George W. Bissell
1907–1929

Henry B. Dirks
1929–1948

Lorin G. Miller
1948–1953

John D. Ryder
1954–1968

Lawrence W. Von Tersch
1968–1989

Theodore A. Bickart
1989–1998

George Van Dusen
1998–1999 (acting)

Janie M. Fouke
1999–

College of Engineering Deans
and Edwin Willits, President
of M.A.C. from 1885–1889
As MSU celebrates its 150th anniversary in 2005, we take the opportunity to explore the evolution of engineering education.

We have come a long way since the first official mechanic arts course was offered in 1885 at MSU—then known as Michigan Agricultural College (MAC). Since that time, the face of engineering has certainly changed. Even the way in which engineers work has shifted dramatically. Fifty years ago, engineers typically carried out research on their own, within their own engineering disciplines. Today’s engineers have become much more interdependent. They collaborate with their colleagues in other areas within the discipline of engineering, and they increasingly work with researchers in other fields including the biological sciences, the social sciences, and medicine. The most exciting things are happening at the interstices between engineering and the other sciences.

The easy, basic problems have been solved; the difficult problems are now left to tackle. That demands a meeting of the minds—the best minds of top-notch engineers and scientists. Through increasingly collaborative efforts, engineers are working to meet the challenges of the 21st century.

Focus areas common to almost all of the departments within the College of Engineering include energy, homeland security, biotechnology, nanotechnology, information technology, and natural resource conservation. Many of the tools to address these challenges did not even exist in the last century.

The needs of society are changing. So, too, are the lifestyles, values, and priorities of our students. We therefore have an obligation to meet these challenges proactively: the effects of globalization; an aging population and an aging infrastructure; the need for our curricula to be broader in non-technical outcomes; alignment of our programs with industry and societal hiring needs; and curricula and co-curricular programs that foster critical thinking, innovation, risk taking, and—above all—integrity.

Here in the College of Engineering at MSU, we have responded to the changes in our world by revising curricula, refocusing research directions and, in some cases, reorganizing departments or changing their names. On the next few pages, our department chairs will reflect on how their respective fields—and their departments—looked 50 years ago. They will also project where things may be headed in the next 50 years.

While engineering may not look like it did 150, 100, or even 50 years ago, the heart and soul remain the same—in keeping with what state legislators wrote when they established a four-year course of study in mechanic arts—training first-class students to be “well-fitted for any positions they may seek,” all working together for the good of society.

Jamie Fouke
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OUT OF THE ASHES AND INTO EXCELLENCE

The Engineering School That A

BY LAURA LUPTOWSKI SEELEY
The College of Engineering owes its beginnings in 1885 to Edwin Willits, also known as “the father of engineering.” As president-elect of M.A.C., he recognized the need for a program in mechanic arts and proposed to the state legislature a four-year course of study.

“...The purpose is to establish a first-class school of technology,” legislators wrote. In addition to drawing, drafting, and experimental physics, students would be taught English, bookkeeping, and business law. The goal was for each student to be “well-fitted by a general and business as well as a technical education for any position he may seek.”

In his inaugural address on August 19, 1885, Willits stated: “Last winter, the Legislature was appealed to for means to erect the buildings and furnish the equipment... for the department of mechanic arts. The response was hearty, and an appropriation ample for the initiative of the new course was made, and the necessary shops are now being erected and the equipment [sic] being purchased.” Nearly 40 freshmen enrolled in the new four-year course when it was offered for the first time in September 1885. The engineering curriculum at M.A.C. seemed to be off to a strong start.

But after fire destroyed the Engineering Building and shops in the early morning hours of Sunday, March 5, 1916, a Detroit Free Press correspondent wrote: “On all sides, the prediction was freely made that Sunday’s fire had wound up the career of the engineering department.” All that was salvaged was some electrical equipment worth a few thousand dollars, and it seemed doubtful that rebuilding would be financed, since a similar program was already underway at the University of Michigan.

