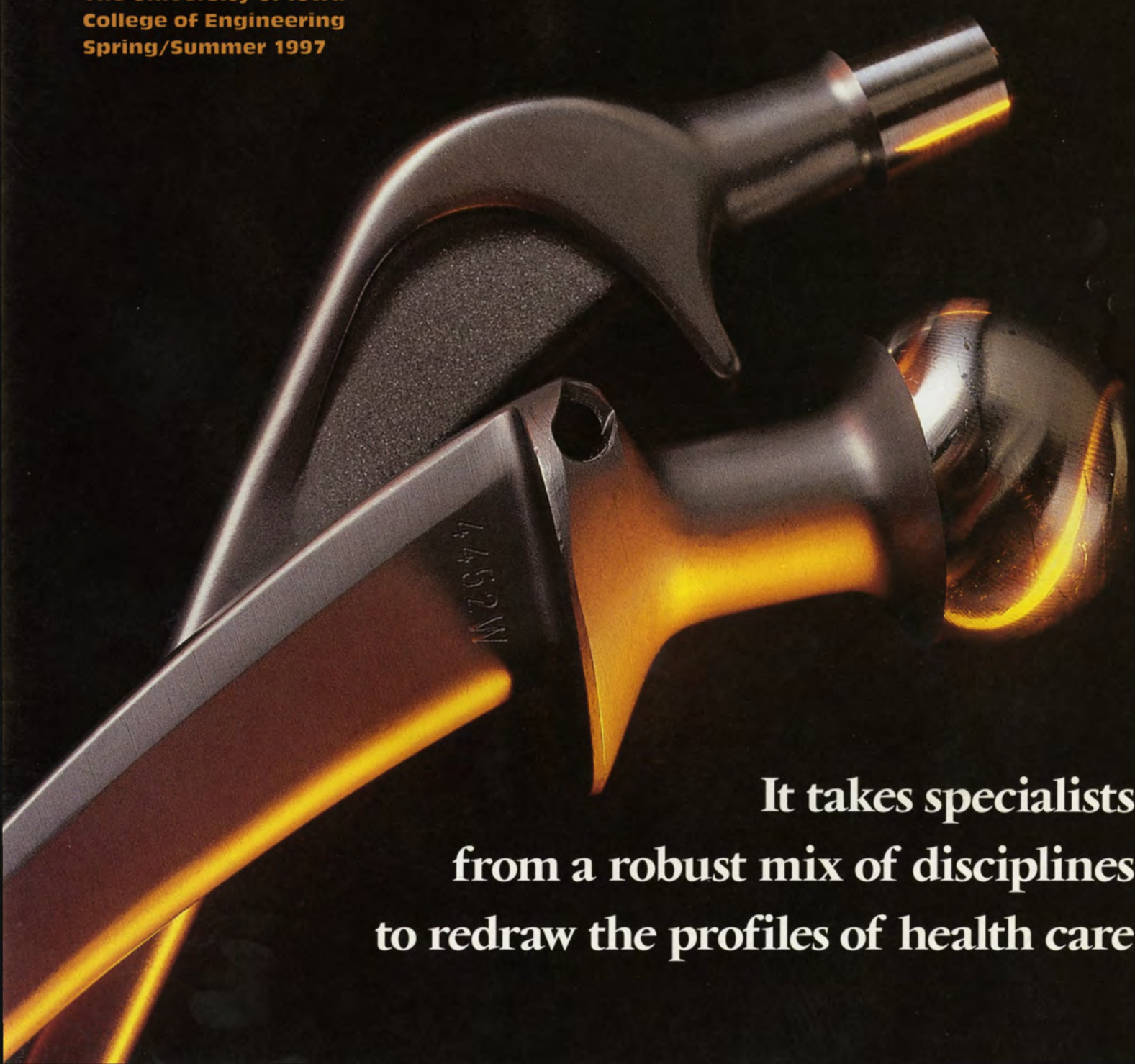


IOWA ENGINEER

The University of Iowa
College of Engineering
Spring/Summer 1997



It takes specialists
from a robust mix of disciplines
to redraw the profiles of health care

FROM THE DEAN



This is a very special issue of *Iowa Engineer*. It tells about some of the most exciting partnerships on our campus today and about how a major rejuvenation of the college's physical surroundings will reflect the changing dynam-

ics of engineering education and research. It also catches up with an alumnus who never tires of putting his innovative ideas to work.

Unique Opportunities

Often I have said that many of our students come to Iowa because they want to be engineers and more. They are drawn by Iowa's long tradition of providing an excellent engineering education along with a wealth of opportunities to pursue a strong liberal arts focus or to take courses in areas such as business, the biosciences, and medicine.

In recent years we have seen significant growth in the number of students who earn an engineering degree in preparation for studying medicine. The University is a superb environment for these students. It is home to The University of Iowa Hospitals and Clinics, one of the nation's most respected teaching hospitals. It boasts a biomedical engineering department that offers one of only 21 accredited undergraduate programs in the United States. And its Colleges of Engineering and Medicine collaborate in specialized research conducted by scientists whose work is widening the horizons of both engineering and the health sciences.

I can't think of a more stimulating environment in which to learn about so many things—from medical informatics (industrial engineering), to groundbreaking work in medical imaging (electrical and computer engineering), to spine biomechanics (biomedical engineering). In the pages that follow, you'll find out about some of these one-of-a-kind partnerships and how important they are to our future.

A Long-Awaited Campaign

About a year ago, I happily reported to you that the Iowa State Legislature had just approved \$14.1 million toward a \$26-million Engineering Building modernization project—the building's first renovation in more than 30 years. Since then, we have made great progress toward realizing our goals. The University reallocated \$4 million for the project, architectural plans were approved by the State Board of Regents, and we celebrated the work's start-up by holding a groundbreaking ceremony. Today we can report that through private gifts, \$5 million has been raised toward the \$8-million goal announced just eight months ago!

Most of the credit for this exciting progress belongs to our loyal alumni. For each of you who earned your degree in spite of crowded conditions and aging facilities, this building project is yours to enjoy. At the same time, we need your help to complete this ambitious fund-raising effort. We invite you to join the distinguished alumni and partner corporations who already have confirmed their support. In this issue you'll read about how the modernization project is progressing, its role in creating an innovative learning environment, and how alumni can help ensure the college's success.

Alumni Leadership

During the 1980s, people called the Midwest and the mid-Atlantic states the "Rust Belt" because of the regions' deteriorating industrial and manufacturing bases. One University of Iowa engineering graduate, R. William Van Sant, not only survived in the Rust Belt but also earned acclaim for helping lead the turnaround of several companies—Deere & Co., Cessna Aircraft, Blount, Inc., and Lukens, Inc.—making them productive, prosperous, and globally competitive. Van Sant's background as a mechanical engineer, his management expertise, and his Iowa-born values have given him solid footing as a business and community leader and as a friend, colleague, and adviser. In February he was inducted into the college's Distinguished Engineering Alumni Academy in recognition of his achievements. We proudly share Van Sant's success story here.

I hope you enjoy all of the stories in this *Iowa Engineer*. Please continue to let us know about your activities, and visit the college whenever you're in Iowa City.

/ Richard K. Miller
Dean, College of Engineering

IOWA ENGINEER

Table of Contents

4 **Bill Van Sant's path of change**

From delaying college until he felt good and ready, to engineering some management/labor agreements that changed the face of the workplace, he has followed his own best judgment to success.

6 **Cooperation's unique results**

When engineers and health science specialists get together to solve problems, some of the most unexpected developments come about. At Iowa, experts are combining their experience, knowledge, and resources in work that redefines our well-being.

15 **Entrepreneurship's first grads**

The college's newest certificate program turns two enterprising individuals out into the world. Both have solid plans, with experience to back them up.

16 **The building project's great start**

Room for students and teachers, for researchers, for project teams, for alumni partners in education—it's all been planned, with input from everyone involved. See how the renovation and remodeling will help the College of Engineering usher in its new era in learning.

14 Honor roll

23 Class notes

25 In memoriam

26 College news

27 Advisory Board/Development Council

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Cover: Iowa scientists are working to extend the life of artificial hips by developing a cement with pores into which the patient's own bone will grow, strengthening the bond between implant and host. (Photo by Tom Jorgensen)

VISION/INSIGHT

RESULTS

You might not know it by looking at him, but Bill Van Sant is a non-conformist. His quiet demeanor and conventional appearance belie the unusual choices and innovative ideas with which he broke the traditional mold of corporate America.

Van Sant grew up in Cedar Falls, Iowa, in an era when most college students began their studies at age 18. But Van Sant opted to work for five years before pursuing his postsecondary education.

"Since my parents were educators, it might seem strange that I didn't go right on to college," he says. "But at the time, I thought it was a good idea to earn my own way. Besides, I just didn't feel I was ready for college."

So in 1957 Van Sant entered the corporate world, hiring on as a tractor test operator and then as a desk clerk in manufacturing engineering at the John Deere Waterloo Tractor Works.

"I began to watch the engineers and decided that I wanted to do what they did," he says.

After five years at Deere, Van Sant enrolled at The University of Iowa College of Engineering. Almost immediately he was smitten by thermodynamics and theories of heat transfer, and the friendly atmosphere.

"My first day on campus, Mary

Sheedy [secretary to the dean] and Professor [Hunter] Rouse made me feel instantly comfortable," Van Sant recalls.

Van Sant earned his bachelor's degree in mechanical engineering in 1966 and his master's degree in 1967, then decided it was time to re-enter the work force.

"I was torn about what would be the right decision for myself and my family," Van Sant says. "So I called my old boss, Ralston Gager, who said that Deere was on the threshold of massive change and the company had a lot to offer me. I decided to go back, and I've never regretted it."

From his first role as a supervisor through stints as a manager and finally as corporate vice president, Van Sant played a pivotal role in developing Deere & Company into a late-20th-century manufacturing powerhouse.

And he wasted no time doing it. At age 37 he became one of the youngest general managers Deere had appointed, and at age 42 he became the company's youngest-ever vice president.

Van Sant could have remained at Deere until retirement, but in 1983 he made the difficult decision to head for new challenges.

"I lost two weeks and twenty pounds before I decided to leave the company where I'd started,"

Van Sant recalls. "But every career change I made was for the better, and this was no exception."

With that departure, Van Sant launched a career of similar successes in planning and implementing large-scale organizational change. He served as president and chief operating officer of Cessna Aircraft Co. from 1983 to 1987 and then as president, chief operating officer, and chief executive officer of Blount, Inc., from 1987 to 1991.

Although he clearly is a skillful and effective corporate manager, Van Sant maintains a strong sense of family within the corporate structure. When the aircraft industry took a nosedive during the mid-1980s, Cessna decided to shut down its single-engine aircraft manufacturing. Van Sant was forced to lay off 4,500 workers in three years.

"Of all the challenges I've faced as a corporate manager, that has to have been the most difficult," Van Sant says.

After Cessna was bought out by General Dynamics, Van Sant left the corporation.

"I never felt comfortable in the huge aerospace bureaucracy," he says, "so I decided to move on."

In 1987 Van Sant joined Blount, Inc., a family-owned business that dealt in everything from international construction to sports equipment to chain saws and lawn mowers. But he faced yet another difficult decision when Blount jettisoned Washington Steel.

"The senior managers and employees of Washington Steel told me in no uncertain terms that they were disappointed," he says.

But a twist of fate would give Van Sant the unique opportunity to mend fences with his former employees.

In fall 1991 the company brass at Lukens, Inc., asked Van Sant to join the steel giant as its president. He agreed and soon added chairman of the board and CEO to his title. Once again, the mechanical engineer found himself in a position to reshape a corporation's traditional structure—and he did, coaxing Washington Steel into the Lukens family.

"Beginning with the purchase of Washington Steel," he says, "we tipped Lukens upside down. We shifted the company from its historic carbon and alloy plate production to the manufacture of specialty steel. Now we make everything from stainless steel sheets for restaurant freezers to

"I lost two weeks and twenty pounds before I decided to leave the company where I'd started. But every career change I made was for the better..."

alloy steel plate products for environmental control equipment and huge steel tanks.”

In just three years, Van Sant transformed Lukens from a \$400-million-a-year company to one that annually pulls in a billion dollars of business.

He notes that at first, the reunion with the managers and employees of Washington Steel was rather strained. But Van Sant worked hard to create an atmosphere in which healing could take place. Today “relationships are very good, and Washington Steel has contributed significantly to the growth and change at Lukens,” he says.

Van Sant is known for his concern about worker satisfaction and for his efforts to integrate all employees—production workers as well as managers—into effective, dedicated teams. He earned this reputation largely as a result of his efforts to resolve two labor disputes at Lukens.

The moment his nameplate adorned the corporate offices of Lukens, Van Sant faced an eight-day-old labor strike at the company’s Coatesville, Pa., plant. The first 108 days of his tenure were devoted to ironing out hostilities. In the end, Lukens and the United Steel Workers accepted a contract that Van Sant feels has benefited both parties. Although Van Sant is credited with shaping much of the agreement, he insists that “the union probably gives me more credit than I should have. What really happened was that a lot of people on both sides finally backed down.”

A second dispute—at Lukens’ newly acquired Washington Steel plant in Massillon, Ohio—allowed Van Sant to work his magic again.

