarian came first, of course. I realize now that this was the validation step in the program. But at the time to share my enthusiasm about a good book with someone else seemed the only thing to do.

I would ride my bike fast to get there, and the library welcomed me, cool and calm. Located in a basement, the children's room was a miniature version of the adult library upstairs (which I still think of as the "Big Library"). Flooring was a deep ruddy tile; the easy chairs of the same color held thick Naugahyde-covered cushions; wide-grained oak outlined the doors and baseboards and made up the kid-scaled tables and chairs. A certain seriousness prevailed. Club posters hung over the temporarily out-of-service fireplace (we would gather around its warmth again, though, in fall and winter for story hour).

My earliest memory of deliberately competing at something was my last summer spent checking out books from this room. I was determined to be the first to finish 10 books, and I was.

I also vowed to read my way from A to Z around the adolescent reading shelves. What hours of browsing satisfaction that meant! And wobbly bike rides home, steering carefully while precariously balancing a too-large stack of books under my arm. I can still see the sections that held, to my juvenile tastes, the richest pockets of good reading.

At least half a shelf was taken up by the Betsy, Tacy, and Tib collection, written by Maude Hart Lovelace and set in Winona, Minnesota, in the long dress days. I followed their fortunes faithfully, right through the last title: *Betsy and Joe*.

Another series, shorter on shelf space but longer on imagination, was *The Borrowers* — a thimble-sized family who lived the adventurous life afield, afloat, and aloft.

Another shelf held the first book I ever reread: Beverly Cleary's *Jean and Johnny*. The pleasure of a favorite book, I discovered, could be renewed.

Favorite books come back to mind now because summer is almost back, with all its lazy opportunities for reading — at the lake, on the porch, in the hammock. Lots of us will pick something from the best-seller list for company in the sun. But why not savor an old favorite while we're at it? After all, we see movies we like more than once, even though we know the ending. You wouldn't pass up a slice of fresh melon because you already knew the taste, would you? Of course not.

So to rouse some good-book memories and to get you started, here are some favorites of University graduates and faculty. We asked about a dozen of them to tell us what their favorite books are and why they chose them. We also asked them to name the best book they had read in the last year. They complied with dispatch, diversity, and an occasional disclaimer.

Here, for example, is how Rutherford Aris, Regents' Professor of Chemical Engineering and Materials Science, responded to our request:

"Ask a professor a simple question and you'll get a complicated answer! What does a 'favorite book' mean? If it is one of which the absence would change your life the most, then the answer is obvious — the Bible. If it is the one that you turn to most frequently for enjoyment as well as instruction — then to the Bible add the Oxford English Dictionary. If it is the one you'd insist on having with you when being wrecked on a desert island — the OED is impracticable, but the Bible is again the one essential. All of which is very obvious — you'd get the same from almost anybody... So I'm inclined to rule out the Bible from consideration — it's no ordinary book anyway.

"That done however, I still have problems coming up with favorite books: I come up with favorite authors."

(For his choices and comments, along with those of Curtis L. Carlson and Patricia Hampl, see the accompanying section.)

Fiction with a certain sweep of history was mentioned most often. Minnesota's attorney general Hubert "Skip" Humphrey III named two of his three favorites in this category: *The Source* by James Michener — "a great book about an area steeped in history and yet the focal point of today and tomorrow's history" — and *Dr. Zhivago* by Boris Pasternak — "a beautiful, romantic novel; well written with deep underlying philosophical concerns expressed."

Exodus by Leon Uris was surgeon John S. Najarian's favorite fiction, a choice he explained in a word: "informative."

Actress Linda Kelsey ('68 CLA, theater) of television's *Lou Grant* series picked two turn-of-the-century European novels as among her favorites: *Growth of the Soil* by Scandinavian Knut Hamsun, published in 1917, and *Anna Karenina* by Leo Tolstoy, first printed in 1886. Each she described as "a brilliant, profoundly moving book."

An even older book than these was the first-choice favorite of anthropology professor Harvey Sarles: *20,000*

RUTHERFORD ARIS


Tom Foley

Rutherford Aris, Regents' Professor of Chemical Engineering and Materials Science

3 Favorite Books of All Time

•***Montrose*** by John Buchan.
"This biography of the great captain breathes the air of the Scottish highlands that were the scene of his campaigns of 1644-46. For light reading I often return to Buchan's words, 'witch hood' particularly, his autobiography and other historical writing."

•***The Wind in the Willows***
by Kenneth Graham.
"I came to this (as also to Winnie the Pooh) in adulthood and find it, like Graham's ***Dream Days*** and ***Golden Age***, the perfect children's book for adults."

•***Collected Poems***
by Gerard Manley Hopkins.
"Both the form and content are worth living with, as, of course, is true of many other poets, e.g. Eliot's ***Four Quartets.***"

Best Book Read in Last Year

•***Heraclitean Fire*** by Erwin Chargaff.
"An autobiography with a difference — a very good style of writing."

Leagues Under the Sea written by Jules Verne and published in 1870. For Sarles the story had the sort of impact authors of every period strive for: "It took my imagination and ran off with it."

A different sort of thrill was what University president C. Peter Magrath found in *1984* by George Orwell. "As a teenager it sent a chill down my spine," he wrote. "It disturbed then as it should continue to disturb us all today now that the title year of this classic has arrived."

The collected short stories of Ring Lardner represent classic Americana. Television news anchor Dave Moore ('49 CLA, speech) made them his first choice, describing the author as "the finest storyteller in the English language. His people embrace all social strata, and Lardner can vary his language and style to accommodate them."

Biography showed up on many lists, its fans usually mentioning more than one. Former Minnesota governor Elmer L. Andersen is an example. Changing our form from "3 Favorite Books of All Time" to read "3 Favorite Books that come quickly to mind — there are many more," he mentioned Boswell's *Life of Johnson* — "such a rich lode of literature, life, and human wisdom" — and Benjamin Franklin's autobiography — "Franklin is my favorite American — I enjoy reading about him."

President Magrath prefers biographies too, even choosing to read about members of the same family. His first-mentioned title is *The Rise of Theodore Roosevelt* by Edmond Morris. "It is a superb biography of one of America's most lively and fascinating political leaders; for me it was one of those books one wishes wouldn't end," he wrote.

Next Magrath named *Eleanor and Franklin* by Joseph P. Lash. "This, too, is a superb biography, and for me its heroine is Eleanor Roosevelt. She comes through as one of our country's most remarkable leaders, a woman of superb commitment who accomplished good things for people. It is also a most instructive biography revealing much about our political life in the first part of this century."

A biography about a fellow in a line of work similar to his own impressed attorney general Humphrey as the best book he'd read in the past year: *Go East Young Man — The Court Years* by former Supreme Court Justice William O. Douglas. He liked this book for its "special insights into the making of a great Justice and the process of establishing national judicial policy."

A biography was also the favorite recent read of Dave Moore: Russell Baker's *Growing Up*. Moore wrote, "I was growing up at the same time and Baker rekindles for me the ambience of the Depression-thirties. I admire his talent for implying and innuendo without explaining the joke."

Biography, of course, is nonfiction, a category our readers mentioned about as often as biography. Professor Sarles submitted some thought-provoking selections: Machiavelli's *Discourses* "taught me a great deal about political thinking and a very long overview of history," he wrote. Similarly, Nietzsche's *The Will to Power* "taught me how to critically re-evaluate an entire historical tradition." Sarles' choice for best recent book is nonfiction too: *The Annotated Work of Goethe*; the "beauty of Goethe's prose" made this collection memorable to him.

PATRICIA HAMPL

Rob Levine

Patricia Hampl, author and associate professor of English.

3 Favorite Books of All Time

•***The Tale of Genji*** by Lady Murasaki.
"People talk about books that 'changed their lives,' but this book — 10th century Japanese novel — changed my eyesight. The correspondences between seasonal change and weather and the psychology of the characters fascinated me. When it rains, I always think of Genji."

•***Jane Eyre*** by Charlotte Bronte.
"The favorite book of my girlhood, full of mystery and genuine passion (all those Victorian headaches!). It's a 'women's book' in the old-fashioned sense *and* a feminist book. It really exposes feminine consciousness — and it's a great read."

•***The Great Gatsby***
by F. Scott Fitzgerald.
"Our most perfect lyrical novel, I think. And a very political book, though people don't often think of it that way."

Best Book Read in Last Year

•***Blue Rise*** by Rebecca Hill.
"A narrative voice so alive and intelligent, I just kept turning the pages. One of the best, most powerful (and detached) novels I know about an angry woman."

The essays of physician-researcher Lewis Thomas (a faculty member of the University's Medical School from 1950 to 1954), attracted the attention of surgeon Najarian, who called *The Medusa and the Snail* "entertaining" and *The Youngest Science* "provocative."

And yes, *The Word Processing Book* by Peter McWilliams showed up in this group, too. Former governor Andersen said it was the best book he'd read in the last year because it "started me toward computer literacy so I can keep up with my third-grade grandnephew."

Two other book categories found favor with our respondents: children's stories and humor. President Magrath picked *Freaky Friday* by Mary Rodgers as his favorite from the last year. "It's a delightful, stimulating book for children — and 'grown-up children' labeled 'adult.' I enjoyed it because I could read it to my daughter, Mo; it was something we could share together."

The Lewis Carroll classic, *Alice's Adventures in Wonderland*, topped actress Kelsey's list. "I loved it the first time I read it (age 8) and it continues to delight me," she wrote.

The writing of American humorist James Thurber — "anything Thurber" — was a hit with newscaster Moore's whole family. "We raised our children reading Thurber — it inspired their lust for reading," he reported.

My favorites? (I thought you'd never ask.) The first books that come to mind stand out because of the circumstances of their reading: *The Wind in the Willows*, discovered during my last semester of college, which provided a wonderful respite from those final frantic months; *The Winter of Our Discontent*, savored during an overcast spring in Paris for its distinctly American sound; *The Motorcycle Betrayal Poems* by Diane Wakowski, read on a cross-country trip with my sweetheart in a car with no radio; a book that delighted us both as a sort of romantic natural history.

But though these titles comforted in their moments, my lasting favorites are these: *Even Cowgirls Get the Blues*, by Tom Robbins — a delicious feast of language, an inventor's fair of metaphor, a circus of ideas; *Sometimes a Great Notion* by Ken Kesey — the brooding tension in the plot, and a sense of place so well described I felt soggy from the endless Pacific Northwest dampness; and *Woman Warrior* by Maxine Hong Kingston — revealing the rich imagery of ancient Chinese myths and evoking, even in a contemporary reader, some of their power. Of books read in the past year, I remember best *Dinner at the Homesick Restaurant* by Anne Tyler. I especially admired how easily she wove the characters' internal monologues into the narrative, and how accurately she understood human motivations.

Speaking of which, I wonder what happened to Tacy and Tib when Betsy married Joe? It seemed like a happy ending when I first read it, but would I say the same now? I think I'll put that one at the top of my list for this summer...

CURTIS L. CARLSON

Rob Levine

Curtis L. Carlson, president and chief executive officer, Carlson Companies Inc.

3 Favorite Books of All Time

•***Letters to the Earth*** by Mark Twain.
"This book was published after Mark Twain's death by his daughter and contains his homespun philosophy, presented in inimitable, satirical style that made Mark Twain one of America's greatest writers."

•***Acres of Diamonds***
by Russell Herman Conwell.
"This should be must reading for every young entrepreneur. The point of the book is that you do not need to go to New York or California or Texas to be successful. All you have to do is recognize the need and create a way to satisfy that need more fully. Like a new frontier, the state of the art is constantly opening new opportunities to fulfill an old need."

•***In Search of History***
by Theodore S. White.
"The author's thoughtful reflection on the use of power throughout the world by America and its consequences for both good and evil. The personal vignettes of many of the world's leaders gives one an insight into the thinking processes and how judgments are formed according with the principles of power politics."

Best Book Read in Last Year

•***Megatrends*** by John Naisbett.
"Naisbett gives an excellent presentation of the changes our society is facing as we shift from industrial production to providing services and information."

IN SEARCH OF A JOB

By **Lynette Lamb**

The small conference room was hot and crowded, but the students didn't seem to notice. For an informal meeting, there was very little talk or laughter; indeed, the mood was deadly serious.

But then, the topic was of great concern to the 15 students there, so it was understandable that the attention they focused on it probably surpassed what they had ever devoted to English literature or general biology.

The subject was job hunting; the students all recent or imminent graduates of the College of Liberal Arts (CLA). Each seemed keenly aware that between these two facts existed a tension that would make their employment prospects problematic and the job hunt ahead a difficult one.

Job hunting is a serious business not just for CLA students, but for all undergraduates. When one tallys the space, time, and resources the University and its undergraduates devote to obtaining employment, it becomes clear that the days are gone when education was undertaken strictly for its own sake.

At least 18 places on campus offer undergraduates some sort of job counseling or service (see accompanying box). In some specialized, job-rich fields like physical therapy, that help just consists of job listings, but in liberal arts fields, where the skills are more intangible and the jobs almost ephemeral, career development offices provide advice and guidance as well.

Regardless of the services they offer, placement offices are in demand. Given the number of career libraries and workshops on campus, some students probably graduate as well versed in job hunting as they are in their major fields. For many, the job hunt is no longer a detail to arrange after graduation; it is a preoccupation.

This serious business is changing the way students shape their education, sometimes before they even get to college.

As numerous articles have noted and statistics reflect, that preoccupation affects not only seniors but underclassmen and even high school students who are coming to grips with a choice of major. It affects a whole generation's career choices and values.

In 1983, according to a national survey recently released by UCLA and the American Council on Education, 69.3 percent of college freshmen said that being very well-off financially was an essential or very important aim. In 1967, just 43.5 percent of students felt that way. Almost 16 percent more freshmen in 1983 than in 1967 felt that having administrative responsibility for others' work was important; but over the same period almost 40 percent fewer students felt that developing a meaningful philosophy of life was an important goal.

How these goals affect career choices is reflected in University of Minnesota enrollment figures; the Institute of Technology, where students earn engineering and computer science degrees, has increased its enrollment 65 percent in the last decade. CLA, by comparison, has about 9 percent fewer students now than it did in 1980.

"We see lots of students coming back for second degrees," said IT student affairs director LeRoy Ponto. "The real motivating factor is employment." School of Management placement director Jan Windmeier agreed. "I do hear a lot of students say they're majoring in business so they can get jobs. A business degree doesn't guarantee a job but it does give students an edge over most other degrees."

It's not just college students who consider the marketability of a degree. "Much more information is asked by parents and students at the high school level about jobs," said Ponto. "A lot of people want to know the bottom line — what are the job prospects, what are the salaries." Recognizing the importance of this information, University admissions recruiters make sure their literature covers employment possibilities along with details on dormitories and social life.

As even high schoolers know, the job prospects, salaries, and the job hunt itself are colored by the student's major. The job-seeking experience of two women — one a journalism/English major, the other an electrical engineering major — are as different as their course loads. The only similarity is that, for both of them, the job hunt took time.

By the end of February, 22-year-old Catherine Braun had four job offers with an average starting salary of $28,000. A senior in electrical engineering who will graduate in June, Braun has taken just four years to complete a program known to be challenging, time consuming, and frequently, five years long. "It's been a hassle, to say the least," she said.

For Braun, the payoff seems to have been worth it. Because of a fortuitous combination of good grades, extracurricular leadership experiences, internships, and an articulate, confident personality, Braun has been offered more job interviews than her busy schedule can accommodate. She has all the factors going for her that recruiters dream of, plus a major in extremely high demand this year.

Yet what she has to say about the job hunt is not unusual. "It just completely blew me away how much time the whole thing has taken."

Most of her job offers and second interviews — or plant trips as IT students call them — have been the result of on-campus interviews arranged by the placement office. But Braun also has been sought after by companies who contact engineering honor society members, interviewed by IBM (which yielded two plant trips), and received calls from interviewers who had read her resume in the placement office while seeking top students. On her own, she's written to bio-engineering firms, an area of particular interest to her. She had been on five plant trips by the end of February and had at least three more scheduled. Although she'd like to take even more, she wasn't sure she could find the time.

Braun realizes that many students would be hard put to sympathize with her dilemma, but it is frustrating nevertheless as she seeks the best job. "I'm looking at companies where I can see a career path that will get me where I want to go," she said. "The first job doesn't have to be the perfect one as long as the opportunities are there."

Hoping to earn an MBA in a few years and jump on the management fast track, Braun is a different kind of engineering student who admits, "I don't like engineering per se that much. Designing circuits at a desk by myself is not what I want to do. But I know I can use that degree to get into technical marketing, which is what I do want to do. I'm much more interested in organizing and speaking and working with people."

Music, a high school love, was something Braun all but gave up during her four years at the University. She hopes to return to that interest, and others, when she begins working this summer or fall. And although she says that money doesn't matter very much, Braun is looking forward to finally having some. "I want a Honda Accord but my boyfriend said I should buy a BMW. 'You can afford anything now,' he said. I guess it's hard to realize that."

Ellen Hatfield is 31 years old, has a double major in English and journalism, and has been job hunting for eight weeks. "I start off fast every Monday, but by Wednesday I start to lose incentive," she said. "I don't expect anything high paying, glamorous, or exciting, but I would like to get a job in my field. I have a talent there and I've worked at it."

Would-be advertising and public relations people are a dime a dozen, and Hatfield knows it. She expected competition, she said, but never quite like what she's found.

After applying for a publications assistant job at the College of St. Thomas, Hatfield called to check on her chances for an interview. "The woman told me I was in the top 46th percentile of 250 applicants," said Hatfield. "She told me I might still get an interview, but — come on. I know when I'm beat."

After finishing school in August 1982, Hatfield worked three jobs, saved her money, and moved to Wales for 10 months, returning last November. She doesn't regret her time there at all, even thinks it might help her job chances with interviewers who also have traveled and know of its broadening effects. "Traveling alone is risk taking, challenging," Hatfield said. "People who have traveled abroad will understand that."

Until she finds that kindred spirit conducting the interview, Hatfield is pounding the pavement. "I read the want ads religiously," she said, adding that she also sends resumes to companies she's heard have jobs, has applied at county, city, and University employment offices, and even tried an employment agency, an experience she calls a "rip-off." "The counselor there told me that jobs in my field are practically impossible to find and then tried to talk me into taking a job I didn't want, like managing a hamburger joint. And the agency wanted 10 to 30 percent of my first year's income. I figured, who wants to be another $1,000 in debt?"

In the spirit of trying everything, Hatfield has gotten rather creative, once handing out her resume at a party she helped cater for a local magazine publishing company. "I thought I might have a chance to slip it to someone, so I brought it along," she said. "Later I got this funny rejection letter from the personnel office saying that the job I had applied for had been filled."

Her sense of humor and self-confidence still intact, Hatfield nevertheless is beginning to understand why some job seekers become discouraged. "So far I've been able to avoid that self-debasement some people get into when they can't find a job," she said. "But I do get frustrated with the search — it seems like I do so much with so few results."

In the meantime, she does tempo-

ry office work by day and is a restaurant hostess by night. Although Hatfield recognizes that her dream job as a travel writer is probably some way off, she doesn't regret her choice of major. "I never believed that my major would mean I'd get a fantastic job," she said. "I studied both English and journalism out of a real interest and love for the subjects. And I still think people are doing themselves a disservice by not talking to me."

Even as she fights off the panic and depression that afflict many liberal arts job seekers, Hatfield recognizes its origins. "The problem is that we believe and were told that if we worked hard we'd get good jobs and be successful in the world," she said. "That's just not always true anymore."

The job hunting experiences of most students fall somewhere between those of Catherine Braun and Ellen Hatfield. During the seminar, most students expressed the same frustrations and wonder at the sheer time-consuming work of it all; many had decided to put off the bulk of that work until spring.

Ambivalence reigned. The same student could in the same interview say, "I'm not worried about getting a job" and "The job future looks pretty cloudy to me."

Mary Hayden, a business and communications major, may have spoken for them all when she said, "I feel confident in myself and in my skills but really scared that I won't get a job." A lack of control over the vagaries of the job market troubles them.

Both Hayden and computer science major Dave Kelly thought about tailoring a major to the job market when they were underclassmen. Now their wishful remarks show their hope that such early attention will make a difference. "The jobs are out there in computer science," said Kelly, "I think the outlook for me is pretty good." "I did some research before choosing my major," said Hayden. "I'm hoping what I did was right."

For senior Robert Gordon, however, the job market had almost nothing to do with his choice of major. "Having a cultural geography major may hinder my job chances somewhat," he said. "But my philosophy is that you

Once again Alex fails to overcome a poorly conceived resume.

Undergraduate Campus Placement Services

(JL = job listings, OCI = on-campus interviews, WM = written materials, Sem = seminars or training sessions on job hunting, interviewing, resume writing)

College of Agriculture — Career Services, 272 Coffey Hall, Alan Anderson, coordinator, 373-0923. JL-posted, OCI, WM, Sem

College of Biological Sciences — Career Information, 229 Snyder, Kathie Peterson, director of student services, 373-1651. JL-posted and mailed to grads, OCI, WM, Sem

Continuing Education and Extension Counseling — 8 vocational counselors for continuing education and nonstudents, 314 Nolte, 373-3905. Interest and ability testing, career planning workshops, individual career counseling

School of Dentistry (Dental Hygiene) — Dental Placement Service, Health Ecology Department, 15-136 Moos Tower, Sharon Mateer, contact person, 376-4414. JL-printed

College of Education — Placement Office, Frank Braun, coordinator, 373-2266. JL-printed, WM, Sem, OCI

College of Forestry — Philip Splett, career opportunity coordinator, 110J Green Hall, 373-1295. JL-posted, mailed to alumni, Sem, OCI, WM

General College — Career Referral Center, 3 Nicholson Hall, 376-2950. JL-posted, individual counseling, WM

College of Home Economics — Career Services Center, 37 McNeal Hall, Sandra Hartje, director, 376-2759. OCI, JL-posted and mailed, WM, seminars on request

School of Journalism — 18 Murphy Hall, Dawn Bremseth, coordinator, 373-3784. JL-posted, mailed, OCI on request

College of Liberal Arts — Career Development Office, 345 Fraser, Gary McGrath, director, 373-2818. JL, OCI, WM, seminars

School of Management — Placement and Career Planning, 260 Management and Economics, Jan Windmeier, director, 373-4174. JL, OCI, WM, seminars

School of Nursing — Student Affairs, Frances Dunning, assistant dean, 373-3462. JL-posted, OCI on request

Occupational Therapy — Marvin Lepley, 373-9041. JL - book, resume file

Physical Therapy — Jack Allison, 373-9038. JL- posted, OCI on request

DUNAGIN'S PEOPLE

"AND IF THERE'S ANYONE HERE WHO HASN'T RECEIVED MY RESUME, IT'S IN THE MAIL."

College of Pharmacy — Office of Student Affairs, 373-7997. JL, OCI, reference letters on file

Institute of Technology — Placement Office, 15 Experimental Engineering, LeRoy Ponto, director, 373-2922. JL, OCI, WM, Sem

Student Counseling Bureau — Minneapolis, Teena Moy, Pat Layton, and Ellen Betz, coordinators, 373-4193. Individual career counseling, Sem, WM

Student Counseling Bureau — St. Paul, Tanya Buhr, contact person, 373-1140, Individual career counseling, WM, seminars on request

go to the University to learn about something you're interested in. I couldn't justify four years of education just to find a job."

Hayden and Kelly had done a little interviewing; Gordon had done none. As optimistic almost-graduates, all three hoped to have jobs by summer; as realistic CLA students, they recognized that this deadline would mean doing most of the work themselves. "They're not going to lead you by the hand, that's for sure," said Gordon. Considering the task ahead of her, Hayden said, "I've barely started and I'm sick of it already."

Success, to most graduates, is measured in job offers. The number and timing of these varies substantially from major to major and from college to college. Each of the three main placement offices on the Minneapolis campus — CLA, management, and IT — surveys its students to determine what percentage has found full-time employment.

CLA waits considerably longer to poll its students, in deference to the longer time it takes them to find jobs. The 1982-83 CLA survey (polling graduates who completed degrees between July 1, 1982, and June 30, 1983, and who used the CLA Career Development Office) found that approximately 70 percent of survey respondents were employed full time. Only 57 percent of respondents, however, felt that their jobs had possible or definite career potential.

"With this survey you have to remember that this is the first job," said CLA placement director Gary McGrath. "For CLA grads, a survey two, four, or even six years later would have more meaning. The first job is the toughest one for them to get and often not at all what they're looking for."

In IT, placement figures vary dramatically by major. Right now, electrical engineering and computer science are the most popular majors with recruiters, said Ponto, and placement rates reflect this preference. Of the electrical engineering graduates who responded to the survey 90 percent had been placed by August 15. Of the 82 percent of computer science majors who responded, 85 percent had been placed. Placement figures fall off somewhat in other fields: 80 percent in aerospace engineering, 73 percent in mechanical engineering, and 66 percent in civil engineering.

By its August 31 reporting cut-off date, the School of Management had placed 68 percent of its graduates who were actively job hunting. Windmeier said that between 75 and 80 percent of its graduates use the placement service; CLA was roughly comparable, with almost 70 percent of its graduates seeking placement services. In IT the figure is 85 percent.

At first glance, the IT and management placement figures don't appear too different from the CLA figures, but there are several critical differences. First, CLA doesn't even poll its students until fall, which for some of them is more than a year after they've graduated. IT and Management, on the other hand, have survey cut-off dates in August for their June graduates. And second, at best only 60 percent of CLA placement office users even responded to its survey. In IT and the School of Management response rates ran at least 10 percent higher.

Placement rates aren't the only item that varies by college — salary does too, rather markedly.

The average starting salary of a CLA graduate last year was $16,424; the average starting salary of an IT graduate was $25,000. School of Management graduates fell in between, with average starting salaries of $17,172.

What all these numbers don't reflect, however, are the far greater time and energy the average CLA graduate must invest in the job hunt compared to an IT or management peer. In 1982-83, 159 companies made 330 campus visits to the School of Management's placement office; 165 companies sent 700 recruiters to IT that year. CLA's office had visits from just 38 companies, making it inevitable that CLA students had to work hard just to get interviews.

CLA's own employment survey report carried this telling line: "The most successful job search leads were found through newspaper ads, friends/relatives, previous employment with the same employer and direct application to employers." No mention of on-campus interviews. McGrath himself admitted, "On-campus recruiting is only the tip of the iceberg for CLA graduates. Neither in good times nor in bad can they count on campus recruiting to find them a job."

What this means for CLA graduates like Ellen Hatfield is that they must be resourceful and imaginative when job hunting. To this end, CLA's career office gives an entire seminar on targeting employers, in which instructors list places for students to consider looking. Chief among them are professional directories, friends and relatives, job boards at companies, and civil service listings at the state, local, and University level. Career adviser Kristine Huck also suggests that students join professional associations, read trade journals, and peruse corporate literature in the CLA Career Placement library. This done, Huck suggests that before going on actual job interviews, students go on informational interviews to find out what companies are like and what jobs they actually have.

Figuring out what jobs they are qualified for is often an essential first step for CLA graduates, whose majors do not always make the job choice obvious. Unlike IT students who know they are trained to be, say, a mechanical engineer, CLA students often have studied something like cultural geography or speech-communication, subjects with less than clear-cut applications to the working world.

For this problem too there is a seminar, in which students identify their skills, interests, values, goals, and personality traits in an attempt to match those to jobs. Placement directors stress that it is vital to have this information before interviewing, because employers look for people who know what they want to do and what they're good at, and can back up their claims with examples of what they've done in the past. "If you say you have good organizational skills, you'd better back it up with examples," said IDS recruiter Tia Simons. "That's how you can convince the recruiter you really can organize."

Although CLA students undoubtedly have to work harder just to get

an interview, once they're in there with the recruiter, the qualities that will set them apart from the rest are the same qualities that will set apart the best technical students.

Interestingly, in many fields a very high grade point average is not all that critical. Catherine Braun was surprised by this, but said, "Once you have a certain level of GPA, they aren't that concerned whether it's a 3.1 or a 3.8. The things they really look for are experience, activities, and communication skills."

Braun's list about sums it up, if you believe what recruiters and placement directors — who often poll recruiters — say. Internships, which show a certain familiarity with the actual work, are particularly popular with recruiters. So is evidence of good leadership skills, which IDS recruiter Simons said can be demonstrated either through campus activities or through jobs.

Students who know about the firm they are interviewing for also make a good impression, said Simons. She mentioned one student who before her interview had talked to an IDS sales rep about the company. "She almost knew more about IDS than I did," said Simons. That student was asked back for another interview.

No matter how great a student is, if that message doesn't come across to the interviewer, the student will never land a job. The importance of communication skills was emphasized by students, placement directors, and recruiters alike as a critical element in job hunting success. And communication skill is more than glibness, recruiters stress. They say that too often students don't really listen to a question and what information is being sought, responding instead by rote. "Be yourself," said Simons. "Some people come in so rehearsed it's almost like turning on a tape recorder."

Beyond all the stated factors in job hunting success lurks a slippery X factor that anyone who has ever been interviewed is aware of, but which is hard to characterize. Perhaps Braun, already an interviewing veteran, put it best when she said, "Interviewers want to see your real personality, how you handle yourself and present yourself. If you're going to be in their company, they want to like you."

Rob Levine

Many campus placement offices, like this one at the School of Management, maintain small libraries of information on local and national companies to help students prepare for interviews.

Assuming that students have everything going for them, including personality, what are their chances of actually landing a job in 1984?

Not great, but better. Or at least, 5 percent better than last year. Companies plan to hire 5 percent more new college graduates in 1984 than they did in 1983, according to a recent Michigan State University survey.

Windmeier, who has been in the School of Management's placement office since 1970, said that although the last few years have been the worst she's ever seen, "this year is better than last year." IT's Lee Ponto also thinks 1984 is shaping up better than 1983; the number of companies interviewing in IT is up 12 percent so far this year. It's really too early for CLA to tell how good or bad a year this will be, but students with liberal arts backgrounds shouldn't despair.

"We hire about 50 percent of our entry level people from the liberal arts," said Simons. "We're definitely just as happy with CLA graduates as with others. They are more communications oriented and have better writing and speaking skills."

IDS is not alone in its enthusiasm for CLA graduates. A March career fair, for which the CLA placement office was a major sponsor, attracted 50 percent more companies this year than last year. "CLA students' biggest problem is just breaking in," said McGrath. "Once they're in, they do well and are respected."

Getting in. It doesn't look like that's going to get a whole lot easier in the near future, but one thing's for sure: at the University of Minnesota, there is no lack of help for the student who's trying.

And University of Minnesota students do have one extra thing in their favor that should continue to help them when jobs are scarce, said Windmeier, who, after talking to recruiters for 15 years, should know. "University of Minnesota students are known to be mature and to be good, hard workers," she said.

That reputation should stand them in good stead during their job hunts.

IN SEARCH OF A JOB 2

Wherein a sense of humor is more important than a clean resume and three letters of recommendation.

By James Lileks

There are two kinds of jobs for liberal arts graduates: few and far between. No slurs against them, of course; I'm one myself, genus *English majora*. And no slurs against the advisers who told us there were jobs for liberal arts majors. (Never mind that those jobs consist of being an adviser and telling freshmen there are jobs for liberal arts grads.)

Trying to make a living with just a liberal arts degree is like trying to wash a lifetime's worth of dishes with a one-ply paper towel. Take it from one who knows: I've been schlepping my way through the real world for nearly a year now, and I've been down so long, graduate school looks like up to me. But I haven't given up, and you needn't either. Read on for my employment tips for liberal arts majors.

First Forget Everything You Know

How many times have you stood wrench in hand, staring at a steaming car, or watching a building burn down unattended, and thought: "Jeez! If only I had a liberal arts graduate!"

There is, to be honest, little practical use for us in situations like those above. The English student would look at the car, read the manual, and cite a reference sooner than a good garage. A philosophy grad would be the last thing you want at a fire. *You! Poindexter! Call the fire department!* Why? he'll ask. *So the pump truck comes!* There's no proof it will, he replies. *It always comes when you call!* Ah, ergo prompter hoc. *Ergo, nuts! Call the truck!*

So forget what you know. You may have just received four years of vigorous education, but if you keep it to yourself no one will hold it against you.

For English Majors, There's Free-lancing...

Let's honestly appraise the qualifications I bring to the working world. *I have a command of the English language.* Fine. Napoleon had command of the French troops at Waterloo and look where it got him. At worst, he could put "Emperor of All of France" on his resume. *I'm not a stranger to critical thinking.* Who? Never met the guy. *I can write.* What's stopping you?

A good point, that last one. Which brings us to job #1 for English graduates: free-lance writing.

On March 3, 1981, at 3:38 p.m., I decided to become a free-lancer. I can nail down the date with precision simply because you don't forget those moments in life when you take stock of yourself and put one foot firmly onto terra incognito. It was also, quite coincidently, the moment I went to the mailbox and learned that the 1,742 magazines and newspapers to which I'd applied for a job had rejected me "with extreme prejudice." The fact that they all replied with one letter made me believe, for a second, in the theory that a tightly knit cabal controls the media. That the letter was mailed bulk-rate presort gave me a notion of my chances for steady employment in the field.

I wasn't daunted. Humiliated, sure. Pitched into an abyss of tar-black depression, yes, but nothing I couldn't pave over with a couple of coats of self-deception. I cheered myself up with a copy of *You Can Make $36,500 a Year Writing! No, Really, You Can!* Take time out to eat and sleep, of course, and the figure drops appreciably.

The book was full of heartening tonics. The author had quit a comfortable job at a university — she was an adviser — and had written this book, royalties for which had already hit

$36,500. Her formula was simple: First, write an article, then, sell it for $100. Do that every day.

According to the book, it takes but one thing to be a free-lance writer: self-confidence. To me these are two separate entities, but I let that ride. Perseverance, call it. The book trundled out the timeworn tale of F. Scott Fitzgerald, who toiled in obscurity, garnering rejection after rejection until he had taped a frieze of 123 editorial refusals around his room. The moral according to the book: *Don't* be discouraged. The moral according to Lileks: *Do* be F. Scott Fitzgerald.

If after 123 rejections you are still fine-tuning the piece about The Day Gramps Cleaned a Trout and Got Guts All Over the Place, it may be time to give serious attention to the door-to-door shoe sales franchises advertised in veterans' magazines. You may stubbornly maintain that, like F. Scott, you have a great novel burning within you. Stay put. It just might be lunch. Take a Bromo.

Second, and this is from experience, for success as a free-lance writer you must be able to crank out endless drivel, masterpieces of astonishing banality. This is good and bad. On one hand, you write for yards and say nothing at all. There isn't an English graduate alive who can't. It's your specialty. But so far it's been weighty drivel. Now you have to write clear, concise drivel.

If, for example, you get an assignment from Refrigeration Quarterly, you cannot give them a charming masque in which Freon vanquishes Bacteria, thereby saving Meat, after which a chorus of maidens frolics in glee and appreciation.

Of course, if you'd read RQ before writing the piece, you wouldn't have written the masque. Which brings us to free-lancing point #3: Read thine homework. Yes, cover to cover. The average English grad, full of bad habits from senior year, will wait until the day before the piece is due and stroll to the bookstore for the Cliff Notes to Refrigeration Quarterly. The fledgling free-lancer will hear that *Reader's Digest* has a section called "Points to Ponder" and will submit essays on bayonets, tacks, and safety pins. If he's exceptionally lax in investigating his publications, he'll go so far as to submit a book review to the *New York Review of Books*.

Sure, free-lance writing sounds discouraging. But what it lacks in fun and money it more than makes up for with the total absence of job security. And you've plenty of ideas. Your brain is a fertile garden, an inexhaustible crop waiting to be harvested, right? Look at me: I just sold an article called You Can Make $36,500 a Year Selling Blood! First, you sell four quarts of blood at $25 per quart. The next day, you do it again.

Teaching...

Teaching and a good respectable career – ah, they go together like a horse and carriage, which is to say they're hardly seen anymore. This option isn't limited to English graduates. Anyone can do it, although it requires a stay in (gasps of horror from the audience) Graduate School.

If you believe in the birth trauma theory, you understand graduate school. When the newborn comes squalling down the pike, pops out into the harsh light of the outside world, and promptly gets paddled by whatever ambassador of humanity is on duty in the OB ward, the kid has no choice but to hang around and see what develops. Yet when the graduate stands blinking in the glare of reality, being greeted with glacial indifference, he can scamper back into the womb for four more years. Provided, of course, that he got good marks as a fetus.

There's but one reason for going to graduate school: to teach, perchance to eat. The end result is to render the aspirant more superfluous than before, all in the hopes of nabbing one of the precious few jobs available. It's a long row to hoe, the teaching biz; first, one becomes a teaching assistant, which is known in that ingenious collegiate parlance as a TA. For the conscientious, duties are grueling: grading papers, grading papers, and upon occasion, reading the papers and grading them.

Then comes the actual teaching. For English grad students, there's Composition. First, Freshman Composition, where the incoming are taught not to write like e e cummings so they can write papers about e e cummings. And there's Athletes' Composition, offered in case a football player should come across a menu without illustrations. Then there's Freshman Decomposition, but once that sets in you can't do a thing with them.

Eventually the graduate student's work comes up for review by his superiors in a process called the orals, where professors drill the supplicant with questions about his thesis. Not, I should add, a situation where one should plead the fifth. If all goes well there, the student is pronounced cured of all practical ambition and kicked out into the real world again.