Over the years, there had been repeated discussion about combining the state’s engineering studies to create a single program in Ann Arbor. Now there was a renewed effort by the state legislature to move the engineering college to Ann Arbor to become part of the U of M College of Engineering instead of rebuilding at the Michigan Agricultural College (M.A.C.).

But the Detroit Free Press reporter and other naysayers were wrong. Before the legislature could meet, M.A.C. President Frank S. Kedzie and George W. Bissell, dean of engineering, had wired Ransom E. Olds—personal friend and Lansing’s industrial leader—in Florida, who gave $100,000 toward rebuilding the engineering program at M.A.C. The R. E. Olds Hall of Engineering, constructed at the old site, was dedicated on June 1, 1917; this finally put an end to the attempt to move the engineering school to Ann Arbor.

The engineering program continued to operate out of Olds Hall until 1962, when a new building was constructed on Shaw Lane. That building was renovated and expanded in 1989. And in 1997, the Herbert H. and Grace A. Dow Institute for Materials Research (known as the Dow Wing) was completed.

The lists of department chairpersons and department milestones on the next several pages were compiled using faculty/staff directories, course catalogs, reports to the State Board of Agriculture, and other publications housed in the MSU Archives and Historical Collections. We have been very careful to ensure that the information published here is correct. However, if you detect errors or discrepancies, please let us know; we welcome your feedback.
100 years ago . . .

. . . two-thirds of the American population lived on the farm, and the main source of power was manual labor or animals. In the early 1900s, it took 57.7 man-hours to produce an acre of wheat compared to 1.82 man-hours today.

Engineers have helped transform agriculture into a major industry, increasing farm productivity by mechanizing agricultural operations, building rural roads, building irrigation and drainage systems, bringing electricity to farms, and designing crop storage and processing systems. Agricultural mechanization has been cited as the seventh most significant engineering achievement of the past century.

As a result of the increase in productivity, less than three percent of the American population is engaged in farming today; yet, the United States is the largest food exporting country in the world.

This increase in productivity did not come without a price, however. Excessive tillage of soil created erosion problems. The increased use of agricultural chemicals created environmental and food safety concerns. Large animal feeding operations created issues of animal waste, air quality, and odors. The boundaries between urban and rural America began to blur, placing new constraints on agriculture.

“Agriculture found itself in the middle of everybody’s back yard,” says Ajit Srivastava, chairperson of the Department of Biosystems and Agricultural Engineering. “And when you’re dealing with a system, anything you do is going to have a ‘domino effect.’ So you must take a systems approach to solving these problems.”

“The introduction of steam power had a significant impact on farming in the early 1900s.”

—History of the Agricultural Engineering Department, Michigan State University, 1906-1964, by N. F. Meador

The response from the agricultural community is to take into consideration these broader aspects of societal issues, such as the environment, and move toward becoming more biosystems oriented; that is, applying engineering principles like quantitative, analytical methods, and combining them with biological innovations and discoveries to address society’s problems.

In 1995, in order to better prepare graduates to meet these changing societal needs, the department replaced its agricultural engineering degree programs with biology-based programs in biosystems engineering, emphasizing the integration of biology and engineering to solve problems in a systems context. Recently, nearly every university in the country has changed the name of its agricultural engineering department to reflect the discipline’s new scope. And MSU’s department joined that movement effective July 1, 2004.

Founded in 1906, the department (which is jointly administered by the College of Engineering and the College of Agriculture and Natural Resources) has long been involved in bringing engineering and technology solutions to problems in agriculture.
The department is now preparing to celebrate its 100-year anniversary. “The goal of the celebration,” says Srivastava, “is not so much to have a party, but to look to the future while we recognize our past.”

within the next 50 years . . .