“When I began at Lukens,” he says, “there had been a history of

testy labor relations in Washington Steel’s Ohio operation. A lot of people saw Ohio as ‘a problem.’”

A week after Van Sant closed the deal to buy Washington Steel, he flew to the Ohio plant so that he could talk directly with the union leaders.

“I sat at the table with these seasoned United Steel Worker representatives, some with 30 or 40 years seniority, and asked them to create their vision for the plant,” Van Sant recalls. “At the end of the meeting they said, ‘If you just give us a chance, we’ll show you what we can do.’”

Van Sant did precisely that, and the result was a novel agreement whose outcome, he says, has been nothing short of astounding.

“There has been a dramatic change in the work culture and plant performance in Ohio,” he says. “Salaried employees and wage earners now work together in teams, and visitors usually can’t even tell who’s who.”

Based on his track record at Deere, Cessna, Blount, and Lukens, Van Sant has become known in the industry as “Mr. Fixit.” The specialist in thermodynamics and interpersonal relations says that he continually draws on his engineering education at Iowa to understand technical problems, forge strong employee ties, and maintain his corporation’s strength.

“Regardless of which engineering discipline you choose, I think engineering is the best education you can get,” he says.

And the way it’s taught at Iowa, he adds, makes engineering a primer not only in identifying and solving technical problems but in forging personal relations, too.

“At Iowa, engineering students study public speaking, literature, and the performing arts,” says Van

Sant, who serves on the College of Engineering Development Council. “I can’t count the number of times I’ve fallen back on my training in heat transfer, kinetic energy, and manufacturing to resolve some high-tech, potentially ex-

pensive corporate problem. But I also constantly draw on the wider education I received at Iowa.

“Ultimately,” he adds, “a really good engineer, like a really good corporate leader, needs to understand other human beings.”



PHOTO BY SAM RADZVLJUK

Partnership

holds the future

At Iowa, engineering and
the health sciences join hands
to advance research, develop
unique technologies, and
train future scientists

All of the College of Engineering's six departments and three of its major research units are active in engineering/medicine research collaborations. Some departments also support interdisciplinary centers dedicated to research in specialized areas.

Biomedical Engineering

Biomaterials
Cardiovascular and biofluid mechanics
Medical imaging

Electrical and Computer Engineering

Quantitative coronary angiography
Intravascular and intracardiac ultrasound
Automated interpretations of MR brain images

Civil and Environmental Engineering

Center for Health Effects of Environmental Contamination
Bioremediation
Water quality modeling

Chemical and Biochemical Engineering

Center for Biocatalysis and Bioprocessing
Membrane technology for artificial organs
Enzyme technology in pharmaceuticals

Industrial Engineering

Medical informatics
Process engineering for pharmaceuticals
World Wide Web-based consultation systems

Mechanical Engineering

Robotics in precision surgery
Micro-electro-mechanical systems (MEMS)
Imaging of cavitation in heart valves

Center for Computer-Aided Design

Man/machine interactions (human factors)
Influence of drugs on human behavior
Human perception/cognition in driving

Iowa Institute of Hydraulic Research

Peristaltic pumping
Fluid flow problems in the brain
Computer modeling of fluid flow in humans

Iowa Spine Research Center

Biomechanics of lifting
Spinal degeneration
Sudden loads on the spine

Left: Three of several artificial heart valves that Iowa has tested for FDA approval; scientists in the college's biomedical engineering department are working to extend the life of the tri-leaflet valve (held separately) by developing a synthetic material to replace the porcine tissue used in the valve.

Bridging past and future, today's collaboration yields the pictures of health

On a bookshelf in the office of University of Iowa radiologist Michael Vannier sits *Cardiac Imaging and Image Processing*, a 1986 reference used by medical computer imaging experts across the country. But if Vannier wants to talk with the scientists who shaped this important work, all he has to do is walk across a bridge.

Vannier and the book's editors, Steve Collins and David Skorton, form a multidisciplinary team that is radically altering the way clinicians process and interpret medical images. Working individually and in teams, the three researchers are designing methods to derive maximum information from today's various imaging techniques.

Skorton, a faculty member and the University's vice president for research, says that "multidisciplinary science is the wave of the future." But collaboration between Iowa's engineering and medical colleges also has a venerable past.

"Like many investigative areas," Skorton says, "multidisciplinary engineering and medical

research at Iowa developed through the spontaneous grassroots efforts of the people involved."

Vannier agrees.

"The University of Iowa has long been known for its team efforts in engineering and medicine," he says, "and the development of cardiac imaging and image processing in particular. Collins and Skorton established that field here, and Skorton still edits a major text in the subject."

Collins and his colleagues have worked for nearly two decades to refine methods of interpreting cardiovascular images captured through angiograms.

"The standard approach to interpreting images of the heart and arteries in clinical practice is visual and subjective," says Collins, professor of electrical and computer engineering. "The problem is, it's too easy with this approach to underestimate or overestimate the amount of plaque that has accumulated in blood vessels."

In addition, the sheer quantity of information contained in med-

ical images is staggering. Interpreting such huge quantities of medical information simply by "eye-balling" images can significantly affect the accuracy of diagnoses and the success of therapeutic outcomes.

In collaboration with Skorton, Michael Winniford, professor of internal medicine, and Milan Sonka, professor of electrical and computer engineering, Collins has been able to develop new digital image processing techniques that bring to light more explicit, objective, and comparable data for clinical use.

The researchers have focused careful attention on blood vessel borders. Using sophisticated computer algorithms, the medical and engineering collaborators can detect the location of both vessel borders simultaneously, a technological "first." By so doing, they are able to measure the diameter of the artery, describe its geometry, and characterize the severity of any blockage.

Their use of quantitative computer analysis not only makes the formidable amount of information more manageable but also reveals information not readily apparent to the subjective human observer.

"When we first started," Collins says, "it took all night for the computer to analyze the image.

Now we can gather much more and better data in just a few seconds."

Collins adds that the technique is five times more reliable than any other current computer technique, let alone the old subjective visual interpretation.

Although the automated process is not yet commercially available, Collins says it could have far-reaching clinical applications as a highly reliable and accurate diagnostic technique.

"We've published widely and hope that the private sector will catch on, apply our research, and develop an easy-to-use approach for clinicians," Collins says.

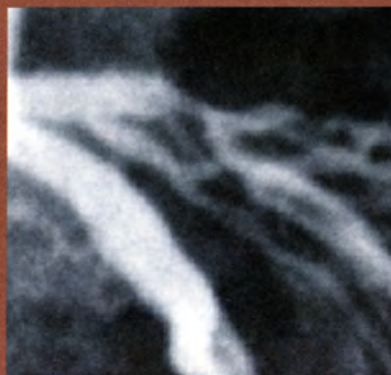
Vannier says collaboration is the disciplines' key to success.

"The future of medicine in general and radiology in particular is intimately tied to that of engineering," Vannier says. "If Iowa didn't have a College of Engineering, many of us on the medical side wouldn't even be here."

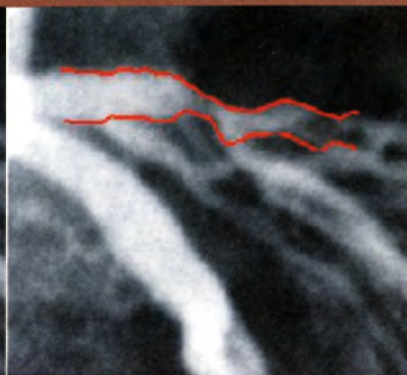
The Iowa team's new kid on the block, Vannier arrived a little more than a year ago from Washington University's School of Medicine, where for 15 years his own radiological research team had pursued theoretical questions related to those being investigated at Iowa. When the

(continued on page 8)

Original



Conventional



Simultaneous



Vessels in the original angiogram image lack distinct boundaries. It's difficult enough to tell where their walls are, let alone determine the location and amount of plaque that has accumulated in them. The conventional border detection method often fails to show a clear picture when there are vessel branches or parallel vessels close by. But the Iowa scientists' border detection technique provides clear definition of artery walls and gives accurate assessments of any blockage that may be present.

(continued from page 7)

opportunity arose to join Iowa's renowned radiology department and work with Collins and Skorton, Vannier didn't hesitate.

Iowa's strong support for multidisciplinary engineering and medical research appealed to several other members of Vannier's Washington University team, who decided to relocate to Iowa City. Gary Christensen has a joint appointment in electrical and computer engineering and radiology, and Ge Wang and John Haller are associate professors of radiology.

Vannier and Christensen brought more than \$3.5 million in grant support with them, and Vannier moved the editorial office of *IEEE Transactions on Medical Imaging* to Iowa. In addition, Christensen has joined forces with Collins, Sonka, Vannier, and professor of biomedical engineering Krishnan Chandran in a major medical imaging effort funded by a \$1.8 million grant from General Electric Corporation.

The intellectual bridges between University of Iowa engineering and medical researchers will continue to lead to technological innovations that can be produced in the private sector and applied in the wider world.

"More and more," Skorton says, "the big discoveries will be made on the edges of traditional fields of study. That's where people can really stretch their imaginations and make a difference."



Steve Collins

Collins holds a joint appointment as professor of radiology in the College of Medicine in addition to his primary appointment as professor of electrical and computer engineering. Skorton holds joint appointments as professor of biomedical engineering and of electrical and computer engineering, in addition to his primary appointment as professor of internal medicine in the College of Medicine. He also is the University's vice president for research.



David Skorton

Vannier, who is professor and head of radiology in the College of Medicine, completed an undergraduate degree with a double major in engineering science and mechanical engineering before going on to earn an M.D. degree.



Michael Vannier



In factory, office, or clinic, the word must get around

Andrew Kusiak should hang a shingle outside his College of Engineering office: "Kusiak's the name; info's the game."

Kusiak, professor of industrial engineering, is bringing the systematic principles of informatics to the medical setting.

"The term 'informatics' is used more often in Europe than here," he says. "It means the study of tools and techniques of information flow within a system."

Kusiak and others at The Uni-

versity of Iowa are working together to apply the theoretical tools of informatics developed in industry to the world of medicine, where political, social, and economic forces are revolutionizing American health care systems and medical practice.

These changes are bound to bring dramatic shifts in how medical institutions handle and disseminate information.

"The change in health care at the national level is creating

profound changes in how medicine is taught and practiced in Iowa," Kusiak says. "We need to develop new organizational structures and design new information systems to help institutions like The University of Iowa Hospitals and Clinics (UIHC) maintain their high quality of care."

Informatics helps organizations perform more efficiently and therefore more economically—an important consideration in today's cost-conscious health care market.

Kusiak says that informatics can affect health care institutions in three distinct ways. The first is through implementation of telemedicine.

"We are using more and more information technology for better health care communication—even at a distance," he says. "Using computers, for instance, University of Iowa doctors can present X-ray images from Iowa City to a physician in a rural area. In addition, University doctors can use computers to participate in real-time conversations with doctors and patients in remote areas."

The second is development of databases. Informatics has played a crucial role in the University of Iowa Virtual Hospital, which Kusiak helped establish. The Virtual Hospital is a vast computerized knowledge base used by students and faculty in the College of Medicine and by hospital patients.

Kusiak also is a key player in applying the les-

sons of informatics in yet a third way: He is part of a 20-member team working on a proposal for design of an integrated advanced information management system for University Hospitals.

When fully funded by a \$2.5-million grant from the National Library of Medicine, the project will help reorganize the hospitals' computer resources and define who is responsible for developing and maintaining the system's information technology.

"From an information point of view," he says, "a hospital can be considered analogous to a manufacturing entity. The two systems perform different functions, of course, but the information principles that apply to one system also apply to the other."

By applying the lessons of engineering systems, Kusiak adds, hospitals can streamline the delivery and use of resources and improve decision making.

"It will be a whole new informational paradigm," Kusiak says of the enterprise. "The ideal system would balance the interaction among patient, physician, and medical knowledge to arrive at the best medical decision."

One facet of the project will address the issue of medical record keeping.

"Maintaining medical records on paper is tremendously inefficient and expensive," Kusiak notes.

One of many researchers and clinicians who collaborate with Kusiak is Michael Vannier, professor and head of radiology.

"Traditionally, medical decision making is done by drawing on observations and on knowledge gained through lectures and consultations," says Vannier. "With medical informatics, that body of knowledge can be encoded and supported by vast information systems. This enables us to build tools that help make medical decision making more uniform, efficient, and effective."

Kusiak stresses that the human element—or the "art"—of medical practice will continue to be important even after sophisticated information technologies are up and running. While high-level tasks will continue to be performed by doctors, patients will become more involved in making decisions about their own health care.

By offering practitioners



Andrew Kusiak

easier and faster access to information, informatics will reinforce and clarify the links between medical procedures, patient outcomes, and health care costs.

"This is our challenge," Kusiak says. "We're at the threshold of a very exciting era."

He adds that studies indicate that traditional health care systems experience 30 percent inefficiencies—"basically waste." In addition, the practice of medicine has been shown to be only 23 percent evidence-based.

"This is in contrast to engineering," Kusiak says, "which is grounded in the sciences."