The smart ones land jobs as Ass. Profs. and, if they survive that sobriquet with dignity, become Full Professors. They publish and eventually perish. Fifty years later their names adorn new buildings and smoking lounges. (Unless, that is, their name happens to be Hall, in which case they will never have anything named after them. It would be hard to say one is going to Hall Hall without pondering

whether or not the gang were all there.)

Then there are the professors whose only publications are frequent guest appearances in the DWI column. They get memorial drinking fountains. The rest of the postgrads find jobs that have nothing whatsoever to do with English, and when you run into them five years down the road they're thinking of getting into computers.

...And Advertising

Sure, an English graduate can go into advertising. It's an honorable profession. The world's oldest, in fact: think of the pitch the snake gave to Eve. If you know what's good for you, though, you'll keep clear of an industry that has given us "pounder" as a unit of weight. All it'll give you is money, steady employment, and an exciting job. After four decades you'll have nothing to show for it but a comfortable retirement. Sure, it sounds okay. But what of Art? What of Literature?

What's that? Why, yes, I have been thinking of getting into computers. Why do you ask?

Jobs for History Majors

No problem. Every new presidential administration wants the best of the crop, the kids who know all the lessons of history. They are hired in batches, dazzled with high salaries. Then they are posted to Pago Pago where they won't cause any problem.

Next question.

Jobs for Philosophy Majors

Philosophy students have it especially rough. To them, philosophy is a complex, demanding discipline involving the study of stupifyingly obtuse theories. Not only do they have to grapple with ideas the size of a Sumo wrestler, they have to dissect them while they are still alive. From this enclave of academic aestheticism the student enters a world where philosophy is not only rendered in calligraphy and hung in the guest room but frequently rhymes.

Nevertheless, the philosophy grad has a skill: He can argue convincingly whether he belives in what he's saying. This is a skill indispensable to the stereo salesman. The customer comes in, says he has five bucks to spend for a system. The salesman has to convince the customer that a rusty nail driven through a block of balsa and attached with bare wires to a styrofoam cup will deliver the best sound for the dollar. Of course, for a little more you can get a knitting needle and pure oak. Now, this is easy stuff. The philosophy grad has spent years arguing as if his life, his grade, and his self-respect depended on it; add his commission to that list of incentives and you have yourself a dedicated employee.

Jobs for Art History Majors

Well, this one is simple! First, you get a degree in art history. You throw your cap in the air at the graduation ceremony and scream, *"I am an expert in Proto-Renaissance Florentine Iconography!"* and before your cap drops you have a knot of desperate museum curators at your ankles, begging you to work for them. But no. You want to spend some time on that monograph you've been thinking of, so you send them on their way. A year later, you publish your ten-page dithyramb on The Depiction of Fingers

in Mid-Maniera Art and then, well hold on to something solid, 'cause the Louvre's on the phone and the Uffizi is getting a busy signal. You fly to Paris and Florence for interviews; both offer you stewardship over the future of the museum. You play one against the other, and a furious bidding war erupts; finally, you consent to work part-time for both at full-time pay. Meanwhile Columbia Pictures has picked up the option on your monograph and they sign Dudley Moore to play Parmagianino. Then you — HUH? WHA — ? WHERE AM — ?

Whew! Must have dozed off there. Boy, what a strange dream I had! What was I talking about? Art history? Nah, couldn't have been. No one majors in that. You minor in it. It's a great degree but hey, the diploma comes with a detachable row of food stamp coupons. May I have the next slide, please?

Jobs for Studio Arts Majors

You can live off the sales of your work. Or, you can wait for an alien spacecraft to land and give you the location of Atlantis so you can raid its aqueous coffers. The latter is a bit more promising of the two.

From my observations of recent studio art projects, I'd say the perpetrators could make a living in several ways. Furniture for the mentally deranged is a good place to start. I base this on the high number of exhibits I have seen where folding tables appear to have been hurled against the wall by brisk winds and thereafter terrorized by a paint spray gun. If it looks crazy to me I'm sure there are scores to whom it would be perfectly acceptable.

Another option is electrical engineering. Objets d'art where agglomerations of metal are wired to duel one another in elaborate arabesques are all the rage. Well, so was swine flu, the patron says. Take a practical approach, one with the homeowner in mind, I say. In other words, when the patron turns on a lamp, the kitchen appliances should not leap to life and execute a ballet.

But there's another hidden skill that the studio arts grad has. It's honed every time he writes a grant proposal. If he can convince an arts board that the world needs another 12-by-12 foot flat-black angst-drenched canvas, and that the artist should be paid to do nothing but daub at this metaphorical navel, then he has no business being a painter. Writing fiction is where he belongs.

Anything for Anybody

Let's cut the kidding. Liberal arts graduates can do anything they put their minds to. Four years of intensive reading and writing will do for your brain what four decades of prancing to a Jane Fonda cassette will do for your body. Success depends on what you do with what you have after you've tortured it into shape.

So what do you do with a liberal arts major? Give 'em a hug and point them in the direction of anything requiring thought. Let's leave it at that.

No, let's not. Secretly those of us with a perpetual stiff neck from our academic efforts are just biding our time. One of our own will get into power someday. The vote will be given only to those who, say, have finished *Moby Dick*. Then you'll see some changes around here. Until that day we're standing by, waiting for the tables to turn.

In the meantime, we're turning to waiting on tables.

The Years You Made the Difference

UNIVERSITY OF MINNESOTA CLASS REUNIONS FOR 1944, 1934 AND EMERITI GRADS

THURSDAY, MAY 17

10 a.m.
Registration
Coffman Union Campus Club

10 a.m. – 2 p.m.
Spring Tent Extravaganza
Displays from the '30s and '40s on The Mall

10:30 a.m. – noon
Campus Bus Tours
Highlighting new buildings on the Minneapolis and St. Paul campuses

12:30 – 2:30 p.m.
Lunch On Your Own
Choose to dine at the Minnesota Alumni Club, the Campus Club, or from a wide variety of restaurants in Dinkytown, Stadium Village and West Bank

2 – 4 p.m.
President's Reception
Visit Eastcliff, home of C. Peter and Diane Skomars Magrath

FRIDAY, MAY 18

9:30 – 11:30 a.m.
Open Houses
Visit your college

12:30 – 2:30 p.m.
All Class Reunion Luncheon
Coffman Union Great Hall
Program: President C. Peter Magrath and "The Years You Made the Difference"

6:30 – 10 p.m.
Class of '34 Dinner
Minikahda Club
Chairman: Howard W. Mithun

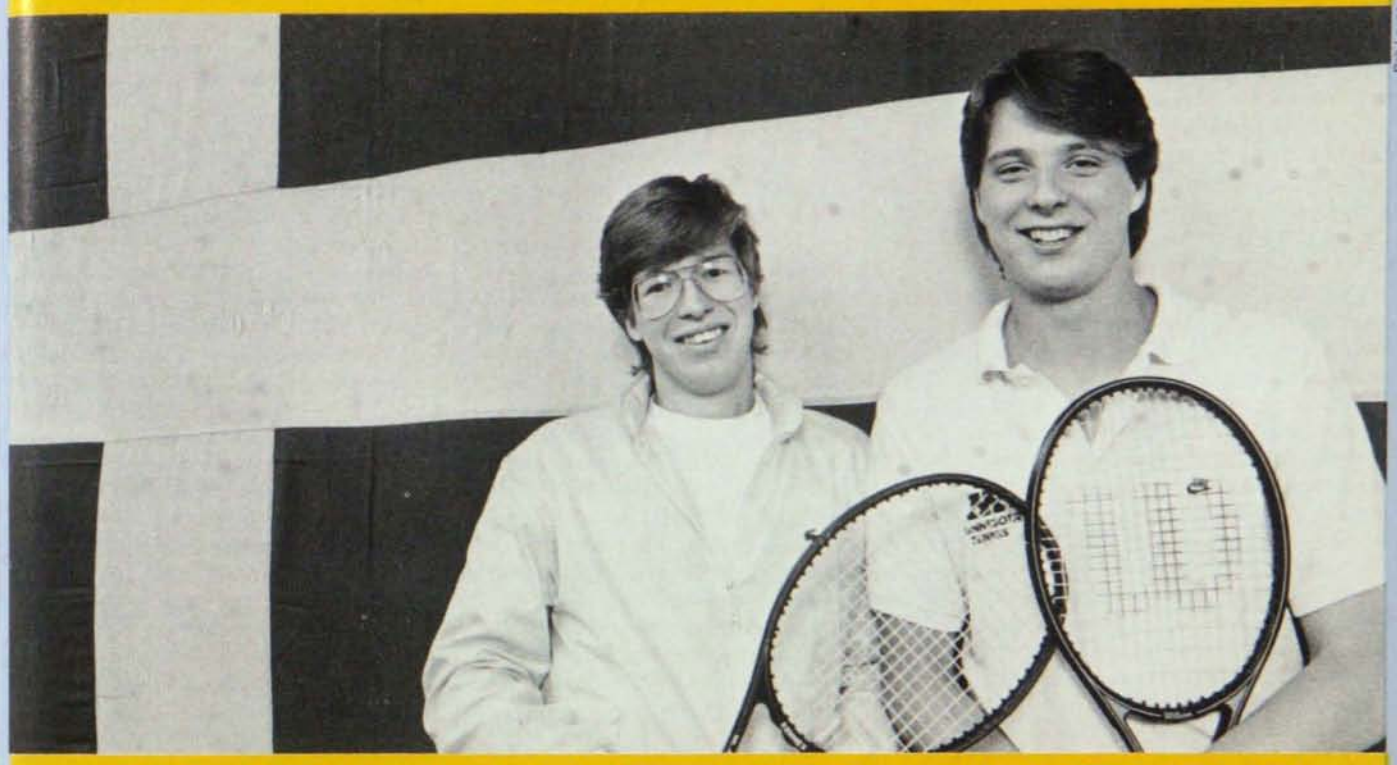
Class of '44 Dinner
Minneapolis Club
Chairman: Margot Auerbacher Siegel

SATURDAY, MAY 19

11:30 – 2:30 p.m.
Emeriti Alumni Reunion Luncheon
Town and Country Club

For further information, call Linda Jacobs, Minnesota Alumni Association, 612/373-2466

THE SWEDISH CONNECTION



Rob Levine

Fredrik Pahlett (left) and Stefan Eriksson.

A transatlantic volley of phone calls netted the University two of Sweden's best young tennis players — and has given Minnesota one of its strongest teams in years.

By **Mikki Morrissette**

No Bjorn Borg posters adorn their living room walls. Except for the wall hanging of a woman standing near a sports car and holding a tennis racket there are no tennis shots at all. Unless, of course, you count the 8-by-10 black-and-white photo of Fredrik that hangs over the television set.

Fredrik Pahlett and Stefan Eriksson, the Gopher tennis team's "Swedish Connection," get a kick out of that. Glancing around the apartment, acknowledging the absence of tennis pros jumping off the walls, their eyes fix on the lone shot of Fredrik, with his *MINNESOTA TENNIS* t-shirt on, returning a serve. And they laugh.

It wasn't as easy to laugh last year. They were scared, lonely, and had several bridges before them that at times looked too difficult to cross.

Based on two phone calls — one from Gopher men's coach Jerry Noyce and the other from fellow Swede and Gopher alumnus Hakan Almstrom — Pahlett accepted a scholarship at Minnesota and left his Vaxjo, Sweden, home to prepare for the pro tennis circuit with American college play. At the time Pahlett was ranked sixth among Swedish junior players and had earned a reputation as one of the four top members of a team that included 18-year-old international star Mats Wilander.

Not sure if he wanted to turn pro yet, Pahlett decided to give the United States a try. After all, he thought, the travel, education, and exposure couldn't hurt.

Eriksson, a native of the small town of Enkoping, Sweden, was more tentative about the move and had even less contact with his future hosts. Noyce had encouraged Pahlett to contact another player with the same offer; Eriksson was Pahlett's choice. The two were barely acquainted — their hometowns are as distant as Minneapolis and Madison, Wis. But

Pahlett knew that Eriksson, rated 10th among Swedish juniors, was the only other player among his country's 1982 top 10 who had no immediate plans to turn pro. Pahlett and Eriksson's father convinced the shy Stefan to take advantage of the opportunity.

Before they knew it, the two were living in a foreign country, trying to understand a foreign language, attending English classes, and playing tennis with a team of strangers under an unfamiliar coach.

Partly because of a "we're-in-this-together" attitude, the two adjusted to the new culture side by side, becoming nearly inseparable. They quickly realized, however, that a common birthplace and similar tennis goals aren't basis enough for a friendship.

"We didn't know each other and we were so extremely different," Pahlett recalled, admitting that he had recurrent doubts about staying in the United States. "From the second week on after all the newness went away, it was really tough. School was hard and we [Stefan and Fredrik] were always together. It was like we had a Swedish team and an American team. Sometimes I thought it was just too tough. It was never really serious, it just always crossed your mind, 'What am I doing here?"

Pahlett (No. 1) and Eriksson (No. 2) swept through their first American college season last year with a good deal of fanfare. Eriksson compiled a 40-4 overall record in the regular season, won all 12 of his dual-meet conference matches, and captured Minnesota's first No. 2 singles title at the Big Ten championships last May. Pahlett, although hobbled by a sprained ankle during part of the season, was unbeaten in eight conference dual meets, had a 34-4 overall record, and was the first Gopher since 1972 to win the conference No. 1 singles title.

Minnesota's "Swedish Connection" gained national attention a year ago when the pair qualified for their first U.S. national tournament, the NCAA's 64-player singles and 32-team doubles championships, held in Athens, Ga.

The unknown pair lost in the second round of the doubles championships, and Eriksson bowed out in the first singles round against the tournament's ninth seed. But unseeded Pahlett knocked off two of the top eight players — including a former U.S. Open quarterfinalist — to advance to the championship round, the only Gopher to do so and one of just five freshmen ever to reach the finals in the tournament's 99-year history. (Only Jimmy Connors and John McEnroe won the national title as freshmen.)

A crowd favorite during the tourney, Pahlett was described in newspapers as "the kid from nowhere" and "the blond-haired, blue-eyed boy from next door that you would like to have take out your sister."

A victim of fatigue, the Swedish All-American boy lost in the final to Utah's Greg Holmes, the number one seed who lost only one set in the entire tournament. "I felt pretty tired," Pahlett said after the match. "My legs didn't do what they should do. This tournament goes on too long."

After his successful NCAA showing, Pahlett was unsure about his future with the Gophers. Should he return for another college season or should he make the jump into professional tennis? After an average summer season, Pahlett returned last fall to Minnesota with Eriksson and the two moved into an off-campus apartment near Lake Calhoun, a year older, a year wiser, and a year of unusual friendship behind them.

As roommates, Pahlett and Eriksson are not exactly the odd couple. But beneath similar heavy accents and athletic abilities, the two *are* an unlikely match. Both admit that if the situation were different and they were playing back home, they probably wouldn't exchange more than a casual greeting at a tennis club.

Pahlett, who is shorter and wears glasses, is unabashedly honest. His self-assurance is evident, as is his natural ability to converse freely. Eriksson, on the other hand, is content to let his friend do the talking. He jumps in when he thinks his roommate has used "we" too many times or has been more honest than necessary, but mostly he is willing to simply nod, or groan, in response to his teammate's monologues.

Although both enjoy the off-campus apartment more than the dorm room they shared last year, they have opposite ideas about what to do with their spare time.

Eriksson, who has a subtle sense of humor, admitted, "I'm pretty shy. I don't say too much." As a result, he prefers staying within the tennis and college circle of friends he has developed attending Gopher basketball games and classes in theatre, studio arts, and sociology, and often he keeps to himself.

"He has changed a lot since last year," Pahlett said. "When we first got here he was really shy, he missed home. Now he has opened up quite a bit.

"He can be spaced out sometimes, in his own world, just thinking," he added. "And if you knock on the door and try to come in when he's like that, he can get really upset. I know when he's like that now. He needs to be alone sometimes. I like to be alone too, but I'm usually spending more time with others than I am with myself."

In contrast to Eriksson, Pahlett is more interested in the off-campus social life, going to bars and "meeting people outside of school just to get away from all those crazy people," he said with a laugh. Pahlett admitted he isn't as interested in school as his roommate is, although he has managed to maintain a 3.2 grade point average in courses such as economics, statistics, and calculus.

"Fredrik likes to meet people," Eriksson said. "He's always looking for new friends and he would do anything for you. He's helping all the guys on the team like the guys at seven, eight and nine [singles positions]. And he's always saying what he thinks. He would never keep something inside him."

Their introverted and extroverted personalities show on the tennis court as well, where Pahlett rarely can maintain a poker face and Eriksson just as rarely shows what he's thinking or feeling.

"When I get mad I show it, but when he gets mad he's keeping it inside," Pahlett said. "I can't say that I like McEnroe, but I can understand, I think, why he behaves the way he does. It's no fun anymore when you're out there and one bad call can change the match and you lose $50,000. Then I can understand why they are behaving bad. I'm much more like that, I can find reasons why I can scream or something like that. I'm not behaving bad, but I always show emotions out there.

"I think Stefan is one of the most stubborn players I've ever seen in my life," Pahlett continued. "He hates to lose more than anyone I've ever met. That's great because he could go out on the pro tour right now and beat anyone in the world. If he wouldn't be that stubborn, he wouldn't be as great as he is mentally. I'm much looser. I'm serious about everything but I'm happy, I can joke with the spectators and stuff."

Although the two have many personality differences, they have similar career goals. Both players expect to enter the business world someday. And though they are pursuing Scandinavian studies degrees at the University, neither intends to graduate from Minnesota.

Pahlett says he plans to turn pro this summer. Eriksson plans to return to Minnesota for one more season, then return to Sweden and turn pro if Pahlett has had some success. The pair are thankful for the opportunity they have at Minnesota, and enjoy their new life, but both players and coach Noyce always knew their stay would be temporary.

"We're both very lucky and we've been playing really well to get where we are now," Pahlett said. At the time he made this comment he was ranked second in the country and Eriksson was rated 13th. "Everything has worked out so smoothly."

Both Pahlett and Eriksson would like to help Noyce develop the Gopher tennis team into a nationally prominent program. "Coach is a friend," Pahlett said. "He's coaching us more with things off the court than on."

But whether either player will follow in Almstrom's footsteps and recruit another Swede remains to be seen. Almstrom, who moved to Minnesota by pure chance (he wanted to play American college tennis and knew two Swedish hockey stars — Kent-Erik Andersson and Per-Olav Braser — who had played with the Minnesota North Stars), struck gold when he helped recruit Pahlett and Eriksson. Because of their success, Pahlett said, expectations might be high for an encore.

"For me to call someone at home and tell them to come over here, and then having to take the responsibility for it would be pretty tough," Pahlett said. "If I would bring two guys over that I thought were good and they wouldn't do that well, or they would behave badly, that would be tough for me to do. I'm willing to help and everything but we would be putting ourselves in a tough position because we would have to bring over someone who qualifies in all of the different aspects."

"It's true," Eriksson concurred. "It's a great experience for someone to come over, but I don't know. Coach, he wants good players. It's tough to find good players in Sweden. They're turning pro so early now."

Two years ago, both Eriksson and Pahlett temporarily delayed potential pro careers because of $30 worth of long distance phone calls. It was a move neither one regrets. Even if, as Pahlett joked, "living next to each other all year" sometimes is "worse than being in prison."

Fredrik Pahlett, the University's number one singles player, is ranked second in the nation among college tennis players.

Donna Terek

Winter Sports Round Up
(through March 4)

By Mikki Morrissette

Hockey

Minnesota turned in two of its best performances in the WCHA semifinals against North Dakota, but came up short with 4-3 and 5-4 scores. The Gophers ended the season 27-11-2, finishing third in the league with a 16-9-1 record. Their 27 overall wins marked the sixth highest total in Minnesota hockey history.

Goalie Mike Vacanti finished his two-year Gopher career with an 18-6-2 record (2.80 goals-allowed average). Sophomore Frank Pietrangelo was 29-12-1 during the same period, with a 3.17 GA. Co-captain Tom Rothstein led Minnesota scoring this season with 30 goals in 39 games and was tied for the most assists with 34. The 64 points he scored is the tenth highest single season total in Gopher history. Sophomore Pat Micheletti totaled 60 points (26 goals and 34 assists).

As a team Minnesota accumulated the fifth highest number of assists (314), total points (502), and number of penalties (339). Coach Brad Buetow's five-year record at Minnesota is 140-62-5, for a winning percentage of .688, the third highest in Gopher history.

Women's Swimming

Gopher coach Jean Freeman was named the Big Ten Swimming Coach of the Year following the Gophers' impressive second-place finish at the Big Ten championships. Ohio State won the conference title for the third straight season, but the 16.5 point spread between the top two places was the tightest in championship history.

Minnesota claimed five league titles. Sophomore Diane Wallner won both the 50- and 100-yard freestyle, clocking 23.50 and 51.46 times, respectively. Both are Gopher varsity records and NCAA national qualifying times. Her 50-yard time was .03 second short of the Big Ten record.

The 200 medley relay team — Elyce Iwerks, Sue Roell, Jo Elsen, and Wallner — finished first with the national qualifying time of 1:46.12, also a school record. National qualifying times and first-place honors also were achieved by the 200-yard (Elsen, Erin Driscoll, Roell, and Wallner) and 400-yard (Iwerks, Marci Olson, Driscoll, and Wallner) freestyle relay teams with 1:35.32 and 3:27.85 marks. Twelve Gopher varisty records were set at the league championships.

Iwerks has won all but two of her 200-yard backstroke events in the last two seasons, finishing first in every 100 and 200 backstroke event she participated in this season.

Men's Swimming

At the Big Ten championships, sprinter Jay Peterson unofficially became the fastest Minnesota-born swimmer ever, and distance freestyler Jeff Shea broke three Gopher records. Peterson placed third in the 50-yard freestyle with a personal-best 20.49-second time. Shea finished 13th in the 500-yard freestyle (4:32.2), breaking a five-year Gopher record by one second. The Madison, Wis., junior also finished 13th in the 1,650-yard freestyle, eight seconds faster than his previous varsity record, with a 15:54.5 time. His 1,000-yard split eclipsed a previous record by two seconds.

In addition to Peterson's finals swim, senior Gerry Rupp finished fifth in the 100-yard backstroke. Minnesota's 800 freestyle team — Chris Tahti, Jim Brzezinski, Shea, and Scott Etnyre — and 400 freestyle team — Tahti, Peterson, Brzezinski, and Scott Ruppert — won the consolation relay events for seventh-place points.

The Gophers finished the season 5-3 overall and 2-1 in the Big Ten.

Women's Track

Sophomore distance runner Jody Eder earned the accolades during Minnesota's indoor track season. Within one month, the Lake Elma native anchored the two-mile relay team for a national qualifying second-place time of 8:57.47, followed by a national qualifying 1,000-yard run of 2:31.05, and a second-place finish in the mile run with a personal-best time of 4:41.12. All three performances set school records.

Minnesota finished ninth in the league championships with Eder, Polly Oas (fifth in the pentathlon), and Kellie Benzow (sixth in the two-mile run) picking up the Gopher points.

Wrestling

Six Gopher wrestlers qualified for the NCAA tournament on the basis of their Big Ten finishes. Junior Ed Giese (39-8-1 overall) defeated Iowa's Tim Riley 8-6 at 118 pounds to win Minnesota's lone conference title. Steve Martinez (150, 35-10 record), Darrell Gholar (167, 18-5-1), Mike Foy (177, 38-6), and Al Jenson (heavyweight, 31-9) all finished second in the meet, and Greg Evans (158, 33-15) placed fourth. Martinez reached the quarterfinals of the NCAA tourney; Gholar and Foy were the only Gophers to advance to the second round.

The Gophers finished the Big Ten season with a six-match dual meet winning streak and 11-5-2 record before placing third behind Iowa and Michigan State in the league tournament.

Men's Gymnastics

An underdog Gopher team, ranked fourth in the conference, won the Big Ten Championship, earning Minnesota its seventh title in nine years. Mixing disappointment with elation, the tournament also marked the first time since 1975 that a Gopher gymnast didn't win the all-around title. Senior Joe Ray finished second, his third time as runner-up at the Big Ten championship level, after winning the title last season. Although the all-around title didn't belong to Minnesota, the Gophers did place three gymnasts in the top five: sophomores Rob Brown and Dave Menke finished fourth and fifth, respectively.

The Gophers' only individual title was won by Ray in the parallel bars, his fourth championship in that event. Minnesota finished the regular season 10-1 overall and 5-0 in the Big Ten.

Women's Gymnastics

Minnesota's team posted a 9-6 overall record (4-1 in dual meets) during the Big Ten season and was ranked as high as 15th nationally. They earned the country's 13th highest team score, a 180.40 total against San Diego State, which established a new school record. Every loss but one came against teams rated in the top 20.

Freshman Laurie Kaiser finished first in the floor exercise and vault at the Big Ten championships, and placed second on the balance beam. As a team, Minnesota finished second to perennial champion Ohio State.

During the regular season, Kaiser earned the highest conference all-around score with a 36.95, as well as the best scores in the vault (9.45) and floor exercise (9.06). Sophomore Wendy Dorsey tallied the second-best all-around score in the Big Ten (36.65) and ranked second on the vault (9.3). Sophomore Julie Kot led Minnesota in the uneven bars with the second best Big Ten score. Freshman Shelly Brown, the third Gopher all-arounder, scored a 36.20 in mid-February, beating her previous best by more than a full point. That performance included a 9.45 on the balance beam, the second-highest score in Gopher history.

Men's Basketball

The Gopher team closed out the season with its fifth straight loss, a 63-52 defeat by Purdue, which ended its only hopes for a National Invitational Tournament bid. It marked the first time in five years that Minnesota had failed to earn a postseason berth. The Gopher records, 6-12 in the Big Ten and 15-13 overall, also were the poorest win-loss marks for Minnesota in five years, and merited a tie with Iowa for seventh place in the league.

It was a season of streaks for the Gophers. Minnesota opened the non-conference season with eight wins in nine games, but then suffered three straight losses to start the league schedule. The Gophers rebounded to win six of eight conference games to put them in a good position for a fourth- or fifth-place conference finish. A fourth-place finish would have assured them an NCAA tournament bid.

After defeating the Iowa Hawkeyes 56-49 in Iowa City in February, the Gophers stumbled at home and lost to the Hawkeyes 62-50. They then went on the road and suffered their second worst loss of the season as Michigan State humbled them 83-62. Two days later the Gophers regrouped but still fell short, losing to Michigan 51-50.

One bright spot for Coach Jim Dutcher's Gophers this season was the performance of Tommy Davis. Leading the team with 15.8 points per game, Davis set a school record, shooting 15 of 16 field goals in a 33-point game at Indiana. Davis, a 6-foot-4 guard from Aberdeen, Md., shot 58 percent from the floor this season.

Women's Basketball

The Gopher team finished the Big Ten home season with its most impressive weekend of the year, defeating Michigan 89-78 and losing a close 66-60 contest to Michigan State. Minnesota went into the last home series averaging 20 turnovers, but committed a season-low 14 against Michigan State. The Gophers scored their highest game total of the year against Michigan while shooting a season-best 55 percent from the field. The Michigan game was televised live locally, a first in Gopher women's sports history.

Sophomore Carol Peterka highlighted most Gopher games during the season, especially after last season's

Donna Terek

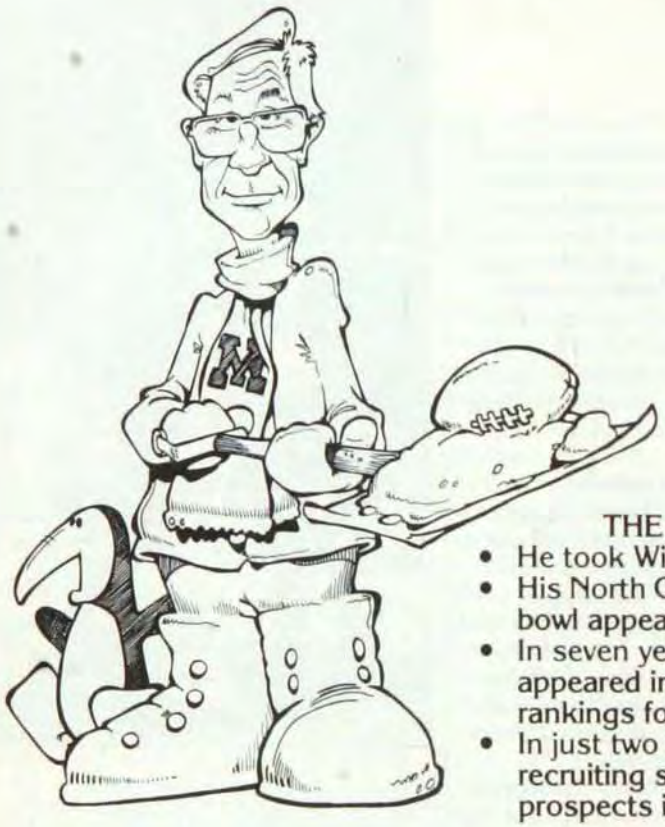
Big Ten Most Valuable Player Laura Coenen was sidelined by a hyperactive thyroid and bronchitis. Peterka converted 14 of 18 free throws — a Big Ten season high — in a 28-point effort against Northwestern. Against Michigan the 6-foot forward from St. Cloud Apollo scored 32 points, the sixth time this season Peterka has scored a career high. Freshman center Molly Tadich set a new school record against Northwestern, nabbing 23 rebounds.

Minnesota finished seventh in the conference with a 9-9 record, 12-15 overall. Senior forward Barb Meredith ended her Gopher career with a personal-best 22 points in the last game of the season, a 71-67 triumph over Illinois.

Football

Coach Lou Holtz was pleased with his first Gopher recruiting season, signing 11 of the 12 Minnesota players who were offered scholarships. Among the 30 high school students who signed national letters of intent with Minnesota are Jason Bruce, a Burnsville wide receiver who runs a 4.38 in the 40-yard dash, and Dennis Carter, a Miami wide receiver who boasts a 4.35 time.

Holtz stressed academics in his recruiting. Heading his list of student-athletes are Blaine's Tim Juneau and Lakeville's Troy Wolkow, who both earned 4.0 high school grade point averages.



"WE NEED THE HELP OF EVERYONE WHO HAS EVER PICKED UP A SNOW SHOVEL"

LOU HOLTZ
DEC. 22, 1983

THE HOLTZ RECORD SPEAKS FOR ITSELF.

- He took William and Mary to its only bowl game in 41 years.
- His North Carolina State teams earned 33 victories and four bowl appearances in four seasons.
- In seven years at Arkansas, Holtz' teams won 60 games, appeared in six bowl games and earned national top ten rankings four times.
- In just two months at Minnesota, he turned in a great recruiting season by bringing eleven top Minnesota high school prospects into the Golden Gopher camp.

Lou Holtz, one of the most successful and highly respected football coaches in the nation, has taken over the reins of the Golden Gophers. The positive response to his presence has been overwhelming.

Coach Holtz' Gophers will be exciting and competitive, and he believes they will be winners with the support of the fans in the stands. "We hope to have the help of all the people in this state—everyone who has ever picked up a snow shovel. This is their University and the Gophers are their team. If we all work together, we can get the job done!"

Make your plans now to join the Gophers as they host Rice, Ohio State, Indiana, Northwestern, Michigan State, and Iowa.

1984

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Report from the Board

Alumni Club Keeps Cityscape View

The bird's-eye view from the 50th floor of the IDS Center will continue to be enjoyed by Minnesota Alumni Club members under the terms of a new lease approved in principle by the Alumni Association Board of Directors at their March 8 meeting.

In other action, the board formally recognized the Black Alumni Society, approved performance expectations to guide and maintain the 24 alumni societies and special interest groups, and accepted suggested dues increases, starting July 1. Single annual dues will increase from $20 to $22; husband/wife dues, from $25 to $28.

The Alumni Club five-year agreement calls for extensive remodeling and a new combination of private and public dining facilities. During the renovation, scheduled to begin in August and wrap up within three months, Club members will have signing privileges at Marquette Hotel dining facilities in the IDS Center. (The Orion Room, the other 50th floor tenant, recently ceased operations. Its space is being converted to offices by the building's manager and part owner, Oxford Properties.)

The Alumni Club will be reconfigured in this way:

- The remodeled main dining room will serve members exclusively for lunch daily. The Club's banquet rooms also will be exclusively reserved for members' private functions, from breakfast through lunch daily.
- In the evenings, the main dining room will be open to the public with Club members given reservation and seating priority. Banquet rooms will be available for Club members' exclusive use if they make reservations seven days in advance. In addition, the Alumni Club itself reserves exclusive use of the main dining room nine times a year.
- The Ski U Mah lounge will become a public bar. Dunfey Classic Hotels will continue to operate food service for the Alumni Club and companion evening restaurant.

The Club lease was negotiated by William Fine, a member of the Association's executive committee and the Club's house committee. The Minnesota Alumni Club is a social, nonprofit corporation related to the Minnesota Alumni Association, and all Association members are eligible to join it. Under the terms of the new lease, Club dues are not expected to rise dramatically.

New Student Crew on Board

The Association's Student Board, now in its fifth year, includes 21 members for 1984. They link alumni staff members to current student concerns and interests and, as campus "ambassadors," increase understanding about and visibility for the Association.

Student board members, their majors, and hometowns are: Lynn Bender (business, New Brighton), Donna Bergstrom (political science, Carlton), Mary Breidenstein (business/accounting, Framingham, Mass.), Alicia Cartes (international business, Milwaukee, Wis.), Brett Chilvers (business, Excelsior), Bob Cohen (business/accounting, St. Paul), Anne Cracraft (international relations, Richfield), Brian Forss (architecture, Sheboygan, Wis.), David Gross (political science, Fridley), Jay Holtmeier (political science, Wayzata), Kathy Hurley (speech communications, Edina), Jeff Judge (economics, Mitchell, S.D.), Tom Lageson (agricultural business, Ellendale), Andrea Marcos (international relations, Minneapolis), Denise Nemanic (mortuary science, Robbinsdale), Steve Plunkett (political science, St. Paul), Chris Pryce (electrical engineering, Vermillion, S.D.), Wendy Russ (speech/English, Burnsville), Shelly Sippl (journalism, Wausau, Wis.), Bill Womack (business/ speech/political science, Lakeville), and Terry Yablonsky (psychology, Minneapolis).

On-the-Road Dayton Chapter Encourages Ohio Alumni Support

Spurred by the Golden Gophers' road trips to Ohio last fall and winter, the Dayton alumni chapter arranged successful pregame events in Columbus, when Minnesota met Ohio State in football, and in Cincinnati, when the Gophers played the University of Cincinnati Wildcats in basketball.

Chapter president Paul Lindquist hopes more area alumni will be interested in joining their future activities. Members in both Columbus and Cincinnati have been involved in the Association's contact network.

The chapter's May 19 annual meeting culminates this year's events which also included a picnic last summer and Christmas potluck dinner. Assisting Lindquist are vice president Lynn Hokenson and secretary/treasurer Jim Micklos. For more information about Dayton area activities, interested University alumni can call Lindquist at 513/884-5601 or 513/255-4853.

New Merit Scholarships Extended to Education Students and Alumni

The first Coffman Alumni Scholarships will be presented at the Education Alumni Society's 30th annual banquet May 17. Jointly initiated by the College of Education and its alumni society, the $1,000 merit awards are available to currently enrolled education students as well as all education alumni and immediate family of alumni society members. The goal of the new scholarship program is to encourage high potential undergraduates and graduates to pursue or further their teaching studies and skills.

Alumni society president Kathy Hoff, '53, said this year's banquet also will honor retiring faculty members Raymond O. Collier, Eloise M. Jaeger, William Kavanaugh, and R. Paul Marvin.

Chicago Alumni Wind Up For Speaker Series

Keeping members of the Chicago area alumni chapter "Apprised of the Situation" is the name and purpose of a new program bringing University faculty members and administrators to the Windy City to discuss current issues and events.

Chapter president Mary Silk said Walter Heller, Regents' Professor of Economics, and Edward Schuh, professor and head of agricultural and applied economics, were among the first to visit the group.

Organizing events to appeal to a wide range of alumni interests, the chapter also has planned Family Day June 10, which includes attendance at the Minnesota Twins-Chicago White Sox game. Rob Marx is vice president in charge of athletic events; Jeff Schmitz, vice president for nonathletic events; and Gary Dillehay, vice president for professional development activities. Barbara Shine serves as secretary and treasurer.

Last fall, Association president Tom Holloran and executive director Steve Roszell joined the chapter for Minnesota Weekend in Chicago. In spite of a rainy downpour, more than 100 area alumni attended a tailgate party before the Gophers played Northwestern in football. A January tip-off party drew about 50 fans when the two teams paired up again, this time for basketball.

University alumni and friends interested in Chicago area activities can call Silk at 312/528-1741 or 312/225-5000.

Twin Cities Communicators Volunteer Valuable Advice

Seven prominent business people, four of them Minnesota alumni, comprise a newly formed communciations committee that will examine alumni and University-wide communication strategies.

L. Steven Goldstein ('73 CLA), senior vice president at Carmichael-Lynch Advertising Inc., chairs the group. Other University graduates involved are executive committee member Jean LeVander King ('71 Education), a communications consultant knowledgeable in government relations; David Mona ('65 CLA, '67 Education), of the public relations firm, David L. Mona and Associates; and Don Picard ('64 CLA), owner of Creative, Inc.