. . . says Srivastava, the challenges will include: How will we feed 11 to 15 billion people? How will we ensure food quality and safety? How will we protect our environment? Will we have enough land and water resources to produce the food we will need? And how do we train students of the future to address these kinds of issues?

The department will focus on two critical areas: (1) conserving natural resources and enhancing the environment; and (2) ensuring food quality, safety, and biosecurity, while keeping agriculture sustainable.

“These are going to be key issues for society for many years to come,” says Srivastava. “We’ll continue to address these issues, and at the same time include more biology in our curriculum. We expect that in the next 50 years we will become a discipline firmly grounded in the science of biology, with applications in food, agriculture, environment, and human health.”

Biosystems engineers will play an increasingly critical role in homeland security issues. “With our ability to understand the system, and with the engineering knowledge to detect and isolate pathogens, we are actually ‘on the front line’ in the fight against bioterrorism.

“We foresee our department growing through collaborations with other departments within the College of Engineering and other units across campus. This is such an interdisciplinary field. We cannot be isolated; we must build strategic alliances,” says Srivastava.

The department will soon break ground on a new Biosafety Level II Food Safety Research Lab, which will be the only one in the multi-state region of Ohio/Indiana/Michigan. This will enable researchers to perform work that can be done only in an isolated lab. “If you were to bring bacteria into an operating plant in order to do research, USDA safety rules would shut down the entire plant,” says Srivastava.

“This critical facility will benefit the food processing industry in an immediate way,” says Srivastava. And more of these types of labs will be needed.

“We see agriculture becoming somewhat of an ‘economic engine’ for the country,” Srivastava sums up. “In order to become more independent of imported energy, we’ll have to figure out how we can ‘grow’ energy and other consumer products from an agricultural base.”

“Agricultural engineering is unique in that it involves specifically biological and environmental factors, since it deals with engineering applied to biological matter—food, feed, natural fiber, animals and humans. . . . The ability to combine the knowledge of biology and engineering . . . offers the greatest opportunity that has happened to our profession in years.”

—ASAE President A. W. Farrall, in an address at the 1962 annual meeting

Honoring the Past . . . Embracing the Future

In March 2006, the department will kick off a yearlong celebration of its 100-year anniversary. They plan to produce a 16-month calendar and a coffee-table book. An Alumni Centennial Fund will be established to support the profession through a variety of activities, including publications, scholarships, and recruiting events. For more information and a calendar of events, go to www.egr.msu.edu/age/.

Department Milestones

1906 Department of Agricultural Engineering founded
1946 Construction of Agricultural Engineering Hall began; it was completed in 1948
1984 Agricultural Engineering Hall was renamed A. W. Farrall Agricultural Engineering Hall
1989 Crop and Food Bioprocessing Center established
1995 Department revises degree programs, replacing agricultural engineering with biosystems degrees
2004 Department changes name from Department of Agricultural Engineering to Department of Biosystems and Agricultural Engineering
2006 Department begins celebration of 100-year anniversary

Department Heads/Chairpersons

1906–1909 L. J. Smith
1909–1942 H. H. Musselman
1942–1945 E. G. McKibben
1945–1964 A. W. Farrall
1964–1970 C. W. Hall
1970–1975 B. A. Stout
1975–1979 D. R. Heldman
1980–1989 D. M. Edwards
1997– Ajit K. Srivastava
The Department of Chemical Engineering and Materials Science has existed under this name only since 2001. That year, the Department of Materials Science and Mechanics was reorganized. Some of the programs were reassigned to the Department of Mechanical Engineering and the Department of Electrical and Computer Engineering. Materials science merged with the Department of Chemical Engineering; hence the new Department of Chemical Engineering and Materials Science was created.

50 years ago . . .

"... chemical engineering at MSU was really blossoming," says Martin Hawley, chairperson of the Department of Chemical Engineering and Materials Science.

Chemical engineering at Michigan State began in the 1930s as an outgrowth of the chemistry department. Early on, the program was tailored to prepare students to enter primarily the oil, chemical, food, and pharmaceutical industries.