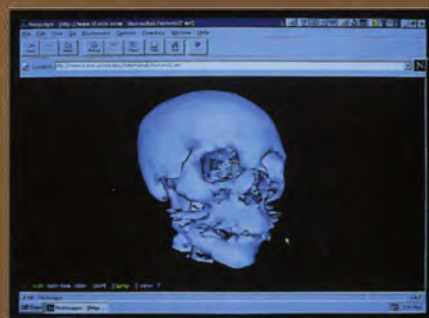
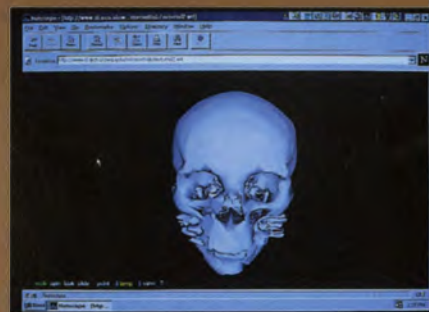
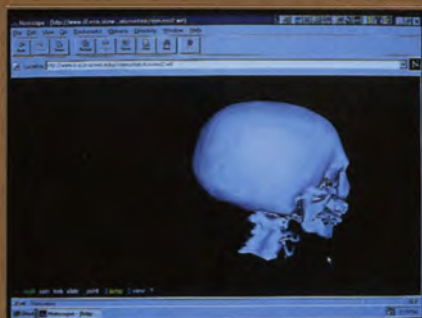
Despite this cultural difference between engineering and medicine, Kusiak relishes the collaborative process.

"Each of us brings our particular expertise to apply to the problem," he says, "and we learn from each other."

This fall Kusiak is teaching a course in collaboration with professors from the Colleges of Business Administration, Liberal Arts, Medicine, and Nursing as well as an administrator from Hospital Information Services.

The course, entitled "Informatics Tools for Health Care Decision Support," will be broadcast around the state via the Iowa Communications Network.

Peter O'Grady, professor and chair of industrial engineering, uses the Internet to "talk" and share 3-D images with physicians and other health specialists in far-flung locations. On the computer screen, O'Grady can rotate an X-ray image 360 degrees in any direction, allowing specialists miles away to view the image in realistic detail and confer about it as though they were together in one room, looking at the same screen.



One department's charge: Solve only the real problems

Researcher follows time-honored rule

"Since the potential for major research contributions is so great at the intersection of technology and medicine, the College of Engineering has worked hard to encourage collaborations. One goal I have is that by the year 2000, each of our departments will have a well established and funded collaborative research program with colleagues in medicine or other health sciences."

*Richard K. Miller, dean,
College of Engineering*

"Research today, whether it be in the basic biomedical field, bioengineering, or in other technologies, is best done in a collaborative manner. There is a synergy that develops when scientists trained in different but potentially interactive areas get together, and that synergy often is required to distinguish a college or university in these highly competitive times."

*Robert P. Kelch, dean,
College of Medicine*

"The collaboration between the Colleges of Medicine and Engineering is a remarkable example of a phenomenon that is growing University-wide. The deans of both colleges have formed a mutually facilitative, positive working relationship—the kind of relationship that is absolutely critical to future research development across the University."

*Jon S. Whitmore, provost
University of Iowa*

In his work as a biomedical engineer and medical scientist, Malcolm Pope applies a rule of thumb to help focus his research: The last thing a biomedical engineer should do is find a solution when there is no problem.

"A lot of research might pose interesting engineering questions," Pope says, "but when clinicians see the results, they would say, 'So what?' In biomedical engineering, we must work toward something that's relevant to helping people."

How can engineers best define the issues that need to be examined? By collaborating with their medical colleagues, Pope says.

"Iowa's College of Engineering has had a national reputation for its multi-disciplinary efforts for many years," Pope says, "[partly] due to the close collaboration made possible by a smaller community of scholars."

He adds that centralization of the engineering departments in one

building also encourages discussion and joint endeavor. Pope's own research includes collaboration with engineering professors Vijay Goel and David Wilder and orthopaedic surgery professor Leon Groble. The team is designing a resilient but adaptive ceramic implant for the human spine.

"The challenge of the research," Pope says, "is to develop materials and create a design that will withstand great stress without failure."

The researchers are working with the private sector to test the prototype in the lab and in animals.

"Collaboration with industry is crucial," Pope says, "because industry is able to support research where both the financial rewards and financial risks are great."

Pope also has teamed up with biomedical engineering professor Roderic Lakes on a project for HON Industries, Muscatine, Iowa, to design the ideal "office of the future."

"The most exciting research problems are those that arise at the interface between two disciplines," Pope says. "That's where we can explore how technology can help solve real-world problems."

Pope is professor and head of biomedical engineering, professor of orthopaedic surgery and of preventive medicine and environmental health, and director of the Iowa Spine Research Center. Goel is professor of biomedical engineering, mechanical engineering, and orthopaedic surgery, and associate director of the spine center. David Wilder is associate professor of biomedical engineering and a researcher at the center.



This widely used spinal implant (the vertical metal rods) was tested for FDA approval by the UI biomedical engineering department; it is used to immobilize two or three broken or herniated vertebrae, preserving natural flexibility in the rest of the spine.

Alumna takes ergonomics to work

For Tracy Marker, graduation from the College of Engineering didn't mean severing ties with her mentor, Malcolm Pope. Marker, who earned her master's degree in biomedical engineering in 1996, is an ergonomics engineer at InterLogics.

"At the moment, I'm the only one," she says about her role in the Hillsboro, N.C., company. "The good thing is, I get to develop the whole ergonomics process and the tools that the company uses in the field."

Ergonomics—or the study of human work—developed as a subspecialty of human factors analysis.

"We look at everything involved in how humans work," Marker says, "including how people process information, the biomechanics of movement, and optimal design of furniture and equipment."

InterLogics conducts research on how to reduce repetitive stress and lower back injuries in the workplace. Marker develops the proprietary tools that help other researchers collect data, recommend interventions, and reduce injuries.

Marker says that Pope sparked her interest in biomechanics—the study of the mechanics of human motion. Through her graduate work in Pope's lab, Marker had the opportunity to work with patients at The University of Iowa Hospitals and Clinics.

"Most engineers, of course, focus exclusively on design and development," she says. "But I was able to spend time with people who suffered chronic back pain and to think about what I could do to make a difference."

Marker says her collaboration with various members of the engineering and medicine faculties was a tremendous educational experience. Among her projects were analyzing the effects of wearing lumbar support and assessing sit-stand workstations being designed by the Iowa company HON Industries.

"Working with HON was great," she says. "The office staff in orthopaedics used the HON office chairs, and we evaluated their design and made recommendations. We also looked at the effects of the sit-stand workstations on lower back motion when people do things like type, file papers, or just sit and sort mail."

Marker keeps strong ties to The University of Iowa. She and Pope often consult about their various projects, and the Iowa professor serves on InterLogics' board of directors.

"We ask him to evaluate new products and processes," Marker says, "and he uses our equipment, including a new device that measures the function of the lower back."

"I feel very fortunate to have gone to Iowa," adds Marker. "I was in the right place at the right time."



Professor Vijay Goel and his colleagues are testing this artificial spinal disk for the company that designed and manufactured it. The UI researchers measure factors such as range of motion, load bearing, and wear and tear. If the implant meets its designers' expectations, it could be used in human spine patients soon.

For scientist, teamwork = discovery

Nicole Grosland came to The University of Iowa because she wanted to have the best of two worlds.

"I decided to come here for engineering because of the school's strong biomedical program and its close ties with the medical school," Grosland says. "Working with Dr. [Vijay] Goel has given me great opportunities to work on a variety of projects."

Grosland, now a Ph.D. student, earned a B.S.E. in biomedical engineering from Iowa in 1994. She began finite element modeling of shoulder prostheses during her senior design course, taught by Goel. Since then, she has studied and helped design a



number of bone prostheses, particularly artificial intervertebral discs of the lumbar spine.

Her finite element modeling efforts currently focus on a spinal prosthesis that she describes as "a threaded cage." Positioned in a degenerated disc space, the device encourages bone growth through and around the implant for long-term stability.

In the course of her engineering research, Grosland collaborates closely with UI Hospitals and Clinics staff members and College of Medicine faculty members. Together they are examining how the baboon spine remodels in response to implanted fusion devices. While her medical colleagues conduct surgery on live baboons, Grosland applies sophisticated finite element modeling techniques, using mathematics to predict bone change. The predictions are then compared to the clinical results.

Since her high school years in Ft. Dodge, Iowa, Grosland has known that her interests in engineering and medicine eventually would merge. She describes the opportunities that engineering students have at Iowa as "unlimited."



DIRECTOR'S MESSAGE

Groundbreaking marks a new era for the college Campaign inspires generosity

May 2, 1997, was a landmark for the College of Engineering. It was the day that ground was broken for the new building addition. The festivities were held in conjunction with a meeting of the college's Campaign Steering Committee, a group of 30 volunteers helping us raise the private funds we'll need to complete the Engineering Building project.

Turning the first shovelfulls of dirt were University of Iowa president Mary Sue Coleman, engineering dean Rick Miller, and campaign chair Gary Seamans. From remarks made throughout the ceremony emerged a theme: The day had been a long time coming.

As part of the campaign to raise private funds, Dean Miller and I have traveled throughout the country calling on some of the college's most loyal alumni and friends. We have literally been from coast to coast and have been well received everywhere.

So far, \$5 million has been committed toward our original goal of \$8 million. Some of the gifts are described on this page. Such great progress, made in such a short time, certainly testifies to the loyalty and generosity of the college's alumni and friends.

While we are extremely pleased to have made such strides, the dean and I know that there is still much work to be done. We will need to encourage the same enthusiasm and support as we extend the campaign, reaching out to all of our alumni.

Inspiration for great projects sometimes comes from unexpected quarters, as it did last February in this e-mail message, which I received from an engineering senior:

"A recent article in the *Hawkeye Engineer* prompted me to write you for more information. I will be graduating in May and would like to consider contributing to the new building after I begin working. Please send me any information you have regarding various giving options, levels available, etc.

"I am also specifically interested in guidelines established regarding the dedication of classrooms, laboratories, etc., through financial gifts.

"Thank you for your time and information."

It is almost unheard of to find a student interested in making a project funding pledge before graduation, so I was pleasantly surprised to hear from this future engineer. You can see why I am so optimistic about the addition and renovation. Everyone, from students to alumni to corporate friends, has embraced the project with enthusiasm; all have been eager to get involved. It is clearly needed, and it is wonderful to see the college's family rally around it. If you would like more information on the campaign, please get in touch with me.

Rich Wretman
Director of Development
College of Engineering



Dean Richard K. Miller visited with guests at a Cedar Rapids reception hosted in May by the College of Engineering. College officials and students met with alumni and friends of the college in five Iowa cities in April and May to spread the word about the building project and other college activities.

Gifts make it happen

The following gifts are part of the \$5 million that has been pledged so far in the fund-raising campaign.

\$750,000 for the Engineering Library

H. William Lichtenberger (BSChE '59), Ridgefield, Conn.

\$525,000 for a 160-seat auditorium

Combined gift from HON Industries Charitable Foundation, the Stanley-University of Iowa Foundation Support Organization, Stanley Consultants Charitable Foundation, and Richard H. and Mary Jo Stanley, all of Muscatine, Iowa

\$500,000 for the Engineering Plaza

John Deere Foundation, Moline, Ill.

\$350,000 for the Interactive Classroom

Joseph B. Summers (BSCE '48), Hanford, Calif.

\$250,000 for the Career Services Office Suite

IES Industries, Cedar Rapids, Iowa

\$250,000 for the Dean's Conference Room

Thomas R. Hanson (BSME '60), Hinsdale, Ill.

\$150,000 for the Roof Terrace

Wayne G. Fethke (BSIE '71), Middleton, Wis.

\$100,000 for the Image Processing Laboratory

Allen S. Henry (MS '68, PhD '71), Melbourne Beach, Fla.

\$100,000 for a 30-40 seat classroom

Richard E. Emmert (BSChE '51), Avalon, Del.

\$100,000 for a 30-40 seat classroom

Randall Meyer (BSME '48), Houston, Tex.

\$100,000 for a 30-40 seat classroom

Donald M. Kehn (BSChE '44), Houston, Tex.

\$100,000 for a 30-40 seat classroom

Gary R. Long (BSME '59), Paradise Valley, Ariz.

\$75,000 for a large laboratory

Lucille J. Smith (B.A. in chemistry '48), Lawrence, Kans.

\$60,000 for the Electronic Team Study Room

Robert M. Chaney (BSME '48), East Moline, Ill.

\$50,000 for the Information Access Study Room

C.E. Peterson (BSME '50), Iowa City, Iowa

College recognizes achievements in research, service, and teaching

Three faculty members were honored for outstanding contributions to the College of Engineering at the college's annual Faculty Awards Luncheon, on April 1.

The Faculty Research Award went to Andrew Kusiak, professor of industrial engineering. A faculty member since 1988, Kusiak is internationally known for his expertise in applications of artificial intelligence and optimization in engineering and design. His work is supported by numerous contracts from several federal agencies and from Rockwell International Corp., which in 1992 cited a series of Kusiak's projects as having saved the company about \$1.5 million.

Kusiak's prolific contributions to research and scholarship include authorship of the major textbook *Intelligent Manufacturing Systems* (Prentice Hall, 1992). He has

edited another 13 books and has published more than 30 book chapters, 100 journal articles, and 100 conference papers and technical reports. He sits on the editorial boards of 15 different journals and is editor-in-chief of another.