Rounding out the membership are Kris Zimmermann, director of market research for Land O' Lakes Inc.; Robert Thacker, vice president and creative director for Chuck Ruhr Advertising; and Jack Bolger, vice president of Bolger Printing.

The committee is staffed by James Day, associate director of the Association, and Elizabeth Petrangelo, director of public information for the University.

"The talent and commitment we've assembled on this committee give us great opportunities to build on the improvements made this year in both *Minnesota* and *Update*," Goldstein said. "The University presents a complex communications challenge, but I'm confident our committee members can provide invaluable perspective and guidance to the University's outstanding staff.

"We hope to improve University communications with all major external constituencies, but we'll look to the bottom line of increased alumni support to measure our effectiveness."

The Big Ten ball was hosted Minnesota-style by the North Texas alumni chapter last fall. Between dances, John Hall and 1983 chapter president Anita Clark Hall visited with Cliff Charlson, who was elected 1984 president at the chapter's spring annual meeting.

CONSTITUENT SOCIETY EVENTS

MAY

15 **Band Alumni Society Annual Meeting and Senior Reception**
6 p.m. to 9 p.m., Campus Club, Coffman Memorial Union. FFI call the Association.

17 **Education Alumni Society Annual Alumni Banquet**
Retiring faculty recognized, Coffman Scholarships and Gordon R. Mork Outstanding Educator Award presented. Campus Club, Coffman Memorial Union. FFI call the Association.

21 **Military Science (ROTC) Alumni Society Annual Meeting**
Minnesota Alumni Club. FFI call the Association.

24 **Black Alumni Society Student Graduation Ceremony**
6:30 p.m., Coffman Memorial Union Great Hall. FFI call Thomas Newton, 612/373-7947.

JUNE

1 **Medical Alumni Society All-Alumni Reception**
6 p.m. to 8 p.m., Minnesota Alumni Club. FFI call the Association.

2 **New Horizons in Minnesota Medicine**
Medical Alumni Society continuing medical education seminar, annual meeting, and luncheon. 8:30 a.m. to 1:00 p.m., Malcolm Moos Health Sciences Tower. FFI call the Association.

2 **General College Alumni Society Annual Meeting**
Twilight Dance. 5 p.m. to 8 p.m., Minnesota Alumni Club. FFI call the Association.

8 **Nursing Alumni Society Reception for Graduating Seniors**
Eastcliff. FFI call the Association.

15 **College of Veterinary Medicine Alumni Society Reception for Graduating Seniors**
5 p.m. to 6:30 p.m., Minnesota Alumni Club. FFI call the Association.

CHAPTER EVENTS

18 **Boston Alumni Chapter Annual Dinner Meeting**
Speaker: Kenneth Keller, vice president for academic affairs. 6:30 p.m, Northeastern University's Henderson House, Weston. FFI call chapter president Jessie Hansen, 617/449-2052 or 617/437-3664.

19 **Dayton Alumni Chapter Annual Dinner Meeting**
7:00 p.m., Homer's Restaurant. FFI call chapter president Paul Lindquist, 513/884-5601 or 513/255-4853.

20 **Washington, D.C., Alumni Chapter Annual Meeting**
Speaker: Kenneth Keller, vice president for academic affairs. Army-Navy Club, Arlington, Va. FFI call chapter president Maxine Piper, 703/356-2072.

JUNE

1 **Detroit Area Women's Club Luncheon**
Installation of officers. Noon. FFI call chapter president Carol Hilf, 313/626-9023.

10 **Chicago Alumni Chapter Family Day**
Minnesota Twins vs. Chicago White Sox. FFI call chapter president Mary Silk, 312/528-1741 or 312/225-5000.

SPECIAL EVENTS

MAY

17 **University Student Leadership and Service Recognition Dinner**
6 p.m. to 9 p.m., Earle Brown Continuing Education Center, St. Paul campus. FFI call the Association.

17-19 **Reunions for Classes of 1934, 1944, and Emeriti Alumni**
Campus tours, president's reception, college open houses, all-class reunion luncheon, individual class dinners. FFI call the Association.

FOR FURTHER INFORMATION ABOUT CALENDAR EVENTS, CALL THE MINNESOTA ALUMNI ASSOCIATION, 612/373-2466.

ADVENTURE TRAVEL

MAA members can now travel with ECHO on any of the trips listed below at a 10% discount. Groups of 10 or more will receive an additional 5% discount. Proof of MAA membership is required. Direct all inquiries to: ECHO: The Wilderness Company, 6529 Telegraph Avenue, Oakland, California 94609. (415) 652-1600.

IDAHO

The Main Salmon. BIG; big river, big rapids, big wilderness, big canyons. $693. MAA members: $624.

Middle Fork (Salmon). The premier mountain whitewater trip. $773.85. MAA members: $697.

Lower Salmon. Sandy beaches, beautiful gorges, good swimming and fishing. $513.45. MAA members: $462.

Snake/Hell's Canyon. Six days through the deepest gorge in North America. $693. MAA members: $624.

Snake/Birds of Prey. Well over 1,000 eagles and other birds of prey. $498.75. MAA members: $449.

OREGON

Rogue. Through the gentle green wilderness of Oregon's Coastal Range. From $362.25 to $435.75. MAA members: from $326 to $393.

Owyhee. Runnable only during high water in late spring. Swift and heady. $514.50. MAA members: $464

Upper Klamath. Five of its 18 miles plunge an incredible 85 feet per mile. $185.85 and $206.85. MAA members: $168 and $187.

CALIFORNIA

American. Pastoral scenery, hair-raising whitewater, and early history. From $68.25 to $152.25. MAA members: from $62 to $138.

East Carson. A brisk drop from high, eastern Sierra meadows into Nevada desert. $134.40 and $144.90. MAA members: $121 and $131.

Lower Klamath. Abundant wildlife, great swimming, and rapids for all tastes. $236.25. MAA members: $213.

Merced. Highlighted by a quarter-mile-long rapid and a 20-foot waterfall. $189. MAA members: $170.

Tuolumne. The champagne of wild rivers; both excitement and solitude. From $116 to $327. MAA members: from $105 to $297.

Kern. Twists through a boulder-strewn canyon in the southern Sierra. From $67.20 to $187.70. MAA members: from $61 to $165.

ALASKA

Kobuk. Eleven days, 125 miles through the Kobuk Canyon and past the Schwatka Mountains...the fishing is incredible. $1572.90 MAA members: $1416.

HAWAIIAN ADVENTURES

A series of leisurely trips, designed to capture the natural beauty of Hawaii in a way no longer readily available to the casual tourist. From $341.25 to $1338.75. MAA members: from $308 to $1205.

STUDY AND TRAVEL ADVENTURES

For the first time, Alumni Association members will have access to the study/travel offerings of the University's Continuing Education and Extension. For more information, write to: Study/Travel Adventures, 180A Wesbrook Hall, 77 Pleasant Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

Natural History of the Highlands and Islands of Scotland. May 18-June 2. Explore the moorlands and lochs of the central Highlands and the sea cliffs of the Orkney Islands. A birdwatcher's paradise. $2515.

Trekking Through Time: Zion National Park. June 16-22. Here is the geological wonder that reveals the changes in this part of the earth during the past two billion years. A backpacking adventure. $445.

The Wildlife and Wildlands of Alaska. July 6-15. The tour will be based in Anchorage and will examine Alaskan fish, birds, mammals, and vegetation of the major biomes. $1625.

INTERNATIONAL TOURS

For more information about any of our INTERNATIONAL TOURS, write to: Travel Director, Minnesota Alumni Association, 100 Morrill Hall, 100 Church Street S.E., Minneapolis, Minnesota 55455.

The Rhine/Moselle Passage. July 7-19. A new version of the ever-popular Rhine River cruise. Starts in Interlochen and ends in Amsterdam. Ports of call: Bonn, Koblenz, Cochem, Worms, Heidelberg, and Speyer. $1895, from Chicago.

The Passage of the Czars. August 17-September 2. Start in Bucharest and cruise the Danube, the Dnieper, and the Black Sea aboard the new Russian ship M.S. *Dmitriy Pozharskiy*. Ports of call: Kherson, Nikolayeva Kakhovka, Zaporozhye, Kamensky Island, Cherkassy, Kanev, Kiev, and Moscow. $2595-$2995. SOLD OUT

Kenyan Safari. September 10-23. A game-watching safari: a comfortable and exciting experience. We will visit all the main attractions of this country. Highlights: Nairobi, Samburu, Nakuru Lake, Mara, and a night in a tree hotel. $2875, from Minneapolis. SOLD OUT

All listed prices are approximate at this time and are per person, based on double occupancy.

By Tim Lyke

Daniel Corrigan

Paul Rosenblatt

HOME ECONOMICS

19th-century Diaries Express Timeless Grief

If the government starts issuing workers' compensation for victims of library research, professor Paul Rosenblatt would certainly be eligible. While conducting research for his recently published book, *Bitter, Bitter Tears*, Rosenblatt often left the libraries he visited with a sore throat, weakened eyesight, and a depressed disposition.

But these are to be expected when one scours the pages of more than 1,000 19th-century diaries to compare their writers' grief experiences with 20th-century grief theories. Rosenblatt found the old accounts interesting because "they were pre-Freud, pre-psychology, pre-behavioral sciences," he said. "People weren't being affected by those influences."

The diaries describe the grieving process more richly and accurately than does current popular literature on grief, Rosenblatt said. "Today we say that if you lose a loved one you should be over it in a year or two. But I found in the diaries that it would bubble up again and again." Yet the journals bore out contemporary notions about grief also. A Minnesota diarist whose husband died in the 1862 Sioux War first feared that she was losing her mind, then became extremely emotional, and finally decided that she had to regain control for the sake of her two children. These stages of bereavement are as normal today as they were a century ago, Rosenblatt said.

Rosenblatt read many of the diaries, most of them unpublished, during a 1977-78 sabbatical in which he visited numerous libraries and historical societies throughout the United States and Canada. Staying with friends and relatives or having his sons along helped him "keep sane" after spending hours reading the often emotionally powerful journal entries.

This excerpt, written in 1863 by a convalescing Civil War soldier, expresses his sorrow about leaving his wife to return to battle:

> "November 6, Friday morning. The dreaded day has finally come. I write with a trembling hand. I have just enjoyed a sweet, glorious, sublime season with my darling, my beautiful, the life of my heart, my existence. Without her I should not wish to live longer. I am going to leave this morning all that makes me happy, the woman for whom I live. What cruelty! Shall I ever see her again? I shall always hope . . ."

The diary search was physically as well as emotionally taxing work. Rosenblatt spent long hours breathing dust from the journals' deteriorating pages. His effort to decipher some of the more difficult handwriting he claims contributed to his need for bifocals.

When he began his research Rosenblatt felt guilty about reading others' personal thoughts, thoughts that some writers expressly requested be kept private. "I felt really invasive, like maybe I should quit. But all the diaries I looked at are in the public record. I share my guilt with the archives."

The diarists' ability to "get things together spiritually" after suffering a painful loss was uplifting to Rosenblatt. Just before the first anniversary of his wife's death, a mourner wrote:

> "The heart bleeds and the tears flow. I try not to murmur or complain. Heaven is just. God is merciful and loving and doeth all things well, does them for our good and his glory and our great loss is the dear one's eternal gain. Heaven help us to admire it all . . ."

After reading the joys, sorrows, and mundane events of each diarist's life (one man's journal spanned 42 years), Rosenblatt often felt he knew the writer personally. Sharing the 19th-century writers' intimate thoughts and personal tragedies touched the 20th-century professor. "The diaries helped me to better understand who I am and what really matters most in life."

PHARMACY

Here's Jell-O In Your Eye

Sue Miller may be the only person who associates rabbits and keen eyesight with Jell-O rather than carrots.

For more than two years the assistant professor has been developing a gel that she hopes will make putting ophthalmic medication in the human eye easier. The colorless, viscous substance that she likens to "half-made Jell-O" has proven very effective when placed on rabbits' eyes.

The problem with the most common form of eye medication, eyedrops, is that tears easily wash them out of the eye before they penetrate the cornea and reach their intended site. So ophthalmologists treating people for eye infections, glaucoma, and inflammation of the eye can't be sure how much of the medicine is reaching the affected area.

To compare the gel's effectiveness with that of an eyedrop solution, Miller put pilocarpine, a drug that causes the pupil to constrict, into rabbits' eyes, using gel for some and solution for others. By measuring the rabbits' pupil diameters, Miller found that despite the equal drug concentrations in both substances the gel produced a "greater than two-fold response to the drug" than the solution.

Miller's water-based substance has the unusual property of becoming

thicker when first placed in the warm eye. Because it liquifies more slowly than other gels, it is released over a longer period of time and is more efficiently absorbed by the eye.

Miller plans to continue examining the gel's unique viscosity properties by adjusting its compounds, changing drug concentrations, and testing it with a few additives. Probably not carrots though.

LIBERAL ARTS

Tactual Maps Give Blind Students Directions

Without a map during her first week at the University, education transfer student Betsy Grimm said she would have had to rely on a guide or "become awfully assertive." Grimm is blind. The tactual maps that enabled her to find her way alone were created by two University geographers and first became available last fall.

Assistant professor Sona Andrews and doctoral student Tony Goddard spent a year constructing the set of 12-by-18 inch campus maps for blind and partially sighted persons. The six tactual maps — one overview and five geographical sections of the Minneapolis campus — are cardboard overlaid with embossed plastic that contains raised symbols and braille. They identify 90 campus buildings, streets, sidewalks, bus stops, parking lots, fences, and other barriers.

A 60-page braille manual describing the campus accompanies the maps. Large lettering for both manual and maps also aids people who are visually impaired though not totally blind.

While a student at a local community college, Grimm tried to make her own map by gluing rope onto paper, but she soon became frustrated when she realized she couldn't make it to scale.

After using the geographers' map set for a week, Grimm shared it with two blind friends who had been attending the University for a few years. "They told me, 'If we'd have had a map like this when we started here we wouldn't have gotten so mixed up running into walls and tripping over bike racks.'"

Andrews completed a similar project while a graduate student at Arizona State University. After coming to Minnesota she contacted Roger Drewicke, the University's handicapped resource officer, who strongly urged her to make maps for this University. He helped her obtain funding from physical planning and handicapped student services, Delta Gamma sorority alumnae chapter, and the Marquette National Bank at University.

"The maps provide some assurance for new students that they can function independently in this huge, complex University," Drewicke said. Until he read the map, Drewicke, who is blind, said he'd never "really realized how much Church and Pleasant Streets veer to the east. That's useful to know for mobility reasons."

(Not all Andrews' tactual maps are for landlubbers. She has created a tactual nautical chart of the Apostle Islands in Lake Superior to aid blind people learning to sail with Windward Passage, a group that works with emotionally disabled people.)

Family social services graduate student Pat Devlin, who is blind, said the maps helped her better understand the relationships between buildings and streets. "They've given me an idea of exactly how the University [geographically] works, which I really couldn't have gotten without doing a lot of exploration," she said.

Devlin had unsuccessfully used tactual maps in the past, finding they contained too much unnecessary detail. But she believes Andrews' maps escape that criticism. "They're the best I've ever seen," she said. "I wish they would be standardized all over the country. Sona was able to be explicit without being cluttered."

The map set is designed to be used as an initial orientation device, not a constant companion. "Blind people use it just as a sighted person might use a map," Andrews said. "You might carry it around for the first two weeks but then you leave it at home."

Andrews hopes to raise funds to construct similar maps for the St. Paul campus. In the meantime, Drewicke's office has about 100 maps for distribution to the University's 60 blind and visually impaired students.

FORESTRY

Googols of Gaggles

The same Canada goose whose graceful elegance has turned many a naturalist's head is proving to be a pain in the neck for Minnesota park visitors, golfers, and airplane pilots.

There's nothing wrong with the beautiful birds — it's just that there are too many of them.

After more than ten years of studying the Canada goose, Jim Cooper, associate professor of fisheries and wildlife, is now exploring ways to control the goose population in selected Minnesota communities.

Too many geese is a relatively new problem, Cooper said. Although the Canada goose is native to Minnesota, commercial and private hunting after the Depression caused the bird to disappear from the state. Only after conservation agencies and private individuals mounted a massive effort to restore the bird to its natural habitat did the species begin returning to Minnesota during the 1950s.

In 1973 Cooper began a research project to identify the major factors limiting survival chances for geese in Minnesota. He soon discovered that the species "was surviving beyond everyone's expectations."

Cooper wasn't the only one to make that observation. Joggers around Minneapolis' Lake of the Isles were trying to avoid stepping on more than cracks in the sidewalk. Airplane pilots at the Alexandria and Minneapolis-St. Paul International Airports were reporting close sightings of large birds — the kind that don't talk to control towers. And golf course owners began to notice an abundance of unplanned hazards. "People began saying that 5 is good, 10 is all right, 50 wasn't too bad, but 500?" Cooper said.

Two years ago in Fergus Falls, aided by representatives from the U.S. Fish and Wildlife Service, Minnesota Department of Natural Resources, and local sports club members, Cooper organized a special (now annual) Canada goose hunt to stabilize that city's goose hunt to stabilize that city's goose population at 2,000.

The human population density in the metropolitan Twin Cities area excluded the special hunt as a goose-limiting alternative there. So Cooper and other naturalists have transferred many of the urban geese to other states, such as Oklahoma. But that solution is only good in the short term, Cooper said. "The time will come when we'll run out of sites where we can transfer the geese," he said.

One long-term solution is removing eggs from nests. Since geese return every spring to the same sites to nest, the eggs wouldn't be hard to locate. Cooper estimates that one trained professional could locate enough nests to stabilize the Twin Cities goose population. The process would be much less expensive than another proposal — giving certain adult male geese vasectomies.

Although he has constructed a working model that allows him to stabilize a particular goose population at any level, Cooper emphasized that the community, not the naturalist, must determine the optimum number of geese that is right for it. "That's wildlife management at its best," he said.

GENERAL COLLEGE

Elderly Teach Students Ageless Lessons

Before it was even graded, a student's term paper became a eulogy for her recently deceased grandfather. The course was aging studies; the paper, a life review — an interview-based biography about a grandparent or other elderly person. This student completed the final interview with her grandfather in the hospital the day before he died; her review was read at his funeral several days later.

Associate professor Daniel Detzner figures that more than 1,000 students have conducted life reviews since 1975, when he first taught the course, Growing Old Together. Students' subjects have ranged in age from 60 to 104.

"I had asked myself, 'How can I make course material about old age come alive for 18, 19, and 20 year olds?'" Detzner said. Life review was his answer. Although it's generally not included in gerontology curricula, Detzner finds the life review assignment teaches students about

Karl Gehring

old age in a personal way that assigned readings, films, and lectures cannot.

Detzner believes people are too willing to accept advertising stereotypes about senior citizens and transfer them to their own elderly acquaintances. "We have to realize that those are not just folks who have trouble getting up and down the stairs," he said. "Here are people who have lived through the greatest cultural, social, and technological changes ever in any society in history. They're a tremendous resource."

Possible discussion topics that Detzner suggests students cover during the four or five interview sessions with their subject include first memories, birthdays, politics, the arts, hobbies, family feuds, pets, inventions, the influence of war on their lives, and attitudes about death.

"Reminiscing is a healthy thing to do, and people of all ages need to do it," Detzner said. For elderly people, reminiscing is particularly important since it enables them to share a part of their lives, a legacy, with their family and friends.

Understanding elderly relatives also provides clues to self-understanding. Last fall student Mary Lou Ott conducted a life review of her 82-year-old mother and found that it gave her a comprehensive view of her mom whom she had never fully understood. "The overall picture was amazing," Ott said. "I now understand why my mother behaves the way she does." She added the interviews also helped explain her own actions and attitudes as well as those of her two daughters. Ott described the inter-generational connections the life review revealed as both frightening and liberating.

Student and subject response to the assignment has been overwhelmingly favorable, Detzner said. Some students have turned in 60-page papers complete with photographs, drawings, and maps, and many elderly subjects have sent Detzner thank-you letters after receiving their life review as a gift. Detzner said student performance on the assignment is typically so high that he rarely gives a grade lower than a B.

Besides, he admits, "It's kind of hard to give someone's grandma a C."

NURSING

No-diet Program Means Healthy Weight Loss

Associate professor Sara Rode has one ironclad rule for volunteers in her five-week nutritional program. "I will not permit them to use the word 'diet' in my presence. They must refer to it as a 'nutritional program for health.'" The 25 overweight people who have obeyed the rule have lost 20 to 40 pounds each.

Rode's weight-loss plan is more than just another "never-say-diet" diet.

She believes that when people decide to make a drastic change in their lives — whether to lose pounds, stop smoking, or quit taking drugs — they too often dwell on their feelings of deprivation. A person's sense of loss must immediately be replaced, Rode said, or the undesired habit will continue.

After making a verbal contract with a participant to stick with a nutritional program for five weeks, Rode places the person on a meal plan totalling fewer calories than before and tells each one, "You are not depriving yourself of food. You are giving yourself a gift of health." Participants chart their weight daily. After a few weeks, when they realize their weight is stabilizing, Rode reminds them their blood pressure is dropping and they're continuing to trim inches from their necks, chests, and waists. After five weeks in the program most of the participants renew their contracts for an additional five weeks. "By that time I have them hooked," Rode said.

When 198-pound nursing secretary John Speckhardt first saw Rode last April, he didn't suspect that in eight weeks he'd be 33 pounds lighter. "I've tried other diet programs but I haven't really learned anything from them," he said. Rode placed Speckhardt on a reduced caloric meal plan he still follows. The Rode plan "gets people to rethink how they're eating," Speckhardt said.

Rode got the idea that feelings of deprivation might impede a person's weight-loss efforts while she was writing a textbook chapter on substance abuse among children. She noticed that the drug or alcohol abusers who were most successful in kicking their habits were those who replaced their addictive behavior with lifestyle changes involving support groups or new friends. Believing "the pathway to recovery is similar" for food and chemical abusers, Rode plans to compare data she's collected from her nutritional program to data on adolescents recovering from drug and alcohol addiction.

Rode emphasizes that she is not a professional dietician and does not plan to start her own weight loss clinic. Her desire to help people lose pounds permanently stems from her interest in motivational research. "And besides, it's fun to see people become winners."

Tom Foley

Ralph DeLong adjusts ART, an artificial chewing machine used to test new materials for dental work.

DENTISTRY

The ART of Chewing

ART chews for 17 hours straight, doesn't gain a pound, and never complains about a sore jaw. ART is a simulated mouth (its "name" is short for artificial resynthesis technology) that two biomaterials researchers are developing to test the durability of restorative dental materials like amalgam, composite, and ceramic compounds used to make fillings and dentures.

Associate professor William Douglas and research associate Ralph DeLong created the three-foot machine almost three years ago. Before then, researchers who clinically tested materials to cap teeth and to produce new ones had long assumed that corrosion of those materials through chewing was too subtle to be detected in a laboratory. "I didn't believe that to be the case," Douglas said.

Using an existing system called servohydraulics (developed by the MTS Systems Corporation, an Eden Prairie-based engineering company), Douglas fashioned a machine consisting of upper and lower teeth mounted, in pairs or on entire arches, on two discs that move up and down in opposite motions to simulate a human jaw. Although the caps and fillings being tested are artificial, the teeth are not: they have been extracted from patients at one of the University's dental clinics.

While ART is chewing for 17 hours — that's 300,000 chews, roughly the number of times a person would chew in a year — a four-way jet sprays the teeth surfaces with an artificial saliva mixture warmed to 98.6 degrees Fahrenheit. The researchers have also varied the spray's temperature to simulate tooth corrosion caused by substances like coffee and ice cream.

The entire apparatus works in a temperature-controlled plexiglass chamber. A computer monitors and controls the pressure and direction at which the teeth meet so that any chewing pattern can be reproduced.

ART is Douglas' brainchild, and the monitoring system was developed by DeLong, who holds a physics Ph.D. as well as a D.D.S. degree.

When the chewing marathon ends, a sensitive stylus glides 50 to 100 times over each test tooth's crown, each pass tracing a slightly different path. The stylus is hooked up to a computer that produces a three-dimensional picture of the tooth's surface contours. The video screen also enables researchers to compare before and after profiles of each tooth as well as to measure how much of the tooth has corroded. In one test Douglas and DeLong detected a loss of only .035 cubic millimeters due to wear on teeth surfaces. "That is extremely small," Douglas said. "It's not possible to accurately measure an area so small using any other method."

The U.S. Public Health Service is now using ART to measure the durability of artificial teeth made from a ceramic compound developed by the Corning Glass Company. Douglas and DeLong anticipate even more widespread use of their artificial mouth as regulatory agencies begin using it to supplement many of the expensive, hard to control, and time-consuming clinical studies required before they can accept new restorative dental compounds.

"We hope our artificial mouth will become the agencies' central evaluation technology," Douglas said.

JOURNALISM

You've Come a Long Way Baby

Slogans. They stick in your head like burdock to wool. That's why advertisers love them. But advertisers aren't the only ones fond of slogans. Professor Harold Wilson and professor emeritus Virginia Harris have produced a slide show and narration that preserves and examines the advertising slogans of yesteryear.

Titled "You Press the Button, We Do the Rest," the show demonstrates how slogans from the 1890s to the present have become memorable, effective features of advertising campaigns. The professors hope to share their program this summer and fall with representatives from several Twin Cities advertising agencies to give the practitioners a better historical appreciation of their craft.

Wilson and Harris borrowed their program's title from a 1900 Kodak ad that instructed consumers to take photos, send their cameras (with film intact) to Kodak, and await the return of their prints and reloaded cameras. The notion of convenience was as central to advertising in the 1890s as it is in the 1980s, said Harris, who wrote the narration for the slide show.

In his search for examples of classic advertising slogans, Wilson combed through old magazines, copies of advertisements sent to him by companies, and his own ad files, which he has kept since 1947. He discovered that slogans' abilities to tout their products have been exceeded only by their immodest claims. He cited Digital's "We change the way the world thinks" and Schlitz's "The beer that made Milwaukee famous" as contemporary examples of the advertiser who "has to be somewhat of a braggadocio as he carves out a bigger place for himself than he deserves."

Creative overstatements became commonplace during the early 20th century, which Wilson describes as a "flamboyant advertising period when advertising agencies were just growing up." In 1906 the *New York Times* adopted the saying that appears on its front pages today: "All the news that's fit to print." Although bold, the *Times*' slogan was certainly not as charming as the *Atlanta Constitution's* "Covers Dixie like the dew."

A review of past slogans reminds viewers of the historical setting in which they appeared, Wilson said. Along with selling products, slogans appearing during World War II also promoted the war effort. Thus "When better automobiles are built, Buick will build them" became "When better war goods are built, Buick will build them." Since steel that was normally used in automobiles had been allocated for production of U.S. war material, Ford consoled its deferred customers with the promise, "There's a Ford in your future."

"Some of the strongest, most copied and longest-running slogans are used for products that will help consumers to achieve happiness, life fulfillment, love, education, and easier living," Harris said. Originally a correspondence school slogan, "They laughed when I sat down at the piano, but when I started to play!—" has become so popular that it's been recycled dozens of times for many other products. A computer magazine advertisement modified it to "They laughed when I sat down at the computer." An air conditioner company varied it even more to produce this advertisement: "They laughed when I sat down at the piano. Then I bought a Carrier Room Air Conditioner. They still laugh when I sit down at the piano, but boy, is my bedroom nice and cool." Harris admits that, while working as a copywriter for a local ad agency, she too toyed with the slogan for a possible Bisquick TV commercial featuring comedienne Carol Burnett.

Although still heard in broadcast advertising, slogans appear less frequently in print media, since advertising agencies now emphasize messages targeted for specific audiences, Wilson explained. Yet he and Harris believe that advertisers will continue to rely on slogans in their future advertising campaigns. "After all," Harris said, "the slogan tells the story."

CLASS NOTES

By **Carolyn Allard**

COLLEGE OF AGRICULTURE

'46 **Harry M. Taylor** of Las Vegas, Nev., is continuing his education at age 72 by taking an accounting course at a local college.

'56 **John D. Lindstrom** of Dundee, Ill., has been promoted to chief pilot with Delta Air Lines in Chicago.

'74 **Clinton G. Halvorson** of Lester Prairie, Minn., received the Clear River Lamb & Wool Association's award for the highest pound average of wool per ewe.

COLLEGE OF BIOLOGICAL SCIENCES

'73 **David S. Devin** of Minneapolis is a data processing training specialist for Medium Well Done, a Minneapolis-based media production company. He also teaches computer programming at the Minneapolis Technical Institute.

Dr. Kristin M. Leiferman of Rochester, Minn., has been appointed consultant in the department of dermatology at Rochester's Mayo Clinic.

DEPARTMENT OF DENTAL AUXILIARIES

'63 **Bonnie J. Newman** of Wilder, Vt., has been appointed director of continuing education and summer school at Tufts University in Medford, Mass.

SCHOOL OF DENTISTRY

'28 **Dr. George W. Grissom** of St. Alban's, N.Y., retired in September after 50 years of practicing dentistry in Queens, N.Y. **Pearl B. Grissom, '30**, was retired from the New York State Department of Mental Hygiene where she was a psychiatric social worker in an aftercare clinic.

'46 **Dr. Gage Colby** of St. Paul received the Academy of General Dentistry's Mastership Award.

Dr. John H. McNutt of Austin, Tex., received the Martin Dewey Memorial Award in November 1983 from the Southwestern Society of Orthodontists for his outstanding professional contribution.

'50 **Dr. Miles B. Hirschey** of Edina, Minn., clinical associate professor of dentistry at the University of Minnesota, has been inducted as a fellow of the International College of Dentists.

'54 **Dr. Donald E. Bentley** of Hawley, Minn., was installed as president of the American Dental Association in October 1983.

'61 **Dr. Robert L. Arneson** of Fairmont, Minn., has received the Book of Golden Deeds award from the Exchange Club to recognize his community service. He has served 12 years on the board of education and was instrumental in establishing the Fairmont education/recreation program. He has been active in scouting for many years and chaired the renovation committee for the Fairmont Opera House.

'74 **Dr. Edward Littlejohn** of Winona, Minn., has been certified in oral implantation by the American Academy of Implant Dentistry.

'76 **Dr. David A. Sather** of Ada, Minn., has joined the local dental practice of Dr. Philip B. Sallberg after six years of service in the U.S. Army.

'83 **Dr. Paul W. Hensel** of New London, Wis., has joined the dental practice of **Dr. Gary R. MacCarthy, '64**, in Cottage Grove and Woodbury, Minn.

DULUTH

'69 **Jerrold A. Maki** of Oklahoma City, Okla., vice president of Baptist Medical Center, has been named a fellow in the American College of Hospital Administrators.

COLLEGE OF FORESTRY

'60 **Gary R. Lindell** of Madison, Wis., has been named assistant director for process and protection research at the Forest Products Laboratory, a joint program of the U.S. Forest Service and the University of Wisconsin.

'69 **Ira R. Adelman** of St. Paul was named department head of fisheries and wildlife for the University of Minnesota's College of Forestry in October 1983.

GRADUATE SCHOOL

'31 **Dr. Robert O. Quello** of Edina, Minn., retired in December 1983, after 47 years of medical practice.

'54 **Roger F. Sandsted** of Ithaca, N.Y., professor emeritus of vegetable crops at Cornell University, has received a meritorious service award from the Bean Improvement Cooperative for his outstanding scientific accomplishments.

'60 **Donald A. Carlson** of Gradenton, Fla., has been named dean of the Wright State University Western Ohio branch campus in Dayton, Ohio.

'63 **Gordon R. Mork** of Lafayette, Ind., associate professor of history, was one of three Purdue University faculty members selected for outstanding teaching awards and stipends in 1982-83 by AMOCO.

'64 **Lucy J. McIntosh** of Grambling, La., was named 1982-83 Teacher of the Year at Grambling State University where she is professor of sociology/anthropology.

'72 **Gerald Christenson** of New Brighton, Minn., has been appointed chancellor of Minnesota's community college system.

'75 **Laurie K. Glass** of Milwaukee, an associate professor of nursing sciences at the University of Wisconsin-Milwaukee, has been designated an American Nurses Foundation Scholar and was awarded a grant to continue her dissertation research on Katherine Densford Dreves.

'76 **Connell I. Saltzman Jr.** of Denver has been promoted to partner with the accounting firm of Laventhol & Horwath.

'77 **Margaret P. Laws** of Decorah, Iowa, is an associate professor of nursing at Luther College.

'78 **Mary Thorton Phillips** of St. Paul has been appointed director of staff resource development for the community college system in Minnesota.

Erv Huether, '50, received a special, nonalumnus award from South Dakota State University for distinguished service to South Dakota. Huether, who received his master's degree in physical education from the University of Minnesota, was head baseball coach at SDSU from 1949 to June 1983. His teams won six North Central Conference championships. In 1982, Huether was inducted into the Hall of Fame of the American Association of College Baseball Coaches.

COLLEGE OF HOME ECONOMICS

'39 Thora H. Campbell of River Forest, Ill., is the author of numerous cookbooks including *Great Treats*, a collection of recipes she tested for the auxiliary of the River Forest West Suburban Hospital Medical Center.

'45 Margaret J. Mott of Lombard, Ill., changed from full-time to part-time clinical dietitian with Elmhurst Memorial Hospital in January 1982.

INSTITUTE OF TECHNOLOGY

'40 Morris E. Fine of Wilmette, Ill., is the Walter P. Murphy Professor of Material Science at the Technological Institute of Northwestern University. He is a fellow of the American Society for Metals, the Metallurgical Society of the American Institute of Mining, Metallurgical & Petroleum Engineers, the American Physical Society, and the American Ceramic Society.

'48 E.A. "Al" Baillif of St. Joseph, Mich., has been promoted to senior vice president of research and engineering for Whirlpool Corp.

'50 Harold Irwin Reynolds of Dayton, Ohio, is a member of Sigma Xi, the scientific research society.

'58 John E. Sandahl of St. Paul has been named district engineer in Duluth by the Minnesota Department of Transportation. His duties include highway maintenance, design, and construction activities.

'63 William F. Raleigh of Cazenovia, N.Y., has been appointed vice president-engineering for TRL Productions of Brookpark, Ohio.

'69 James T. Fries of Blue Grass, Iowa, has been promoted to assistant to the vice president of manufacturing for Sears Manufacturing Co. and is responsible for all manufacturing and industrial engineering functions.

'70 Charles N. Standing of Minneapolis has been appointed director of research and development for the Betty Crocker Division of General Mills.

COLLEGE OF LIBERAL ARTS

'31 Ethel Mae Bishop Gullette of New Canaan, Conn., a pianist and accompanist in Fairfield County, Conn., performed in Dallas in June 1983. She hopes to attend the dedication of the University's music building in 1985.

'36 Kenneth D. Carlander of Ames, Iowa, has received the 1983 Outstanding Achievement Award from the American Institute of Fishery Research Biologists.

'40 Mary Jean (Kerr) Willis of Boulder, Colo., a librarian since graduation, has traveled worldwide, most recently to Mexico.

'50 Mary J. Arneson of Fairmont, Minn., has received the

Former Hockey Star Finds Unexpected Success

By Mikki Morrissette

When John Mayasich, '55, graduated from the University, he thought his intercollegiate athletic experience rather than his education degree would dictate his future. Chance, it turns out, presented yet another option entirely.

The former All-American Gopher hockey player led Minnesota scoring each of his four years and helped earn two NCAA team championships. He might have signed a professional hockey contract on the basis of his collegiate scoring ability and silver medal performance with the 1956 U.S. Olympic hockey team. The six-team National Hockey League, however, didn't look too closely at American college products in the 1950s. Besides, Mayasich also had a two-year military commitment to fulfill.

By the time he left the service he had a wife and two children. Making money, not sports history, was top in his mind. He applied his education degree (emphasis on social science), to a part-time stint as a teacher. A sales representative position at KSTP-AM radio lured him away from the classroom. The careers he had groomed himself for gave way to an unforeseen opportunity. Today Mayasich is president of the Hubbard Broadcasting radio division and oversees five radio stations, including KSTP-AM and KS95-FM in Minneapolis.

"I had some business courses in college, but I didn't do anything specifically to prepare me for what I'm doing now," he said.

Instead, he credits the liberal education he gained in college and the maturity he gained through hockey as two primary factors contributing to his current role with Hubbard Broadcasting.

"Hockey, as a team sport, is spent working with people," he said. "Added to that is the winning, the goal concept of working together to improve."

More young athletes throughout the country are dreaming of pro careers, he noted. They find more opportunities, too. The NHL, as one example, has expanded from six to 21 teams since Mayasich's days. But the two-time Olympic competitor advises high school athletes to concentrate on academics so they can earn a college scholarship. When college is completed, whether or not the player has developed into pro material, "a degree provides something to fall back on."

Except for the link of a season ticket, Mayasich has left hockey. Hockey, however, hasn't left him, as the statistics show.

After a record-setting high school career at Eveleth (he still holds nine state hockey tournament records), Mayasich duplicated his scoring feats at Minnesota. His performance is still tops in six Gopher scoring categories, including most career points (298), most career goals (144), and most career assists (154).