"As these industries have grown," says Hawley, "they have become more diverse in their products, especially in the area of materials—particularly polymers, which today account for over half of the chemical products that we use in this country. And the nature of chemical engineering educational programs has changed over time to reflect this.

"Today, our graduates are serving a more diverse industrial base than they did 20 years ago. They work not only for petroleum, chemical, pharmaceutical, and food companies, they also work in the electronics industry, for small startups, and as consultants and analysts for financial and venture capital companies," says Hawley.

Chemical engineering is a program based on a systems approach to solving large, integrated problems. "Chemical engineers viewed things back in the old days by unit operations—such as distillation, absorption, extraction, drying, heat transfer—and then put them together in the context of chemical plants, refineries, and pharmaceutical plants." In the '60s, there was a paradigm shift from unit operations to transport phenomena, and the nature of education changed to become more model based.

More recently, says Hawley, chemical engineering curricula across the country are being modified to reflect another major change—the role of the chemical engineer in solving biology-based problems. "Here at MSU, we have just completed a major curriculum revision to reflect that." Students enrolling in the department today can choose from the following options: biochemical, biomedical, environmental, food science, and polymers.

within the next 50 years . . .

"... I think that the field of chemical engineering is going to morph again, maybe several times," says Hawley. "One of the big things coming down the pike is the energy situation. Without cheap energy, a lot of other things won’t be possible."

The pressure will be on to consider different resources for fuels and chemicals. And chemical engineers will play a major role in that transition from a cheap, petroleum-based economy to our future energy economy—a more distributed energy economy, which will include biobased fuels and chemicals, solar collection and conversion to electrical power, nuclear energy, and conversion of coal to fuels and chemicals. "Michigan State is poised to be a national leader," says Hawley.

"In the future, we are probably going to revisit the nuclear issue more directly in this country, along with direct solar conversion to electricity, mainly photovoltaics. I think a big breakthrough is out there for the taking in the area of converting solar energy to electric power and I think nanotechnology is going to have a role there," Hawley says. "We have faculty here at MSU working on these problems."

Chemical engineers will also play a major role in the field of medicine, he says. "They understand chemical reaction systems and separation systems—the same types of systems found in the human body. So when it comes to drug delivery and drug target molecules, this is an area where chemical engineers will have a great influence."

In the area of materials science, Hawley
predicts quite a bit of overlap with chemical engineering. “The materials engineering program is in itself very integrated across all fields of engineering—mechanical, electrical, chemical. It’s a fundamental discipline that comes into play any time you deal with engineering. Buildings, bridges, aircraft, mechanical devices, furniture, medical devices, electrical appliances—all have a materials component,” says Hawley. “Without materials, we wouldn’t have anything!”

Metals, polymers, and ceramics will remain the foundations of this discipline, but there will be an increased interest in composites. “There will be a need for materials with specific properties for efficient processes,” he says. “In a nutshell, we’re going to be focusing on ‘designer materials’—tailoring material properties for very specific applications. This is going to become one of the really strong thrusts of materials science. “In the next 10 years, we’re going to have to embark on a very ambitious program to significantly increase the laboratory capability at MSU to accommodate the engineering research that we’ll need to do; we intend to be a player,” says Hawley. “We need to have a vision for the importance of engineering in the future, which means we’re going to need many more highly educated problem solvers in all branches of engineering, including chemical and materials engineering.”