"Beyond the facts and figures," said Richard Miller, dean of the College of Engineering, "Andrew is a tremendously hard worker with lots of ideas."

The Faculty Service Award went to John Liittschwager, professor of industrial engineering, for his unwavering commitment to the college and the University.

"John is a person who takes everything very professionally, very seriously," said Peter O'Grady, chair of industrial engineering. "He chaired the college's ABET Engineering Accreditation Task Force committee, and he just masterminded the whole thing. He gave real

attention to detail, got things focused, got all the documentation in line, and pulled all the departments together. From the service perspective, he's done a lot for the college."

Liittschwager came to the University in 1961 and since then has held a variety of leadership posts. He has been a department chair and a division chair, and has served on more than 25 committees and chaired eight. In addition, he has served on 20 University committees, chairing four.

Miller voiced high praise for Liittschwager.

"Distinguished service is always characterized by a selfless dedication to others, without regard for personal gain or recognition," the dean said.

"Liittschwager's work fits this description."

This year's recipient of the Faculty Teaching Award consistently wins high marks from his students. Asghar Bhatti, as-

sociate professor of civil and environmental engineering, was described by a graduate student as "the nicest man on campus."

Another remarked that Bhatti's ability to illustrate complex and technical material clearly and concisely makes him an ideal teacher for students at all levels.

"Students routinely comment that his preparation for each class is meticulous and that he is thoroughly familiar with every detail of the material for each lecture," Miller said. "But perhaps his most frequently cited quality is that of an intense personal commitment to student success."

Those assessments were confirmed by the University's Council on Teaching, which named Bhatti to receive one of its coveted University-wide Faculty Teaching Awards earlier this year.

"I enjoy teaching," Bhatti said, adding that it is the main reason he is at the University rather than a consulting firm or research lab. "It gives me great pleasure to see students develop into professional engineers."

Collegiate Faculty Award winners Andrew Kusiak, John Liittschwager, and Asghar Bhatti



P. Barry Butler

Prof takes new role

P. Barry Butler, professor of mechanical engineering, has been appointed to a three-year term as the College of Engineering's associate dean for academic programs. Butler's term began in September.

Butler, a nationally recognized expert in thermal science and energetic materials, joined the engineering faculty in 1984 after earning bachelor's, master's, and doctoral degrees from the University of Illinois at Urbana-Champaign.

In announcing the appointment, engineering dean Richard K. Miller praised Butler's accomplishments as a researcher and his commitment to students and teaching. Miller noted Butler's extensive work in advising students, his participation on scholarship and award committees, and his work in recruiting students to the college.

Butler succeeds John P. Robinson, professor of electrical and computer engineering, who has served as associate dean for several years. Robinson will return to full-time teaching and research.



Honor Roll

This honor roll gratefully acknowledges University of Iowa engineering alumni whose generous 1996 contributions qualified them for membership in the College of Engineering donor recognition clubs. The clubs, whose members made high-level contributions in 1996 to the Engineering Development Fund and other college-wide funds, include the Dean's club (annual contributions of \$1,000 or more), the Transit Club (annual contributions of \$500-\$999), and the MECCA Club (annual contributions of \$250-\$499).

Other contributors, including spouses of alumni and corporate contributors, are recognized in the college's annual honor roll of contributors (published each fall) and in the University of Iowa Foundation's Annual Report on Giving.

Dean's Club

MECCA Club

Transit Club

Engineers get a leg-up for new business

"The more creative you can be, the more rewarded you will be."

That's how Tim Bechen touted entrepreneurship to members of the College of Engineering Campaign Steering Committee during their spring meeting in Iowa City. And Bechen is ready to put his words into practice. When he and Dong Banh graduated in May with B.S. degrees in engineering, they became the first two students to earn University of Iowa certificates in technological entrepreneurship.

The entrepreneurship program, a joint venture of the Colleges of Business Administration, Engineering, and Medicine,

"I didn't want to sit in a cubicle for the rest of my life." —Tim Bechen

helps students learn how to succeed in the creative and competitive business world. The program offers courses on how to establish a small business, launch a product, transfer technology to the private sector, and manage technology in the workplace.

Banh, whose bachelor's degree was in mechanical engineering, took courses

in each of these subjects.

"Earning the certificate added special distinction beyond just taking a few courses," says Banh, who grew up helping his parents in their Des Moines restaurant and grocery store. "I think that when it comes time for me to talk to bankers and financial people, having earned this certificate will make a big difference."

Banh already has launched one successful enterprise. Adventure Isle Collectibles sells collectible cards, toys, and comic books over the Internet. Begun a year ago, the company has projected annual sales of \$70,000.

"And I'm only putting in about five or six hours per

week," says the young entrepreneur.

Banh soon will join the management team at the Chicago firm Price Waterhouse Consulting. Bechen plans to study at Franklin Pierce Law Center.

"I didn't want to sit in a cubicle for the rest of my life," Bechen says. "I also didn't want to just solve problems for someone



Dong Banh and Tim Bechen

else. I like the fact that with my own business, I can take an idea and run with it."

Bechen adds that he also is intrigued by the notion that engineers can go beyond solving a series of individual technical problems to establish and achieve long-term business goals.

Both students note that their engineering training was put to good use in their business classes.

"Engineering teaches you how to think," Bechen says. "While other students saw designing a new business as a gigantic problem, I could break it down: How do we get a certain amount of financial backing? How can we become incorporated in two months? Where can we find the technical expertise to help us get up and running?"

"And there were many times," Banh adds, "when

I was asked to explain the technology to the business students, medical students, and lawyers in my classes."

The College of Engineering is the nation's first to develop a full-fledged technological entrepreneurship certificate program. The program requires 18 semester hours of course work—an additional semester.

But graduates can make that investment pay off, Banh says.

"Traditionally, it's been the engineers who have come up with the creative ideas and the businesspeople who get rich off of them," he says.

"Why not let the engineers learn the business and get rich, too?"



Alumnus and building campaign chair Gary Seamans, Dean Richard K. Miller, and President Mary Sue Coleman break ground for the Engineering Building project.

Time for a Change

The time line for modernization of the Engineering Building includes the following dates.

September 16, 1996:

Dean Richard Miller and architect Kevin Monson presented the concept to members of the State Board of Regents, who offered their enthusiastic approval.

May 2, 1997:

The groundbreaking ceremony was held.

May 1997:

After detailed plans and specifications were developed by the architectural firm Neumann Monson, initial work revamping and relocating the structures lab was opened to contractor bid.

Summer and fall 1997:

Space for the new structures lab, which will be relocated in the west wing basement, is modernized.

Phase I, 1997-1998:

Portions of the existing Engineering Building will be demolished, including the Materials Testing Lab and the Radio Broadcasting Services wing. The University's Public Safety Building, located south of the Engineering Building, also will give way to the wrecking ball.

Phase II, 1998-2000:

The new wing, which will wrap around the south and west sides of the existing building, will be built. When completed, the new space will accommodate a southside outdoor plaza, an eye-catching and accessible main entrance, a laboratory wing with more than 20 new labs, and a central building core with a four-story atrium, student commons, 160-seat auditorium, outdoor plaza, and new classrooms.

Phase III, 2000-2001:

With some college operations moved to the new addition, renovation will begin on the old structure. The result will be a new Student Learning Center, upgraded classrooms, enhanced library space and facilities, and modern labs and offices.

Beep beep beep— Watch out!

Construction's under way

When the 20th century was still young, the College of Engineering settled into a new home just south of the University's Pentacrest. The new building was solid and distinguished—like engineering at Iowa.

But every generation brings change. By the 1930s the college needed more and different kinds of space, so an addition was constructed down the slope to the west. A generation later, developments in electrical and computer engineering motivated the college to update its facilities again.

Now, looking ahead to new generations of students, the College of Engineering is undertaking a massive modernization project that will allow it to remain an educational leader well into the next century.

The transformation will be rewarding if not easy, according to project planners.

Says the University's senior architect, Steve Buchman, "This is a complicated project with a lot of pieces. It's a tremendous challenge, but fun."

Doug Eltoft, operations director for the Iowa Computer-Aided Engineering Network (ICAEN), echoes those sentiments.

"The building renovation will create a lot of stress while it's going on," says Eltoft, a member of the college's modernization committee. "Dust and noise create a hostile environment for computers—and people."

But when it's all over, he adds,

the college will see dramatic and long-awaited improvements.

Over the next four years, the College of Engineering will demolish, renovate, add on, and move between the original and new wings while still teaching and conducting research on-site. And the design and construction of a new high-tech facility in and around an extant building present unique and complicated challenges of their own.

"With all the trucks and debris, it's going to get to look like a 'zone' pretty quickly," says modernization project coordinator Sue Heeren, a 10-year veteran of managing major construction projects for the U.S. Army.

"We have research spaces that can't be duplicated anywhere else on campus," she adds. "And of course, we must continue to provide an excellent engineering education through it all."

That job, like the college's facilities, is gaining new dimensions, even changing direction.

"The number-one reason for a university to exist is to educate its students," says John Robinson, professor of electrical and computer engineering and former associate dean for academic programs. "And in a subtle but important way, the college has begun to shift its emphasis from teaching toward learning."

In fact, student learning has driven this massive project from its inception. Students were actively involved in designing the

Student Learning Center, student organization offices, and Engineering Commons. These innovative, student-oriented spaces will reflect the new direction of engineering education in the 21st century.

"For instance," says architect Buckman, "the 10,000-square-foot Student Learning Center will look like an engineering work floor. It will be divided into several large cubicles containing computer terminals, spacious work surfaces, whiteboards, and other equipment that will enhance learning, communication, and teamwork."

"The center's design," Robinson says, "reflects

the kind of learning that will be important for students of the future: learning that takes place in groups and outside the traditional classroom."

The learning center also will offer three smaller areas for quiet study and teleconferencing.

"Let's say a student is working on a project for Deere & Company," says Heeren. "She can go into the teleconferencing room, give a professional presentation via computer directly to her corporate partner in Dubuque, and then get immediate feedback.

"Engineers in the private sector tell us all the time that they are looking for students who can

communicate well," she adds. "The new learning center will encourage students to polish those interactive skills."

Students working in the center also will have easy access to the adjacent engineering library, which will be modernized and expanded to house the library's collection. For years, lack of space has forced the college to store nearly half of its collection elsewhere on campus.

Undergraduate students, too, will be "at home" under the same roof. Today, nearly one-third of all engineering classes must be taught outside the building in facilities scattered across

campus. The expanded and renovated Engineering Building will provide more classrooms and equipment, including computer presentation technology and fiber-optic or other worldwide links for interactive and distance learning.

And finally, the entire building will be accessible to everyone.

"You know the expression 'You can't get there from here,'" Heeren says. "Well, believe it or not, we have several places, including a classroom in the electrical and computer engineering wing, where people in wheelchairs simply can't go."

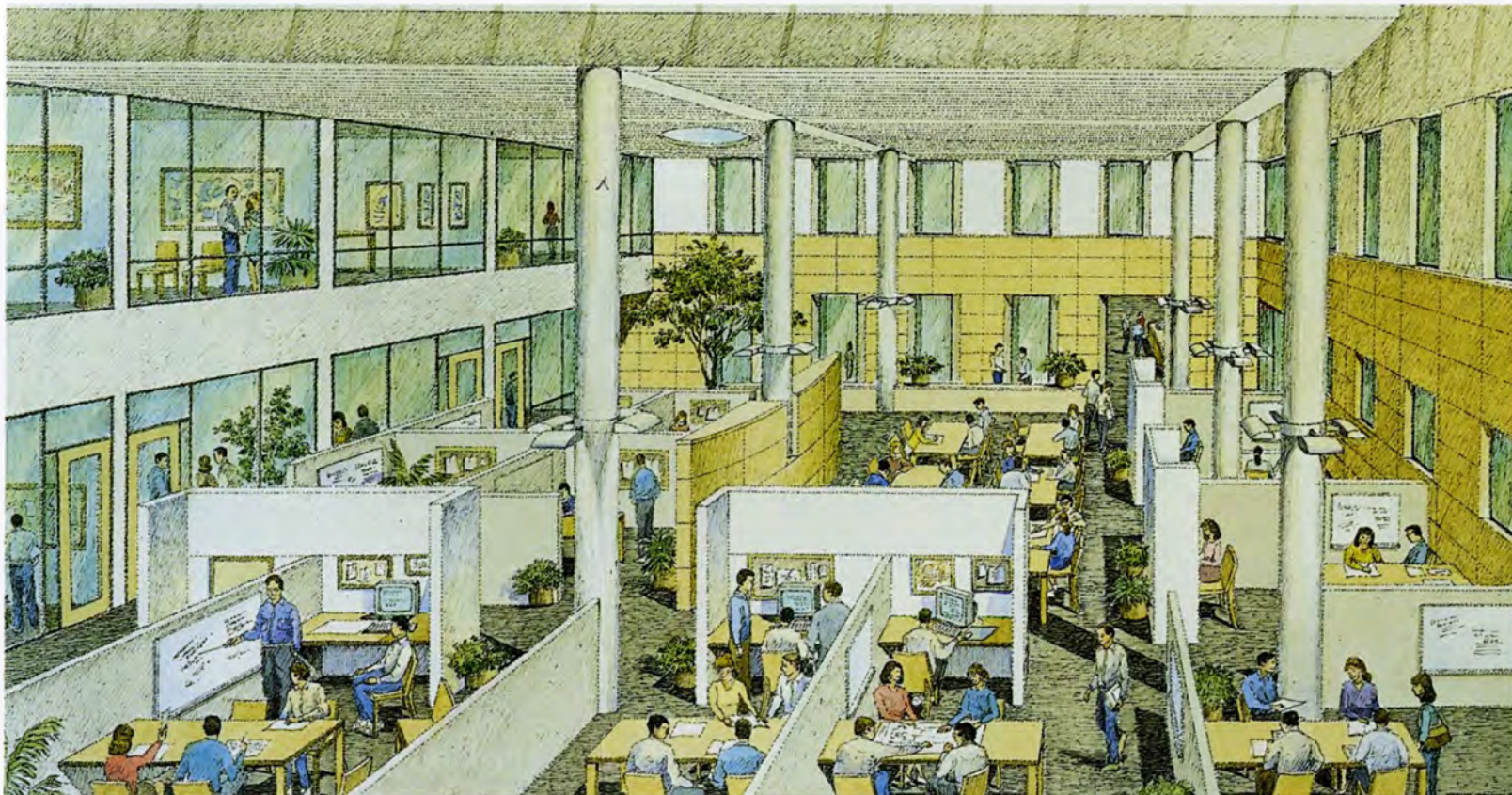
In straightening out the current maze of corridors

and levels, the project architects will pay particular attention to making the entire building accessible to all.