A U.S. Hockey League coach in Green Bay for several years — between KSTP-AM sales jobs — Mayasich also is remembered as a member of the 1960 gold medal Olympic hockey team. In 1976, just before his induction into the U.S. Hockey Hall of Fame, one enthusiast described Mayasich as "the foremost amateur hockey player of the period since World War II."

Now Mayasich is content to let hockey remain merely a part of his past. His current ambitions are to maintain KSTP radio's number one and two ratings in the Twin Cities' AM and FM markets. KSTP-FM ranked 13th when Mayasich returned to the station 10 years ago.

"It's been a privilege to grow with these stations," said Mayasich.

Chance may make the best career choice after al

Salvation Army Others Award recognizing community service, marking only the second time in 80 years this award has been given in Martin County. She has served on the boards of the Martin County Library, the Lakeview Health Care Facility, the Salvation Army, and has been active in church functions.

'65 **Michael C. De Moss** of Harlingen, Tex., is dean of the Reynaldo G. Garza School of Law in Brownsville, Tex.

Steve Seidl of St. Paul has been named executive vice president and management supervisor at Grey-Twin Cities, a marketing and advertising agency.

'66 **Dennis Holman** of Minneapolis has been named director of human resources/public relations for the newly opened Fairview Ridges Hospital in Burnsville, Minn.

John H. North of St. Charles, Ill., has been elected vice president of the financial services department of the Continental Illinois National Bank and Trust Company in Chicago.

'67 **Dr. J. Timothy Diegel** of San Francisco, a specialist in neuro-ophthalmology, has joined the staff of Park Nicollet Brookdale Medical Center.

'68 **Janet A. Henquinet** of St. Paul has been promoted to manager – international human resources for Economics Laboratory in St. Paul

Richard C. Struck of La Harpe, Ill., is vice president for development and university relations at Winona State University, Winona, Minn.

Marsha Theis of Glencoe, Minn., has joined the staff of the Glencoe Hospital as a certified speech pathologist.

'70 **Michael G. Kurtz** of San Diego received a bronze director's award at the International Film & TV Festival of New York for directing the Public Broadcasting System series, "Moneymakers II." He is a vice president and senior director of Western Video in San Diego.

John Otterlei of Minneapolis has been named first vice president by the board of directors of Piper, Jaffray and Hopwood.

'71 **Michael W. Boehne** of Brooklyn Park, Minn., has been promoted to assistant vice president of Alexander and Alexander, an insurance brokerage firm in Minneapolis.

'74 **Brian A. Madson** of Minneapolis is a copywriter for Red Barron, a Minneapolis-based advertising agency.

Frederick R. Whitney of Chaska, Minn., has been promoted to data processing manager in charge of all computer operations for Klein Bancorporation, a multi-bank holding company in Chaska.

'75 **Jane P. Nerison** of Montevideo, Minn., has been promoted to assistant counsel with Armco Corp. of Middletown, Ohio.

'79 **Dr. Michael M. Dummer** of New Brighton, Minn., has started a three-year family practice residency at the Methodist-University Family Practice Clinic in St. Louis Park.

Stephen J. Nash of Mound, Minn., has joined the law firm of Babcock, Locher, Neilson and Mannella in Anoka, Minn.

Pfc. Franklin L. Ruhl of Rochester, Minn., has completed basic training in the United States Army at Fort Jackson, S.C.

'80 **Catherine A. Dallner** of Minneapolis has joined the law firm of Babcock, Locher, Neilson and Mannella in Anoka, Minn.

Keith N. Goeka II of Lake Benton, Minn., has been promoted to lieutenant in the United States Navy. He is assigned to Attack Squadron 85 onboard the aircraft carrier USS John F. Kennedy, now operating in the eastern Mediterranean.

Gene A. Pearson of Rockford, Ill., is associate producer for Agri-Business Report, a news service providing agri-business features.

MORRIS

'81 **Robin D. Quincey** of Vermillion, S.D., has been appointed chief administrative officer for the Chino Municipal Court in California.

SCHOOL OF NURSING

'61 **Shirley A. Berglund** of St. Paul received the Minnesota Nurses Association's 1983 Creative Nursing Award.

'68 **Larry M. Weigum** of Bismarck, N.D., has been promoted to lieutenant colonel in the United States Army. He is chief of Psychiatric Nursing for the Academy of Health Science, Fort Sam Houston, Tex.

'73 **Dorothy V. Lundin** of Minneapolis has received the 1983 Excellence-in-Writing award from the Minnesota Nurses Association and the *American Journal of Nursing*.

Ruthann Knudson, '63, '66, received the 1983 Margaret Mead Award for "the application of anthropological theory in the real world." Knudson, director of the Cultural Resources Management Program for Woodward-Clyde Consultants of San Francisco, has worked for passage of national legislation on historic preservation.

CLASS NOTES

'78 Gretchen G. Musicant of Minneapolis won the 1983 C.F. Anderson Scholarship presented by the Minnesota Nurses Association. She is assistant head nurse of University Hospitals.

COLLEGE OF PHARMACY

'31 Kermit C. Mattison of Minneapolis has been elected 1984 president of the Metropolitan Professional Pharmacists Society. He has had Gopher basketball and football season tickets since he first entered the University of Minnesota 57 years ago.

SCHOOL OF PUBLIC HEALTH

'64 F. Donald Davis of Louisville, Ky., has been promoted to senior vice president for administration in the Hospital Division of Humana Inc.

'69 Martin L. Kieffer of Golden Valley, Minn., has been named vice president, regional services, for HealthOne Corp.

'81 Alice C. Murphy of Andrews AFB, Md., was commissioned a lieutenant in the United States Air Force Nurse Corps in November 1982. She is charge nurse of the pediatric outpatient department at Malcolm Grow USAF Medical Center in Washington, D.C. She practiced nursing in Minneapolis for 13 years before joining the Air Force.

UNIVERSITY COLLEGE

'52 Walter A. Gammel Sr. of Miami, a business management consultant, owns and operates Modern Seedlings, a tropical plant brokerage firm in Perrine, Fla. He is past president of the Florida Nurserymen and Growers Association.

COLLEGE OF VETERINARY MEDICINE

'56 Dr. Donald G. Low of Davis, Calif., has been appointed associate dean – public programs and director of the Companion Animal Laboratory at University of California, Davis. He is a veterinary urologist and a professor in the School of Veterinary Medicine at UCD.

DEATHS

Dr. Edwin R. Anderson, '24, Warren, Pa., on October 21, 1983. He had a private ear, nose, and throat practice in Warren from 1934 until 1972, and was a staff member of Warren General Hospital until his retirement in 1972.

John J. Crowley, '39, Medford, Ore., on January 10, 1984. He served as assistant secretary of defense for research and development in the United States Air Force from 1954 to 1958. In 1963 he joined the Central Intelligence Agency and retired in 1970 as deputy director of research and development.

Marjorie Haugen, '71, Harbor Springs, Mich., on January 7, 1984. She served as a university librarian and was a member of the faculty senate at Winona State University from 1971 to 1973. She was active in various community groups and state organizations.

Joseph F. Herbenar, '34, Plymouth, Mich., on November 23, 1983.

Marcia (Helmey) Hovland, '13, Virginia, Minn., on October 30, 1983.

Milan W. Jerabek, '37, Kensington, Md., on December 15, 1983. He worked for the State Department for 35 years and was a public affairs officer in its European affairs bureau before retiring in 1979.

Hilfrid Johnson, '33, Redwood City, Calif., on November 25, 1983.

Earl M. Johnson, '41, Minneapolis, on December 8, 1983.

Nicholas J. Knickerbocker, '36, Fairhope, Ala., on January 11, 1983.

Walter J. Lee, '20, Seminole, Fla., on December 27, 1983. He was employed by General Electric for his entire working career.

Robert L. Logan, '39, Clinton, Iowa, on August 1, 1983.

Alice MacFarlane, '29, New Wilmington, Pa., on January 24, 1984. She taught French at Westminster College until her retirement in 1973, then became emeritus assistant professor of French. She was a member of the American Association of University Women.

Maynard Meade, '31, Glendora, Calif., on February 12, 1984. He worked for several leading electronics firms and retired from Hughes Aircraft Co. He was the organist at the Oxford Theater in St. Paul during the days of silent movies.

Edwin W. Molander, '25, Colbert, Wash., date unknown. He practiced architecture in Minot, N.D., for 16 years before moving to Spokane, Wash., in 1942.

Muriel E. (Brunt) Poirrier, '41, Jacksonville, Fla., on December 27, 1983. She was a public health nurse in Pine Bluffs, Wyo., Omaha, Neb., and Jacksonville and was a member of the American Nurses Association, the American Association of University Women, the Florida Nurses Association, the American Nurses Century Club, and the American Nurses Foundation.

Selma P. Robbins, '25, Grand Forks, N.D., on July 18, 1983.

James W. Stephen, Edina, Minn., date unknown. From 1946 until his retirement in 1976, he was a professor of hospital administration at the University of Minnesota. He was also president of James A. Hamilton Associates, Minneapolis hospital and health care consultants, from 1966 to 1974, and served as a visiting professor at the University of Mexico and the University of Chile.

Dr. Marvin Sukov, '30, Minneapolis, on February 10, 1984. He was a clinical professor of psychiatry and professor emeritus at the University of Minnesota, a contributing editor of *Modern Medicine*, and historian of the Minnesota Psychiatric Society.

George Thiss, '51, Edina, Minn., on December 2, 1983. He was chief aide to U.S. Senator David Durenberger and served as state Republican Party chairman from 1965 to 1971. For the past three years he was an advisory committee member for the Hubert H. Humphrey Institute of Public Affairs at the University of Minnesota.

Clarence R. Zimmerschied, '23, Minneapolis, on September 14, 1983.

Editor's Note:
When sending information for Class Notes, please include the name you were known by in school so your friends and classmates will recognize you.

Arnold Clickstein, '60, has been named executive vice president of the American Jewish Historical Society. Clickstein, a noted Boston educator and development consultant, will be in charge of educational and membership development for the 91-year-old society.

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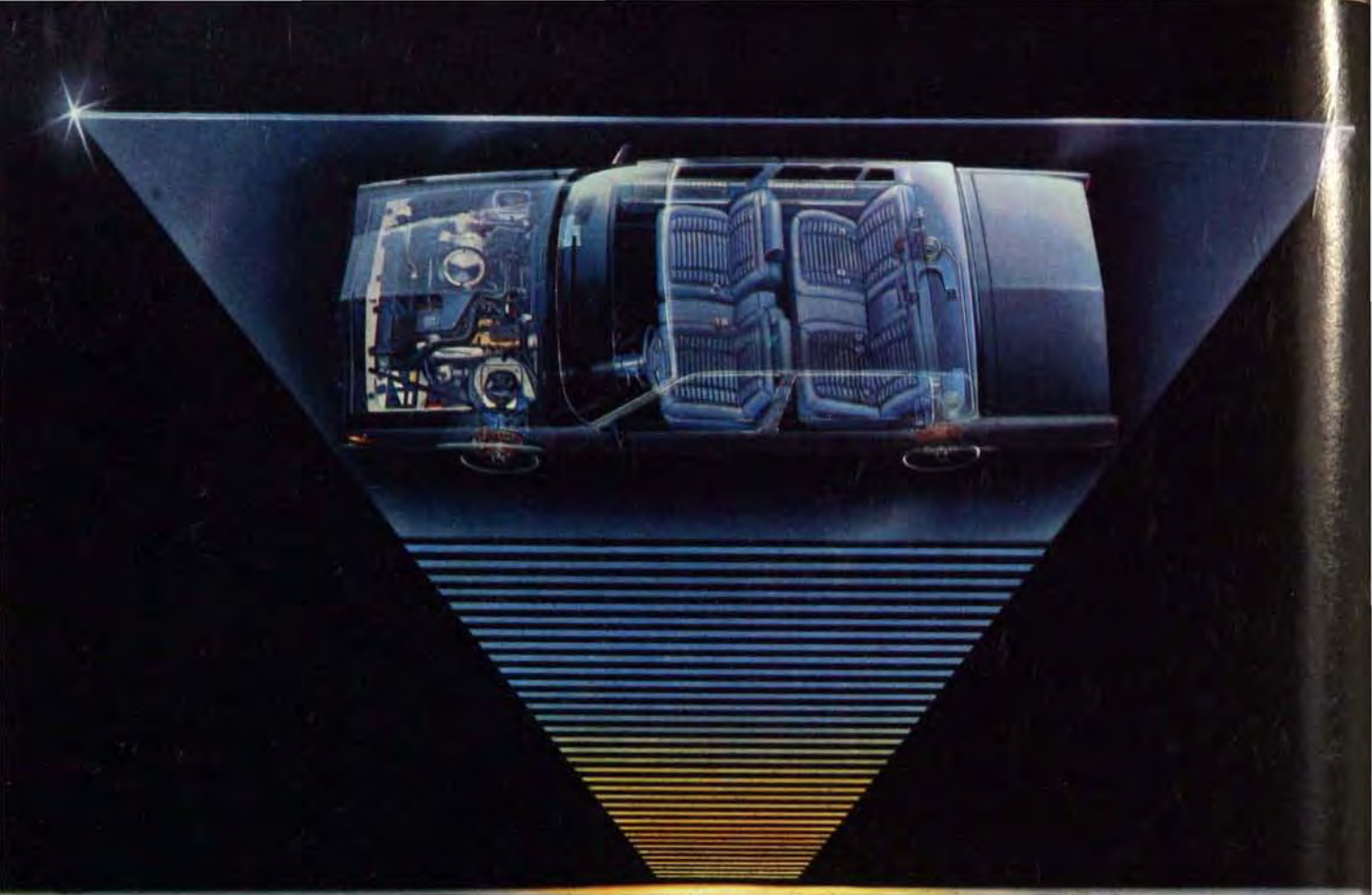
JULY • AUGUST 1984

MINNESOTA

University of Minnesota Alumni Association

Who's looking after the atmosphere? Page 16



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JULY • AUGUST 1984

MINNESOTA

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COVER STORY

On the Cover
From outer space or earth, the view is the same: The atmosphere is invisible. So are ozone, carbon dioxide, and sulfur dioxide, three trace gases clouding the future of our invisible life-support system.

FEATURES

DEPARTMENTS

LETTERS

More Favorite Books

I enjoyed reading your article on "Favorite Books," but I have to point out a couple of errors in your research.

I, too, loved the Betsy-Tacy series (and have passed my books on to my daughters—they're in tatters now). But the author was Maud (no "e") Hart Lovelace, and I fear you stopped reading them too soon. After *Betsy and Joe* came *Betsy's Wedding*, with much more information on what happened to Tacy and Tib.

But I still enjoyed the piece, even though no one mentioned any of *my* all-time favorites: *Emma*, by Jane Austen; *Time and Again*, by Jack Finney; all the Mary Renault books on Alexander the Great; and Jean Auel's *Clan of the Cave Bear* and *Valley of Horses*.

Maria Murad
Assistant Editor, Communications Department
Super Valu Stores, Inc.
Minneapolis

P.S. I almost forgot *Betsy and the Great World*, which came after *Betsy and Joe* and before *Betsy's Wedding*. You're dealing with an afficionada here.

Minnesota Brings Memories Across the Ocean

Please allow me this opportunity to say how much I enjoy reading *Minnesota*. Not only is it a tie to familiar names and faces, but it is singularly the finest alumni publication I have seen. My wife, Polly, and I have reminisced over recent pictures of C. Peter Magrath and R. Lee Clark, and I have shared your article on educational reform with Dr. Ali Fakhro, Minister of Education.

Here in Bahrain, all goes well. We are integrating a national system of clinics and hospitals. We stay busy with high occupancy rates and all our positions stay filled as well.

We are planning to be in Denver for the National Forum on Medical Staff Issues and the American Hospital Association convention in August. We are sure the Minnesota alumni will be well represented at these meetings.

Again, please accept our thanks for the *Minnesota* and our fondest regards.

Jerry Campbell, '76
Minister of Health's Adviser for Hospitals & Health Centers
Manama, Bahrain

Editor's note: Bahrain is a small island country in the Persian Gulf.

Comments? Questions?

Drop us a line. We're always eager to know what you think. Tell us what you like, what you don't like, and what you would like to see more of in *Minnesota*. Address your comments to: Editor, *Minnesota* Magazine, 100 Morrill Hall, 100 Church Street S.E., Minneapolis, MN 55455.

EDITOR

Chuck Benda

In Minnesota, few topics of conversation are held in such high esteem as the weather. And with good reason, for the weather here is as dynamic as it is extreme.

In less than a fortnight early this spring, we were beset by an amazing display of meteorological wonders: a quartet of warm, sunny days, followed by a duet of thunderstorms and house-smashing tornadoes, topped off with a final, solo blast of old man winter's best—half a foot of wet snow.

The snow soon melted, however (as it always does), and there followed the days of heaven, which, in Minnesota, are limited to the last two weeks of May and the first two weeks of June.

It is a time when the air is the most striking aspect of weather. Cleanly washed by frequent rains, sweet with the fragrance of lilacs and plum blossoms, it is a commodity pure and rare enough to be bottled and sold as tonic for ailments of the soul.

The air we breathe is one of our most precious natural resources, though only recently have we come to think of it as such. For centuries the atmosphere was simply there, like the forests, also once deemed so vast as to be inexhaustible.

Gradually, as with the forests and even the oceans, we have realized that the atmosphere is finite. Immense though it may be, it is also a fragile resource. Its vitality depends upon a delicate balance among its constituent elements. And that balance is continually assaulted by human activity, from heating our homes and driving our cars to spraying our hair and refrigerating our food. Everything we release into the atmosphere has an effect.

There are ominous signs: Ozone in the atmosphere—a form of oxygen that shields us from excessive ultraviolet light—is being depleted; carbon dioxide is increasing, a phenomenon some say will cause average global temperatures to rise, possibly leading to calamitous changes in food production worldwide; sulphur dioxide, a by-product of the combustion of coal and other fossil fuels, is increasing, causing acid rain.

However, because of the atmosphere's immensity, its dynamic nature, its complexity, no one is quite sure what the final outcome may be and what needs to be done to protect the atmosphere. University scientists, many among the leading experts in their disciplines, have been studying the atmosphere for several years. In this month's cover story, "Atoms in the Atmosphere," you learn why these scientists are becoming alarmed about the legacy of a polluted, depleted atmosphere that we are leaving for future generations.

Looking into the nature of things through basic research is intrinsic to a university, whether it be the atmosphere, the oceans, or a new variety of wheat to help feed the world. "Will the Fields Lie Fallow?" examines the pressures being put on researchers by changes in the nature and level of funding through grants. In "A Library to Sing the Body Electric," Paul Dienhart, editor of *Update*, takes you on a visit to an unusual museum/library of old books and electrical devices that may provide inspiration for modern inventors.

Finally, in "Writing for You," you'll read about journal writing. What has traditionally been a very private literary form is going public. Writers—professional and amateur alike—are discovering therapeutic and educational benefits through keeping a journal. You might even want to give it a try, do a little basic research into the nature of the person you *think* you know best. Who knows what you'll find?

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Steve Roszell

I'd like to believe that every one of you reads *Minnesota* magazine from cover to cover each time it arrives at your home. I'd also like to believe that every graduate reads each piece of mail from the Alumni Association, but I'm enough of a realist to understand that the demands on our time force us to be selective in what we read, watch, listen to, or attend. All of us establish attention patterns that suit our individual priorities and make us feel comfortable.

These days I'm distracted by a new sound: the beeping of digital watches. Inevitably they go off during those silences in small group meetings, practically forcing me to scan the group until I spot the culprit. The sound stands out and demands attention because it breaks through the established boundaries of our perception. Eventually we will all become insensitive to this sound. Not only will it seem ordinary, it will no longer be a distraction.

Within one 48-hour period recently, a series of University-related activities penetrated the familiar boundaries of my awareness and, like those beeping watches, demanded my attention.

It started on a Friday afternoon in May with the news that the University of Minnesota had generated more voluntary financial support than any other public institution in the country. The Council for Financial Aid to Education released statistics showing that the University attracted $62.7 million during the 1982-83 reporting period. This amount made Minnesota number three in the nation, well ahead of the next nearest public institution, 11th-ranked Michigan with $50.6 million.

The University of Minnesota total again put us in the top 20 for the 11th year in a row. More impressive, however, was the fact that Minnesota ranked well ahead of many outstanding private as well as public institutions, behind only Harvard and Stanford.

Unfortunately, the local news media treated this milestone as a nonevent. For the University and all of its alumni, though, it reflects the outstanding quality of this institution and its graduates.

The anomalies continued the next day. I was at home, just tuning in a nationally televised sports contest, when the station cut away for a local commercial. It turned out to be a 60-second public service announcement, developed by University Relations, depicting the virtues of the University of Minnesota for prospective students and other citizens of our state. I was instantly alert to the significance of this announcement. The University plans to aggressively develop its relationship with the community and with prospective students, and this public service announcement represented a beginning of this effort.

Later the same day I took my family to the Gophers' annual spring football scrimmage. This is a traditional spring activity for my family but before this year it has meant an afternoon outing to cold bleachers in Memorial Stadium or, more recently, to a chilly spot behind Bierman Field Athletic Buiding. With the arrival of coach Lou Holtz this year, it became an evening outing to the Metrodome, with promises of large crowds and lively competition.

And the promises were kept. Though we arrived an hour before kickoff, the best available seats were near the end zone, the stands were full, and the field was a crush of athletes and young autograph seekers. Nearly 43,000 tickets were sold for the scrimmage, making it the largest spring game in NCAA history. More importantly, attendance showed a crowd — families, individuals, and groups — interested in a University program as never before.

We can't ignore these events. Individually, they represent exciting milestones. Collectively, they represent a university that is alive, progressive, and reaching for excellence in a variety of directions. Let's hope we never reach a time when we tune the University out of our daily lives.

Steve Roszell, executive director of the Minnesota Alumni Association since 1979, was recently promoted to associate vice president for alumni relations and development at the University.

He's Just A Guy Who Can't Say No

By Mikki Morrissette

A near-legendary story about University music professor Vern Sutton and his heavily booked schedule dates back to 1968. One evening he finished a University Opera Workshop performance for a national convention at 8:30 p.m. in Wayzata, a Twin Cities suburb. Because of a late schedule change, the St. Paul Opera also required Sutton's services the same night. So they picked him up by helicopter—where he changed costumes—and flew him the roughly 20 miles to downtown St. Paul for a 9 p.m. stage appearance in "La Vida Breve."

Since then, Sutton says he's learned to say no more often, but his days hardly seem less full.

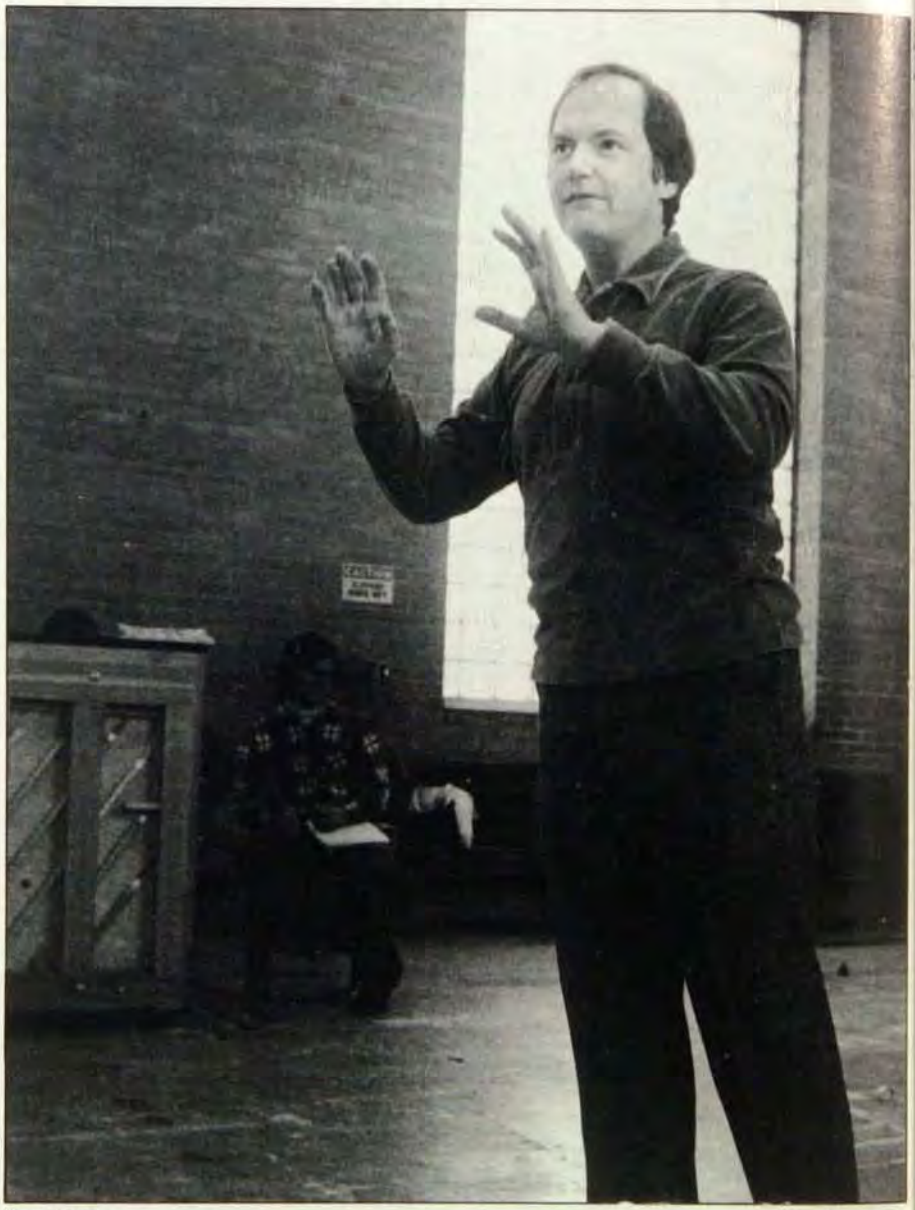
Sutton, 46, has been a Minnesota Opera Company tenor since it opened in 1963. He is an original cast member of Garrison Keillor's nationally broadcast "A Prairie Home Companion" show, which celebrates its 10th anniversary on Minnesota Public Radio this July. He has appeared in more than 700 performances with the Stagecoach Players in Shakopee. He performs with the Minnesota Orchestra, and he's done numerous recitals with local guitarist Jeffrey Van. He organizes church shows. He has directed 32 University operas in 16 seasons and this winter will revive a KUOM radio course reviewing the basic elements of music (20 half-hour sessions).

So, does the professor teach?

Sutton teaches. So well, in fact, that in 1981 he was one of seven faculty members throughout the University system to win the Morse-Amoco award, an annual honor recognizing "outstanding contributions to undergraduate education."

"I was very proud when I won that award," Sutton said. "It indicated that indeed I was giving priority to my teaching."

An Oklahoma native, Sutton earned an undergraduate degree at Austin College in Texas and worked a season in summer stock doing musical comedy at a professional theater before moving to Minnesota to study voice with former music department head Roy Schussler. He completed master's and doctoral degrees in music at Minnesota. Before joining the University faculty in 1967, Sutton studied under Luigi Ricci and conducted research for his Ph.D. dissertation in Italy on a Fulbright grant in 1966.



Vern Sutton

Many local critics have suggested that Sutton could make a living as a performer. He has been described as "that rare breed: the singer who can act." Three New York-based agents have offered to represent him. Calling his voice "more sweet than powerful," reviewers have also cited his "vocal clarity," "precise enunciation," and "dramatic ability."

Sutton, the musicologist, attempted to explain the positive public reaction to his voice in a *Minneapolis Tribune* article several years ago. "I don't have a beautiful voice, it's not your typical pear-shaped tone, so it can't be beauty of sound or beauty of tone. I'm not sure what people get from my music. It's something extra-musical. It's something about my performance that helps people understand something about the music they didn't before."

That ability to draw out music appreciation keeps Sutton in the classroom as well as on the stage. "I really *must* teach," he said. "I enjoy

pe forming, but I could do without it. My biggest enjoyment comes from helping people learn to perform. And I think my performances enhance what I'm teaching my students. They can come to the Walker Art Center and see me do what I'm trying to teach them. At the same time, I can use my performances as a lab. I know what my students are going through, and I bring that back to the classroom."

Sutton has integrated his University and community ties in several other aspects as well.

He has performed in and produced several recitals featuring only his students' work and has directed seven operas written by five different graduate students.

As University opera workshop director, Sutton has developed a reputation for producing and encouraging modern American opera. Minnesota, in fact, recently received a new endowment because of the school's reputation for doing contemporary opera.

"Concert halls have become museums, dedicated to the music of the 18th and 19th centuries," Sutton said in the *Tribune* interview. "Our obsession with history has blunted our taste for the new."

"At the University we do unusual operas as well as the traditional. They need special encouragement," he said recently. "As a branch of academics I think it's our privilege and our duty. I don't have to sell tickets or worry about the box office like the Metropolitan Opera Company does."

Audience members know that Sutton is fascinated with interjecting the unexpected into both University and community productions. As a free-lance writer explained five years ago, "Vern Sutton would be the first to tell the emperor he doesn't have any clothes on, and yet compliment him on looking rather elegant that way. He is an iconoclast with soul."

Sutton enjoys adding new twists to recitals, such as abandoning the traditional Mozart or Bach concert openers and starting instead with a romantic, turn-of-the-century parlor song. He enjoys his work with "A Prairie Home Companion" because Keillor allows him freedom to "let my hair down," he said.

Similarly, he said, being able to pursue a frequent performing schedule has solidified a happy marriage at Minnesota. "I like to perform and teach. Many schools wouldn't give me that opportunity to do both. University administration has always encouraged me to pursue my active performing schedule in addition to my teaching career."

Schools and production companies in several other cities have offered Sutton work, he said. He turned down an entire season with the Boston Opera because it would have required an eight-week leave of absence from teaching.

"I used to find if difficult to say no," he said. "I'm now more selective about what I say yes to."

Audiences—and students—benefit from that selectivity.

Members of the winning College Bowl Team *(left to right)*: Mark Molenaar, Mark Lacy, Tina Karelson, Matt Marta, and Barney Hadden.

"Bowling" for Dollars

Before a national television audience on May 23, the University of Minnesota College Bowl team won the national championship. Minnesota defeated Princeton 165-105 in the semifinals, then bowled over Washington University of St. Louis, 205-120, in the finals.

College Bowl, first popular in the 1950s, pits teams of four in a competition to answer questions about a variety of topics such as history, literature, and mathematics. Points are awarded for correct answers and subtracted for wrong answers.

The Alumni Association has provided financial support for the University's team in the past few years to help team members revive interest in College Bowl, billed as "the varsity sport of the mind."

NBC, which broadcast the championships, awarded $20,000 to the Minnesota team. The money is to be used for scholarships at the University.

U Fares Well in Legislative Session

The 1984 session of the Minnesota Legislature ended on a positive note for the University. Although some funding requests were denied and others scaled down, the University will not be struggling with budget problems as severe as in the past few years.

According to George Robb, associate vice president for institutional relations, "By any kind of measure, the legislature's building appropriations were very responsive to the University's needs — not only for 1984, but also in terms of planning money for capital improvements in 1985 and 1986."

The legislature appropriated $58 million for planning, building, and remodeling at the University, including $21 million for renovating Smith Hall, a chemistry building on the Twin Cities campus; $8.2 million for remodeling buildings for microbiology and public health; and $2.7 million for working drawings for an electrical engineering and computer science building.

The request for 1984-85 budget money fared less well, according to Robb, but well in comparison to recent years. In a supplementary appropriations bill, the legislature approved $3.8 million for a supercomputer institute (See "The Number Crunchers," May/June 1984 *Minnesota*), $960,000 for restoration of the faculty retirement plan, and about $900,000 for six other programs.

Recovery in the state's economy and strong support of Gov. Rudy Perpich both contributed to the successful session, according to Robb.

Ten in a Row!

The University of Minnesota ranked third in the nation in the amount of private donations given to higher education institutions in 1982-83, making it the 10th consecutive year the University has been among the top 10.

The $62.7 million donated to the University by alumni, corporations, foundations, and others was more than any other public institution received. Only Harvard ($126 million) and Stanford ($91.9 million), both private universities, received more. The University of Michigan, ranked 11th with $50.6 million in donations, had the second highest level of private support among public institutions.

Dale Olseth, president of the Minnesota Foundation, credited Robert Odegard, the Foundation's outgoing executive director, Steve Roszell, Alumni Association director, and others for much of the growth in private support.

"To appreciate the University's success, one must realize that there are approximately 1,500 public colleges and universities and a total of 3,200 institutions of higher learning across the United States," president C. Peter Magrath said. "To rank number one (among public institutions) and number three (overall) among such competition is downright incredible."

Telephone solicitation is playing an increasing role in the University's fund-raising efforts. Through the TEAM program (Telepledge for Excellence at Minnesota), the foundation raised $391,148 in 1982-83. In 1983-84, TEAM callers raised more than $650,000 in pledges. Working four nights a week, student callers solicit alumni donations as well as comments. The information is used for alumni relations planning and improvement efforts.

IN BRIEF

C. **Eugene Allen,** professor of animal science and food science and nutrition, is the new dean of the College of Agriculture and associate director of the Agricultural Experiment Station. Allen began his new duties July 1.

Preston Townley, former executive vice president of General Mills, has been appointed dean of the School of Management. Townley replaces David Lilly, now vice president for finance and operations at the University.

Steve Roszell, executive director of the Minnesota Alumni Association, has been chosen to replace Robert Odegard as associate vice president for alumni relations and development. Roszell will begin his new duties August 15. A search is being conducted to find a new director of the Association.

C. Peter Magrath will end his 10-year tenure as president of the University of Minnesota to become the president of the University of Missouri January 1, 1985. Magrath announced his plans on June 18. Further information will appear in the next issues of *Update* and *Minnesota*.

Ettore Infante, director of the Division of Mathematical Science at the National Science Foundation and professor at Brown University, has been named dean of the Institute of Technology. Infante will begin his duties in July. He is a native of Italy and has been a U.S. citizen since 1964.

Richard Caldecott resigned as dean of the College of Biological Sciences, effective June 15. Caldecott, who founded the college, had been dean for almost 20 years.

FOR YOU Writing

By Lynette Lamb

June 1933

I regret nothing. I only regret that everybody wants to deprive me of the journal, which is the only steadfast friend I have, the only one which makes my life bearable; because my happiness with human beings is so precarious, my confiding moods rare, and the least sign of non-interest is enough to silence me. In the journal I am at ease.

Anais Nin

DATE: Tuesday, April 5, 1983 TIME: 6:00 am.

Although Nin wrote these words more than 50 years ago, the sentiment is shared by many journal keepers, whose ranks grow all the time. The number of local diarists has grown exponentially in the last decade, the movement's growth easily charted by the mushrooming number of classes offered in the Twin Cities.

The first University of Minnesota course in journal writing was taught 10 years ago through Continuing Education and Extension; at about the same time classes began in the Twin Cities at the Loft, the College of St. Catherine, Chrysalis Women's Center, in community education programs, and in area high schools.

During the '60s and '70s American culture began to allow, even to encourage, people to explore their internal selves. Some trace the journal's renaissance to this human potential movement; others date it more exactly to 1966, when the first volume of *The Diary of Anais Nin* was published. For many journal keepers her diaries were the first real evidence that the form could grow far beyond a simple recitation of daily events, that indeed, as Nin wrote, "the personal life deeply lived always expands into truths beyond itself."

In this I am typical: Both times I have kept journals have been periods of crisis in my life. The first was written during a high pressure summer internship in a big city far from home; the second, during my divorce. Both times I was driven by a relentless need to purge through scribbling—feelings, thoughts, activities, changes, questions, characters, ideas—everything that whirled around and around in my brain and allowed me no rest. Once the words were on paper, rest came. That the words themselves were neither careful nor profound wasn't important. What was important was the record and the inner journey it represented.

Probably two major reasons prompt people to begin recording their lives: a significant external change, such as those I experienced, or the more benign but equally unsettling feeling that "life is like a needle skidding across a record album." At least these are the opinions of Christina Baldwin, who has done a great deal of thinking about the subject. She wrote *One to One: Self-Understanding Through Journal Writing* and taught those first journal writing classes offered through extension.

Whatever the initial impulse, journal writing seems to be a form that is here to stay. At the University of Minnesota alone, courses are now offered through the English department, Independent Study (a course on tape), and Continuing Education and Extension's Split Rock summer arts program. Former students become teachers to new students, and the practitioners of the form multiply.

The journal is a good place to practice trying on changes, a good place to dream.

But the popularity of journal writing has roots other than the need to record and reflect, for these can be accomplished through other forms, such as letter or essay writing. "The journal is a form that is very personal and idiosyncratic . . . there is no wrong way to keep a journal; anyone can do it," said Phebe Hanson, who teaches the Split Rock journal workshop. What Hanson says of her class could also be said of the form itself: "There's never an evaluation, simply the telling of stories, the writing of stories, and if you wish, the sharing of stories."

Purging and recording are by no means the only benefits to be gained from keeping a journal. Becoming more honest "because the more you write the more honest you become" is, according to Hanson, another important gain to be had from journal writing. Other results are developing a keener sense of observation—you must see to record; rehearsing on paper future communications with others; leaving a mark on the world; and, for writers, experimenting with writing styles and ideas too formless to experiment with elsewhere.