It's clear that the impact of this long-awaited project will be dramatic and enduring, well worth temporary upheavals.

Says ICAEN director Eltoft, "Despite construction's inconvenience, I don't know a single staff or faculty member who's not saying, 'Go for it!'"

The student learning center will embody the number-one goal of the building project: to nurture the broad range of learning experiences that students need to become tomorrow's engineers.





Plans show reliance on alumni as partners in educating students

With their continuing commitment of time, effort, and financial support, engineering alumni have recognized the benefits of an Iowa education. In a very real sense, the college has returned the favor by designing a new facility that will underscore those bonds between the students of yesterday and today.

Engineering at Iowa claims a rich and vibrant past: a century of excellence in a highly personalized environment. A key goal of the modernization project is to pre-

A new 160-seat auditorium will accommodate undergraduate core courses, visiting lecturers, and other large-group events. It will feature theater seating with tablet arms and laptop computer hook-ups, and the latest in computerized presentation technology.

serve the college's historical strengths in a new era of educational enterprise.

Iowa's engineering alumni are vital links between the past and future. The college is fortunate to have active, committed alumni who continue to enrich the educational experience of engineering students. As mentors, co-op partners, and visiting lecturers, alumni bring their own educational and work experience to new generations of dedicated engineers.

To nurture those ties, the College of Engineering has consciously integrated "alumni-friendly" spaces into the new building design. A number of features will help the college welcome back alumni who return for casual visits or planned events.

Engineering Commons

Located on the second floor, the Engineering Commons will be the Engineering Building's "town square." In keeping with that notion, the area is designed to spark informal meetings between students, faculty members, and visitors. It will have comfortable seating with clusters of tables and chairs, a small vending area, and other amenities.

Engineering Plaza

Near the commons, this outdoor space will welcome people to the new main entrance, on the building's south side. The area will foster small gatherings of people and provide a relaxed atmosphere for alumni to meet old friends during reunion weekends. The 6,900-square-foot plaza

will be paved with stones on which the names of building project contributors are engraved.

Student Learning Center

This "academic heart" of the building will become a familiar place to alumni who work with students on engineering projects. The center, located on the building's second floor, will function as a working extension of the adjacent Engineering Library. The center's state-of-the-art computer facilities will encourage team-based projects that involve off-campus mentors and consultants. The center also will have comfortable rooms for study, consultation, and team meetings.

Interactive Classroom

A 70-seat classroom on the building's third floor will be linked to the state's fiber-optic Iowa Communications Network (ICN) and will be equipped with satellite transmission capability. For the first time, engineering students will be able to participate in distance learning from within the Engineering Building, exchanging information and ideas with colleges, corporations, and other organizations around the world—many of which include Iowa engineering alumni.

Roof Terrace

Above the Student Learning Center on the building's fourth floor will be the 5,000-square-foot Roof Terrace, which will serve as an attractive outdoor courtyard during good weather. Like the Engineering Plaza, the terrace will be used by students, faculty, staff, and visitors for impromptu meetings as well as college-sponsored social gatherings for alumni and friends.

The renovated Engineering Building will have a true main entrance, opening onto the dramatic atrium, whose natural light will provide an open, airy ambience. As well as improving the building's aesthetics, the project will enhance the college's focus on students, encourage team-based learning, and gather together the teaching facilities of all six engineering departments.



“One of the strengths of Iowa’s engineering college is its track record of working with other colleges on campus to come up with solutions for industry.”

Barbara Sines (BSIE '80), vice president for logic components, Rockwell Automation, and member of the College of Engineering Advisory Board and Campaign Steering Committee

“The modernization of classroom facilities, including computers, is essential if Iowa wants to keep pace.”

Dubuque native Jaymie Lynn Braun, (BSE in EE '95)

“Improvements in the Engineering Building, particularly in the teaching facilities, are critically important.”

Tom Lowenberg (BSCE '62, MS '63), director (ret.) of facilities, engineering, and real estate at 3M Company, and member of the College of Engineering Development Council and Campaign Steering Committee

The college’s commitment to build on the past is apparent in the very design of the engineering building’s new and renovated space. Recognizing the importance of being part of the wider University community, college faculty and administrators chose to remain in the original building across the street from the liberal arts campus and near the new business school. In addition to reinforcing the college’s historically strong ties to the rest of the University, the new Engineering Building design will honor the past by dovetailing rather than competing with the original architecture.



Students have their say in the building’s design

Grungy...confusing...antiquated.

These are three of the more printable words students use to describe the building that has housed the College of Engineering for almost a century.

Built in 1905, the structure still has some classrooms that are throwbacks to the days when “high tech” meant blackboards that were green. “Study space” usually means a chair wedged into a hallway corner.

“The current building doesn’t reflect the open teaching style of Iowa engineering professors or the friendly atmosphere among students,” says Hans Johnson, who earned his B.S. in biomedical engineering in 1996 and remained at Iowa for graduate work.

Johnson notes that working in teams—a critical skill for engineers today—is not easy in the current space.

“There’s only one room where we can congregate in small groups to discuss a project,” he says, “one room with only nine tables plus several lockers, vending machines, and storage boxes—for 1,200 students.”

To achieve the new building project’s number-one goal of enhancing student learning, the college asked several students to sit on its Building Planning Committee. Their advice was instrumental in shaping the design concepts for the Student Learning Center, student organization offices, and the Engineering Commons.

Johnson and Jerry Steele, a senior in electrical and computer engineering, were two of the student planners. Steele pointed out that the proposed space intended for engineering student organizations would be inadequate.

“At first they were going to put 30 student groups into one room,” says Steele, the managing editor of *Hawkeye Engineer*. “When we pointed out the problems of that design, the architects listened to our ideas.”

“They found that while *Hawkeye Engineer* needs a lot of space to do layout and get our large staff together,” Steele says, “other groups mainly just need filing space.”

The information provided by the students dramatically altered the architects’ plans. The room design now accommodates nine student organizations, all of which are open to any engineering student. Theta Tau, the Society of Women Engineers, and *Hawkeye Engineer* will be among the new residents. The remaining organizations are connected to particular engineering specialties and will be housed in the appropriate departmental wings.

Kendra Wyatt also sat on the planning committee.

“The physical plant certainly isn’t what attracted me to Iowa,” says Wyatt, who graduated in May with a degree in industrial engineering. “After all, there’s water dripping on your head!”

But, Wyatt emphasizes, although the new building design has been a real enticement for prospective students and their parents, the excellent faculty and student body are the most important attractions for top-flight engineering students.

Steele concurs, emphasizing the importance of fulfilling the building project’s chief goal.

“The administrators and architects always emphasized that the building—like the college—is centered on education,” he says. “That has been the traditional focus of the college, and I hope it will always be so.”

Iowa deans make visits statewide

Engineering and Iowa have a time-honored connection, one that the deans of the state's two engineering colleges celebrated together during National Engineers Week this year.

Richard K. Miller, dean of The University of Iowa's engineering college, and James L. Melsa, engineering dean at Iowa State University, spent February 16-22 promoting engineers and engineering across the state. They met with civic and business leaders and community college representatives in Sioux City, Cedar Rapids, Des Moines, and the Quad Cities to talk about work force development, technology transfer, and how the two state schools work with and complement each other, how they serve students and promote economic development.

Travel was just part of the two colleges' collaboration during the national celebration. The schools also produced a brochure telling about the importance of educating engineers, how research at the two campuses yields solutions that are applied worldwide, and why partnerships with the schools benefit businesses, industry, utilities, and health care providers, to name just a few.

This was the second year that Miller and Melsa have celebrated National Engineers Week together. In fact, the deans have extended their partnership to ongoing exchanges and cooperative programs between Iowa and Iowa State, including faculty lectures delivered at both schools, seminars, research collaborations, student projects, and regular meetings of the colleges' respective department chairs.

Last but not least, the two colleges have plans well under way for National Engineers Week 1998.



Left: Rich Wretman visits with Pat Lichtenberger at the Distinguished Engineering Alumni Academy brunch; Lichtenberger accepted an academy induction plaque for her husband, Bill Lichtenberger, who was unable to attend the weekend ceremonies. **Right:** Jim and Bill Sangster chat with UI president Mary Sue Coleman.

Brunch honors new academy inductees, kicks off National Engineers Week

In mid-February, the College of Engineering hosted a gala send-off to National Engineers Week when it invited its alumni, friends, and supporters to celebrate the induction of three new members of its Distinguished Engineering Alumni Academy. University of Iowa president Mary Sue Coleman welcomed attendees to the induction brunch, and

Ed Moldt, entrepreneur-in-residence at the Wharton School, University of Pennsylvania, and former head of the University's Pappajohn Entrepreneurial Center, gave the keynote address.

Guests celebrated the induction of H. William Lichtenberger (BSChE '59), William M. Sangster (BSCE '47, MS '48, PhD '64), and

R. William Van Sant (BSME '66, MS '67).

Every year the College of Engineering welcomes nominations of individuals who have maintained a close association with the college and have substantially contributed to their profession and society.

Inductees for 1998 will be honored during National Engineers Week, next February.

They give students all-around help

With two new appointments, the College of Engineering rounded out its Student Services offices over the spring semester. Jane M. Dorman was appointed director of admissions. Her responsibilities include scholarships and undergraduate outreach. Dorman's experience includes student services work in UI residence services and at Sauk Valley Community College, in Dixon, Ill., and at Northern Illinois University, in DeKalb.

Julie A. Fell was appointed the college's registrar. Among her responsibilities are graduation analysis and transfer credit. Fell previously held University of Iowa positions in the registrar's office, the business office, and in the radiology department at UI Hospitals and Clinics.

Also as of the spring semester, the college promoted Nancy J. Schneider from academic counselor to director of academic development. Schneider continues to head orientation and do initial ad-

vising of all new engineering students. Now she also supervises some of the Student Services Office staff.

Cathy Colony Bunnell continues as director of Engineering Career Services, responsible for career planning, co-ops and internships, and job searching.

Staff members win recognition for their outstanding work

Three College of Engineering staff members have won high honors this year for professional contributions to the college and the University.

Two were among six University of Iowa employees who received State Board of Regents Staff Excellence Awards, which are presented in collaboration with the staff councils of The University of Iowa, Iowa State University, and the University of Northern Iowa.

They are James R. Goss, an engineer at the Iowa Institute of Hydraulic Research, who was recognized for his work in supervising and organizing large research projects, many of them collaborative efforts between the University and Iowa cities and other agencies; and Craig L. Just, senior

research assistant in civil and environmental engineering who, as laboratory director for the Environmental Engineering and Science Program, brings his expertise in analytical chemistry to a wide array of research projects.

The University's Staff Council also presents six Staff Excellence Awards annually to staff members who have distinguished themselves in special endeavors. This year Twila Meder, secretary at the Iowa Institute of Hydraulic Research, was recognized for her work in organizing the 27th Congress of the International Association of Hydraulic Research. This year's congress is being held in the United States, for the first time in 30 years.

Experts speak in lecture series

Two engineering professors from The University of Iowa and one from Iowa State University presented Iowa Distinguished Faculty Lectures during the 1996-97 academic year. Part of the ongoing collaboration between the state's two engineering colleges, the series brings experts from one college to share their knowledge with faculty, students, and staff at the other. UI faculty who lectured at Ames this past year included Adrian Korpel, professor of electrical and computer engineering, and V.C. Patel, professor of mechanical engineering. Peter Reilly, professor of chemical engineering at Iowa State, lectured in Iowa City.

Among the many lecturers at the

college during the past academic year were several guests who presented Caterpillar lectures: Greg Barton, a mechanical engineer and Olympic gold medalist; Mel Ramey, Professor at the University of California-Davis; Van C. Mow, professor at Columbia University; Bruce Gates, professor of chemical engineering at the University of California-Davis; Bruce M. Kramer, director of the design division at the National Science Foundation's Manufacturing and Industrial Innovation Directorate for Engineering; and Glen R. Cass, of the California Institute of Technology's environmental engineering science department.