All these benefits to be gained from journal writing are fairly obvious ones to the new diarist. One that is less obvious, but very important to decades-long journal keepers like Baldwin, Hanson, and Dinkytown bookstore owner Jim Cummings, is the way in which keeping a journal can actually improve the quality of one's life. "It's a mysterious process," said Hanson, "but I think that the more you pay attention to your life by writing it down, the more serious you become about the way you live." Said Cummings, who has written a journal entry every day since 1951: "By simply recording your life you will want to make it an interesting one."

Life improves not just because we increase our activities and our seriousness of purpose, but also because we increase our understanding of all human relationships by exploring our own few. "In the journal," Baldwin wrote, "we develop an intuitive intelligence about the nature of human beings that may be translated from the self to the world."

This self-awareness (and its resulting "other-awareness") is probably not the goal of the beginning journal writer, but any veteran will tell you it becomes a key one. "I think the self-understanding you gain is probably the single most important thing of all," said Hanson, who has taught journal writing for 10 years and kept a journal of her own for 15. "I didn't deliberately go into it with that in mind, but that's what happens."

In her book, Baldwin takes self-awareness a step further, suggesting that the journal is also a highly useful therapeutic tool. A trained therapist herself, currently working on a Ph.D. in psychology, Baldwin devotes most of her book to a series of exercises and topics designed to help the novice journal writer "explore various areas of content and self-knowledge." Some of the topics suggested are privacy, time structure, problem solving, mortality, and sexuality. For any subject a writer explores, Baldwin has this caveat: "You have to tell yourself the truth to have it be therapy."

For many of us, the truth is easier to manage in a journal precisely be-

Lynette Lamb is a writer for the University News Service.

DATE: Wednesday, July 27, 1983 TIME: 11:00 pm

cause it *is* private. Some would say, however, that this emphasis on privacy is changing. Hanson, who encourages her students to share their journal entries during class, thinks that the intense privacy of the form is disappearing. "The fact that we're having classes on diary keeping says a lot," she said. "If people are willing to take a course in keeping a diary you know that they're making that first step away from secrecy. It's very liberating to come out with secrets and to realize you're not alone."

Perhaps after years of journal keeping privacy seems less paramount. Said Cummings, "I used to be kind of hassled about somebody reading my journals but I've become kind of philosophical about it. I figure if anybody reads my journal they should take the consequences of doing so. If they don't like it, it's their fault more than mine because I'm not going to hype my diary."

The privacy of our past journals is probably less important than that of our current ones, Baldwin suggests. "The journal we're keeping now we'll feel vulnerable about because we haven't resolved those issues. Those we kept five years ago are less scary. It's just that as we peel back another level of self-awareness we're too vulnerable to share it."

We can tell our journals what we can't tell another human being; we can tell our journals what we can barely admit to ourselves. "In the journal I am at ease," Nin wrote. This is true for most of us. "By saying something to someone else you are making a commitment about it, taking a risk," said Baldwin. "You must deal with their response. The journal is a good place to practice trying on changes, a good place to dream."

But what we write about in journals needn't always be weighty stuff. As English professor Patricia Hampl points out in the independent study program she wrote, "There are lots of ways to keep a journal." Some she enumerates include a daily log of the day's activities, a weather journal, a dream journal, a work journal, a journal about people in your life, a philosophical or spiritual journal, a journal devoted to reading.

Cummings said he worries sometimes "that I'm not being introspective enough when I record, that I'm mostly recording physical events." He's concluded, however, that a lot of his days are spent that way, and it is still rewarding to have a record of those physical events to read years later. "I've never read an entry yet where I don't relive that day and actually remember it," he said. "And this is one of the beauties of the diaries, that you get this recall where otherwise your life would be just a chaos of events that you could remember only a few of and then only occasionally."

Journal writing veterans say it's important to accept, as Cummings has, that not every entry must be profound, moving philosophy. Hampl calls the journal "a homely form . . . not aloof at all." Says Hanson, "Just start writing. It's a book that celebrates the ordinary—it doesn't have to be something exciting."

There is no wrong way to keep a journal; anyone can do it.

Certain central issues do seem to reoccur in diaries all the same. Love, work, and power are three themes around which Mary Jane Moffat and Charlotte Painter fashioned their book, *Revelations: Diaries of Women*. Including excerpts from the diaries of many women, some famous like Anne Frank, Anais Nin, and Virginia Woolf, others relatively obscure, the compilers discuss how work and love have historically been areas of conflict for women and hence the subject of much of their writing.

The subjects Baldwin suggested that new journal keepers try writing about were topics that had consistently reoccurred in her writing or were noticeably absent. Journal writers, she said, often "forget to write about the happy things—the first daffodils, the power of a thunderstorm, the awesome moments."

It's difficult, Baldwin added, to have a truly full journal as Nin did, unless like her, you devote hours of your time and most of your creative energy to it.

Some can't even put pencil to paper, much less imitate Anais Nin. If this is your problem, Hampl suggests that your first task is to "outwit your own self-consciousness." Both she and Baldwin say that, when paralyzed by fear or blocked by insecurity, the would-be diarist should write very fast. Baldwin calls this "flow writing," which she says "allows the thoughts to tumble out of us onto the page."

But more than a facility to write, the journal keeper needs "some kind of discipline, introspection, and self-interest," Baldwin said. "There are a lot of people in the world who just don't invest in those qualities. They come home from work and eat and watch TV all night. You need a certain level of awareness to keep a journal at all."

On a humbler level, but equally important when beginning the task, is what physical form the journal will take.

The first diaries many women encounter are the small, pink, five-year diaries they received as girls. They allowed just enough room to write two or three lines a day: Today I played with my dolls. Today we learned multiplication tables in school. "This is one way girls are taught to trivialize their experience," said Baldwin. "Those five-year diaries are set up for no freedom; with their daily requirements, they make diary keeping a chore."

Baldwin uses a three-ring notebook because she likes being able to choose between carrying an entire volume or just a few loose pages to fill as the mood strikes.

For most of his 33 years of journal keeping, Cummings has been using oversized bound journals he buys from St. Paul Book and Stationery. They are dated, and he has filled every line, every page, every day for those 33 years. "At one time I had to special order my diary but now the stores stock them," he said. "To get the biggest one isn't always easy, however, and I like to have the same format."

Phebe Hanson is much less exacting than Cummings when it comes to her journal's physical format. "I always

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keep at least 15 books at any given time that are half written in," she said. "Some are small, some are large—I can never resist buying a new book whenever I see one, and I always start writing in it immediately."

Most journal keepers fall somewhere in between Cummings and Hanson, experimenting with several formats until they find one that feels right—a steno pad, a ledger, a bound book with a floral cover, a spiral notebook, a sketch pad.

It *is* vital that the book and the writing tool—fountain pen, typewriter, felt pen, or ballpoint—feel right. This is not a minor point. Said Baldwin: "In journal writing we allow ourselves to venture deep into the writing process, and the kind of notebook and writing instrument used can either foster or hinder this process by their convenience and appropriateness."

A very different physical approach, which has been explored at the Split Rock workshop for the last few years, is the visual journal. Instructor Judith Roode said the visual journal, like its written counterpart, serves "as a way of seeing more intensely, a vehicle for self-exploration, a record of one's life." Also like the written journal, the artist's visual journal can be a tool for exploring personal imagery and artistic themes.

Keeping a visual journal is in many ways a different process, however, and its most ready distinction is its physical form. Although the most common visual journal is the sketchbook, Roode and her students have stretched the definition of the visual journal far beyond that into all sorts of three-dimensional possibilities.

Roode's own visual journal is a basket she keeps in her studio, into which she tosses any visual image that interests her—a magazine ad, a sketch on the back of an envelope, a leaf, a bone, a photograph. One student in her class concluded that her entire home was her visual journal, which Roode agreed was a possibility.

Roode does not require that her students have an art background or training; maintaining a visual journal, she says, is much more a matter of awareness and observation than of artistic technique. What Roode said about visual journals is also true of written ones: "If you take the time to observe, you will see what is going on."

What is seen and what is going on in journal keepers' lives have both changed and stayed the same since the last century. To read diaries from other eras is to be struck by how much the concerns of life remain constant. "It's that wonderful shock of recognition," said Hanson, "that feeling that, oh yes, their lives had this too, I don't need to be as worried as I thought."

This similarity in content as well as the introspective ones more involving. "I do a lot of skimming, and some of the entries are pretty bald," he said. "They're just giving data about how many miles they covered and what the weather's like. I spend more time with the ones in which the writer is asking things like, 'Why am I on this earth?' and 'What am I doing with my time?' Those are the ones I find the most interesting."

We find the personal struggles in others' diaries meaningful because, as the honest nature of the form led family social science professor Paul Rosenblatt to use 19th-century diaries as the basis for his recent book on grief. Because he also has assigned students to keep journals in classes he teaches on grief and loss and on family relationships, Rosenblatt has a unique perspective for comparing the diaries of the last century with those of today.

> I can't imagine what I would be without it. It's not the journal itself, but the writing of it that's been important.

The chief difference, and a major reason he chose to work with 19th-century diaries, is that today's writers are much more sophisticated in the behavioral sciences, Rosenblatt said. "Even freshmen know about concepts like defensiveness. There can be a tendency to get tangled up in the jargon rather than in talking about their lives."

Rosenblatt also sees less religion in today's journals, more leaving of relationships (although no more relationship pain), and more men willing to explore their feelings in their journals.

By contrast, said Cummings, many of the 19th-century men's journals in his collection are external sorts of journals in which the writer talks about his explorations in the west or his farming experiences rather than about his internal life.

But Cummings, who has annotated every one of his 9,800 journals, finds Baldwin wrote, "The intimate does describe the whole." To Roode one of the paradoxes of journal writing is that "the more personal, specific, and individual we are, the more likely we are to have something of importance to say to somebody else. If we are willing to go to the deepest levels of ourselves, we're bound to touch on some universal experience that has meaning to other people."

Having your own diary contain some universal truth may be something to aspire to. But what is probably more important to most journal keepers is that, as Baldwin put it, "The journal is our book."

Each journal is unique, a record of one human being's struggle to come to grips with a life. "I had to find one place of truth, one dialogue without falsity. This is the role of the diary," wrote Anais Nin. "I can't imagine what I would be without it," said Baldwin. "It's not the journal itself, but the writing of it that's been important."

Trying to explain the urgency they feel about that process, journal writers frequently end up quoting the famous diary of a 15-year-old girl in World War II Holland: "I want to write, but more than that, I want to bring out all kinds of things that lie buried deep in my heart."

ATOMS IN THE ATMOSPHERE

By William Hoffman

Extending 22,000 miles above every inch of the earth, the atmosphere is our most immense resource. But infinitesimally small changes — a matter of a few molecules among millions — endanger our invisible life support system.

Why is there air? By his own account, comedian Bill Cosby faced this profound question when he was a self-conscious physical education student at Temple University in 1960. His college sweetheart, a philosophy major with an IQ of "three-hundred thousand," used to walk around asking, "Why is there air?"

Cosby was baffled because the answer is so easy: "Any phys ed major knows why there's air. There's air to blow up volleyballs, blow up basketballs. Guys call *me* dumb, for crying out loud. Walking around asking why there's air!"

All right. Suppose there were no air, no atmosphere. Of course you couldn't breathe, but let's say you could adapt to that. If you walked outdoors, you might think you were on a stage: the sun would be like a brilliant spotlight against a coal-black background. Before the meteor showers forced you back indoors, your skin would be zapped with an instant tan, courtesy of unmitigated ultraviolet light. From the windows of your house, you would witness dramatic changes in the scenery. Trees, grass, animals—literally all life as we know it—would cease to exist.

Of course the atmosphere isn't just going to float off into space someday, gravity is not so easily denied. Nonetheless scientists have been posing some frightening scenarios: a disrupting warming trend caused by the greenhouse effect of carbon dioxide build-up; a new ice age brought on by the cooling effect of increased particulate matter in the atmosphere; threats to plant and human life from increased ultraviolet light due to depletion of the earth's ozone. They see lakes and rivers dead, forests decimated by acid rain.

What is happening to the air we breathe?

The atmosphere is constantly changing, but since the industrial revolution it has been changing in ways nature is only partly responsible for. We are beginning to realize that the atmosphere is as precious a resource as water, wood, and soil. It has been compared to cell membrane: Both its protective and permeable qualities are vital to life.

If we were as conscious of our atmosphere as deep-sea divers are of their air supply, perhaps we would do a better job of shepherding this global life-support system. Only now, when human activities have begun to threaten the atmosphere, have we begun to recognize the atmosphere as a finite resource that must be conserved for future generations. University researchers, along with scientists across the country, are examining the ways we are endangering the air we breathe and, perhaps, threatening the survival of future generations.

Studying the atmosphere

Scientists have been studying air for as long as there have been scientists, that is, for about 7,000 years. Air would be easier to study if it weren't so dynamic, if it weren't constantly in flux with the changes in the weather. At least it is stable in its makeup: Clean dry air at sea level contains nitrogen (78 percent), oxygen (21 percent), and argon (1 percent).

But some of air's trace gases—elements so rare they are measured in parts per million rather than percentages—are changing in their atmospheric concentrations. Although they compose only a minute proportion of the atmosphere, even slight changes in these trace gases can upset the delicate balance in the atmosphere. Because these gases are produced partly by human activity, we need to understand what impact our actions will have.

Three trace gases are of special concern: ozone (O_3), carbon dioxide (CO_2), and sulfur dioxide (SO_2). Understanding how they are formed and what effect they will have on the environment is the business of both basic and applied science. A number of University researchers are playing key roles in nationwide studies aimed at learning more about the behavior of these gases in a changing atmosphere.

Searching for the ozone factor

Oxygen is the most abundant element on earth, making up about half of earth's surface material and 90 percent of water, in addition to nearly one-fourth of the air. When molecular oxygen (O_2) is separated by solar energy high in the stratosphere (the layer of air between six and 15 miles above the earth's surface), it can recombine with elemental oxygen to form ozone (O_3). Farther out, at 30 miles into the stratosphere, ozone concentration is only 12 parts per million. That may not seem like much, but it is vitally important. Ozone is the only atmospheric gas that absorbs ultraviolet light, shielding the earth's surface, and us, from harmful and potentially lethal radiation.

Several trace substances are interfering with the ozone shield, and all of them are increasing their atmospheric levels. The most critical are chlorofluorocarbons—CFCs—often known by the trade name Freon. Molecules of CFC drift into the stratosphere from the

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earth's surface, where their inertness has made them useful as refrigerants and as spray propellants. They are broken down by sunlight into chlorine and chlorine oxide which in turn react with ozone, weakening the shield.

The use of CFCs in aerosol sprays was banned in the United States in 1977 after widespread concern that they were depleting the ozone layer. A drop of just a few percent could decrease crop productivity, especially of ultraviolet-sensitive crops like soybeans, and could increase skin cancer. CFCs in parts per trillion of surface air could spell trouble for stratospheric ozone.

Since 1978, University physics professor Konrad Mauersberger has been sending balloons into the stratosphere with an instrument aboard that measures ozone concentration. The instrument he uses is a mass spectrometer, invented by University Regents' Professor of Physics Alfred O. C. Nier in the 1940s and modified by Mauersberger to operate at high altitudes.

Mauersberger's balloons are launched from the NASA station in Palestine, Texas. Each flight obtains "a single profile, a snapshot" of stratospheric gas particles, Mauersberger said. His research complements other NASA projects that involve satellite and ground-based measurements of ozone.

Because his instrument is extremely precise, Mauersberger is able to obtain data crucial for calibrating other instruments in operation constantly. Information from these instruments is used to build large-scale mathematical models "that can simulate the pace of chemical reactions that are occurring in the stratosphere," Mauersberger said, explaining that there are more than 150 such reactions.

"Personally, I think the models are getting better and better," he said, adding that, with better data, scientists should be able to predict ozone change "a hundred years from now." His launchings are being coordinated with NASA satellite launchings scheduled for the next three years.

Last winter, the National Research Council, the research arm of the National Academy of Sciences, reported that new estimates for ozone depletion were reduced from the range of 5 to 9 percent to the range of 2 to 4 percent, based on better information and more sophisticated models. The NRC concluded that ozone depletion in the stratosphere is being accompanied by ozone increase in the troposphere (the layer of air extending from the earth to a height of 6 to 15 miles).

Rob Levine

Physics professor Konrad Mauersberger measures ozone concentrations in the stratosphere with a specially adapted mass spectrometer. He sends the instrument aloft, tethered to a huge balloon. When the instrument has sampled the ozone, it disengages from the balloon and returns to earth by parachute.

"There appears to be a large decrease at the higher levels of the stratosphere and an increase where jet aircraft fly," Mauersberger said. Subsonic jets release certain oxides of nitrogen (NO and NO_2) that result in increased ozone. Supersonic jets, on the other hand, inject nitrous oxide (N_2O) into the stratosphere, which depletes ozone much the same way CFCs do, locking it in a "catalytic cycle," he said.

Even though current estimates of ozone depletion are somewhat lower than previous estimates, long-term prospects are not encouraging. CFCs have no efficient substitutes in refrigeration and air conditioning, and they have excellent insulating properties. According to one report, industrial production of CFCs in the west has started to climb once again after dropping significantly between 1975 and 1980. Production has never been curtailed in the east, and, as Mauersberger noted, developing nations will probably use more CFCs as they modernize.

Ironically, at the same time that less ozone in the stratosphere threatens our well-being, excess ozone in surface air is creating a different set of problems. Normally present in parts per billion of surface air, ozone is also a major constituent of urban smog. It is produced by the action of sunlight on automobile emissions. Humans have a defense mechanism that neutralizes ozone when it is inhaled, but plants are vulnerable. In 1980, the Environmental Protection Agency established a program to estimate crop loss nationally that can be traced to air pollution. Since then, ozone has emerged as the leading crop polluter.

Sagar Krupa, associate professor of plant pathology, has studied the effects of ozone on cash crops in Minnesota. He sets up open-top growing chambers downwind of urban areas and uses filters to compare plant growth in purified and unpurified or ambient air.

"Air quality affects plant productivity," Krupa said. An "immense" plume from the Twin Cities moves westward, where ozone attacks plant chloroplasts that are exposed on the underside of the leaf. Soybeans and alfalfa are especially sensitive to ozone, he said.

In a recent study, Krupa and his University colleagues estimated that Wright County west of the Twin Cities lost 14,000 tons of alfalfa to ozone damage in 1979, compared to no loss in Nobles County in the southwestern corner of the state. Loss estimates of alfalfa statewide jumped from 35,000 tons for 1979 to 415,000 tons for 1980. (Corn and wheat also showed some loss in 1980 after no loss in 1979). The drastic difference in alfalfa production may be that in 1980 alfalfa plants tended to have their stomata (minute openings in the leaves) open at the time of high ozone concentration, according to Krupa.

Examining the effects of ozone on cash crops is a fairly new field of study. Krupa's group was the first to show evidence of ozone injury on Minnesota crops. He calls it a "unique problem" that requires an understanding of atmospheric chemistry, meteorology, and plant pathology and the aid of a computer to model crop loss trends.

CO_2: From the icehouse to the greenhouse

Most of the carbon in nature is locked up in rocks and marine sediments. Only a tiny fraction circulates in the atmosphere in the form of carbon dioxide (CO_2), where it acts as a thermostat for surface temperature through the so-called greenhouse effect.

The earth absorbs solar energy and emits infrared radiation, which is in turn absorbed by, among other things, carbon dioxide in the air. CO_2 then scatters radiation in all directions. Some escapes into space.

Rob Levine

In an average life span, a person will breathe almost enough air to empty Minneapolis' 50-story IDS building. Each breath alters the composition of the atmosphere.

As the amount of an infrared absorber such as carbon dioxide increases, more radiation is absorbed by the earth's surface and temperatures rise.

If scientists perfectly understood the carbon cycle and if the burning of fossil fuels remained constant, they could calculate what part of the expected rise in temperature is due to the carbon dioxide released when fossil fuels are burned. But carbon is keeping some secrets as it cycles through the environment.

In geological time, we are emerging from an ice age when the average temperature was two to three degrees Celsius cooler than it is today. The last warming episode was 1,000 years ago and helped the Vikings to sail as far as Newfoundland. A century from now, average global temperatures could be from five to eight degrees C higher if nothing is done to curtail the burning of fossil fuels such as coal, oil, and natural gas.

That's the view of Peter Ciborowski, a research fellow at the University's Humphrey Institute of Public Affairs. Ciborowski has studied the greenhouse effect since 1980 as part of the institute's Global Environment Policy Project under the direction of institute professor Dean Abrahamson. He is a walking compendium of facts and figures surrounding the greenhouse problem.

Ciborowski concedes that a two- to four-degree C increase in average global temperature is probably inevitable, but without concerted action now the increase could be twice that, with catastrophic consequences for agriculture. Most crop varieties are not bred to withstand changes in climate. Soil moisture would be depleted and erosion intensified. Yields would be drastically reduced, and massive starvation would ensue in countries dependent on U.S. food production.

"We have to seek a limit" to fossil fuel combustion, Ciborowski said. Waiting 30 years to begin changing from carbon-based to noncarbon-based power generation would have enormous ramifications, in his view.

The U.S. could take the lead because it burns more fossil fuel than any other nation. About a ton of carbon as carbon dioxide is released every year for every person on earth. (Breathing releases only about a quarter ton of CO_2 per person per year.) Of the worldwide total, Americans contribute about five tons per person per year, according to one report.

Last fall, the EPA and the NRC released reports on carbon dioxide and world climate. The reports concluded that the level of CO_2 will probably double sometime after the middle of the next century. A doubling will be accompanied by a global warming of three degrees C, depending on the rate of fossil fuel combustion.

The EPA report, in Ciborowski's opinion "arbitrary" in its prediction, did take into consideration the many trace gases—methane, ozone, CFCs, oxides of nitrogen, and carbon monoxide—that add to the effects of carbon dioxide. But the agency used what Ciborowski considers "very conservative numbers" in its estimate: the trace gases were thought to increase warming by at least 70 percent over the CO_2 effects. Yet a recent study indicates that these trace gases may equal, or even double, the warming effects of CO_2, Ciborowski said.

The preindustrial level of carbon dioxide in the atmosphere is estimated to have been about 270 parts per million of air. Direct atmospheric sampling of CO_2 began in 1958 and registered 318 ppm compared to 340 ppm today. But scientists are just beginning to analyze the concentrations of other infrared-absorbing "greenhouse" gases and include them in their computer models of climatic change. Indirect contributions to atmospheric CO_2 by the clearing of rain forests, though much smaller, also may have to be reassessed.

One of the biggest problems is detecting a definite sign of climate warming amidst the "noise" of a dynamic atmosphere and shifting oceanic currents. Since 1940, average global temperatures have exhibited a cooling trend except for 1981, which was the warmest year on record in the northern hemisphere. In 1982, the eruption of the Mexican volcano El Chichon is believed to have had a cooling effect on global temperatures.

University agricultural climatologist Don Baker doesn't think there has been a clear signal yet. In any event, the expected temperature increase probably has been exaggerated in its predicted effects, he said.

"You get the idea that there will be this tremendous heat, with temperatures here in Minnesota like those in Phoenix and cactuses growing in the backyards," he said. "Actually, temperatures here may become more like those of southern Iowa and northern Missouri.

Baker thinks there should be room for disagreement on the greenhouse effect. He cites the example of Sherwood Idso, head of the Institute for Biospheric Research in Tempe, Ariz., and a 1964 graduate of the University's Institute of Technology. Idso is regarded by many scientists as an outlaw on the CO_2 matter because he has questioned the reliability of current climate models and the motives of the National Academy of Sciences, which he charges is promoting "science by decree."

In Idso's view, the greenhouse effect, rather than melting polar ice, raising ocean levels, flooding coastal lowlands, and disrupting agriculture, will benefit a hungry world. Higher concentrations of atmospheric CO_2 will aid plant photosynthesis, translating into abundant yields.

Other scientists also have argued that there are serious discrepancies between how the atmosphere actually works and how mathematical models show it works. One of the unknowns is whether there is a natural self-regulating mechanism in the atmosphere that would compensate for increased surface temperatures. If there is, it may be in the clouds.

Clouds reflect some of the incoming solar radiation back into space. If warmer temperatures create more cloud cover, this bouncing off might offset the greenhouse effect. Though there is a flurry of activity now in cloud physics, such a mechanism has not been described so far, Ciborowski said. He, for one, wouldn't count on it.

Strong rain and sulfurous vistas

Besides altering the equilibrium of stratospheric ozone and the carbon cycle, we may be upsetting the natural sulfur cycle by loading the air with sulfur compounds from fossil fuel emissions. According to one estimate, nearly half of the 500 million tons of sulfur dioxide released annually is thought to be the result of human activity, and the percentage is growing.

Whatever effect we are having on the sulfur cycle, we are clearly upsetting delicate aquatic ecosystems in Scandinavia and the northeastern United States, and now forests in West Germany and along the Atlantic seaboard are showing the damaging effects of acid rain. Indeed, it is estimated that two-thirds of the land area of North America receives acid precipitation.

The power plant emissions mainly responsible for acid rain contain large amounts of sulfur dioxide (SO_2) gas. SO_2 is transformed into sulfuric acid in the atmosphere and returns to the earth's surface in acidified rain or snow, sometimes hundreds of miles from its source. If the ground soil where it falls has poor neutralizing capacity, lakes and streams in the area will eventually become acidified. In a manner of speaking, they die.

Ecology professor Eville Gorham is an internationally recognized pioneer in the study of acid rain. In the 1950s, while investigating peat bogs in northern England, Gorham identified sulfuric acid in rain when the wind blew in from the industrialized regions to the south and east. He also happened to be living in London in 1952 when sulfur dioxide smog killed several thousand people in a week.

Despite the difficulty in tracing environmental damage to specific sources, there is "no doubt" that air pollution is the culprit behind acid rain, Gorham said. Acid rain, which can contain nitric and hydrochloric acid, in addition to sulfuric acid, destroys lakes and forests and is a major factor in pipeline and building corrosion, he said. In addition, acid sulfate particles that contribute to acid rain "are in the size range that penetrates deep into the lung," and may well be a factor in lung diseases, according to Gorham.

Soil scientists have suggested that acid rain can have beneficial effects on croplands low in sulfur, but Gorham argues that farmers already know very well how to treat sulfur-depleted soil: "They apply fertilizer."

Recently, scientists reported in the journal *Atmospheric Environment* that a tracing method involving the element selenium, which accompanies other smoke stack emissions in certain concentrations, successfully linked a sulfate haze in the Shenandoah Valley to Midwestern coal-fired power plants. Gorham believes that for years there has been enough evidence on which to base legislation to reduce emissions.

Minnesota representative Gerry Sikorski introduced a bill in Congress last year that would tax industries using nonnuclear-powered plants to generate electricity, with the aim of reducing sulfur dioxide by 10 million tons. Senator David Durenburger also proposed legislation to control emissions.

Sikorski's bill failed in committee in early May and Durenburger's was never seriously considered, according to David Thornton, acid-rain coordinator of the state Pollution Control Agency. Acid rain legislation "appears to be dead this session," he said.

In Minnesota, no serious damage from acid rain has occurred yet. "We haven't seen any clear evidence of lake acidification," Gorham said, adding, however, that the poor buffering capacity of soils in northeastern Minnesota makes that area especially vulnerable.

The PCA announced in May that it would publish a weekly index comparing the acidity of normal rainfall with rain collected at nine sampling stations across the state. The agency estimates that 2,500 lakes and 3.5 million acres of forests are sensitive to acid rain damage.

In a three-year analysis of rain chemistry downwind of the Northern States Power coal-fired plant in Sherburne County, Sagar Krupa, Gregory Pratt, and Michael Coscio of the University's plant pathology department found no definite trend in the ionic components of rain that might indicate increasing acidity. Their findings confirm other studies' findings that sulfur dioxide emissions are distributed in the atmosphere in a highly complex and as yet poorly understood manner and may have longer-than-expected residence time.

This long life would come as no surprise to Peter McMurry and James C. Wilson of the Particle Technology Laboratory in the Institute of Technology. They study the formation of aerosols—fine solid or liquid particles suspended in the atmosphere. They are mainly interested in sulfate aerosols, both near the earth's surface and in the stratosphere.

In the presence of radiant energy, sulfur dioxide combines with water vapor to form sulfuric acid aerosol, a gas-phase chemical reaction. Sulfur dioxide can also dissolve in a suspended water droplet, again forming sulfuric acid aerosol, this time in a liquid-phase reaction. The latter reaction, which tends to occur more frequently at high humidity, is the reaction McMurry is currently trying to decipher.

In the laboratory, McMurry has been able to trace a particle from its molecular beginning. Data from his field and laboratory experiments are then used to construct numerical models of aerosol behavior in the atmosphere, a problem of batfling complexity. (Aerosols are in constant motion, Brownian motion.)

Particles formed by the chemical reaction of aerosols have certain optical qualities that produce a characteristic haze. These particles are about one-half micron in size (a human hair is about 50 microns in diameter), and they scatter light. Larger particles do not produce a haze, McMurry said.

Wilson is currently analyzing the concentration of stratospheric aerosols and how they are formed. He and two undergraduate students developed an instrument—a condensation nucleus counter—to measure the concentration of submicron particles. This information helps Wilson to estimate the rate at which sulfur dioxide is converted to sulfuric acid in the stratosphere.

After the eruption of the Mexican volcano El Chichon in 1982, Wilson took his instrument to California where it was placed aboard a NASA U-2 airplane along with other instruments and flown into the stratosphere to do its work. Once data collected by the instrument are analyzed, they will be compared with measurements taken from satellite, balloon, and ground-based instruments and used to test computer models of gas-to-particle conversion rates.

Wilson's instrument refines a system first used by the French. "We developed the concept further," he said, adding that the condensation nucleus counter "has helped us to test our understanding of mechanisms responsible for forming sulfuric acid aerosols in the stratosphere.

It has been suggested that stratospheric sulfuric acid may be responsible for pitting aircraft windows, but some scientists think it also may influence the earth's climate. Stratospheric aerosols both absorb and scatter radiation. A warming of the stratosphere has been confirmed, Wilson said. He would like to know if the increased concentration of aerosols is cyclic or steadily building.

Scientist Carl Sagan has written that stratospheric aerosols may be generated by the incomplete burning of fossil fuels, but volcanic activity is considered to be a more important factor. The eruption of El Chichon ejected millions of tons of gaseous sulfur dioxide into the stratosphere and produced a cloud 100 times denser than that of Mount St. Helens in 1980. Wilson is in the process of analyzing data taken after the eruption and comparing them with those from balloon instruments to get a picture of sulfuric aerosol formation in regions of the stratosphere sampled by the U-2.

Jerome & Nancy Borucki

Mechanical engineering assistant professor James C. Wilson uses U-2 airplanes — high-flying aircraft also used for espionage — to study the formation of aerosols, the fine solid or liquid particles suspended in the atmosphere. A condensation nucleus counter housed in a wing tank of the airplane measures the concentration of submicron particles.

The information should deepen our understanding of the ways volcanoes can alter global climate. El Chichon is estimated to have had a maximum effect of .2 degree C two months after the eruption, when a stratospheric cloud of sulfuric acid aerosol was reported to be fully formed. Some scientists have suggested that El Chichon also contributed to El Nino, the sudden change in atmospheric and oceanic circulation in the equatorial Pacific during the winter of 1982-83.

Mathematical models and supercomputers: An answer for the future?

Ozone, carbon dioxide, and sulfur dioxide are not the only ingredients in the air that are drawing the attention of scientists, policy makers, and the public. They are the most important ones, however, because their effects are global. Together, they compose only a tiny fraction of ambient air, but they have the potential to change living conditions for future generations.

Atmospheric research, as we have seen, relies heavily on mathematical modeling. Large-scale computation allows the scientist to simulate the activity of complex and dynamic physical systems like the atmosphere. Theoretical, experimental, and computer scientists interact in this problem-solving process.

Because the problems are so complex, the fastest and most powerful computers are required. In this respect, the University is at least a step ahead of most research institutions. (See "The Number Crunchers" in the May/June 1984 *Minnesota*). But the complexity of current mathematical models is limited by the capacity of computers to execute them. As fast as current machines are (the University's Cray-1 supercomputer can make a million calculations a second), they are not yet fast enough to address satisfactorily many of the problems of the magnitude posed by the atmosphere.

On the other hand, scientific computing is only about 25 years old and has already proven an indispensable tool to researchers studying the air. Perhaps the biggest uncertainties will not be about how the atmosphere works but whether we are willing and able to protect it from ourselves.

A LIBRARY TO SING THE BODY ELECTRIC

Alumnus Earl Bakken's old books and devices demonstrating the early medical uses of electricity could provide inspiration for modern science.

By Paul Dienhart
Photos by Tom Foley

Bakken Library curator Albert Kuhfeld demonstrates the rare d'Arsonval Spiral, a giant induction coil that broadcast radio waves at the patient.

A Tudor-style mansion on the western shore of Lake Calhoun is, very possibly, the only place in the world to find a d'Arsonval Spiral. A six-foot-high circular cage, looking like a gigantic Chinese lantern stripped of rice paper, the d'Arsonval Spiral was used in the late 19th century to treat patients with diseases ranging from gout to cancer to syphilis.

It worked—sort of. The metal spiral was a giant induction coil that beamed radio waves when hooked to a generator. Although it was no all-purpose cure, the spiral's high frequency waves had a heating effect on tissue—a forerunner of the modern electrotherapy of diathermy. "It's the same basic principle as the microwave oven," explained Albert Kuhfeld, curator of the Bakken Library of Electricity of Life.

The library offers a surprisingly full vision of the early uses of electricity. For almost 200 years before the development of the electric motor, the only practical use of electricity was for medical therapy.

At first glance it is easy to regard these old medical apparatus as wonderfully eccentric creations from a mad scientist's basement. One might chuckle at the mixture of ignorance and outright quackery involved in the early days of electricity. But a guided tour

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Paul Dienhart is the editor of ***Update****.*

of the library reveals medical artifacts that anticipated today's electrosurgery, heart pacing, and electrocardiography. Old ideas like electrostimulation for the relief of pain are under scrutiny again.

Earl Bakken ('48, B.S., electrical engineering) did not begin collecting the old books and devices of electrotherapy because they were amusing curiosities. "There was tremendous insight 200 years ago," Bakken said. "People had the ideas, they just lacked the technology to put their thinking into practice. I think there are a lot of inventions at the library that remain to be rediscovered. That's part of the reason we're trying to promote the use of the library by scholars.

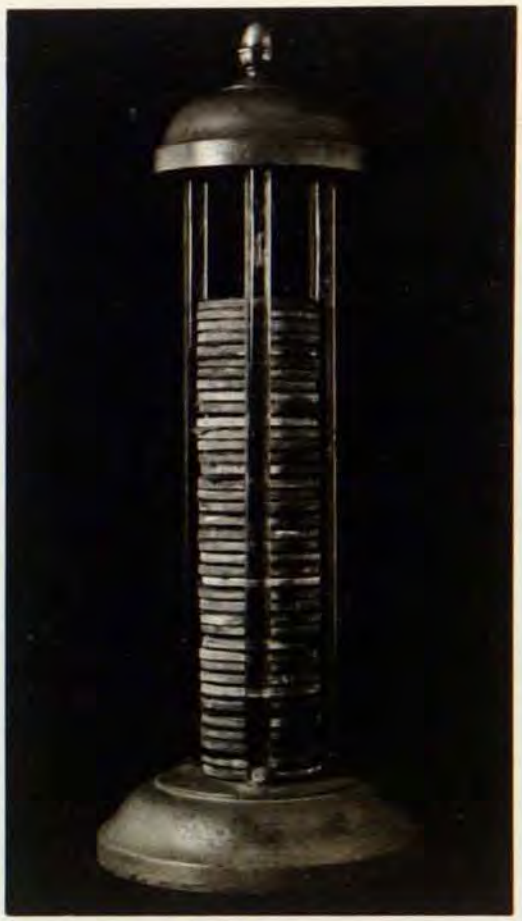
"Heart pacemakers go back to 1850," continued the inventor of the first wearable pacemaker. "We have a book from 1788 that refers to a DC defibrillator, the same concept that is now being used to help heart attack victims."

Bakken began the collection 18 years ago because of his interest in the history of pacing, the idea of electrically stimulating the heart to rhythmically contract. Medtronic Inc., of which he is cofounder and chair of the board, is the world's largest manufacturer of implantable battery-powered pacemakers. In 1958, working with University of Minnesota pioneer heart surgeon C. Walton Lillehei, Bakken succeeded in making the first pacemaker that patients could wear instead of wheel around. In 1981 the University honored Bakken with its alumni Outstanding Achievement Award.

Over the years the collection expanded to include all uses of electricity in early medicine. Bakken donated his personal collection to a foundation formed in 1975, and the next year the books and devices moved into West Winds, the Lake Calhoun mansion built in 1930 as the dream home of W.E. Goodfellow, best known as the Minneapolis dry goods merchant who sold out to a man named Dayton.

"The collection is the envy of the Science Museum of London," said John Senior, director of the Bakken Library, who formerly ran the History of Medicine Museum in Toronto. "We're especially strong in the 18th and 19th centuries," he said, pointing out a recently acquired lab instrument used in the 1800s by French scientist Etienne Marey to detect the shock of the electric torpedo fish.

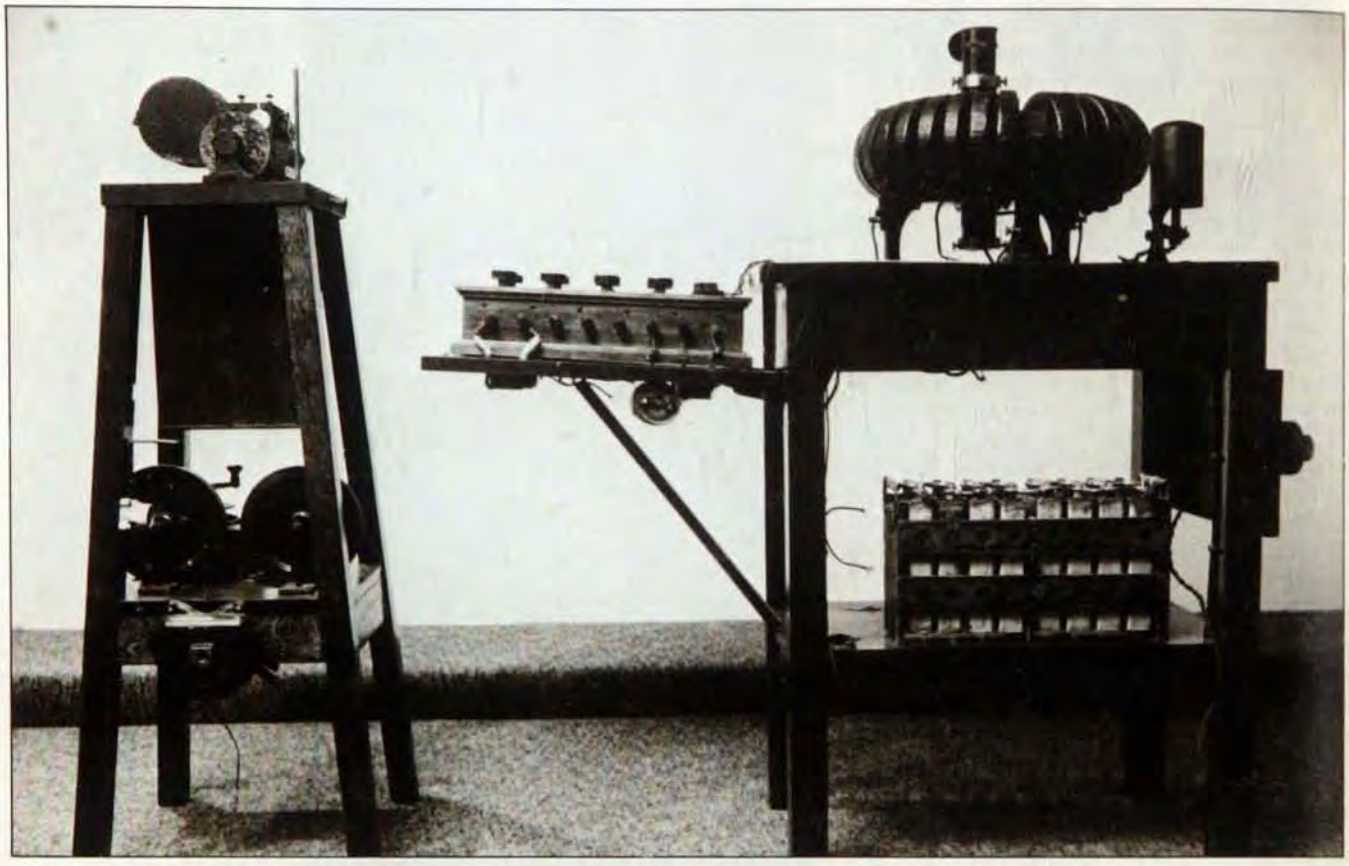
Although the library does not have the first electrostatic generator, built in 1660 by Otto von Guericke, it does have a replica. To demonstrate it, curator Kuhfeld spent a smelly time melting sulphur to form what looks like a yellow softball on a stick. "Von Guericke didn't know he had built a generator," Kuhfeld said. "He designed it as a model of the earth to show why people didn't fall off the southern hemisphere. He chose sulphur because in alchemy it represented the earth principle." Rubbing the ball with one's hand makes it crackle and pop as it attracts bits of feathers and chaff with static electricity.



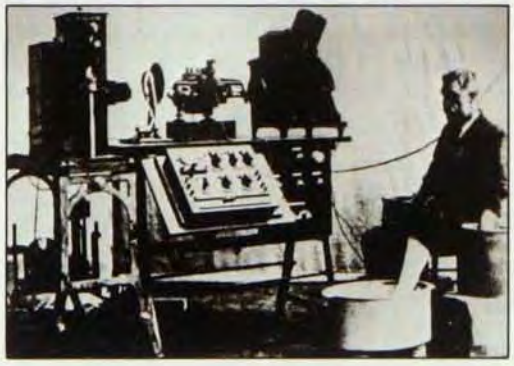
The voltaic pile, 1800, provided the first continuous source of electric current. Alessandro Volta's invention showed that "animal electricity" could be produced using solely inanimate materials. Until then there was much support for the theory that electricity was a special property of animal matter.

The 1,000 early electrical devices in the collection are a sort of "three-dimensional library," Bakken said. "Authors of books written hundreds of years ago didn't have modern terms to describe electricity or disease. It's hard to know exactly what they're doing when they describe their experiments in writing. But if we have the actual instrument they used we can make the necessary measurements to fill in the missing or unclear data."

The heart of the collection is a humidity-controlled vault containing some 12,000 rare books, manuscripts, and journals. "These are the kind of books usually seen as pictures in textbooks. We allow scholars to use the original books," Bakken said. Among the library's treasures is a 1751 first edition of Franklin describing electricity in terms of the positive and negative flow of electrons. There are manuscripts written in Latin that predate the printing press and six books printed



The most perfect scientific instrument ever made: That's what this electrocardiograph (EKG) machine (above) from 1913 has been called. The first EKG machines (right) filled two rooms and required five technicians for operation. The patient stuck both hands and the left leg into buckets of water.



before 1500. "It's amazing to think that books on the electrical treatment of disease were contemporary with the Gutenberg Bible," Bakken said.

The book collection was built under the guidance of Judith Overmier, curator of the University's Biomedical Library. She and two other University professors, Roger Stuewer of history of science and technology and Harrison Tordoff of the Bell Museum of Natural History, are members of the Bakken Library's board of directors. It's not surprising that its resources complement the University's. For example, two of the three volumes of a 1280 science encyclopedia can be found at the Bakken Library, the third volume at the University.

A particular favorite of Bakken's is an 1818 edition of Mary Shelley's *Frankenstein*. It reminds him of his boyhood when he watched every Frankenstein movie that came to Minneapolis. "I think those movies first got me excited about the possibility of using electricity to reanimate people," Bakken said. He also enjoys browsing through an 1802 physician's reference on electrical treatments for *every* disease. A doctor who recently conferred with Medtronic on electrical methods for treating burns wondered if the idea was new. Perhaps, but the 1802 book contained a treatment for it too.

Many of these early treatments, if they didn't do harm, could most kindly be said to have had a placebo effect. This tradition carried over into the 20th century, exemplified by the library's collection of devices and letters of the notorious Dr. Albert Abrams (more about him later).

The origins of electrical quackery can be traced to Anton Mesmer who claimed in 1778 that disease was a result of an imbalance in a "universal fluid" and that it could be controlled by a method he called "animal magnetism." Mesmer had the cream of Parisian society sitting around in tubs filled with iron filings, soaking up the universal fluid. He also employed trances and convulsions and preached the importance of suspending dis-

Classic Experiments Come Back To Life

Glass cider jugs, aluminum foil, and coat hangers are among the materials that might help increase students' scientific literacy.

This fall in 19 high school physics classrooms around Minnesota, students will be repeating classic experiments first performed by the likes of Franklin, Faraday, and Cavendish. Using simple replicas of 18th- and 19th-century science devices, the students will discover physics principles in the same way as the great names of science.

This will happen because their teachers are taking a course this summer at the Bakken Library to make replicas of the instruments and duplicate the experiments of the science pioneers.

"Not only can these devices teach the fundamental concepts of physics, they can show students how scientific knowledge is created," said Russell Hobbie, associate dean of the University's Institute of Technology and director of the summer project. Funds to pay tuition and provide $450 stipends for 15 of the 19 high school teachers come from a Minnesota Department of Education teacher improvement grant.

The monthlong workshop, called History and Development of Physics: The Art of Experiment, is being taught by Samuel Devons, who heads the history of science teaching lab he founded 17 years ago at Columbia University. During Devons' visit to the Bakken Library last year, Hobbie got the idea for the course, which provides graduate degree credits from the University's physics department.

A historical method of teaching science seems to be gaining momentum lately. In France, from the president on down, the nation is promoting the thought of Denis Diderot, a man who died 200 years ago. Diderot wrote a 25-volume encyclopedia to explain science to what was essentially a literary culture. That's exactly the kind of communication needed today, say the French officials.

Karen Fleckenstein's ambition is to teach introductory physics at a small college. The University Ph.D. candidate in the history of science and technology used references at the Bakken Library to prepare a recent journal article on the "rheoscopic frog." Before instruments were developed to detect the weak electric signals of animal muscles, scientists used the sensitive sciatic nerve of the frog leg. "I think the history of science offers a great way to show what science is about," she said.

One of the instruments the high school teachers are building this summer is a simple electrostatic generator from the mid-18th century—the first cheap and readily available generator. Variations of it were used by people like Benjamin Franklin to figure out some of the early principles of electricity. "If enough dilettantes have a chance to fool around with a contraption they just might figure something out," said Bakken Library curator Albert Kuhfeld.

Hoping that the same might be said of high school students, their teachers will make a generator out of a glass cider jug that turns on a crank and rubs against a leather pad. The static electricity this friction produces is held to the glass with a piece of oiled silk. The electricity can then be transferred by spikes projecting from a collector made of wood and wrapped with aluminum foil. From here the electricity can be discharged or drawn off into a storage device called a Leyden jar. A group of Leyden jars was called a battery, after the word for a bunch of cannons; Leyden jars could store a wallop of a charge.

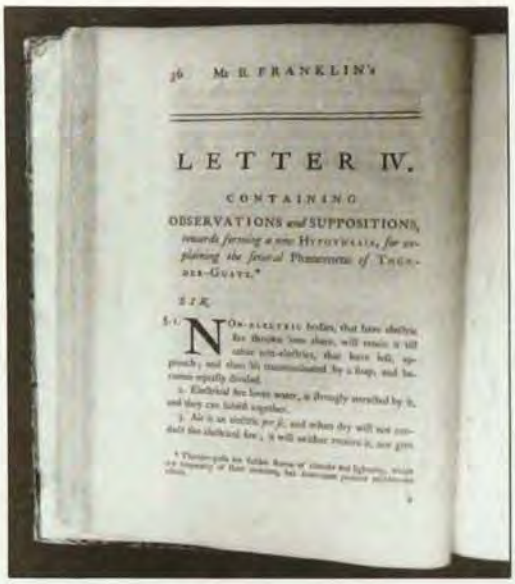
This summer 19 high school physics teachers from around Minnesota will be making devices like this electrostatic generator from the mid-18th century.

Science education is an important aim of the Bakken Library, said Earl Bakken. "What I dream about is building an addition that would allow students to come in and get some hands-on experience with electrical experiments. Along with that we need a small auditorium for teaching."

Until changes in the building allow regular visits by classes of students, the Bakken people are thinking of a stopgap measure. "We've done 18th-century lectures on physics using the devices in the collection," said the library director John Senior. "We'd like to videotape the lectures and make them available to schools"

Meanwhile, don't be too surprised if a high school student starts explaining to you how the class repeated Henry Cavendish's 1771 experiment to determine the law of force between electric charges.

A prize possession of the Bakken Library is a first edition of Ben Franklin's 1751 book on electricity. It contains the first description of electricity as the flow of positively and negatively charged particles.



36 Mr B. FRANKLIN's

LETTER IV.

CONTAINING

OBSERVATIONS and SUPPOSITIONS, towards forming a new HYPOTHESIS, for explaining the several Phænomena of THUNDER-GUSTS.

SIR,

The tingling current of this drugstore machine was promoted as a tonic to cure headaches, nervousness, rheumatism, and a host of other maladies.

belief—a tenet of quacks throughout history. One of his most enthusiastic followers was the Marquis de Lafayette, who tried to convert George Washington to the movement.

The popularity of the mystical Austrian alarmed the French court, and the king appointed a commission to investigate Mesmer. Among the royal investigators was the world's foremost authority on electricity, Benjamin Franklin. His famous kite and key experiment proved the electrical nature of lightning and led to Franklin's development of the lightning rod. Property owners were deeply grateful for this simple method of preventing their houses from burning down.

In one of history's weird connections, Franklin was sitting in Mesmer's salon when he heard a musical instrument that made the eerie sound one gets when circling the rim of a glass with a wet finger. Franklin designed a version of this instrument with a series of glass bowls revolving on a central shaft. A "Glass Armonia" constructed by Franklin himself is owned by the Bakken Library, which often turns into a musical salon on weekends. The paneled hall of the library lends a rich sound to the string quartets, harpsichordists, and pianists who play there.

Despite Franklin's musical debt to Mesmer, he joined the royal commission in denouncing the claims of animal magnetism. Geoffrey Sutton, who has a doctorate in the history of science from Princeton, has researched the rise and fall of mesmerism while working under the joint fellowship program sponsored by the Bakken Library and the University. Sutton found that the secrecy surrounding Mesmer's beliefs contributed to their debunking. But there was also the matter of social status. Material at the library indicates that better connected contemporaries of Mesmer were honored for holding similar beliefs. A crucial difference, however, was that these healers were "electricians" who employed the demonstrable force of electricity.

Both electricians and mesmerists saw disease as a deficiency in "an imponderable fluid." One of the first electrical devices designed for medical use was an electric bath, where the patient was hooked by wire to a hand-cranked friction generator. The Bakken Library has a particularly ornate example from 1770. To enhance the effect of bathing it even has what appears to be a sit-down shower stall with curtain.

By the 19th century hand-cranked static generators had developed to the point of delivering 100,000 volts. Some doctors used massive shocks to free fused limbs without surgery. This method may have been better than risking infection on the operating table in the days before antiseptics. An early electric blanket used to produce a germ-killing fever was certainly preferable to the alternative: deliberately infecting the patient with malaria.

Electric machines were so common in doctors' offices around the turn of the century that they appear in some of Norman Rockwell's nostalgic paintings. There is evidence that the machines were used to resuscitate patients in cardiac arrest, just as a defibrillator would be used today.

The early 1900s were the time of the patent medicine craze, and electric medicine found a place in that movement. Electric belts—strings of small batteries soaked in vinegar to generate a weak current—were very popular. Advertising described their healing properties as "multifarious," claiming to cure every-

thing from paralysis to writer's cramp. "Even though our focus is pre-1940," Kuhfeld said, "every so often I pick up a *National Enquirer* to keep up on the latest electric wonder cures."

Few took electric quackery further than Dr. Albert Abrams, a leading member of the California Medical Association who seems to have run into some money problems around the turn of the century. Abrams, who appears in pictures to be a beneficent old doctor with a goatee and pince-nez, invented the Hemodimagnometer. Scientists had then recently discovered that colors of light differed in their frequency of vibration. Abrams proposed that all disease was a result of bad vibrations. By simply putting a sample of blood in his Hemodimagnometer he claimed to be able to diagnose the disease vibrations. A cure, then, was a simple matter of reversing a dial 180 degrees. His favorite diagnosis was "bovine syphilis."

By 1923 there were 3,500 therapists using Abrams' push-button medicine. An amazing number of people testified that they had been cured. The therapy was defended by muckraker Upton Sinclair and by detective writer Arthur Conan Doyle. In a statement that gives little evidence of a Sherlockian keenness of mind, Doyle marvels over Abrams' machine: "Approach it to the antenna. There comes a buzz every 30 seconds. That is syphilis."

The Bakken Library has several of Abrams' machines, including one in working order. Housed in an art deco cabinet, it has a glowing light, a dense facade of switches and dancing dials, and a steady hum. The back of the machine had been sealed with pitch to hide the fact that most of the switches and dials were functionless.

"The machine itself was a lie," said Kuhfeld, who took it apart to restore it. "And it was shrouded in secrecy, another characteristic of quackery.

"The danger of being too free with the word *quack* is that the term could be applied to people we simply don't agree with. There's a difference between a quack and a crank. The big trouble comes when a quack gets hold of a crank's idea and runs with it. Then there's the problem of people being overly enthusiastic. The Chicago Magnetic Shield Co. claimed that 'more people die every year in consequence of cold feet and limbs than any other cause.' They sold battery-powered foot heaters. They had something, they just got carried away."

Scholars examining the Bakken Library materials are likely to find both ideas that were carried too far and, more importantly, ideas that were never taken far enough.

The Bakken Library, 3537 Zenith Ave. in Minneapolis, offers guided tours to the public by appointment only. Call 612/927-6508 for information.

Some quacks used electricity to promote push-button medical cures. This Hemodimagnometer of the notorious Dr. Albert Abrams gained thousands of adherents early in this century.

Will the Fields Lie Fallow?

Diminishing funds for basic research could be the academic equivalent to selling the farm.

by Sara Saetre

Basic research is like Minnesota farmland: A frozen chunk of it at the end of November doesn't look like much. It takes stubborn hope and imagination to picture the hedgerows of lilacs, the wheat, the nodding stands of sunflowers that the summer sun will shine on.

In the meantime, we risk not seeing the connection. Between November and May we could rip out the lilac hedge to make room for a satellite dish. Or give up on the bleak old farm and move to Florida.

Faculty members at the University of Minnesota wouldn't dream of doing any such thing with their research. It's part of their professional commitment. Even though a manila folder stuffed with a research report doesn't look like much, they can imagine the possibilities. They are long on stubborn hope.

They know that by investigating the nature of things through basic research, they continually renew and replenish our shared storehouse of knowledge. They dig deep into all that makes our universe mysterious. Sometimes they come up empty-handed, sure. That's part of the gamble. But they believe that in the long run, the breakthroughs will occur precisely where they are least expected: in the most obscure, or innovative, or farfetched projects.

Their results are impressive and, in many cases, produce incredible returns. For example, researchers at the University developed the phenomenonally successful Era wheat variety, which is now planted on three-fourths of Minnesota's wheat acres. From 1973 to 1982, Era yielded an additional six billion loaves of bread in the state. It had an economic benefit as well, bringing an estimated $267 million in added income to Minnesota farmers.

The story doesn't end there. A still newer wheat variety, Wheaton wheat, has just been released by University researchers. Tests show it will outyield Era by six bushels an acre. Though Wheaton's full impact is yet to be measured, it is clear that continued research is essential to continued progress.

Other achievements of University faculty are too numerous to list. Some examples in the humanities are the accomplishments of Dominick Argento, who won a Pulitzer Prize for his song cycle "From the Diary of Virginia Woolf." Studio arts chairman Warren MacKenzie has been named one of the world's greatest living ceramicists by an open poll of readers of the prestigious *Ceramics Monthly* magazine.

Scientific contributions include the first successful implantation of an artificial heart valve, development of the taconite process, elimination of wheat rust and other plant diseases, and isolation of uranium isotope U-235, which led to nuclear fission.

But today concern is growing across the country about the future of basic research. Research depends largely on federal government funding (which pays 80 percent of the sponsored research bill at the University of Minnesota — over $75 million in 1983). It also relies on the backing of industry and, ultimately, on public attitudes about it.

Risks to the future of research are posed by the agendas being set for it by all these funding sources. Although much is vigorous and healthy in support for basic research, there are also dangers, dangers that many experts feel we cannot afford to overlook.

First, the availability of federal funds for research reflects a narrow emphasis on science and technology, rather than a holistic approach balancing the sciences and the humanities. Some say that one without the other is impoverished and ultimately self-defeating.

Second, federal spending in all areas of research has not kept pace with inflation and rising costs of super-sophisticated equipment. Since the federal government is the largest underwriter of sponsored research (research paid for by sources other than the University or special state appropriations), a competitive scramble has developed for the

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Sara Saetre is a graduate student in journalism at the University.

limited funds. According to the University's Office of Research Administration, federal research expenditures in 1983 were $75 million, a significant drop from $79 million in 1982. The decline may mean fewer innovative proposals are accepted and fewer young investigators receive funding. It may also mean that proposals that can't forecast practical applications lose out.

Third, a newly emerging relationship between industry and university research is being cemented. While many administrators and faculty welcome the partnership, others warn that it, too, raises questions for the future of research.

"We may be in a particularly critical time," says Judson Sheridan, associate dean of the Graduate School. Sheridan administers the General Research Fund, which tries to pick up the slack in funding from conventional sources. He believes that the scramble for money may leave behind important projects in all disciplines. Some areas are more hard hit than others.

"The situation is absolutely *terrible* when you get outside the sciences," says Sheridan. "There's just not money at the national level, or the foundation level, or anywhere."

The National Endowment for the Humanities and the National Endowment for the Arts are two of the few sources of grants for scholars in the arts, philosophy, languages, and literature. The 1983 grants of $2.5 million to the College of Liberal Arts are minuscule compared to about $19.4 million granted to the Institute of Technology.

"Support for technology is certainly worthwhile," says Sheridan. "However, technology has been so much identified as the goal that, in some peoples' minds at least, there is a risk that basic research will suffer."

Knowledge — our understanding of the deep-down nature of things — is threatened by the lopsided approach, according to Sheridan. Advances in science and technology without accompanying advances in the humanities could leave us "a population of technologists," he warns.

"How can we handle any problems with social or moral implications — like those of genetic engineering, if we don't have a proper understanding of the human situation? What we need is a balance."

Kent Bales, chair of the University's English department, also notes the "relatively few" opportunities for sponsored research (research paid for by sources other than the University) in the humanities. While fellowships may help, sponsored research funding is still severely limited in these disciplines.

Bales has been on the English faculty for 17 years, but submitted his first sponsored research proposal just last fall. In fact, the proposal is the first ever submitted by an individual investigator in the department. Titled "The Reception of American Literature in Hungary since 1945," the study would explore how the social contexts of American and Hungarian readers affect their readings of the same texts.

The National Endowment for the Humanities should decide by next fall on Bales' request for $163,761 in funding — a small sum in today's grant marketplace.

Humanists may be reluctant to seek research funding for several reasons, Bales explains. For one thing, they think of research as "something they do in the course of teaching."

For another, humanists often reject "the market notion of research," as Bales puts it. That is, they dislike competing for grant money because it tends to pit individual faculty members against one another. Sometimes the contest becomes one between disciplines — with the humanities on the losing end.

For example, Bales says the Nixon budget cuts for sponsored research in medicine caused the University to pick up the salaries of tenured professors in the sciences from its own budget. One result of that reallocation and further retrenchment was that "faculty members in the College of Liberal Arts were dropped," says Bales. "We're more expendable because we don't generate money for the University."

Like it or not, generating money for the University is an unspoken — but real — expectation of faculty members. To some extent their academic careers are measured by their grantsmanship savvy.

A recent advertisement in the *Chronicle of Higher Education* reads: "Available — chemistry professor with 15 years experience, 4 million dollars in grants." Four million dollars in grants means, "Look, I'm a proven commodity. When it comes to drawing research dollars for a university, I know what I'm doing."

After all, the success (or failure) of a research proposal largely rests with individual faculty investigators or teams of coinvestigators. They must hit on a good idea. They write the proposal and send it to the appropriate agency. Despite help from administrators like those at the Office of Research Administration at the University, the brunt of the responsibility falls on researchers.

Succeeding is more difficult for some than for others. Humanities scholars are not the only ones who suffer a built-in disadvantage in a time of tight funding.

"It's a very serious situation in mathematics," says Willard Miller, mathematics department head. According to Miller, most mathematics faculty nationally receive research support only to the extent that they receive salaries. "A good portion of math researchers are

Tom Foley

Agricultural research at the University has increased yields of many grains and developed disease-resistant varieties.

not supported outside their departments."

Last year, Miller's department was able to attract the Institute for Mathematics and its Applications, funded with $1 million from the National Science Foundation annually. His faculty members do significantly better than most, with more than half of them funded by NSF grants. "The institute and the faculty together make the department third or fourth in the country in terms of the amount of research money brought in by mathematics," he says.

Still, the national shortage of money for math poses a risk to the future of all science research, Miller believes. "Mathematics is the language of all the sciences. If you have a weak math area, it's like something rotten at the core. What's happening now is that the sciences are spreading away from the core. People don't recognize math as being central."

Even in better-funded areas, money for research is scarce. An example is the University's Hormel Institute in Austin, Minn., which is devoted entirely to research, particularly research on lipids, the principle structural material of living cells. The institute rode the wave of interest in research after World War II, when the National Institutes of Health were founded. Today NIH provides three-fourths of Hormel Institute's budget.

"After the war, we could get money easily to expand programs," says Ralph Holman, institute director. "Now money is more difficult to get. It's more competitive."

The institute's budget has dropped in recent years, according to Holman, reflecting a drop of almost 20 percent in NIH grants since 1981. About one-fourth of Hormel Institute grant applications are accepted now, compared to "the 80 to 90 percent yield we used to have," says Holman.

Judson Sheridan at the Graduate School points out another kind of loss felt when funding goes down. "Competition has become so keen . . . that the less certain, perhaps more exciting proposals might not get funding," he says. "But this is precisely where the major breakthroughs may come."

Holman agrees. "It's poor economy to close down the investment in science research because it has a tradition of producing unexpected and wonderful things."

An example at the Hormel Institute occurred during longstanding research into the effects of disease and physiology on polyunsaturated fatty acids and their patterns. In the course of their work, researchers examined blood samples of victims of Reye's syndrome, a condition often fatal to small children. "We observed an interesting change in the polyunsaturated patterns in fatty acids of children with Reye's," Holman explains. "I'd never seen a pattern like that before. It was completely unexpected."

The discovery provided a new understanding of Reye's, says Holman, an understanding that may lead researchers to a solution for this now incurable illness.

No one at Hormel Institute could have predicted this outcome of the research. Yet it is just such practical applications for research that funding agencies are now looking for, according to Holman. The distinction between *applied* and *basic* research is often difficult to draw — but it may make the crucial difference in whether or not a project receives funding. "Whether you call research basic or applied, unless it benefits man, it's play to the lay people," says Holman.

Psychology professor Bruce Overmier calls the difference "a matter of immediate versus future needs." Basic research is like a seed crop, he says: What we invest in it reflects our willingness to invest in the future.

A master of the grantsmanship game himself (he has been continuously funded by federal agencies since 1966, for a total he estimates to be one to two million dollars), Overmier has seen firsthand the shift in federal funding. "I remember when 48 percent of proposals in the behavioral sciences were funded," he says. "Now it's down to one in eight."

Overmier is concerned about the threat to research when applications cannot be forecast. At the outset of his own research projects, he says, "I would never have claimed they would produce what they have." An example is his investigation of the relationship between human emotions and overt behaviors, and the accompanying physiological responses. "That turns out to have a lot to do with stress and coping behaviors," he says.

Individual projects sometimes seem insignificant because "everybody's working on a little piece of a big problem," says Overmier. Titles can be misleading, too. A project titled "The Sex Life of the Screw Worm" drew laughs, says Overmier, but it yielded information on how to control reproduction of the worm, which attacks the cotton plant.

"It was worth billions of dollars a year in crops," says Overmier.

Loss of funding to projects with long-term or unexpected results could create damage that will be difficult to repair, Overmier says. "Research seems to be something nobody will notice if we cut back. Well, nobody *will* notice — tomorrow. The effects come later. But by then, the best researchers have left the field. They're not dumb. They've found other jobs. So you lose the people, you lose the infrastructure. And that takes years to rebuild."

The Graduate School's Sheridan believes that process may hurt young, untested investigators more than others. In disciplines where adequate research funding is unlikely, young scholars may drop out early, moving to other fields. "There's a strong possibility that we lose people way down on the educational scale," he says.

Peer review (a system of reviewing research proposals by having other faculty members in the field read them) has become increasingly competitive, says Sheridan, so that even proposals that are "very meritorious" are not funded. Because agencies can afford to fund only the top proposals, a number of criteria may hurt a proposal's chances of success. The investigator's "track record" is one.

Small wonder that many faculty members are looking to a new source of relief from the funding crunch: industry. "We're encouraging more collaboration between the University and industry," says Tony Potami, director of the Office of Research Administration. "We can help our own programs and help the economy of the state by working together with business and industry."

The new relationship is helping Victor Bloomfield, director of the Biotechnology Research Center on the

St. Paul campus, raise funds for the new Institute for Advanced Studies in Biological Process Technology. The institute will investigate methods for getting useful products out of biological cells. This will involve three tasks: engineering cells; cultivating them in large reaction vessels; then purifying and using the products of the cells.

The institute got a generous start last year with a half a million dollars from the state legislature. This coming year, it will receive an additional $220,000 — contingent on a two-to-one match.

Bloomfield is looking, at least in part, to industry to make that match. Molecular Genetics Inc. of Minnetonka has already promised $75,000. 3M has promised the same amount. Economics Laboratory (which recently set up a five-year grant of $375,000 for faculty salaries in biochemical engineering) is currently considering a grant as well.

The institute's partnerships with industry do raise specific problems for researchers, Bloomfield recognizes. "How does the scientist do fundamental research to develop knowledge which is at the same time intended to be used in a commercially viable process?" he asks.

Bloomfield does not believe, however, that the collaboration with industry substantially undermines research. "The companies we are working with have taken a long-term view," he says. "They are looking at the training of students whom they may have a chance of hiring later. It's an opportunity to see basic research — such as the cell research — without the kind of investment in equipment they would otherwise need. They can see the research firsthand without waiting until the results are published. And it gives them access to equipment and to faculty."

Industry alone cannot make up for the difference in federal funding, Bloomfield says. "We don't expect industry to contribute two billion dollars. But what they are contributing can make a big difference in giving us new research opportunities. It gives us a little room for new directions."

Not all share this view. In a May 1983 letter to the *Chronicle of Higher Education*, philosophy professor Charles Reagan of Kansas State University cited the dangers of the university-industry collaboration. "Industry rarely wants to support basic research," he wrote, "Its interest lies in applied research with projects leading to a patentable product or process within the short run."

Some major educational institutions, such as Harvard and Yale, have drafted regulations limiting the influence of commercial interests on their laboratories. The regulations address problems of secrecy, ownership of patents, and the conflict of interest that arises when a researcher is also an investor in a company created around the results of a research project.

The underlying fear is that faculty researchers will tailor their work to where the funding is. A. J. Linck, associate vice president for academic affairs, doesn't think that's happening. "Faculty members, whether in the arts or sciences, pick their area," he says, "They are devoted to it. I don't think they get diverted very easily."

Potami believes the relationship with industry should be further cemented. "We're considering forming a central office as a liaison between the University and industry," he says. "We're really trying to foster that relationship. But it's still 80 percent government funding. We're never going to have industry take over the government's role."

For all the dangers, there are clearly many signs of health and vigor in basic research at the University of Minnesota. Every year since 1971, the University has ranked among the top ten higher education institutions in volume of federal research support. In fiscal year 1983, it ranked sixth, just behind Johns Hopkins, M.I.T., and Stanford, and ahead of Harvard, Cornell, and the University of Wisconsin-Madison.

Projects now underway at the University prove that the drive to explore our mysterious universe is far from dead. "There are a couple of thousand active grants at this University," Potami says. Researchers are developing genetically superior seedling stock to replenish Minnesota's dwindling forests. They are monitoring acid rainfall. They are developing a promising new drug in the fight against organ rejection by transplant patients. They are pioneering work in underground construction. They are applying gene-splicing technology to crop production, with results as promising as those Nobel laureate and University alumnus Norman Borlaug found a decade ago.

Whatever the funding difficulties, the importance of basic research will not diminish. Such research will continue to feed the world, clothe her children, explain her inhabitants. It makes sense of things.

Our quest to create knowledge is part of our very nature. Yet that endeavor can be threatened and limited. With vigilant care, the quest can be the future for us all — our stubborn, and enduring, Minnesota hope.

Tom Foley

Federal funds are more readily available for medical research than for research in the humanities and even some of the other sciences, such as mathematics.

GRACE & TRUE GRIT

The Women's Crew Team Pulls Together

By Mikki Morrissette
Photos by Rob Levine

It's 7 a.m. and 42 degrees.

University of Minnesota traffic hasn't crowded the Washington Avenue bridge yet. The Mississippi River is calm, the sun is bright, and only an occasional bird disturbs the quiet.

Then the slow, rhythmical splashing is heard. Splash-two-three-four, splash-two-three-four.

An eight-person rowing shell slides into view near the east river flats. In seemingly effortless unison, members of the Minnesota women's crew team gently drop their oars into the water, pull, lift, and start the stroke again. Their graceful glissade belies the effort involved.

The shell weighs about 200 pounds, the women in it more than another 1,000 pounds. Each stroke taken against the water resistance with the eight-pound oar is equivalent to raising a 70-pound weight to shoulder height. During a race the eight rowers repeat this feat in complete unison every two seconds for six to seven minutes. The shell cuts the water at about 13 miles per hour.

They've competed quite successfully, these 24 team members, consistently ranking among the nation's top 10 teams. Coached by Ron Korpi, the team has won three national titles, finished

sixth in the Olympic pair trials, and been selected to represent the Midwest at the National Sports Festival. Last summer, two Gophers (Chris Arndt and graduate Yvonne Goff) captured the gold in the festival's pair competition. At the four-day Dad Vail competition this spring, Minnesota won both the varsity and frosh events, the first sweep of these events by the same school in the regatta's history.

Minnesota women's crew, begun in 1973, is a sports hybrid: a varsity-club sport. As such, its members must meet eligibility requirements of the NCAA and Big Ten if they want to use athletic department training facilities and to enter varsity competition. They are affiliated with the intercollegiate women's athletic department, yet do not receive the benefits of scholarships and expense-paid travel. Even with partial funding from the recreational sports department, each competing crew member pays about $800 per year for equipment and trips.

They compete almost every weekend of spring quarter, practice year-round for an average of two hours daily, have to maintain academic eligibility requirements as full-time students, and shell out $800 annually for the privilege.

Why?

For Diane Kennedy, a 6'1", 165-pound junior captain from Pipestone, Minn., the answers are: personal challenge and maturation. Staying away from home this summer to train with the club, she said, strengthens her independence and self-confidence. Kennedy was the team leader last season in only her second year with the club.

The premed student, who got involved in crew so she wouldn't burn out academically, earned varsity letters at Pipestone High School in basketball, volleyball, track, and softball. She was a two-year all-conference selection and Most Valuable Player in basketball and volleyball, playing the captain role for both teams. She has won numerous academic awards and scholarships.

Kennedy believes that she and her teammates are among the "real student-athletes" on campus. She offers a candid and philosophical glimpse at the impact that crew has had on the lives of her and her teammates.

"When you spend 24 hours with people, travelling in a van, you find out the sore spots of everyone, and what pleases them," she said. "You learn to understand their strengths and weaknesses. In high school it's easier to just disagree with people, you have these spats all the time. On a team like this, with eight different people who have to work together and row together, you have to learn how to negotiate and work things out.

Ron Korpi, coach of the women's crew team

"Some mornings I don't want to think about getting in that boat. But once you're on the water, all that matters is you and the other people in the boat. You work out your frustrations.

"You pay for it," she added. "But in 10 years I'll still be glad I did it."

Another answer to the question, Why crew? comes from Denise Wiese, a 5'0", 100-pound sophomore from Shakopee, Minn. When she moved into Comstock Hall last fall, team leader Kennedy took one look at her and, according to Wiese, "the first thing she said was, 'How much do you weigh?'"

The crew captain told her she was the perfect size for a coxswain, showed her a picture of a boat, and dragged her down to the river to explain all about them. Wiese, who is putting herself through college and crew from savings earned during high school selling men's clothing, had lots to learn.

The coxswain navigates the boat by word of mouth. "If we're in a tough bind, going around a corner, I direct what side to row harder," Wiese said. She uses a stroke meter to measure the boat's speed. "I keep them controlled during a race. I need to take it down if the boat is sloppy and take it up if they are rowing well but not winning."

The former high school cheerleader, whose only other extracurricular activity had been as class treasurer, also is responsible for team morale during a race. "If one person isn't rowing or pulling their weight, the whole boat can feel it and everyone quits. I have to keep shouting at them to keep the boat going at a nice, fast pace through the water, but can't let them get mad about it."

Wiese has had to learn how to count strokes and to learn what the boat, and her teammates, can handle. "The

Coaches can teach the mechanics, but they can't teach you intuitively how to do it. It can get frustrating sometimes. If you have a bad practice, eight people know about it, they can feel it. If a rower has a bad morning, no one really knows who it is."

Last fall, soon after Kennedy convinced her to join the team, Wiese quit. But only for a short time. She's hooked, she says, but that doesn't mean she's never had second thoughts about what she's doing.

Wiese was ready to quit earlier in the year also when her little voice wasn't powerful enough to direct her teammates correctly. "We ran into a buoy and got a hole in the bottom of the boat.

"Sometimes I really don't understand why I do it. But when we do it well it's very, very satisfying. To see it all come together is really nice.

"Besides, crew is really unique. No one has ever heard about it before."