Professors retire

Three College of Engineering faculty members have "gone emeritus" this year, retiring at least on paper from their University duties.

John Keith Beddow, professor of chemical and biochemical engineering, had taught at the University since 1968. A Ph.D. graduate of Cambridge University, in England, Beddow specializes in metallurgy and applied chemistry.

Robert G. Hering, professor of mechanical engineering, joined the college in 1971. Hering, a specialist in heat transfer and fluids, earned his Ph.D. from Purdue University. As well as serving as a faculty member, Hering also has chaired his department and was dean of the College of Engineering from 1973 to 1992.

John Liittschwager, professor of industrial engineering, came to Iowa in 1961, after earning his M.S. at Northwestern University. This spring he received the college's Faculty Service Award (see story on page 13).

Beddow and Liittschwager both retired in May, and Hering retired in July.

Commencement

On Sunday, May 18, the College of Engineering once again sent a group of new engineers out to make their mark on the world when it conferred degrees upon its spring graduates. Clifford V. Smith Jr. (BSCE '54), president of the General Electric Foundation, was guest speaker. College dean Richard K. Miller and University president Mary Sue Coleman presided at the ceremony. Vice president for research David J. Skorton conferred the degrees.

The college awarded 136 B.S.E. degrees, 44 M.S. degrees, and 23 Ph.D.'s.

Winning bridges

The college's student chapter of the American Society of Civil Engineers placed ninth out of 40 teams competing this spring in the national ASCE bridge building contest, held at California State Polytechnic University. The University of Iowa chapter had qualified for the competition by finishing second in the ASCE upper midwest conference in February.

The student teams were charged with designing and constructing 20-foot-long steel bridges that were as light as possible (the UI entry weighed about 80 pounds) and yet were able to support a load of 2,500 pounds with minimal deflection. Contest rules stipulated fabrication, materials, and specifications, and judging criteria included stiffness, lightness, efficiency, economy, aesthetics, and speed of construction.

Have a preference for reunion year?

Some alumni prefer to attend the reunion celebration for a class other than the one with which they graduated. Alumni who ask for "preferred reunion year" status automatically receive reunion mailings for their desired class year. To request "preferred reunion year" status, write to the Alumni Association, 100 Alumni Center, The University of Iowa, Iowa City, Iowa 52242-1797; or call the Alumni Records Department or the Reunion Director, 800-IOWALUM (800-469-2586).



Christensen



Eichinger



Lin



Thomas

Four join ranks of college faculty

Gary E. Christensen

Assistant professor of electrical and computer engineering

B.Sc. in computer science ('88), B.Sc. ('88), M.Sc. ('89), and D.Sc. ('94) in electrical engineering, Washington University, St. Louis

Professional Experience

Director, craniofacial imaging laboratory, St. Louis Children's Hospital; assistant professor of radiology and surgery, Washington University School of Medicine; research assistant at the biomedical computer laboratory and the electronic signals and systems laboratory, and computer programmer at the biomedical computer laboratory, Washington University

Research interests

Medical imaging, image and signal processing, deformable templates, global shape models, parallel processing, and 3-D visualization

There were very few places I would have wanted to work in the country. My goal was to get in a good electrical engineering school with a good medical school.

I want to set up a world-class medical imaging laboratory with other faculty members here. It helps to have a preeminent medical school with renowned collaborators to work with.

William E. Eichinger

Associate professor of civil and environmental engineering

B.S. in physics ('76), U.S. Military Academy, West Point

M.S. in nuclear physics and engineering ('85), Air Force Institute of Technology and Nuclear Engineering

Ph.D. in atmospheric science and hydrology ('95), University of California-Davis

Professional experience

Staff scientist and military research associate, Los Alamos National Laboratory; assistant professor of physics, U.S. Military Academy; senior project engineer, Camp Casey Korea; commander, engineer bridge company, and executive officer, directorate of combat developments, Fort Belvoir, Va.

Research interests

Hydrology and fluid mechanics in the environment, atmospheric pollution control and remediation

The people at the Iowa Institute of Hydraulic Research influenced my decision to come here. They have high standards and are truly nice people.

We'll build a laser radar to measure pollution. It will allow us to make a three-dimensional picture of pollution concentrations and show us what's really causing the problem. Today we can only make educated guesses. This will change that.

Ching-Long Lin

Assistant professor of mechanical engineering

B.Sc. in mechanical engineering ('86), National Taiwan University

M.Sc. ('89) and Ph.D. ('94) in mechanical engineering, Stanford University

Professional experience

Research coordinator, Colorado State University; visiting scientist, National Center for Atmospheric Research; research assistant and teaching assistant, Stanford University; instructor, Chinese Military Academy

Research interests

Turbulence dynamics and modeling, turbulence active control, flow instability, vortex dynamics, heat transfer, thermodynamics, geophysical and stratified flows, development of numerical schemes

I chose The University of Iowa because it is one of the best universities, especially in terms of research. I'm affiliated with the Iowa Institute of Hydraulic Research, and the director, Virendra C. Patel, is an internationally known researcher. I'm very happy to have a chance to work with him.

My specialty is computational fluid dynamics, and my current research is about coherent structure in planetary boundary layer. In the future I would like to do research on the active control of coherent structure.

Geb Thomas

Assistant professor of industrial engineering

B.Sc. in physics ('89) State University of New York, Stony Brook

M.Sc. ('95) and Ph.D. ('96) in industrial engineering, Pennsylvania State University

Professional experience

Research assistant and instructor, Pennsylvania State University; technical assistant, nuclear structure laboratory, State University of New York

Research interests

Telerobotics, virtual reality, complex system design, and human-machine interface.

I've been working on a project called NOMAD Desert Trek, which is a NASA/Carnegie Mellon University project. By learning ways to control a robot using virtual reality, we can figure out how to drive it long distance on another planet.

I came to The University of Iowa because of the high quality of driving simulator research. I'll bet the University will be one of the main bastions of research related to virtual reality.

CLASS NOTES

Readers who would like to correspond with alumni mentioned in Class Notes can get address information from the University's alumni office. Contact the Division of Alumni Records, The University of Iowa, 100 Alumni Center, Iowa City, IA 52242-1797; phone 319-335-3297. E-mail: margaret-lillard@uiowa.edu

1920s

William L. Robinson (BS '28) is retired as president of the Burr Oakes Co., a Clarion, Iowa, concern liquidated in 1975. Robinson writes that he majored in civil engineering, and after graduating worked at the Citizen's National Bank in Hampton, Iowa, until the bank closed in the 1930s. Then he contracted building and repairs for apartments, offices, and stores until his company closed. From 1975 on, he traveled worldwide and invested in the stock market. He spent winters in Florida until his wife died in 1991. Since then he has resided at the Meadows Retirement Home in Clarion.

1930s

Raymond Edward Zink (BSCE '36, MS '38) is retired as an environmental engineering consultant and principal engineer for the state of Nevada. Zink reports that he served in the armed services for three-and-a-half years during World War II and saw foreign combat. He also cofounded St. Vincent's Charities in Nevada. He lives in Las Vegas.

Wilbur J. Schindler (BSME '39) is retired and lives in Poway, Calif. He was a design engineer with J.I. Case and then with the Federal Power Commission, in Chicago. He was called to active military duty in April 1941 and spent 19 months in places such as Fiji and Guadalcanal before returning stateside for pilot training. He retired from the U.S. Air Force after 22 years of service and then worked for 10 years with Northrop and McDonnell Douglas.

1940s

Charles K. Hurst (MS '40) received the Governor General of Canada Caring Canadian Award for 1996. Hurst is retired and lives in Ottawa.

Melvin W. Naylor (BSEE '42) is retired after working for NASA and the Department of Defense. Now he is a certified ombudsman for the state of Kentucky, working as a residents' advocate in nursing homes. Naylor and his wife, who live in Elizabethtown, enjoy group travel to destinations including Europe, the American and Canadian Rockies, and Branson, Mo.

John V. Cole (BSChE '43) is retired as a project manager at Fluor Corporation, in Irvine, Calif. Cole worked on domestic and foreign projects in Brazil, Venezuela, Mexico, Taiwan, India, and Iran, where he was pinned down by gunfire during the revolt against the Shah. On another project, starting a chemical plant in India's remote jungles, Cole was the only non-vegetarian, a practice he ended after the cook prepared a special feast just for him—a chicken, cooked and served with the meat and bones chopped together. In a Brazilian adventure, Cole won a VW Beetle with a \$2 ticket in the national lottery.

Now Cole teaches an investment finance course in the Continuing Learning Experience, an educational organization for senior citizens at California State University—Fullerton. He and his wife, Barbara, live in Santa Ana. They have been married 50 years and have a daughter, two sons, and two grandsons.

Edward Schneckloth (BSME '43) is retired as a market engineering manager at Lockheed Martin, of Baltimore. He lives in Sherman Oaks, Calif.

Norman L. Smith (BSEE '48) is retired and lives in Ponca City, Okla.

Robert L. Paul (BSEE '49) is retired from Consumer's Energy and lives in Jackson, Mich.

1950s

Donald A. Edwards (BSEE '50) is a retired national account manager for General Electric, where he worked for 38 years in a variety of locations, including Schenectady, N.Y.; Philadelphia, Pa.; Ft. Wayne, Ind.; Portland, Ore.; and Seattle, Wash. He was involved with the sale of paper machine drives, crane drives, switchgear, transformers, substations, steam and gas turbines, and was an account manager at Weyerhaeuser Co. He lives in Sunriver, Ore.

Ellis B. Pickett (MS '50) is a retired professional engineer and self-employed consultant. He lives in Madison, Miss.

Michael Bar Shany (MS '50) worked many years for Tahal, an Israeli water resources development consulting firm, as vice president for foreign operations. After leaving Tahal he worked as a partner in private practice for eight years and has had his own consulting firm for the past 12.

Randall E. VanDenover (BSChE '51) lives in Clearwater, Fla.

William F. Conway (BSME '52) lives in Wilmot, S.D. Conway reports that he was the principal engineer for Honeywell on control system design for the first manned space vehicle, Mercury. He worked at the Naval Weapons Lab at China Lake, Calif., and transferred to the Air Force, at Thiokol, following the Challenger catastrophe in 1986. He was nominated in 1988 for the Air Force Outstanding Engineer of the Year Award, and he retired as Air Force chief engineer at Thiokol in 1991.

Gale B. Hansen (BSME '53) writes that he is "still working!"—as a sales manager for QuadGraphics, in New York City, where he also lives.

Olav Harket (BSCE '54) retired in 1992 as a civil engineer in Drammen, Norway, where he had worked in public roads administration since 1960. He reports that he was head of the

road development department for most of that time.

Steven E. Modrick (BSCE '58) retired last year after 29 years in the Des Moines, Iowa, public works department, 26 of them as assistant superintendent or superintendent. Modrick began his engineering career with the Metropolitan Sanitary District of Greater Chicago, in the sewer and plant construction divisions, where he worked until 1966, interrupted by two tours in the U.S. Army. He and his wife, Rita, are taking it easy and plan to do some traveling. They have five children, who live with their families in various locations throughout the country.

Alfred Decker (BSME '59) is retired from IBM and works as a consultant to machine builders. He lives in Ocala, Fla.

H. William Lichtenberger (BSChE '59) was inducted in February to the college's Distinguished Engineering Alumni Academy. In late May he received the UI Alumni Association's Distinguished Alumni Achievement Award. Lichtenberger, who serves on the college's Campaign Steering Committee, was profiled in the fall/winter 1996 *Iowa Engineer*.

1960s

Roger J. Byrne (BSCE '58, MS '61) writes that he recently moved from New Jersey "back to the heartland," where he is a manager in sales and marketing for ABJ, of Brown Deer, Wis. Byrne lives in Mequon.

Richard Hajec (MS '61) is retired and lives in Pawleys Island, S.C. Although he arrived there just before hurricane Bertha moved in, he says, the pleasure of living there the rest of the time makes up for the hurricane season.

Donald E. Schima (BSEE '61) retired in 1994 from Hughes Aircraft Co., at El Segundo, Calif., where he worked for many years as a chief scientist in electro-optical systems and controls, responsible for EO systems transition from engineering to manufacturing. From 1990 until he retired, Schima worked for the Hughes consulting organization, providing system engineering management consulting for General Motors' automotive advance programs. Schima continues as a consultant with GM and currently works with the company's research and development division. He lives in Shelby Township, Mich.

Dewey W. Geary Jr., (BSCE '62) lives in Jakarta, Indonesia, where he is self-employed as a quality assurance specialist with the Indonesian Ministry of Public Works, developing and implementing a quality assurance system for Indonesia's Directorate General of Water Resource Development. Geary writes that he was elected a fellow of the American Society of Civil Engineers this spring.

Dennis A. Rhoads (BSME '62) resides in Redondo Beach, Calif., where he is a department manager at TRW Space & Electronics. Rhoads' department includes 64 engineers, technicians, and administrative support personnel, who are responsible for thermal analysis, design requirements, and thermal cycle/vacuum testing of all TRW spacecraft. Rhoads writes, "We are always looking for a new Iowa grad who is interested in thermal engineering."