And so it goes — each team member has a slightly different reason for being there for practices and training. Amy Gribb, a 5'9", 140-pound sophomore from Mount Horeb, Wis., puts it this way:

"I like to feel that every day I do something to work on my body. When I was younger I was thin and weak. I like to feel strong.

"And a certain amount of it is prestige, doing something that I can be proud of . . . and I am proud of it.

"The social part of it has been really helpful, too. I'm not the type who goes out and meets people easily. I've met a lot of good friends in crew."

Or take Chris Arndt, a 5'9", 160-pound junior from Hutchinson, Minn. She spent her freshman year simply going to school but, like her teammates, decided that wasn't good enough. "I needed something to do, to compete again."

She discovered crew through an ad. "Now everything else is sacrificed for rowing. If rowing wasn't there, it would be hard to hang onto school."

Arndt, an animal science major interested in genetics, works a late-night job as a cook and a weekend job as a nurse's aide. "Sometimes I get bogged down, especially after we've competed three weekends in a row. It gets kind of tough. But hopefully, there'll be a reward at the end."

Already rewarded as a National Sports Festival gold medalist last summer, Arndt sees her involvement as purely competitive. "We're pretty intense, so there's not much time for being social."

Crew member Cathy Dahlstrom, 5'11", 180-pound senior from Bloomington, Minn., is a nursing student and secretary at University Hospitals who says crew has enabled her to cope with difficult working conditions. "I've become more tolerant. There's a lot of communication that has to be done. You can't really have stars in a boat. There's no such thing as an extremely good rower who makes the boat go better. If everyone isn't moving at the same time, if everybody isn't putting out, the boat isn't doing anything. It's really a team sport in the purest sense."

Although a synchronized swimmer for five years in high school, Dahlstrom was leery when a member invited her to join the team. "I had no muscles in my body. I was a slab of flab." Even today she quips, "I'm not an athlete — I only do this because I can row sitting down." But she started dry-land training with the team "January 26, 1983, 12:30 p.m.," she said. "I never even saw a boat before then. I took a big chance."

The last time she ever had second thoughts was last fall just before the important Head of the Charles regatta. Dahlstrom had missed two weeks of practice because of a serious cold, hadn't had much sleep the night before, and her boat was instructed to row three miles at full pressure — equivalent to about 17 minutes of hard rowing.

"The thought of getting into that boat and doing that for three miles was more than I could stand. I told Ron that I quit. I was miserable, I was crying . . . I don't know what he said to me, but we rowed down and did the piece, then it was over. After I did it I felt like I had passed this big crisis."

Because of the time and financial commitment each member voluntarily invests in the team, coach Korpi allows each woman to commit at her own level — he doesn't try to force motivation and hard work down their collective throats. The result is something more than an opportunity to compete and travel.

Assistant coach Carolyn Reckman explained: "Since we have women from so many backgrounds, with different levels of athletic skill and outside interests, they learn to respect others for what they can offer the team. That's a lesson that is important for women to learn in college. When you graduate and are in the work world, you have to separate whether you like people from whether you can work with them.

"They learn to appreciate what motivates people, appreciate hard work. When you cross that finish line, you really respect what you and everyone else has done in order to get that far."

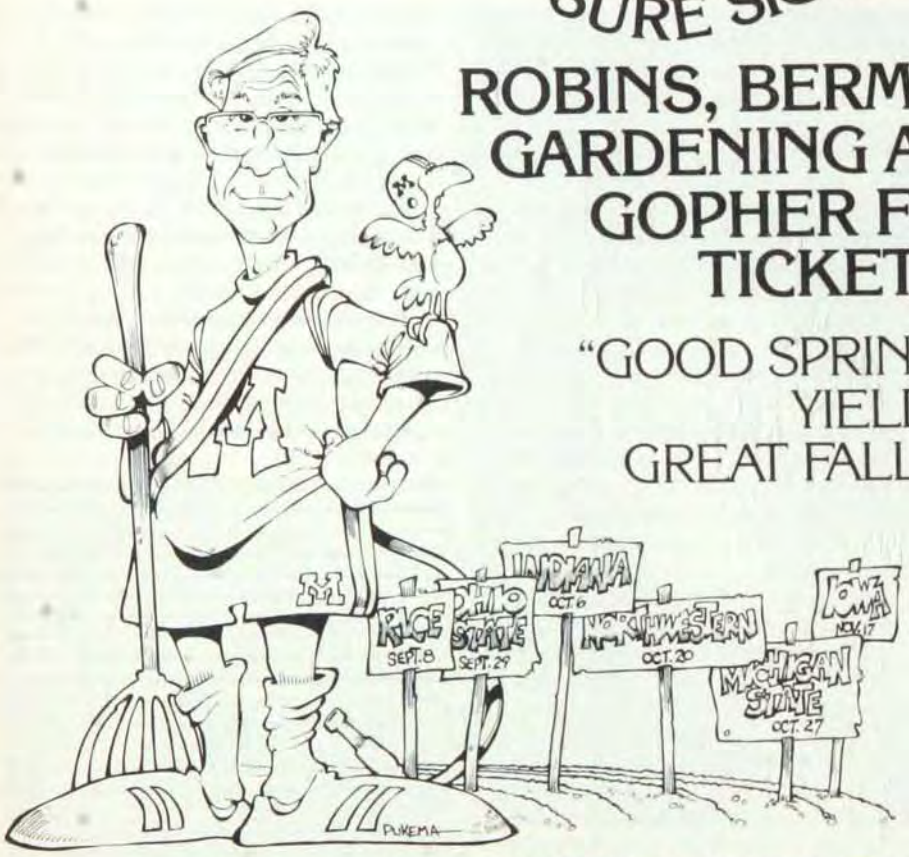
The risers of Memorial Stadium are ideal for building leg strength, but the empty stadium can be a lonely place to train.

SURE SIGNS OF SPRING

ROBINS, BERMUDA SHORTS, GARDENING AND GOLDEN GOPHER FOOTBALL TICKET SALE.

"GOOD SPRING PLANNING YIELDS A GREAT FALL HARVEST."

LOU HOLTZ, APRIL 18, 1984



Spring is here, and while the snow is *finally* gone, Coach Lou Holtz remains, and he's already looking ahead to fall. He knows, just as all Minnesota gardeners know, that the proper blend of hard work and planning in the spring can yield an exciting harvest in the fall.

The response from Minnesota's "shovelers" to our winter sale was outstanding as more than 5,000 new season ticket holders joined the ranks of the Golden Gophers. But there are plenty of seats left. If you haven't already done so, we hope you will make your plans now to join the Gophers this fall. The Dome just might be bulging by then, and you'll be glad you planned ahead.

THE "U" IS YOU.

TOGETHER, WE'LL GET THE JOB DONE!

SINGLE GAME APPLICATION
University of Minnesota
1984 OUT-OF-TOWN FOOTBALL

PLEASE PRINT

Name:

Address:

City & State: Zip:

	Number	Price	Amount
Sept. 15 At Nebraska	Limit 4	**$15.00**	
Sept. 22 At Purdue		**$12.00**	
Oct. 13 At Wisconsin		**$12.00**	
Nov. 3 At Illinois		**$12.00**	
Nov. 10 At Michigan		**$13.00**	
Service & Handling			**$1.00**
Williams Fund			
TOTAL Payable to U. of Minn.			

SINGLE GAME APPLICATION
University of Minnesota
1984 HOME FOOTBALL

PLEASE PRINT

Name:

Address:

City & State: Zip:

	*$12.00	Amount
Sept. 8 **RICE**	No:	
Sept. 29 **OHIO STATE**	No:	
Oct. 6 **INDIANA**	No:	
Oct. 20 **NORTHWESTERN**	No:	
Oct. 27 **MICHIGAN STATE**	No:	
Nov. 17 **IOWA (Limit 4)**	No:	
Service & Handling		**$1.00**
Williams Fund		
TOTAL Payable to U. of Minn.		

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BIERMAN FIELD ATHLETIC BLDG.
UNIVERSITY OF MINNESOTA
516 15TH AVENUE S.E.
MINNEAPOLIS, MINNESOTA 55455

Introducing Your Alumni Association Officers

Charles M. Osborne, President
'75 Business Administration

The youngest president in the Association's 80-year history, Osborne joined the board of directors in 1977. He has served one year as vice president and two as treasurer and chaired the finance committee. Osborne is vice president for finance for Deluxe Check Printers Inc.

Penny Winton, Vice President
'74 College of Liberal Arts

Winton is beginning her fourth year on the board. She held the office of secretary last year and chaired the committee to explore high-visibility projects for the Association.

Harvey Mackay, Secretary
'54 College of Liberal Arts

During his past two years on the board, Mackay has devoted his efforts to building Association membership. He is president of Mackay Envelope Co.

Fred R. Friswold, Treasurer
'58 Business Administration

Friswold has served on the board for two years and chaired the finance committee last year. He is president of Dain Bosworth Inc.

Alumni Invited to Assist Innovation Project

With increasing attention focused on the research and development potential of small businesses, the state of Minnesota has established a program to assist companies of 500 or fewer employees in securing federal grants. Minnesota Project Innovation, a public-private partnership, will pair grant applicants with technical advisers, provide assistance in locating facilities and equipment for research activities, and link award winners with potential additional funding sources as their projects develop.

MPI's board of directors, chaired by Lt. Gov. Marlene Johnson, is looking for volunteers interested in innovation to review proposals, develop business plans, and provide other professional services. University alumni and faculty members are encouraged to participate as advisers or grant seekers.

The primary impetus for developing MPI services is the Small Business Innovation Development Act, which directs federal agencies with research and development budgets of more than $100 million to allocate a portion for grants to qualified small businesses. The goal is to support the development of an idea from the feasibility stage to marketable service or product. The three-phase grants, combining federal and private funding, are available to enterprises ranging in size from a sole proprietor up to a maximum of 500 employees. From 1983 to 1987, more than $1 billion will be available in grant awards.

People interested in the small business grant program and the assistance of Minnesota Project Innovation are invited to attend a seminar August 23 at the Registry Hotel in Bloomington, Minn. If you would like to volunteer your expertise or need more information, write Kathleen McLaughlin, Executive Director, Minnesota Project Innovation, 511 11th Avenue S., Box 85, Minneapolis, MN 55415. Or call 612/375-8084 (outside the Twin Cities, call 800/642-1073).

Happy As Clams

They may miss out on Minnesota carp and catfish, but alumni on the East Coast take advantage of their own regional specialties when planning chapter get-togethers.

With an Atlantic Ocean whale watch and a Boston Pops concert already behind them, the Boston alumni chapter next will host a New England-style clambake Saturday, July 14, in Essex, Mass. All University of Minnesota graduates and friends living or vacationing in the area are invited. Also scheduled this summer is an outing to the Red Sox-Minnesota Twins baseball game Saturday, August 18.

For its 1984 annual dinner meeting, the chapter hosted Kenneth Keller, vice president for academic affairs. Dr. Aldo Castaneda, a cardiovascular surgeon at University Hospitals, visited and spoke to the chapter in May 1983. Chapter president Jessie Hansen has been assisted by vice president Robert Gefvert, secretary Flo Mode, and treasurer Arnold Lepisto.

University alumni and friends interested in Boston area activities can call Hansen at 617/449-2052 or 617/437-3664.

Nursing Alumni Conclude School's 75th Anniversary

Nearly 500 alumni and friends from across the country returned for the Nursing Alumni Society's Diamond Jubilee Banquet on May 12, the culmination of a yearlong celebration of the School of Nursing's 75th anniversary. Founded in 1909, the school was the first in the nation to be recognized as a separate college with its own faculty.

Lucile Petrie Leone, former professor and former assistant dean of the school, spoke on challenging issues for the future of nursing. Leone was the first woman to serve as assistant surgeon general for the U.S. Public Health Service. When she left the University in 1941, she became the director of the U.S. Cadet Nurse Corps program, and later chief nurse officer. Today she is a distinguished lecturer for international nursing and health at the University of California, San Francisco, School of Nursing.

To conclude the festivities, dean Ellen T. Fahy read congratulatory messages from nursing schools nationwide.

During the week of May 8, designated Minnesota Nursing Week, alumni, faculty, and students also sponsored an honors convocation, class reunion luncheons, several seminars, an all-school picnic and dance, and tours of the school.

September Summit Orchestrated for Alumni Leaders

Saturday, September 8, is Leadership Day, an opportunity for alumni volunteers invited from around Minnesota and across the country to meet each other and the University's chief officers and deans. This year's program will focus on building effective leadership skills and setting priorities for alumni service to the University.

During the past five years, Leadership Day has grown to recognize more than 200 Association members who serve on 19 chapter boards and 24 constituent society boards, in 125 national contact network locations, and in 17 statewide presidential network communities. Their contributions of time and talent are essential to the more than 500 events and activities involving thousands of Minnesota alumni each year.

Leadership program participants will be invited to the Minnesota-Rice University football game in the Metrodome that evening. Further details will be mailed to leaders this summer.

We Can't Thank Them Enough

A bunch of maroon and gold balloons, a photograph in the Minnesota *Daily*, and a hand-delivered message of thanks on behalf of all University alumni — the rewards are not elaborate, but these signs of public recognition for "University people who make a difference" are as sincere as can be.

For the second consecutive year, the Minnesota Alumni Association has sponsored 'U' Person of the Week awards to honor students, faculty, and staff members who go out of their way to improve and personalize campus life. From more than 75 nominations, ten individuals were selected for recognition during winter and spring quarters.

Here are our 1984 'U' People of the Week:

Leslie Bowman
Principal Food Manager
Coffman Memorial Union

Paul Escen
Services Coordinator
College of Liberal Arts

Dr. Roger Hallin
Assistant Director
Boynton Health Service

Roger S. Johnson
Assistant Director
Accounting Records and Services

Nancy Lind
Teaching/Research Assistant
Department of Political Science

Ray Oechsler
Assistant Administrator
Walter Library

Mary Hastings
Coordinator, Council for Health Interdisciplinary Participation

Emmie Ingram
Secretary
Rhetoric Department

Barbara Pillinger
Director
Academic Honors Program

Leonard Polakiewicz
Assistant Professor
Eastern European Studies


Teresa Fett

Margot Auerbacher Siegel


Teresa Fett

Howard Mithun


Teresa Fett


Teresa Fett

Reunion festivities attracted more than 400 alumni from the classes of 1934 and 1944 and from years before 1934 back to campus in May. Margot Auerbacher Siegel ('44 Journalism) and Howard Mithun ('34 Law) chaired volunteer committees of their classmates to plan two days of activities, including class dinners, a reception at the president's home, campus bus tours, and college open houses.

CONSTITUENT SOCIETY EVENTS

JULY

19 **Agriculture Alumni Summer Social**
Dinner and Showboat play, "The Count of Monte Cristo." 5:45 p.m., Campus Club, Coffman Memorial Union. FFI call the Association.

25 **Alumni Band Performance**
For the Minneapolis Aquatennial.

AUGUST

25 **Forestry Alumni Gathering**
To celebrate the 75th anniversary of the Itasca Forestry Session. Itasca State Park. FFI call Ann Mayhew, College of Forestry, 612/373-0825.

SEPTEMBER

28-30 **College of Biological Sciences Alumni Society Itasca Family Weekend**
Forestry and Biological Station, Itasca State Park. FFI call the Association.

CHAPTER EVENTS

JULY

14 **Boston Alumni Chapter Clambake**
New England style clambake for all alumni and friends. 1 p.m., Woodman's, Essex, Mass. FFI call chapter president Jessie Hansen, 617/449-2052, or call the Association.

26 **Chicago Alumni Chapter Big Ten Football Kickoff Luncheon**
13th annual luncheon featuring Gopher football coach Lou Holtz. FFI call Terry Simmons, 312/259-5000 or 312/367-8925.

AUGUST

18 **Boston Alumni Chapter Baseball Outing**
Minnesota Twins vs. Boston Red Sox. FFI call chapter president Jessie Hansen, 617/449-2052 or Robert Gefvert, 617/475-0026.

25 **Detroit Area University of Minnesota Women's Club Picnic**
Hosted by Howard and Betty Melin. FFI call chapter president Carol Hilf, 313/626-9023.

FOR FURTHER INFORMATION ABOUT CALENDAR EVENTS, CALL THE MINNESOTA ALUMNI ASSOCIATION, 612/373-2466.

By Tim Lyke

VETERINARY MEDICINE

'U' Students Run Midwest's Only Wild Animal Clinic

After veterinary students treated this egret for multiple lacerations, the bird flew back to Florida—via Ozark Airlines.

A fox wounded by a hunter's bullet, a white-tailed deer caught in a barbed-wire fence, a raccoon stunned by a speeding car, a crow whose beak has been broken by an unseen window — all are likely patients for the University of Minnesota's Wildlife Rehabilitation Clinic, a student-run, faculty-advised service that typically treats 300 wild animals a year and nurses them back to health. This September will mark the clinic's fifth anniversary.

Thirty veterinary and preveterinary medicine students operate the clinic, which is licensed by the Minnesota Department of Natural Resources and the U.S. Fish and Wildlife Service. Six rooms on the first floor of a building that formerly housed the University's anatomy department now serve as headquarters to the Midwest's only clinic for wild animals.

Like its neighbor, the Lewis Hospital for Companion Animals, the wildlife clinic performs a variety of operations on afflicted animals while providing students with practical experience in veterinary medicine. Unlike the hospital, the clinic claims no state-of-the-art equipment or dogs and cats accompanied by anxious owners; the clinic's caseload includes squirrels, cardinals, geese, pheasants, herons, skunks, pelicans, and hundreds of other kinds of undomesticated birds and mammals.

A typical wildlife patient wears no collar, has never received distemper shots, and is rarely brought in on the end of a leash. Although representatives from nature centers, the Humane Society, and the DNR bring many patients to the clinic, most are found and rescued by individuals who spot them while walking in the woods or along the roadside. The clinic receives over 2,000 calls per year.

Student clinicians are often as unfamiliar with setting broken bones and administering medications as the animals are with being hospitalized. Like many of the other students who staff the clinic for two to ten hours per week, first-year veterinary student Mark Drew explained that his reasons for working at the clinic aren't all altruistic. "This is one of the only places to get experience in wildlife medicine," Drew said. "I think it's important for me to get my hands on a warm-bodied animal. My freshman classes are all academics, no touchy-feely. This is a way to keep in 'touch' with reality."

Transferring knowledge from the classroom to "reality" is not a new desire for beginning veterinary students. A student-organized wildlife club established in1979 was the clinic's predecessor — its members brought injured animals home with them.

The wildlife hospital has since grown considerably in patients and personnel. Although the University has provided the clinic with facilities and some equipment, almost all supplies, cages, medicine, X-rays, and other diagnostic tests are purchased through private gifts and students' fund-raising efforts.

While short of money, the students have done well with hand-me-downs they've acquired. An old refrigerator donated by an appliance shop stores the animals' food and medicine. Recuperating ducks swim in Smurf-decorated wading pools, and a graduating senior's gift of three python cages has become flight cages for smaller birds such as robins and sparrows.

The students' ingenuity extends into their medical practices as they try to treat injuries that often have little precedence in more traditional veterinary practices. A mallard duck missing most of his bill's upper half has been fitted for a prosthetic bill made of dental acrylic. Accustomed to making do with what's available, the students plan to affix the artificial bill to the duck's face using super-strength glue.

An egret bearing multiple lacerations on its body entered the clinic early last fall and was ready to be released after two months of treatment and rehabilitation. Fearing that the migratory bird would die in Minnesota's November temperatures, the students contacted the Wild Bird Care Center in Fort Lauderdale, Fla. The center agreed to accept the egret, but the students still faced the problem of getting it to Florida. Arrangements were made for the bird to fly south — on Ozark. Reasoning that the egret was a "frequent flier," the students persuaded the airline to accept the egret under its "Frequent Fliers Get Free Flight" promotion. The egret rode cargo class, arrived at the center, and eventually made a new home for itself in the Everglades.

One of the clinic's most committed volunteers, co-coordinator Linda Wolf, admits that her last name and current address (Bald Eagle Avenue in White Bear Lake) would seem to make her a natural to work in a wildlife clinic. Like many of the clinicians, Wolf claims that her love for wildlife — healthy and injured — dates back to "the time I was old enough to pick up a bird and see that there was something wrong with it."

Although she enjoys treating and rehabilitating the wild animal patients, Wolf said her greatest satisfaction comes when recovered patients are released. "There's nothing better than freeing an animal that two months earlier might very well have died," she said.

Over a thousand animals in the Minnesota wilds — and one egret in the Everglades — might well agree.

LIBERAL ARTS

Missouri Murder Is Dramatic Source for D'Andrea's "Bully"

From the moment it appeared in *Time* magazine and aired on "60 Minutes," the story behind the murder of Skidmore, Missouri's town bully displayed all the elements of ready-made drama.

It took place in an unassuming setting — a sleepy Missouri farm town of 440 citizens, within 30 miles of the Kansas, Nebraska, and Iowa borders.

It had the worst kind of antagonist, a bully. As burly as he was mean, 47-year-old Kenneth McElroy had, at various times, been charged with rape, arson, livestock theft, and attempted jailbreak.

And its denouement asked as many questions as it answered. Fearing that McElroy might shoot someone else while free on bail pending conviction for the shooting of a local grocer, 60 townspeople took the law into their own hands. They surrounded McElroy as he sat in his Chevy pickup, and one among them pulled the trigger of a high-powered rifle that put a bullet through the bully's brain. All refused to reveal who.

Humanities professor and playwright Paul D'Andrea was reading his newspaper one morning in 1981 when he came across an account of the Skidmore shooting. Having written more than a dozen plays, he knew instantly that this "inherently sensational event" begged to be the climax of his next one.

"Bully" had its world premiere last February on the University of Alabama's main stage, a setting not usually presenting first-run plays. The production opened to favorable reviews and has, according to its author, "been very well received by critics and audiences."

D'Andrea visited the scene of the crime while writing the play. His trip to Skidmore and conversations with the locals were less a means to inject accuracy than to give himself a feeling for the environment. "I wanted to get a sense of the ambience, a sense of the occasion, a sense of the place, which are very important if you're writing

Tom Foley

Paul D'Andrea, author of "Bully"

something," he said. "It was stimulating. But when you're creating a play, conceived of as a work of art, you aren't solving murder mysteries and you aren't doing documentaries."

The play's characters then are D'Andrea's own creations. For that reason, the playwright concedes that his production bears only a general resemblance to the real Skidmore story. "The fact that's most interesting about the actual event, namely, that a town collaborated in silence about killing a man, remains constant," D'Andrea said. "That which led to it and follows from it have been changed."

"Bully" takes place in Missouri, though its setting is the fictional town of New Liberty. In addition to being a dangerous nuisance, New Liberty's bully bears a significant similarity to his Skidmore counterpart; neither can be written off as a simple character. "I don't claim to be an expert or have privileged information about McElroy," D'Andrea said. "The media have claimed he was a psychopath. The murder was a cleaner job if he was. It's a much more complicated thing if there were any ambiguities in his character."

D'Andrea describes the bully in his play as "the possessor of a great deal of psychic energy, which, given his economic circumstances and background, has manifested itself in a lot of cruel acts." The way the bully channels his energy is what D'Andrea finds most interesting about his character. "The energy that makes a Michelangelo, if bottled up, could have gone out some other outlet and created an arsonist," he said. "That's what's intriguing about my character. It's one thing to kill Hitler. It's another thing to kill a complex figure with pros and cons."

D'Andrea is reluctant to describe his play as merely a comment on vigilante justice. "Reviews have referred to it as a play about justice," he said, "but when you're aware of the complexities of what you've built, you bridle at its being categorized and reduced to an abstraction."

In New York recently "Bully" received four showcase readings, presentations of the play by professional actors before prospective directors and financial backers. This July, D'Andrea will travel to London for showcase readings of "Bully" before the Double Image Theatre and the New Dramatists playwrights group.

NURSING

Life Stress and Cancer: Does Learning To Cope Make a Difference?

After 30 years of selling tires in Omaha, assistant professor Terry Rothweiler's brother John received a promotion transferring him to his company's home office in Denver. Less than two years later, the 51 year old died from glioblastoma, a malignant brain tumor.

A move that should have been the hallmark of a successful sales career may have been the prelude to cancer. John's death, and other family members' bouts with cancer following stressful incidents, led Rothweiler to believe that the way people cope with stress may determine their susceptibility to cancer.

Past studies have suggested a cancer-stress nexus, but Rothweiler decided to examine more closely the possible relationships between the two. In a study, the results of which she presented to the Minnesota Cancer Society in May, Rothweiler compared the coping strategies of 103 cancer patients and 62 healthy senior citizens. When

members of both groups shared the same problems — the death of a loved one, marital separation, personal injury, sexual difficulties, or a sudden move — Rothweiler wanted to know if each dealt with their difficulties differently. "We all have stress," she said, "so why do some of us have cancer while others don't?"

Nearly all (92 percent) of the study's cancer patients reported the occurrence of a particularly stressful event or problem in the 15 months before their cancer was diagnosed.

Comparing coping strategies between the elderly subjects and the cancer patients who shared similar problems, Rothweiler discovered that the cancer patients were more apt to react to their problems in ways that "would have a depressing physiological effect." While 36 percent of the cancer patients reported "preparing for the worst" as a coping strategy, only 7 percent of their elderly counterparts did the same. Among the cancer patients, 26 percent tried to reduce tension through excessive eating, drinking, and smoking, compared with 8 percent of the seniors. And 41 percent of the cancer patients said they felt helpless, while only 18 percent of the seniors felt the same way.

Although she notes that the same situation, divorce for example, can cause widely varying degrees of stress in people, Rothweiler believes that these data, taken as a whole, confirm her hunch: A person's likelihood of developing cancer depends partly on how that person deals with stress.

Rothweiler is now writing a grant proposal to set up a stress management program in conjunction with the Ramsey County Community Health Nursing Program. She hopes to develop a six-week series of group and individual meetings explaining how exercise, diet, and relaxation might help people diminish their chances of getting cancer.

Whether established within communities, at workplaces, or in schools, stress management programs can play a significant role in fighting cancer, the second most common cause of death in the United States, Rothweiler believes. "Prevention is the key to decreasing the incidence of cancer," she said.

BIOLOGY

Cancer Research May Leap Forward With Leopard Frog Clones

The leopard frog clones of University biology professor Robert McKinnell and a collaborative study with British and Belgian cancer researchers could produce some "very interesting and worthwhile" findings about the nature of metastasis, or the way cancer spreads from a primary tumor to other parts of the body.

The three-month study, to be conducted in the laboratory of Belgian metastasis specialist Marc Mareel, will continue an investigation begun at Oxford University on how frog tumor cells invade normal tissue. During his Oxford sabbatical last year, McKinnell worked on this project with David Tarin, a British cancer researcher. The three will work together at University Hospital in Ghent, Belgium, starting this September.

Tarin suspects that the enzyme collagenase may promote the spread of cancer by clearing away fibrous tissues that normally impede the movement of cancer cells into the bloodstream.

Internationally renowned for his cloning research, McKinnell has observed that cancer cells in his leopard frogs move much more slowly when the frogs' bodies are cooled. That observation, coupled with Tarin's research in the role that collagenase plays in metastasis, have caused the scientists to wonder whether cooling a frog's body might inhibit collagenase and thus restrain malignancy.

Answers provided by cooled clones may give the researchers important clues to understanding human cancer.

EDUCATION

Bilingual Teachers Preparing to Serve Asian, Hispanic Students

Even if Johnny *can* read and write, his inability to do so in English could cause him a future of academic frustration and failure. The College of Education began changing that prospect for Minnesota's Asian and Spanish-speaking children when it approved earlier this year a program to certify teachers in bilingual education.

Headed by assistant professor Constance Walker, the Bilingual Education Teacher Training Program prepares prospective teachers to instruct in bilingual classes students whose first languages are Hmong/Lao, Spanish, or Vietnamese. In a bilingual classroom, students study subjects in their native languages, thus enabling them to keep pace with their English-speaking peers. Walker believes bilingualism offers an important alternative to inundating chidren with new concepts using unfamiliar English words and grammar. "The submersion approach really hasn't been effective for a great number of limited and non-English speaking students," she said.

To enter the bilingual teacher training program, applicants must demonstrate a proficiency in English and either Hmong/Lao, Spanish, or Vietnamese and have "experience in and commitment to programs serving limited English-proficient populations." Four Minnesota school districts — Minneapolis, St. Paul, Rochester, and the Red Lake Indian Reservation — currently receive federally funded bilingual support.

Teachers from the University's bilingual program will have the double duty of encouraging students to maintain their first language while helping them learn English. Walker estimates that typical non-English speaking students need five to seven years of English training before they can sit in a "mainstream" classroom and acquire knowledge and skills with the same proficiency as students who have spoken English all their lives.

Encouraging non-English speaking students to hold on to their first language skills also will serve English-speaking students, Walker said. "You hear so much talk these days about the importance of learning a foreign language," she said, "and we probably have many, many students who, if their first languages are maintained, will be real valuable resources for their classmates."

Tom Foley

Edward Fletcher and the "solar furnace" atop Akerman Hall.

INSTITUTE OF TECHNOLOGY

Rooftop Solar Furnace Sizzles, Splits Compounds

A solar furnace housed atop Akerman Hall is demonstrating one commercially practical way to lessen the United State's dependence on fossil fuels for energy.

Although the rooftop furnace is the brainchild of mechanical engineering professor Edward Fletcher, post-doctoral engineer Rich Diver designed and built it with help from five other engineering students. The sun's light, concentrated in the furnace, separates hydrogen sulfide into its two components, hydrogen and sulfur. The researchers' success in extracting hydrogen from the compound means that industries now dependent primarily on fossil fuels for hydrogen production may look to the sun as an alternate provider.

Hydrogen can be added to coal to make high-grade gas and liquid synthetic fuels. Diver estimates that hydrogen produced by the thermo-chemical process could "potentially upgrade enough coal to create 59 million barrels of liquid fossil fuels per year."

The furnace works this way: A 20-by-18-foot flat mirror, called a heliostat, directs sunlight to 312 hexagonal mirrors positioned to reflect the rays through a 2½-inch opening into a ceramic reactor, or furnace.

Heat generated from one mirror alone could easily start paper on fire, according to Diver. The cumulative solar energy collected in the reactor causes it to act like a high-powered, 2,800-degree-Fahrenheit furnace. Temperatures can become high enough to split compounds like hydrogen sulfide, water, and zinc oxide.

The solar chemical processor took two years and $100,000 to build. Although the U.S. Department of Energy funded the construction, it didn't provide suggestions for finding the building materials. "We literally had to beat swords into plowshares," Diver said, pointing to the base of an old military radar dish on which the heliostat is mounted.

Researchers in New Mexico, California, France, and Canada have experimented with similar furnaces. But Fletcher and Diver are the only scientists testing high-temperature solar-treated hydrogen sulfide. They've discovered that hydrogen produced by this method from this compound provides a higher yield of fuel and is much more economical than hydrogen derived from water.

Fletcher and Diver's creation isn't perfected yet. Nevertheless, the energy potential of the hydrogen the furnace produces exceeds the solar energy needed to extract it from hydrogen sulfide. "We are much more optimistic that the [process] will be commercially viable in the foreseeable future," Diver said.

HOME ECONOMICS

Something Old for Something New

A 12-year-old's paper route, a New Jersey nunnery, and a farmer's hayloft have provided some of the furnishings that will soon adorn the new house being built by Harold Alexander, associate professor and extension specialist in interior design, and his wife, Marjorie.

For over two decades Alexander has encouraged his design students to elevate functional and aesthetic design above all other considerations when completing assignments or working with clients. As important to the interior designer as practicality and tastefulness, however, are innovation, imagination, and the ability to use old things in new ways. "Although it may sound like heresy," Alexander said, "I believe a home should reflect the family, not the interior designer. There is nothing worse than thinking your home must look like your next door neighbor's, your decorator's, or what you see in the latest magazine."

Alexander speaks from years of experience. At a farm auction he acquired a small table covered with dirt and pigeon droppings that had been stored for years in a barn's hayloft. His $20 impulse buy turned out to be a 16th-century Flemish desk. For a dollar he purchased a large wooden mantel from a New Jersey convent slated for demolition. The handsome oak piece will surround the Alexanders' new fireplace. While helping his son deliver papers 20 years ago, Alexander pulled the pieces of an ice cream parlor table and two chairs out of a garbage can. The recently reassembled grouping will grace the Alexanders' breakfast nook.

A self-described scavenger, Alexander admits that "I have to put blinders on not to look in garbage cans." But he has encouraged others. His son brought home the base of an 1880s lamp he'd found on his paper route. The Alexanders now use the wrought iron base as a plant stand.

"Not everything old is good," Alexander said, "but very useful things can be found and utilized in their original way or differently." He built a refectory table using oak flooring

scraps from a former home, the wrought iron railing from another house, and the slate shingles from his church roof.

Whether new, valuable antique, or just used, Alexander believes that the worth of a piece of furniture can best be measured by how it meets its owners' needs. "I've had people ask me, 'Do you think a crystal chandelier would be right over the dining table in my mobile home?' Probably not, but what's 'right'? People should make their home function and reflect how *they* live."

INDUSTRIAL RELATIONS

Incentive Plan — More Vacation Days — Reduces Absenteeism

Given a choice between three and 12 paid-leave days, employees will opt for the greater number of days off, right? Not necessarily, according to M.A. student Dale Schlotzhauer, who compared employees' choices under a St. Paul hospital's new absenteeism incentive plan with their choices during its former sick leave policy.

The hospital became concerned in 1979 that its absenteeism rate was far too high — its policy granted employees 12 paid sick leave days per year. Rather than reduce the number of sick days for which employees could be paid, in 1980 the hospital added an incentive provision whereby employees using none of their sick leave days in a year would receive three additional paid vacation days the following year. Likewise, employees using one sick day received two free days the next year, and those who were sick two days accrued one extra vacation day.

What Schlotzhauer found when she compared the absenteeism rates for the years before and after the incentive plan's introduction surprised her. "You'd expect employees to see more utility in taking up to 12 days off in one year rather than three days off in the next year," she said. "Yet my study clearly showed a decline in absence during the incentive year. From a psychological view, the employees had the desire to come to work, but required an extra push."

The extra push had more than a temporary effect. The hospital's absenteeism rate between the two years almost halved, dropping from an average of 37 hours of sick leave per employee to 19 hours. Schlotzhauer's continued monitoring of absenteeism rates for 1981 and 1982 convinced her of the incentive plan's efficacy.

Although Schlotzhauer concluded that the hospital's incentive plan worked well in reducing absenteeism, she emphasized that other management actions — providing employees with realistic job reviews, posting the names of high attendees on bulletin boards, conducting exit interviews, and encouraging supervisors to discuss frequent absences with workers — can also promote significantly higher employee attendance.

JOURNALISM

Retiring Journalism Historian Passes the Torch

When a Prentice-Hall editor approached co-authors Edwin Emery and Henry Ladd Smith about reprinting their textbook, *The Press and America*, the two journalism professors had different reactions. Although the book had earned them journalism education's highest honor — the Sigma Delta Chi national award — an older text (Frank Luther Mott's *American Journalism*) was then still considered the preeminent authority among journalism history scholars and teachers. For this and other reasons, University of Wisconsin professor Smith sold his book rights to Emery, a Minnesota professor.

According to Emery, Smith said, "'I don't like to revise, and if you're going to rework what I wrote I don't want my name on it. Why don't you buy me out? I want some money to put in the stock market.'" It was 1962, eight years after the book was published.

More than two decades and 150,000 books later, *The Press and America* has undergone three more reprintings, has been published in five different languages, and has been hailed by academics and practicing journalists as being, in the words of University of Missouri historian William H. Taft, "the most widely used book in its field." The same year that Emery's book went into its second printing, the Mott history was printed for the third and final time. *The Press and America* replaced *American Journalism* as the definitive journalism history text.

Reflecting on his partner's decision to remove his name from a book that is now read in thousands of journalism schools and libraries around the world, Emery suspects that were Smith given

Edwin Emery

Tom Foley

the option to sell out again, the stock market might not look so inviting. "I kind of figure that maybe he made a mistake," Emery said, "but I asked him once and he said, 'You don't know how high the stocks went up.' Still, I think maybe he might have regretted it a little."

This fall *The Press and America* will begin its 30th year of teaching journalism students the history of the fourth estate. This fall will be important to Emery for another reason also: It will mark the beginning of his retirement.

Since he began teaching at Minnesota five decades ago, Emery has written or edited eight other books besides *The Press and America*. Co-author Smith's decision to exchange prospective book royalties for stock dividends didn't mean, however, that Emery would be sole author of the book's subsequent editions. When *The Press and America* was reprinted for the third time in 1972, Emery called on his son, Mike, a California State University journalism professor, to contribute some broadcast journalism sections to the book. With its fourth reprinting in 1978, the book bore Mike's name as co-author.

Emery admits to a passing of the journalism history torch. "During his recent visit to Minneapolis for my retirement party, I told Mike, 'I sense you are beginning to take over,'" Emery said. Mike rejected his father's suggestion that perhaps the sixth edition of *The Press and America* should reverse their names, with the younger Emery listed first. Given the elder's ambitious postretirement plans, he may find he has so little time to think about the book that Mike will have to take on the primary rewrite responsibilities anyway. This August, Emery and his wife, Mary, will leave for China where he'll spend nine months teaching feature, science, and opinion writing to graduate students in the department of journalism at the Chinese Academy of Social Sciences in Beijing.