Heikki Joonsar (BSME '64) is assistant vice president for Science Applications International Corp., of Newington, Va. Joonsar writes that during summer 1996, he spent 10 weeks in the Ukraine working on government projects to help the region rid itself of its stockpiles of nuclear weaponry. He was there when the U.S. secretary of defense and the defense ministers of Russia and the Ukraine met to declare that the region would no longer be the world's third largest nuclear power.

Fabio Villegas (MS '64) is technical manager of the Medellín, Colombia, concern INTEGRAL S.A., a consulting firm with more than 300 professional engineers. Villegas writes that he is in charge of technical supervision for hydraulic and hydroelectric projects. He lives in Medellín.

William M. Sangster (BSCE '47, MS '48, PhD '64) was inducted in February to the college's Distinguished Engineering Alumni Academy. Sangster serves on the college's Campaign Steering Committee.

Helmut Kobus (PhD '65) has been awarded an honorary doctoral degree from the Technical University of Civil Engineering, in Bucharest, Romania. Kobus, who is president of the International Association for Hydraulic Research, writes that he hopes to see many of his Iowa classmates at the IAHR Congress in San Francisco this fall.

(continued on page 24)

CLASS NOTES

Continued from page 23

Robert E. McIntosh (PhD '67) has been elected to the National Academy of Engineering in recognition of his contributions to microwave and millimeter wave remote sensing. He also was awarded the Distinguished Career Achievement Award for 1997 by the IEEE Geosciences and Remote Sensing Society, in an August ceremony in Singapore. McIntosh is distinguished professor of electrical and computer engineering at the University of Massachusetts-Amherst.

R. William Van Sant (BSME '66, MS '67) was inducted in February to the college's Distinguished Engineering Alumni Academy. Van Sant, who serves on the college's Development Council and its Campaign Steering Committee, is profiled on page 4 of this *Iowa Engineer*.

William A. Gearman (BSCE '69) is engineering manager at Westinghouse Savannah River Corp., in Aiken, S.C. Gearman reports that he manages a diverse group of engineers—mechanical, electrical, and chemical—who do a variety of work that involves such things as environmental issues, safety documentation, system engineering, process improvement, and capital project input. Gearman lives in Aiken.

Richard Clarence Luedtke (BSChE '69) is president of RCL Offshore Engineering, Inc., of London, U.K. His stateside address is in Dubuque, Iowa.

1970s

C.K. Arora (MS '71) is deputy chief of the project development and management branch, Administrative Office of U.S. Courts, in Washington, D.C. Arora writes that after a seven-year assignment with the Army Corps of Engineers, in Frankfurt, Germany, he joined the federal judiciary's space and facilities division to participate in the courthouse building program. It is "challenging and demanding," he says, adding that he and his wife, Santosh, "often remember our days in Iowa City." The couple resides in Fairfax Station, Va.

Mark J. Lee (BSME '71) is president and CEO at Mica Accounting Software, of Port Arthur, Tex. He lives in Port Neches.

Daniel W. Swallow (BSME '69, MS '70, PhD '72) is director of power and propulsion programs for Textron Systems Division, Wilmington, Mass. Swallow reports that at the recent 12th International Conference on MHD Electrical Power Generation, held in Yokohama, Japan, he presented a paper describing results of the Pamiir-3U Program performed by Textron and the Russian Academy of Sciences Institute for High Temperatures. Swallow lives in Reading.

Thomas W. Moore (BSChE '68, MS '72) has spent the last three years as an industry consultant and recently became manager of systems engineering for SEER Services, a division of Standard Laboratories. Moore is developing SEER, Standard's energy and environment-related services division located in South Charleston, W.Va. Before that he spent 20 years in process engineering and quality control for the coal mining industry. Moore lives in Newburgh, Ind.

L.D. McMullen (BSCE '68, MS '72, PhD '75) has been appointed chair of the U.S. Environmental Protection Agency's National Drinking Water Advisory Council. He also recently was appointed a member of the agency's Science Advisory Board drinking water committee. McMullen is general manager and CEO of the Des Moines Water Works and chairs the College of Engineering Advisory Board.

Travancore S. Krishnaswamy (MS '76) lives and works in Trivandrum, India, where he is executive director of Autoserv Pvt. Ltd. He also is president of the Rotary Club of Trivandrum South, a member of the All-India Management Association and of the Institute of Engineers (India), and is a Freemason, Lodge Minchin. His son graduated from school in the United States in May.

Richard E. Larew (BSME '53, MS '73, PhD '76) is associate professor emeritus at The Ohio State University, having taught civil and environmental engineering and geodetic science, specializing in construction engineering and management. He has returned to Iowa City to live and is doing consulting in construction engineering and management, work that includes serving as an expert witness, trainer, and problem solver.

Brasil P. Machado (MS '76) lives and works in Curitiba, Brazil, where he is director of operations for Intertechne Consultores Associados Ltd., a firm with operations worldwide. Writes Machado, "My professional life has been involved with consulting engineering for dams and hydroelectric works, a field particularly important for Brazil, where more than 90 percent of the electric power is generated in hydroelectric plants." Machado currently is working on a Southwest Asia project.

W. Dennis Dunlap (BSIE '77) recently returned to Iowa from seven years in Belgium. He lives in Davenport and works as chief of the Resource Systems and Support Division, U.S. Army Industrial Operations Command, at the Rock Island Arsenal, in Illinois. Dunlap earned an M.B.A. degree in 1987.

Fernando De Mayo I (MS '78) is general manager of Tecno Control, a Santiago, Chile, company dedicated to control and instrumentation for the mining industry. De Mayo writes that his company collaborates with several U.S.-based manufacturers, so he travels to the States often. He also teaches process control at the University of Chile's electrical engineering department. De Mayo and his family came back to Iowa City in 1993 to visit friends and professors and to show his oldest daughter where she was born. He would like to get in touch with a former classmate, Mike Miller, who was at the college in 1977 and lived in Hawkeye Drive Apartments.

Steven Trilling (BSIE '79) is vice president of L.R. Hein Construction Corp., of Rolling Meadows, Ill. He lives in Buffalo Grove.

1980s

Gary S. Sandburg (BSIE '80) is a manufacturing engineer for Heatilator, Inc., of Mt. Pleasant, Iowa, a division of Hon Industries that manufactures wood- and gas-burning fireplaces and free-standing stoves. Sandburg reports that he is engineer for the gas department and that the gas business is growing 30-40 percent per year. Before joining Heatilator in 1994, Sandburg worked 12 years for Sheaffer, of Ft. Madison, Iowa. He lives in West Point.

David Field (BSE in EE '85) is president of Great Lakes Environmental, Inc., of Addison, Ill. He and his wife, Sherri Jewett-Field, who earned a B.S.N. in 1986 at Iowa, live with their three children in Elmhurst.

Steve Goodwin (BSE in CE '82, MS '85) is a project manager for Cham Hill. He recently transferred from his company's Gainesville, Fla., office to its Charlotte, N.C., office. He lives in Charlotte.

Karen Lunde (BSE in BME '85) is working on a Ph.D. in biology at the University of California-San Diego. Lunde writes that she is using a genetic approach to investigate wing development in the fruit fly *Drosophila melanogaster*. She lives in La Jolla.

Kian Niu (BSE in IE '85) reports that he has moved from Oregon to Malaysia.

Jose Matos Silva (PhD '86) writes that he keeps busy teaching hydraulics in Lisbon, Portugal, during the week and farming on the weekends. He has two daughters, 19 and 17 years old.

Jeffrey R. Bream (B.S.E. in EE '87) has moved from Waltham, Mass., to Torrance, Calif.

Steve Britt (BSE in EE '85, MS '87) resides in Roseville, Calif., where he is a software design engineer at Hewlett-Packard Co.

Robert L. Mead (BSE in ChE '87) is director of environmental affairs at Precoat Metals, of Chicago. He joined the company in 1989 as an environmental manager and was promoted recently to his current position, in which he is responsible for the design of industrial wastewater treatment systems to remove heavy metals. He also negotiates permits and enforcement issues with federal, state, and local regulatory agencies. Mead lives in Oak Lawn, Ill., with his wife and four children.

Remigio H. Galarraga-Sánchez (MS '87) is professor of hydraulics and water resources at Escuela Politécnica Nacional, in Quito, Ecuador. He teaches classes in groundwater and is coordinating the study of climate change based on aerial photograph analysis of Chimborazo Volcano. In September 1996 Galarraga-Sánchez was appointed executive director of Ecuador's National Institute of Meteorology and Hydrology.

Bao Do (BSE in EE '85, MS '88) is co-owner of ABC Virtual Communications, a Des Moines firm that writes software for Internet-related business projects. The company recently collaborated with Uniden Corp., a Japanese firm, to produce an e-mail telephone that was to go on the market this year. The company's work on the project was the subject of a story published in *The Des Moines Register* in March.

Mike Lowenberg (BSE in BME '88) has been promoted to director of cardiac rhythm management products for Guidant Australia, a global corporation specializing in cardiac and vascular products. Lowenberg is responsible for technical marketing, sales, clinical studies, regulatory approval, and assisting implants, cardiac devices, and accessories. He lives in St. Kilda.

Shankar G. Hemmady (MS '89) is president and CEO of Guru Technologies, Inc., of Santa Clara, Calif. He reports that after three years of stellar growth as a design consulting company, Guru Technologies is "graduating," becoming an electronic design verification software company. Hemmady's wife, Seema, an Iowa College of Pharmacy graduate, is starting a contract pharmaceutical laboratory for the biotech industry. The Hemmadays live in Cupertino.

Scott D. Wallace (BSE in CE '86, MS '89) writes that he has founded a new consulting company named North American Wetland Engineering PA., which provides specialty engineering services in point/nonpoint source effluent load trading, wetland mitigation banking, and innovative wastewater treatment systems. He also has developed three patents relating to use of wetlands for wastewater treatment. Wallace, whose new company is in Forest Lake, Minn., lives in St. Paul.

1990s

Khar-Yee Chuah (BSE in EE '90) is a product engineer for Northern Telecom (NORTEL) in Penang, Malaysia. He also is a part-time lecturer at the Royal Melbourne Institute of Technology College, in Penang. Chuah recently received his Master of Science in electronic communication from Universiti Pertanian Malaysia.

Robert Foote (BSE in ME '90) is a purchasing agent and analyst for Allied Signal Laminate Systems, in La Crosse, Wis. He lives in La Crescent, Minn.

Bruce E. Rowe (BSE in BME '90) earned his M.D. degree in 1994 and went on to do a residency in family practice at the Medical College of Wisconsin, which he completed in June. Now he is in private practice in Brown Deer, Wis. He and his wife, Laura, who earned B.A. and M.A. degrees in speech pathology from Iowa, reside in Mequon.

Timothy B. Adams (BSE in BME '88, MS '91) works for Boeing, in Seattle. Beginning in February, he spent three months in Japan, troubleshooting the assembly of the first shipset of Boeing's "stretch" 777. Adams served as a liaison between the Japanese engineers on the project and Boeing engineers in Seattle.

Adams also reports that he recently became engaged.

Robert M. Beardsley (BSE in IE '91) and **Kim Loehr Beardsley (BSE in IE '90)** live in Bettendorf, Iowa, with their son, Robert Jr. Robert Sr. is a factory manager in work surfaces and accessories for HON Industries, at the company's Systems Component Plant in Muscatine, and Kim is a manufacturing engineer at the John Deere Seeding Group, in Moline, Ill.

Scott Ferguson (BSE in BME '90, MS '91) works at Electronic Data Systems, in Atlanta, Ga. Ferguson, who lives in Roswell, reports that he is still a night owl and alternative music lover, and continues to buy a season football ticket to the Hawkeye games every year.

Tzuen-Yu "Arthur" Geeng (MS '91) lives and works in Taipei, Taiwan, where he manages the engineering department at TYCO Development Corp.

Amy Sather Wehrle (BSE in IE '91) is an information technology health care consultant with Ernst & Young LLP, in Tampa, Fla. She reports that she travels a great deal, working on projects

that take her throughout the Southwest. Before joining Ernst & Young she worked as a management engineer with Tampa General Hospital.

Wehrle and her husband, Eric, who earned a B.A. in psychology from the University in 1992, were married last November. They live in Lutz.

Kon Wong (BSE in EE '91) lives and works in Cedar Rapids, where he is a design engineer for Square D Co.

Cara Dankle Hull (BSE in IE '92) is a manager in health care consulting at Ernst & Young LLP, in Minneapolis. Hull works with hospital reengineering projects across the country and has spent much of the last two years on an assignment in New York City. She lives in Eagan, Minn.

Laura Wollenweber (BSE in ChE '92) is a clinical trials assistant at Duke University Medical Center's anesthesiology department. She currently is working on a collaborative project with a Raleigh, N.C., company to develop a thrombolytic assessment system. Before signing on at Duke, Wollenweber did medical research at The University of Iowa's internal medicine department. She lives in Durham.

LaShawn Freeman (BSE in ChE '93) resides in Jacksonville, Ill., where she is a process engineer for specialty products at Tenneco Packaging. She previously worked in Danville, Pa., as a production supervisor and technical support engineer at Merck & Company. She writes that she's enjoying motherhood with her 13-month-old son.

Gregory Mackey (BSE in ME '93) is a project engineer for DuPage Die Casting Corp, which makes high pressure aluminum die castings. He also is pursuing an M.B.A. degree at DePaul University. Mackey works in Niles, Ill., and lives in Glenview.