Emery may find himself so busy, in fact, that he might offer Mike — just as his co-author 30 years ago offered him — exclusive authorship of *The Press and America*. But before Emery makes his son an offer, he may be well advised to consult his former partner to see which stocks look most promising.

GENERAL COLLEGE

Equal Access for Deaf Voters

Come this November's presidential election, Cheryl Pray, '84, hopes that the quarter of a million deaf Americans who traditionally shy away from polling places won't this time. As a graduate in human services studies, she already has done more than just hope to bring about this change.

A year ago when people were beginning to think about presidential candidates and campaigns, Pray's attention was fixed on a political battle of another sort — congressional consideration of the Equal Access to Voting Rights Act. Believing the bill would ease deaf Americans' access to the political process, Pray appeared last July before a congressional task force to speak on the bill's behalf.

Pray's interest in what she calls the subtle disenfranchisement of deaf people began last summer when she worked as an interpreter and lobbyist for Deafpride, a Washington-based political advocacy group for the hearing impaired. Pray is not deaf. During her four-month internship, though, she met many deaf people who were reluctant to face the procedural obstacles that often make their visit to a polling place a humiliating and sometimes physically impossible experience.

For many deaf people, the biggest barrier to casting a ballot is their inability to speak English, Pray said. "They can read English but it's not their primary speaking language — American Sign is," she said. "Yet many of our registration procedures and voting instructions are spoken, thus causing the deaf to become victims of their own invisible handicap."

Pray specifically criticizes in the voting process the lack of written instructions, insistence on voters' ability to identify themselves orally, and exclusion of sign-language interpreters to accompany deaf people into voting booths.

The Equal Access to Voting Rights Act has yet to receive congressional approval. Yet Pray is optimistic the bill will become law before the November election. If it doesn't? "We'll shoot for 1988," she said.

LAW

Noted Lawyer and Judge to Fill Sonosky Chair

A professor described by *Newsweek* magazine as "fast becoming the best-known law teacher in the country" has agreed to fill the Marvin J. Sonosky Chair in Law for the 1984-85 school year.

Former teacher, lawyer, and judge Irving Younger is the first visiting professor to be appointed to the Sonosky chair. Established by Marvin J. Sonosky, '32, of Sonosky, Chambers, Sachse & Guido, the chair was created for the purpose of "attracting to the faculty of the Law School an advanced legal scholar of national reputation."

Younger will teach Civil Procedure to first-year students and Evidence and the Art of Advocacy to second- and third-year students. He is widely acclaimed among attorneys for his lectures on evidence and trial techniques. "There are few trial lawyers in the country who do not know his work," Law School dean Robert Stein said. "He is, simply, the best."

Since graduating from New York University Law School in 1958, Younger has served as a New York civil court judge, practiced as a litigation partner in the law firm of Edward Bennett Williams, and written numerous articles for legal and popular publications on topics ranging from computers to congressional investigations. But the former Columbia, Cornell, Georgetown, and Harvard faculty member is best known for his flamboyant teaching style. A former competitor has characterized Younger as "a cross between Louis Brandeis and Bob Hope."

Younger's lectures have been so popular among lawyers, law students, and faculty that they've been videotaped and transmitted by satellite hookup to numerous legal meetings and classrooms. Stein described the lectures as being "as close to a gospel as there is in litigation."

Younger's appointment to the Sonosky chair brings an added bonus to Minnesota: his wife, Judith Younger, Cornell Law School professor and former dean of Syracuse University Law School, also has accepted a one-year appointment to the Law School faculty. She will teach courses in the areas of property, trusts and estates, and family law.

FORESTRY

Foresters Swap Students in New Exchange Program

Although they're not yet talking detente, forestry professors on both ends of a Minnesota-Moscow connection are gambling that their student exchange program, to begin this September, will prove mutually beneficial and ultimately further the cause of world trees.

Through a recent agreement between the University of Idaho in Moscow (Idaho) and the University of Minnesota, forestry students from each school will have the opportunity to trade places during their senior year, thus enabling them to concentrate in the other school's specialty. Minnesota's specialty is the pulp and paper sciences. Fiber processing facilities in the University's Kaufert Laboratory of Forest Products and Wood Science will give visiting Idaho students a chance to learn firsthand how raw materials are manufactured into paper and other pulp products.

Minnesota forestry seniors will take advantage of the University of Idaho's emphasis on the engineering and management of forest harvesting operations.

The idea to exchange students was first discussed during a Forest Product Research Society meeting last year in Norfolk, Va. Attending the academic summit were Minnesota's forest products department head John Haygreen and Idaho's forestry director Ali Moslemi. "We were just sitting around and talking when I happened to mention that harvesting was Minnesota's weakness," Haygreen said. "Ali then mentioned that his school didn't have the facilities for pulp and paper processing, so we asked ourselves, 'Why can't we get together?'"

Minnesota's exchange students will enroll in the University's College of Forestry and Idaho students will enroll in their College of Forestry, Wildlife, and Range Science. Students from both schools will take preparatory courses and fulfill liberal arts requirements before attending the companion college during their senior year.

Terms of the joint agreement also stipulate that seniors will receive baccalaureate degrees from their home institutions. (To discourage defections, perhaps?)

Strip Search, by Rex Burns, '65, *Viking, $13.95*

Reviewed by James Lileks

When a good mystery novel gets its hooks into you, reading the book takes over your life. Inconsequentials like eating and sleeping get shunted aside, and for a while you live just for the story, walking the streets with the hero, sharing his doubts, rueing the petty tragedies that make up his life, savoring his victories. When the book concludes, the return to reality comes with a graceless thunk.

Those who do not wish to interrupt their life in this fashion are advised to pick up Rex Burns' *Strip Search,* for it will not threaten to take over your life. It won't even borrow it for an hour.

Strip Search concerns the quest by Denver detective Gabe Wager for the killer of two exotic dancers. He's convinced there's a connection between the two slayings. He is equally, and just as predictably, certain that not everyone connected with the dancers is telling the truth. But he is hampered from getting to the truth by the police department's new team concept, where detectives work in shifts on a variety of cases. It's a wretched notion to Gabe, let alone any thriller devotee, both of whom know that the detective has to follow a case through to the end himself. So Wager goes it alone on his own time with that brave, weary dedication that comes with being a conscientious dick. Does he find the killer? Is there indeed a connection? Are people really hiding something, and will Gabe feel that old familiar angst welling up when he stops to consider how imperfect the world really is? Is there any doubt? No.

Burns, in other words, is going through the motions. He establishes a character, a situation, mixes in ciphers and clues and lets the concoction ferment to a predictable result. He provides a payoff at the book's conclusion, but he can hardly do otherwise: All detective novels provide a payoff, a triumph of justice over forces that compromise or subvert the society's ideal, if barely evident, social order. Any detective book that neglects to give this to the reader is asking to be thrown against the wall. But a payoff can't carry a book; it's not enough just to have the loose ends woven together. It's where the author takes us that counts, what he says and provokes us to feel that makes the conclusion resonate in one's mind. In the case of *Strip Search,* Burns takes us to a juicy locale — Colfax Avenue, the porno strip of Denver, home to pimps, prostitutes, grubby bums, oily-faced entrepreneurs. He establishes a mission — find the fiend who killed the women, and learn what made him commit his sins. He cuts a

Rex Burns

broad swath off the I-got-me-a-duty-to-humanity bolt for his hero. Potential abounds for an anguished descent into a world that has long given up hope, that views life through darker lenses than our cynical protagonist will ever wear.

The potential is all the more obvious for Burns' failure to exploit it. The tawdriness of Colfax is recounted in a desultory fashion, never dissected; it is a place that should teem with menace and fascination, but we stroll through it as though it were a museum diorama, the people on the streets nothing more than curious, harmless specimens. The plot apes the pace of the people who walk the streets, moving at a numbing lope, never threatening to break into anything but a safe, steady canter.

Above all, the hero, the man on whom we pin our hopes for compassion and justice, is rather boring. The name bears study — Gabriel Villanueva Wager. Gabriel, a name for an angel; Villanueva, Spanish for *new town,* a town like Denver; and Wager, a bet. In other words, a compromised angel, a savior tossed in a town in the still-lawless west and forced to gamble what he has, what he is to establish his values. If that seems a bit forced, it fits right in with Wager's obligatory musings:

"He hoped (the river) stayed that way: free of dams and wild enough to worry people every spring with its runoff. But a lot of things never stayed the way they should. Maybe nothing did. Maybe when things stayed, they were dead. Still, he wondered why change so often seemed to be for the worse."

Wager's lack of depth seems to have infected every other character in the novel. Burns appears to be asking us not to believe his own creations but recall from other books and movies certain archetypes — the slimy stoolie, the gruff and loyal partner, the jive black fixer, the smoothie crook — and plug these into the shadows sketched by his dialogue. When it comes to women, Burns' lesser skills of characterization underscore the book's most discomfitting flaw: a subtle contempt for women. The only place they have in this book is to be a dutiful wife, a stripper, or a corpse. Even when they are privileged enough to attain the latter status, their death serves no purpose other than to propel the hero on his mission. Who they were before they were killed is of minor interest.

The title tells it all. A strip search in its more familiar context, is the now-discredited procedure of stripping a female suspect and submitting her to a degrading examination at the whim of the police. The title here purportedly refers to Wager's search on the porno strip. But Burns' treatment of women does his book a double disservice: His descriptions of the strippers ("The other sides of her panties inched down and she ran her tongue in circles over wet lips as her shiny hips ground in the glow") fulfill the distasteful titillation the title implies; second, by making the victims mere vessels for the act that will spark Wager into action, we have less of a sense of a crime, of an injustice wanting redressing. Eventually we do sense the killer's reprehensibility — but only after he has brutalized two *men.*

If the above makes the work sound like grade C trash, it isn't a reflection on

the book so much as it is an expression of the cliches of the genre and the need to rise above them if one is to produce a work of quality. The most one can say about *Strip Search* is that it is a standard story, competently told. Mystery writer Robert Parker says it "fulfills . . . Burns' continuing promise." Well, this is Burns' sixth Wager novel, and he should be doing more than showing promise or even fulfilling it. He should be surpassing it. What may have looked like promise several books ago may have been the apex of the author's ability and everything that followed, a recapitulation of that level of skill. *Strip Search* shows nothing to suggest that this isn't the case with Mr. Burns.

Christian Theology, by Millard J. Erickson, '53, *Baker Book House.*

This three-volume set is described as a "comprehensive trilogy on contemporary evangelical theology." Volume one provides a basic introduction and a study on the nature of God. Volume two, which will be available this summer, relates to the condition of mankind and God's response. Volume three, scheduled for release early next year, deals with aspects of regenerated life. Erickson is a professor of theology at Bethel Seminary, St. Paul.

The One Minute Scolding: The Amazing Effective New Approach to Child Discipline, by Gerald E. Nelson, M.D., '54, '58, *Shambhala Publications (distributed by Random House), hardcover $13.95, softcover $6.95.*

Described as a useful guidebook for parents and professionals who deal with children, *The One Minute Scolding* outlines a technique for disciplining children effectively while maintaining a warm and loving relationship between a child and adult.

"Parents who are having difficulty in disciplining their children will find that it is a useful and helpful book, which if followed, will allow them to apply discipline firmly, but more importantly, with love," according to Dr. Lewis L. Judd, professor and chairman of the department of psychiatry at the University of California, San Diego.

When Your Mountain Won't Move, by Craig Selness, '76, *Victor Books, $4.95.*

Selness, a law student at University of California, Berkeley, and assistant pastor at Willowglen Baptist Church, San Jose, Calif., discusses the role of faith in modern life.

I Remember, Book II, by Jennie I. Hiscock, '05, *self-published, Minneapolis.*

Hiscock, who finished this book at the age of 102, delivers her homespun memoirs in a simple paperback that includes a number of interesting old photographs and several anecdotes from her days at the University.

CLASS NOTES

by Helen Schneider

COLLEGE OF AGRICULTURE

'23 Wilbur A. Korfhage of Sacramento, Calif., is serving his fourth year as chaplain of the California State Senate, after 55 years in the pastorate.

COLLEGE OF BIOLOGICAL SCIENCES

'76 Dr. William Drehmel of Woodbury, Minn., has opened a family practice office in Woodbury.

SCHOOL OF MANAGEMENT

'37 Edward C. Schleh of Atherton, Calif., is author of *How to Boost Your Return on Management* published by McGraw-Hill. A frequent lecturer, he is a recipient of the Frederick Taylor Award from the National Society for the Advancement of Management.

'42 Kenneth L. Block of Winnetka, Ill., has been reelected chair of the board of directors of Evanston Hospital, Evanston, Ill. He is also chair of Kearney Management Consultants of Chicago.

'47 Norman H. McMillan of Chicago has been appointed executive vice president of planning and development for Household Merchandising, Des Plaines, Ill. He had been vice president of strategic planning for Montgomery Ward.

'57 Thomas Plaisted of Buffalo, Minn., is a candidate for state representative in District 22 A. He operates an emergency foster shelter for teenagers in Buffalo.

'62 Robert J. Moeller of Chaska, Minn., has been appointed executive vice president of the Toro Co.

'73 John P. Gauthier of St. Paul has been promoted to Gateway Division manager for Ortho Pharmaceutical, N.J. He was previously a special training representative for the firm.

'79 John T. Barthel of Fergus Falls, Minn., has been named business manager of Fredrickson's Orthopedics, Fargo, N.D.

SCHOOL OF DENTISTRY

'23 Dr. Harold L. Harris of Denver received the University of Colorado Regents Distinguished Service Award in May 1983. In June 1983 he received the Colorado Dental Association Distinguished Service Award.

COLLEGE OF FORESTRY

'59 Edward A. Hansen of Rhinelander, Wis., received a Technical Achievement Award from the Department of Energy in January 1984. He is project leader at the USDA Forest Service's Forestry Sciences Laboratory, Rhinelander.

'60 Brian E. Stout of Washington, D.C., has been appointed director of information for the USDA Forest Service's northern region. He has been on the legislative affairs staff in the Forest Service's national headquarters in Washington since 1981.

'79 Darryl E. Pfeifer of Parkdale, Ore., is joining the California timberlands operations staff of Champion International. He had been a forester for the company's Hood River, Ore., district.

GENERAL COLLEGE

'79 Harold Meeker of Mound, Minn., has been elected first vice president of the University's General College Alumni Society. He is a consultant in human services for Hennepin County and for Gerry Sikorski, U.S. representative.

GRADUATE SCHOOL

'53 Leibert B. Wallerstein of Chevy Chase, Md., is retired, after 30 years' service, from the office of the secretary, U.S. Department of Transportation. He is currently an adjunct professor of economics at Benjamin Franklin University, Washington, D.C., and at Montgomery College, Takoma Park, Md.

'60 Dr. William S. Caldwell of Balboa Island, Calif., will be listed in the 1984 edition of *Who's Who in the West*. He is a senior lecturer at California State Polytechnic University, Pomona.

'63 David W. Haskin of St. Paul has been elected senior vice president of corporate resources at Northwestern National Life Insurance in Minneapolis. He had been president and chief executive officer for Campbell Electronics of Eden Prairie, Minn.

'68 John S. Swift, Jr. of Adrian, Mich., has been appointed assistant dean of the University of Toledo's University College. An academic adviser in University College since 1980, Swift is expecting to complete his Ph.D. degree at the university in August 1984.

'75 Sue Zuidema of Minneapolis directs the Hennepin County Community Health Department. She had been a senior planner with the county health department.

'76 Dr. Mark J. Engebretson of St. Louis Park, Minn., has been promoted to associate professor of physics at Augsburg College, Minneapolis. He has been an Augsburg faculty member since 1979.

Gary Roseth of St. Paul is the band director and music department chair at Tartan High School, Oakdale, Minn. He has also played music professionally in the Twin Cities.

Thomas C. Umfrid of Lincoln, Neb., has received an internship grant from the National Institute for Music Theatre. He is an assistant professor at the University of Nebraska at Lincoln.

'77 Alan V. Abramson of Bloomington, Minn., has been named director of decision support systems for HealthOne Corp., Minneapolis.

'78 Rosalie V. Clark of Minneapolis has been named assistant professor of social work at Augsburg College in Minneapolis. She has been a member of the college's faculty since 1979.

'79 Dr. Jeffrey E. Froyd of Terre Haute, Ind., has been promoted to associate professor of electrical engineering at Rose-Hulman Institute of Technology, Terre Haute. He has been a faculty member since 1981.

'81 Claudia Esslinger of Granville, Ohio, was featured in an art show at Denison University, Granville, in April. Her works deal with visual imagery and gesture. She is an assistant professor at Denison.

Barbara Kiester of Minneapolis has joined Process Dynamics of Eden Prairie, Minn.,

Chun Hsu, '59, of Woodbridge, N.J., has been named manager of electrical engineering for the Information Engineering Division of Lockheed Electronics Co., Plainfield, N.J. Hsu, who received his undergraduate degree from the National Taiwan University, received a master of electrical engineering degree from the University of Minnesota.

an employee counseling and management consulting company.

'82 Dr. Richard A. Borstad of Minneapolis has been promoted to assistant professor of health and physical education at Augsburg College, Minneapolis. He has been an instructor at Augsburg since 1981.

Judith M. Eaton Lamp of New Brighton, Minn., is president of the Minnesota Association of Secondary School Principals. She previously served in all offices of the Hennepin County division of the association.

Glen C. Ramsborg of New Hope, Minn., has been appointed deputy executive director of the American Association of Nurse Anesthetists. He is a major in the U.S. Air Force Reserve and serves as military consultant to the surgeon general.

'83 Nancy Shea of Madison, Wis., has been promoted to marketing assistant in consumer products at Oscar Mayer and Co., Madison.

COLLEGE OF HOME ECONOMICS

'52 Helen Y. Nelson of Ithaca, N.Y., has been named professor emeritus at Cornell University. Now retired, she was a professor at the university's New York State College of Human Ecology.

INSTITUTE OF TECHNOLOGY

'41 William I. Weisman of Tulsa, Okla., retired in August 1983 as president of Ozark-Mahoning, after 35 years with the company. He is now vice president of business development at Chemical Marketing Services in Tulsa.

'47 Leif W. Ericksen of Minneapolis has been appointed chairman of the board at Ericksen Ellison and Associates, a St. Paul mechanical and electrical engineering design firm.

'48 George Ellison of Cannon Falls, Minn., has been named president of Ericksen Ellison and Associates, St. Paul.

'59 Larry G. Larson has been appointed president and chief executive officer of Recon/Optical, Barrington, Ill. He had been vice president and general manager of the electro-optics division at Honeywell.

COLLEGE OF LIBERAL ARTS

'39 Elmer B. Staats of Washington, D.C., is president of the Harry S. Truman Scholarship Foundation. He also is a board member of the American Academy of Political and Social Science, the National Academy of Public Administration, and Radio Free Europe/Radio Liberty.

'43 Russell W. Nash of Dubuque, Iowa, presented his paper, "A New Phase for Walden Three," at the March meeting of the Midwest Conference of the National Conference on Family Relations. He is associate professor of sociology and chairs the sociology and social work department at the University of Dubuque.

'49 James M. Stanton, formerly of St. Paul, has been named vice president of materiel at the Spencer Kellogg Division of Textron, Buffalo, N.Y. He had been director of materiel and business manager of commodity products for the company.

The Well-versed Traveler

By Mikki Morrissette

Let's imagine you've been scrimping and saving for a vacation to the Netherlands this summer. You've got your Dutch-English dictionary in hand, you know that the American dollar is equivalent to 3.15 guilders, and you're prepared to eat a lot of herring, red cabbage, and pancakes. Chances are you'll return home satisfied that your money and time were well spent and not too worn down from the adjustment to a foreign culture.

But what if you are planning a business trip to the Netherlands? Rather than sightseeing, you are expected to mingle confidently with the natives and to avoid offending potential clients or associates. Will your tourist preparations make you familiar enough with the culture to accomplish a well-done job?

Rob Levine

John Giordano

John Giordano, University alumnus and former faculty member, is gambling that travelling businesspeople *aren't* familiar with the customs and protocol of foreign countries. In February he opened his own business—Datafax Corp.—to help close that intercultural gap.

"Very few companies, even as recently as three or four years ago, paid much attention to intercultural communication," Giordano said. "But things are changing now. America is being challenged from all sectors of the business world. We can no longer go in and make assumptions about getting contacts.

"We've felt that our advantage all along is that we're bigger, more modern, and more advanced technologically than anyone else. That's not something we would want to rely on heavily these days. We're working side by side with the British, Japanese, Germans . . . understanding other cultures is crucial.

"Americans have a special problem because we are so isolated and provincial," he continued. "We have an English-speaking country to the north of us, we've never really paid much attention to Mexico to the south. United States business people do not speak other languages. The assumption is that people speak English wherever they go. To that extent, geographically we're in a position that is not terribly advantageous."

Giordano's company doesn't attempt to scale the language barrier by offering intensive foreign language lessons. Instead, it concentrates on nonverbal communication—the dos and don'ts of over 50 foreign countries.

Take that business trip to the Netherlands, for instance. Giordano's three-page "Travelfax" summary covers the political,

'53 Louis M. Thomas of Nashua, N.H., has been promoted to technical director of the MITRE Corp.'s strategic command and control division. He has been with the firm for 25 years.

'54 Gordon Renfro of Seattle is retired from *The Seattle Times* after 28 years with Seattle newspapers.

'69 Dr. Robert C. Colligan of Rochester, Minn., has been selected to head the psychology section of the Mayo Clinic's department of psychiatry and psychology in Rochester. He has been a Mayo staff member since 1970.

'71 Mark D. Cowan of Evergreen, Colo., is joining the Home Builders Association of Metropolitan Denver as chief executive officer. He had been chief of staff to U.S. Department of Labor Secretary Raymond J. Donovan.

'73 Harold "Ed" Siddy of Alexandria, Minn., has been promoted to divisional loan manager at United Federal Savings and Loan, Alexandria.

'75 Sigrid Bergie of Minneapolis judged the creative writing division of the third annual Youth Arts Festival held in Grand Rapids, Minn., in April. She manages The Photographic Collection, an art gallery/shop in the Twin Cities.

Mary L. Small of Minneapolis has been named director of communications/public relations at Abbott Northwestern Hospital, Minneapolis.

'79 Jeanne A. Reinhart of Dallas has been named corporate communications associate for Viacom International, N.Y. She had worked for Celanese Chemical Co. in Dallas.

'83 Nancy A. Nelson of Minneapolis has joined Piper, Jaffray and Hopwood of Minneapolis as a registered representative. She had been a store manager and receiving manager for Seifert's.

Laura D. Sahr of Minneapolis has joined Carlann Communication Concepts, a Minneapolis-based public relations and communications firm, as a consultant.

MEDICAL SCHOOL

'59 Dr. Thomas Litman of Hopkins, Minn., has been elected medical staff president at Methodist Hospital. He is an orthopedic surgeon with Drs. Davis and Litman, St. Louis Park, as well as a clinical instructor at the University of Minnesota.

'63 Dr. Charles Ehlen of St. Cloud, Minn., has joined the staff of the Kanabec Hospital and Mora Medical Center in Mora, Minn.

'69 Dr. Robert D. Courteau, formerly of Onamia, Minn., is the 1984 recipient of the St. Thomas College Humanitarian of the Year Award. For several years he has been a volunteer for the Mission Doctors Association in Rhodesia and in Thailand. He and his family now live in Thailand and plan to remain there until 1985.

'74 Dr. Timothy J. Rumsey of St. Paul is the author of *Pictures*, a novel to be published by William Morrow. He practices medicine in St. Paul.

UNIVERSITY COLLEGE

'68 Diana Doshan of Minneapolis has been named vice president of human resources for the Pillsbury Co., Minneapolis.

business, and trade climates; social quirks; and housekeeping data that might make or break a business deal for the uninformed American. Here are some excerpts:

• Business Customs: Meetings are carefully scheduled, making punctuality important for appointments. Dress is conservative, with an emphasis on woolen suits. Working business lunches are common, but dinners lean more toward the social.

• Conversation Topics: Music, soccer, speed skating, weather, the American TV program "Dallas," land reclamation, art.

• Tipping: Leaving small change in addition to calculated tip is customary. Theater ushers get 1 guilder, tour guides/canal boat captains 1-2 guilders, hotel doormen who get taxis .5-1 guilder, washroom attendants .5 guilder.

• Dos: Bring flowers as a gift to a hostess. Failure to do so is considered impolite. Bring an odd number, not a dozen . . . Expect the Dutch to be reserved at first, but they should warm up after subsequent meetings. They love to joke and drink . . . Use Sir or Madam when addressing people, unless otherwise requested.

• Don'ts: Don't speak German, call anybody Herr or ask for German food. A sensitive issue . . . Don't ask about your business contact's family. This is too personal . . . Don't say things if you don't mean them literally. The Dutch will expect you to live up to them. Avoid saying, "See you later," "We've got to get together for lunch sometime," etc.

Giordano, 40, holds a Ph.D. in intercultural communication from Minnesota, but foreign cultures were not his first love. He earned his undergraduate degree at Pratt Institute, nationally recognized for its art curriculum. In addition to a master's degree in English as a second language, he also has a master's degree in fine arts.

His interest and expertise in foreign cultures started in 1965 when he was a Peace Corps volunteer in Libya. After completing his service, he was hired by the Libyan government to work for its Ministry of Education. "My imagination was captured by the process of crossing cultures," he explained.

A popular lecturer about his intercultural communication experiences during the past 15 years, Giordano was a University teaching associate in the speech-communication department for six years, teaching Intercultural Communication as recently as last summer. He served as Minnesota's intercultural student adviser last fall before going public with his Datafax business, soliciting 200 shareholders within a few weeks.

The eight-member staff includes writers, researchers, a librarian, and a public relations person. Datafax researchers interview state department officials and natives living in the local area, regularly meet with frequent travelers, and garner information from short-wave radio programs, foreign magazines, and newspapers. "We're very creative on how we get our information," he said. "Those are our family secrets. But what it boils down to is collecting information and having the expertise to figure out whether it rings true or not and is of value to the business community."

The state's progressive nature and large business environment make Minnesota a good test site for his business, Giordano said. "We're now expanding nationwide. We thought that if Minnesota liked the product then everyone else would too."

As Giordano has learned—and is teaching others—you need more than a dictionary when you leave the United States.

DEATHS

Sister Francetta Barberis, '44, of Nerinx, Ky., on February 26, 1984. A teacher and school administrator in Denver, Colo., and El Paso, Texas, she moved to St. Louis, Mo., in 1958 to become president of Webster College. In 1965 she joined the Women's Job Corps in Washington, D.C., serving as national director until retiring in 1975. She was a recipient of the U.S. Labor Department's Meritorious Achievement Award.

Melvin Oliver Benson, '34, of Alexandria, Va., on January 25, 1984. During World War II he worked first with British intelligence in the Middle East and then with the Office of Strategic Services. He joined the CIA after the war and also worked for Pepsi Cola International in Africa, Europe, the Far East, and Latin America. He resigned from these posts in 1960 to work as an industrial development adviser for the Agency for International Development. In 1963 he became a staff consultant to the House Foreign Affairs Committee. He retired in 1972.

Dr. Eldon B. Berglund, '46, Minneapolis, on February 29, 1984. He was chief of family practice at Hennepin County Medical Center, Minneapolis, until retiring in 1982.

Franklin O. Briese, '24, St. Paul, on March 15, 1984. He worked for Minnesota Mutual Life Insurance Company for 42 years, becoming president in 1966. He retired in 1971.

Dr. Max W. Goldberg, '20, Minneapolis, on May 29, 1983. He retired from his Minneapolis dental practice in 1963.

Ralph G. Golseth, '31, Tucson, Ariz., on March 4, 1984. He was vice president of Cargill in Minneapolis, vice president of the Glidden Co. in Chicago, and president of Lauhoff Grain Co. in Danville, Ill. He moved to Tucson in 1965 where he was involved in real estate investments.

Frances J. Gross, '47, of Washington, D.C., on February 10, 1984. She worked for several years at the Library of Congress in the manuscript section. She belonged to the Sisterhood of Temple Sinai in Washington and to Common Cause. She was a volunteer for the Children's Hospital and for the Meals-on-Wheels program.

Clara Heylmun, '26, of Ontario, Calif., on March 15, 1984.

Victor S. Jensen, '25, Laconia, N.H., on January 22, 1984. He worked with the U.S. Bureau of Indian Affairs in Oregon before joining the U.S. Forest Service's Northeastern Forest Experiment Station in New Hampshire. He was a federal civil servant for 44 years before retiring in 1968.

Viola M. Johnson, '74, Minneapolis, on February 17, 1984. She was employed for 22 years in the Minneapolis school system as a teacher, reading and human relations specialist, assistant principal, and principal, until retiring in 1980. She was a member of Phi Delta Kappa and the St. Peter A.M.E. Church. She was also a volunteer for the United Negro College Fund, the Education Task Force of the Minneapolis Urban League, and the Muscular Dystrophy Association.

Tora T. Kreiner, '36, Raleigh, N.C., on January 11, 1984. For many years she taught high school French and Spanish and later directed the language division of the North Carolina Department of Public Instruction. After retiring she became a docent and lecturer at the North Carolina Museum of Art.

Henning Linden, '17, of Fairfax, Va., on March 15, 1984. He served in World War II in the Aleutian Islands and in Europe, where he was assistant division commander of the 42nd (Rainbow) Division. He was stationed at Fort Belvoir, Washington, D.C., in 1949 and remained there until 1952, when he retired as chief of the military arts department. He was decorated with the Silver Star, two Legions of Merit, two Bronze Stars, the French Croix de Guerre, and the Belgian Order of Leopold.

Mary Malcolm, '21, Worthington, Minn., on December 14, 1983. She retired in 1967 after 45 years of teaching music at the University of Minnesota.

Robert D. McIntosh, '36, Edina, Minn., on April 8, 1984. He worked as an accountant before joining Piper, Jaffray and Hopwood, Minneapolis, in 1953. He held many positions in the firm before retiring in 1981, when he became a marketing consultant and radio commentator for the firm.

James W. Nielsen, '48, Berkeley Heights, N.J., on May 3, 1983. He was a chemistry teacher at Kearney State College in Nebraska before moving to New Jersey, where he joined the technical staff of Bell Laboratories. In 1960 he began working for Litton Industries as a manager in the solid state materials department. He returned to Bell Laboratories in 1967 to supervise the electronic materials and processes division. He was an editorial board member for the *Journal of Electronics Materials* and a planning committee member for the 1984 American Association for Crystal Growth meeting. He held many patents and published more than 50 papers.

Leonard P. Roberts, '42, Dayton, Ohio, on March 19, 1984. He joined General Motors in 1947 as a financial analyst and had been general manager of the company's Inland Division since 1981. He was on the YMCA board of directors and its executive committee, was president in 1980-81, and chaired the YMCA's capital development program steering committee. He was past chair of the Dayton Area Chamber of Commerce and the Dayton Board of Education's long-range planning committee.

Hermann R. Wiecking, '24, St. Paul, on March 10, 1984. He worked for the *Mankato Daily Free Press*, the Associated Press in Minneapolis and St. Paul, and the *Winona Republican Herald*. He was director of the Associated Press Managing Editors' Association, president of the Minnesota Associated Press, and president of the First Minnesota District Editorial Association. He was cofounder and co-owner of KWNO radio in Winona until 1944, when he joined the public relations staff of Great Northern Railway. He retired in 1955.

Editor's Note:
When sending information for Class Notes, please include the name you were known by in school so your friends and classmates will recognize you.

Carolyn Iverson Schroeder, '55, of Edina, Minn., has been elected to a two-year term as chair of the board of trustees for Minneapolis Children's Medical Center. Schroeder, who received her degree in nursing, is past treasurer of the University School of Nursing Foundation.

From Ballroom Dancing to Broadway and Back

Rob Levine

Dan Dee

By Mikki Morrissette

When Dan Dee, a St. Paul native, enrolled at the University of Minnesota in 1972 he intended to study chemistry. A course he took to meet girls and earn an easy credit changed all that . . . for a while anyway.

During his sophomore year Dee registered for ballroom dance, his first exposure to organized dance. He liked it, had a knack for it, and served as a teaching assistant for more than a year while adding jazz and ballet courses to his transcript. Instead of a chemistry degree, he graduated in 1977 with a theater degree and took a job as dance coordinator for an inner city youth program.

As Dee energetically explained his former job, though, traces of his science background were still evident.

"You have all these kids jumping around, and it was my job to try to keep them contained in a room," he said. "But it's like containing gas molecules in a box. As the temperature increases, those molecules start bouncing around even faster."

Yet for a while at least, the dichotomy between art and science continued.

Someone suggested he join the Minnesota Jazz Company, so he did. Then someone else suggested he try ballet also, so he moved on to the St. Paul City Ballet and from there was accepted for an intensive summer session with the San Francisco Ballet Company.

Dichotomy #2: In the summer of 1979, Dee was a construction worker by day and a St. Paul City Ballet dancer by night. He took one afternoon off when the ballet company performed for a senior citizens group and never heard the end of it from his coworkers. He almost passed off a friend's suggestion that he take another day off to audition for an understudy job with the touring company of "A Chorus Line."

Talked into going to the audition, Dee joined about 35 men and 55 women hoping to be discovered during the company's three-week run at the Orpheum Theater in Minneapolis. He was the only local dancer selected and performed with the company for the rest of the tour.

For 55 weeks Dee was an understudy for three parts. Although there were performances eight times a week, Dee had time on his hands during each show. He usually was on stage for the opening scene and the finale and sang in the backstage chorus during the rest of the show. "After about three months I could've sang the parts in my sleep," he said.

Dichotomy #3: To occupy his time, Dee renewed an old interest in electronics. He started reading *Byte* magazine backstage during performances, bought a computer that he carried with him in a briefcase—Amy, as the computer was named, was adopted as the tour mascot—and earned the nickname "Mr. Computerhead."

When the tour ended, Dee headed for New York to see if fate would lead him to Broadway. It did, albeit in a short-lived production of "Copperfield" in which he was a swing man, covering 12 dance and chorus parts. He had a sprained ankle and was wearing a fiberglass cast when he had to substitute for a bottlewasher in the play. "I had to climb up this ladder and wash bottles, but I didn't know anything else about the part," he said with a laugh. "So there I was, on Broadway, just making things up as I went along, with a cast on my foot. It was pretty wacky."

When that show closed he was offered a spot with the American Dance Machine, which performs several foot-stomping numbers from Broadway shows. The group toured Japan for three months in 1981, and Dee was swallowing about 12 aspirins a day because of ankle pain. After returning to the United States, Dee was cast in a holiday television special that featured 21 stars, including Ethel Merman, Debbie Reynolds, Barry Bostwick, and Anthony Perkins.

Dichotomy #4: Meanwhile, back at his New York apartment, Dee continued to play with his computer. He bought a ranging device that turned it into a homemade robot that scanned the apartment using ultrasonic waves. Dee returned to Japan with the Dance Machine and followed that trip with a London tour. While in Europe, he started to think about leaving the stage. "I had tendonitis in both ankles, I got hit with a fez and had a bruised eye, and was just hurting all over my body. One night I was standing on stage with this plastic smile on my face, thinking 'I don't care if I ever do this in my life again.' I was really wiped."

So last year he returned to Minnesota, was accepted into the Institute of Technology, and planned to start school in fall 1983 after a dance tour through Italy. Dee's story, however, wouldn't be complete without his swan song.

To celebrate the September 29 performance of "A Chorus Line" as Broadway's longest-running musical, all members of its former touring casts were sent to New York, all expenses paid, for a nationally televised grand finale. "I had to miss the first week of school, but it was the most exciting thing," Dee recalled, his eyes twinkling. "The lights went down, and then the original cast was on stage. The audience went wild. They kept adding casts until we had 13 rows on stage, shoulder to shoulder. We were the toast of the town. At parties I was rubbing elbows with Gregory Peck, Tommy Tune and Twiggy, Joel Grey. It was just wild."

Dee, now 29 years old, is back on campus as an electrical engineering student. He's a member of the ballroom dance club again, but he recently turned down an invitation to join a dance tour in Europe this summer, insisting that he's going to nurture the science aspect of his personality.

At least until something triggers that "Gotta dance!" feeling again.

Hats Off to Thee!

What a way to go—buried alive in painter's caps! But you won't hear Brad Peterson, '79, complaining. At 29, Peterson is a partner and chief financial officer of Crowd Caps Inc., manufacturer of more than 460 varieties of painter's caps. Last year the Minneapolis firm sold more than 4 million caps, bringing $7.2 million in revenue to the five-year-old company.

The idea for the company came from the firm's other partner, 25-year-old Brett Johnson of St. Paul. When Crowd Caps was just getting on its feet, Peterson ran the company out of Johnson's home while Johnson finished school at Harvard. The partners expect sales to double in 1984 and are beginning to look into other areas for expansion, possibly banners and pennants.

This fall the athletic department is offering a Minnesota Gophers Crowd Cap as a premium for Williams Fund donors and for purchasers of student season tickets. The cap will also be sold at concession stands.

When the band strikes up the rouser, Peterson hopes to see caps, not just hats, off to thee.

Brad Peterson, partner in Crowd Caps Inc.

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