Marty Teal (MS '93) has been promoted by his company, West Consultants, and moved to Phoenix, Ariz., in March. He and his wife became parents of a baby girl in December.

David Ancel Tucker (MS '93) is an environmental engineer at Khafra Engineering Consultants, of Atlanta, Ga. He lives in Dunwoody. Tucker reports that he passed Georgia's professional engineering exam last summer.

Kathryn Miller (BSE in EE '94) is an electrical engineer at Orbital Sciences Corp. She works with

the company's launch systems group, which builds and launches suborbital and orbital rockets. Miller lives and works in Chandler, Ariz.

Uendra D. Belhe (PhD '95) has returned to India to pursue management consulting opportunities there. His current address is in Kalyon, India.

Robert C. Richardson (BSE in ChE '94, MS '95) writes that after 24 years with Monsanto, he took early retirement to work with Campus Crusade for Christ, where he now is manager for conference materials. This year Richardson will manage resource centers for 85 conferences nationwide, with some 78,000 attendees. His home base is Little Rock, Ark.

Joel G. Burken (BSE in CE '91, MS '93, PhD '96) is an assistant professor of civil engineering at the University of Missouri-Rolla,

where he is conducting environmental engineering research. He and his wife, Hope, live in Rolla.

Brady Fuller (MS '96) works in the water resources department of OTAK, Inc., of Lake Oswego, Ore., where he has done modeling for proposed stream developments, bridge construction, and related analyses. He reports that he enjoys being "back home," where the mountains have snow and the salmon run.

Garrick Forkenbrock (BSE in ME '96) is a research engineer for the Transportation Research Center, Inc., of East Liberty, Ohio. Forkenbrock currently is investigating antilock brake systems and conducting performance evaluations. Forkenbrock lives in Dublin.

Fangbiao Lin (PhD '96) is an engineer at TESMA International, Inc., of Toronto, Canada.

Kirk A. Miller (BSE in BME '96) is a project biomedical engineer for Stryker Endoscopy, of Santa Clara, Calif. He lives in San Jose.

Andrew Veit (BSE in ME '94, MS '96) is a mechanical design engineer for MTS Systems Corp, a maker of servo-hydraulic test equipment. Veit works in the company's material testing division with machines to test biomedical devices such as hip and knee prostheses. He lives and works in Eden Prairie, Minn.

Bill Walker (MS '96) lives in Lincoln, Neb., where he works for UN-L Landscape Services. He was married last October in Pennsylvania.

Kendra Wyatt (BSE in IE '97) is a systems analyst with Cerner, a health care information systems company. She lives and works in Kansas City.

In memoriam

Victor J. Richter (BSCE '29), of Cedar Rapids, May 1, 1997

Orville B. Hathaway (BSEE '31), of Omaha, Neb., January 18, 1997

Orville H. Tousey (BSIE '31), of Naples, Fla., December 12, 1996

John W. McDonough (BSCE '33), of Ventura, Calif., December 9, 1996

Earl R. Ewald (BSEE '34), of Normal, Ill., February 27, 1997

Frank Erznosnik (BSEE '38), of Durham, N.C., January 21, 1997

Erwin E. Beaudry (BSCE '41), of Albuquerque, N.M., November 30, 1996

Edward C. Clark (BSEE '41), of Marco Island, Fla., October 15, 1996

E.M. Myers (MS '41, PhD '42), of Gautier, Miss., 1997

William C. Morrison (BSEE '42), of Rock Island, Ill., May 24, 1997

Edward J. Maxfield (BSChE '43), of Waverly, Iowa, April 17, 1997

Richard G. Henneman (BSME '47), of Rock Island, Ill., September 28, 1996

Gordon F. Warner (BSChE '47), of Wheaton, Ill., May 1, 1997

Joseph C. Cropper (BSIE '48), of Waterloo, Iowa, August 8, 1996

Chia-Shun Yih (MS '47, PhD '48), of Ann Arbor, Mich., April 25, 1997

John P. Almon (BSME '50), of Fox Point, Wis., September 29, 1996

David H. Brunk (BSEE '49, MS '50), of Lynn Haven, Fla., April 7, 1996

Stanley R. Hermann (BSChE '50), of New Concord, Ohio, May 21, 1996

Donald E. Semelhack (BSME '50), of Charles City, Iowa, September 19, 1996

Roland L. Vander Hamm (BSEE '50), of Cedar Rapids, April 25, 1997

William H. Olson Jr. (BSIE '51), of Racine, Wis., April 16, 1997

Paul S. Soteropoulos (MS '57), of Mandeville, La., November 16, 1996

Jerry W. Beltman (BSEE '58), of Anoka, Minn., March 13, 1997

Elwin F. Thornburgh (BSME '59), of Boise, Idaho, October 25, 1996

Gerald W. Schuck (BSME '60), of New Hartford, Iowa, July 18, 1996

Joseph L. Michels (BSEE '69), of Cedar Rapids, September 30, 1996

James L. Cleppe (BSCE '73), of Tampa, Fla., May 17, 1997

Grant A. Piphon (BSME '77), April 6, 1997

Martin B. Berry (BSEE '75, MS '79), of Denver, Colo., January 21, 1997

Michael R. Bertschy (MS '92), of Iowa City, November 4, 1996

Hydraulics pioneer set pace for premier research institute

The year the United States celebrated its bicentennial was also a milestone year for Hunter Rouse: The UI Carver Professor of Fluid Mechanics published *Hydraulics in the United States 1776-1976*, a history of the sciences of hydraulics, and soon thereafter retired after 37 years on the engineering faculty.

Rouse died last year on October 16 in Sun City, Ariz.

Born in 1906 in Toledo, Ohio, Rouse earned his bachelor's degree in civil engineering in 1929 and his master's degree in hydraulic engineering in 1932 from MIT. He went on to earn two Ph.D. degrees, the first in hydraulics from the University of Karlsruhe, Germany, and the second in fluid mechanics from the Sorbonne.

Rouse joined the University of Iowa faculty in 1939 as a professor of fluid mechanics and consultant to the Iowa Institute of Hydraulic Research (IIHR), and became the institute's director in 1944. His vision spurred IIHR to become one of the preeminent hydraulic research centers in the world.

In 1966 Rouse relinquished his post at the helm of IIHR to become the engineering college's dean.

Rouse won international renown for his work in hydraulics, which included efforts during the 1930s to apply the theories of fluid mechanics, a burgeoning subfield of aerodynamics, to the problems of hydraulic engineering. This melding of theory and experimentation with practical application produced significant scientific and technical advances.

Rouse's early theoretical work on jet and plume dispersion established the fundamental techniques for evaluating the impact of municipal and industrial discharge into the atmosphere and waterways.

During his career, Rouse published 130 technical papers and



Hunter Rouse

seven books, including the comprehensive *Engineering Hydraulics*. He was a leading authority on the history of hydraulics.

His work earned him recognition from the American Society of Civil Engineers (ASCE), which made him a fellow of the society, named the keynote address of its annual Water Forum conference for him, and presented him with its History and Heritage Award.

He also was a member of the National Academy of Engineers and a fellow of the American Society of Mechanical Engineers and of the American Academy of Arts and Sciences.

In 1972 Rouse stepped down from the deanship to return to teaching and research. In 1973 he was named a University of Iowa Carver Professor.

Rouse retired in 1976, and he and his wife, Dorothee, moved to Arizona. But his love of teaching never waned, and he continued to teach during summer school at Colorado State University until age 83.

According to a biography written by the late John F. Kennedy, Rouse's successor at IIHR, Rouse was known not only for his intellectual prowess but also for his love of raw oysters and chocolate sundaes.

Rouse is survived by his wife, two sons, a daughter, six grandchildren, and three great-grandchildren. A memorial fund has been established in his name at the University of Iowa Foundation. The Hunter Rouse Graduate Tuition Fellowship will be awarded to outstanding students in engineering hydraulics.

COLLEGE NEWS

Biomedical Engineering

Jeffrey B. Bishop, graduate student, in June won the 1997 Young Investigator Award at the annual meeting and exposition of the Association for the Advancement of Medical Instrumentation. Bishop was honored for his work on a classification system for chronic low back pain patients, using analysis of dynamic motion.

Thomas C. Brown, professor of biomedical engineering and mechanical engineering, was named the University's Richard D. Johnston Professor of Orthopaedic Biomechanics in March, honoring his contributions to the field.

Vijay K. Goel, professor and associate director of the Iowa Spine Research Center, received the American Society of Engineering Education-Bioengineering Division's 1997 Theo C. Pilkington Outstanding Educator Award at the society's annual meeting in June.

Malcolm H. Pope, professor and director of the Iowa Spine Research Center, participated in the Musculoskeletal Outcomes Research Meeting, held during March in Washington, D.C.

Michael Schneiders, senior from West Branch, Iowa, won the prestigious national Barry M. Goldwater Honors Scholarship in April for the 1997-98 academic year. He was one of 282 scholarship recipients nationwide. The award grants up to \$7,500.

Chemical and Biochemical Engineering

Tonya Peeples, assistant professor, was chosen in April to receive a National Science Foundation Career Award.

Angelica Williams, junior from DeWitt, Iowa, won honorable mention in a nationwide student essay competition for undergraduate

chemical engineering students. The May contest was sponsored by the American Institute of Chemical Engineers' centers for safety in chemical engineering education and process safety.

Civil and Environmental Engineering

Pedro Alvarez, assistant professor, returned in May from Venezuela, where he presented an invited short course on bioremediation at the Ministry of the Environment, in Caracas. He also was a keynote speaker at the Second Latin American Conference on Environmental Risk, in Valencia. Later that month he conducted a short course on redox processes in biological systems at the Federal University of Santa Catarina, in Florianopolis, Brazil. In July Alvarez and **Jerry Schnoor**, professor, conducted a short course on environmental microbiology at the Metropolitan University of Mexico.

Seniors **Jennine Cota**, from South Milwaukee, Wis., and **Jennifer McMahon**, from Tucson, Ariz., earned second-team All Big Ten Honors in March. Cota is on The University of Iowa swimming team and McMahon is a pitcher for the Hawkeye women's softball team. The award is presented every year to student-athletes who have completed eligibility and have demonstrated outstanding academic and athletic excellence and leadership.

In April McMahon also received the Robert F. Ray Faculty Representative Award at the University's 80th annual Finkbine Leadership Dinner.

Robert Ettema, professor, and **Tatsuaki Nakato**, adjunct associate professor and associate director of the Iowa Institute of Hydraulic Research, were among 22 engineering professionals from around the world invited to make presentations in November 1996 at the International Workshop on Floodplain Risk Management, in Hiroshima, Japan.

S.C. Jain, professor, delivered a sesquicentennial celebration lecture at the University of Roorkee, India.

Witold F. Krajewski, professor, has been appointed to the editorial board of *Journal of Hydrology*.

Wilfrid A. Nixon, associate professor of civil and environmental engineering, received the Special Achievement Award for 1997 at the 16th International Conference on Offshore Mechanics and Arctic Engineering, in Yokohama, Japan. OMAE is a division of ASME International.

Nixon also spoke on winter highway maintenance research in June to the Finnish Road Administration in Helsinki, Finland.

A. Jacob Odgaard, professor and associate dean of graduate studies and research, presented the keynote lecture in May at the 1997 Conference of the Korea Water Resources Association, in Seoul, South Korea.

April Privett, senior from Duluth, Minn., was one of 25 University of Iowa teaching assistants chosen to receive a 1997 Outstanding Teaching Assistant Award.

Jerry Schnoor, professor, was reappointed in May to a two-year term on the 15-member Board of Scientific Counselors, U.S. Environmental Protection Agency.

Electrical and Computer Engineering

Irith Pomeranz, associate professor, received a 1997 University of Iowa Faculty Scholar Award in February to conduct creative, extended, and concentrated research. Pomeranz is developing procedures and software tools in three areas of testing and verification of digital electronic circuits, in collaboration with design and test groups in industry and with researchers in academia.

Fitzgerald Steele Jr., senior from Minneapolis, was elected president of the College of Engineering Student Council in May.

Industrial Engineering

Geb Thomas, assistant professor, has been awarded a project by the National Aeronautics and Space Administration. Thomas is building a telepresent, telerobotic interface and writing software that allows remote operators to view a robot's environment from a panospheric camera.

Mechanical Engineering

V.C. Patel, professor and director of the Iowa Institute of Hydraulic Research, was presented the 1997 Fluids Engineering Award of the American Society of Mechanical Engineers, at the society's summer meeting in Vancouver, Canada. Patel was honored for his work in aerodynamics, ship hydrodynamics, and hydraulic engineering.

Patel gave plenary lectures at the Advanced Fluids Engineering Research Center annual meeting and at the Wind Tunnel Users' June meeting at the Pohang Institute of Science and Technology, Pohang, Korea. He also delivered the Iowa Distinguished Engineering Faculty Lecture at the UI last November and at Iowa State University in April.

Kenneth Piffner, junior from Dewar, Iowa, was awarded the Sylvia W. Farry Scholarship by the Auxiliary of ASME International (the American Society of Engineers).

Fred Stern, professor, and **Eric Paterson**, research scientist at the Iowa Institute of Hydraulic Research, received a 1997 U.S. Department of Defense Challenge Project Award for their demonstration of near-field modeling and simulation of unsteady turbulent nonlinear flows around ships.

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