**Department Milestones**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1912</td>
<td>Chemical engineering courses administered jointly by the Department of Chemistry and the Division of Engineering</td>
</tr>
<tr>
<td>1918</td>
<td>The first four undergraduates in the formal engineering chemistry option receive bachelor's degrees in chemical engineering</td>
</tr>
<tr>
<td>1929</td>
<td>MSU’s Department of Chemistry expands to become the Department of Chemistry and Chemical Engineering</td>
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<tr>
<td>1931</td>
<td>Department of Chemical Engineering splits from the Department of Chemistry and Chemical Engineering and joins the Division of Engineering as a degree-granting program.</td>
</tr>
<tr>
<td>1933</td>
<td>First woman engineering graduate—Ethel V. Lyon—receives bachelor’s degree in chemical engineering (see story, page 36)</td>
</tr>
<tr>
<td>1941</td>
<td>Department of Chemical Engineering becomes known as the Department of Chemical and Metallurgical Engineering</td>
</tr>
<tr>
<td>1949</td>
<td>Department of Chemical and Metallurgical Engineering splits to form two separate departments—the Department of Chemical Engineering and the Department of Metallurgical Engineering effective July 1</td>
</tr>
<tr>
<td>1952</td>
<td>Name of Department of Engineering Mechanics changed to Department of Applied Mechanics, effective in October</td>
</tr>
<tr>
<td>1962</td>
<td>The Department of Metallurgical Engineering and the Department of Applied Mechanics merge to form the Department of Metallurgy, Mechanics, and Materials Science (MMM) effective January 1</td>
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<tr>
<td>1983</td>
<td>A Center for Composite Materials and Structures was established in the college in July</td>
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<tr>
<td>1988</td>
<td>On December 2, the MSU Board of Trustees approves permanent status for the Composite Materials and Structures Center</td>
</tr>
<tr>
<td>1991</td>
<td>NSF Center on Low-Cost, High-Speed Polymer Composites Processing established on September 1—the first National Science Foundation research center in the college</td>
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<tr>
<td>1992</td>
<td>Department of Metallurgy, Mechanics, and Materials Science (MMM) becomes Department of Materials Science and Mechanics (MSM)</td>
</tr>
<tr>
<td>2001</td>
<td>Department of Materials Science and Mechanics reorganized; materials science faculty and programs merged into existing chemical engineering department. Official name becomes Department of Chemical Engineering and Materials Science. Martin Hawley named first chairperson.</td>
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**Department Heads/Chairpersons**

**CHEMICAL ENGINEERING**

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
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<tbody>
<tr>
<td>1918–1945</td>
<td>Arthur John Clark (Department of Chemistry)</td>
</tr>
<tr>
<td>1920–1930</td>
<td>A. J. Clark (Department of Chemistry and Chemical Engineering)</td>
</tr>
<tr>
<td>1931–1936</td>
<td>H. S. Reed (Department of Chemical Engineering)</td>
</tr>
<tr>
<td>1936–1940</td>
<td>H. E. Publow</td>
</tr>
<tr>
<td>1940–1948</td>
<td>Clyde C. DeWitt</td>
</tr>
<tr>
<td>1948–1949</td>
<td>J. W. Donnell (Listed in 1948–49 MSU Directory as department head; no other official records indicate this.)</td>
</tr>
<tr>
<td>1949–1950</td>
<td>Austen J. Smith (also chair of Department of Metallurgical Engineering)</td>
</tr>
<tr>
<td>1950</td>
<td>David F. Smith (April 16–October 31, 1950)</td>
</tr>
<tr>
<td>1951–1952</td>
<td>R. W. Lutd, acting</td>
</tr>
<tr>
<td>1952–1961</td>
<td>C. Fred Gurnham</td>
</tr>
<tr>
<td>1961–1963</td>
<td>Austen J. Smith, acting (also chair of Department of Metallurgy, Mechanics, and Materials Science, 1962–64)</td>
</tr>
<tr>
<td>1977–1995</td>
<td>Donald K. Anderson</td>
</tr>
<tr>
<td>1995–2001</td>
<td>Bruce E. Dale (also acting chair of Department of Materials Science and Mechanics, late 2000–01)</td>
</tr>
<tr>
<td>2001–</td>
<td>Martin C. Hawley (first chair of new Department of Chemical Engineering and Materials Science)</td>
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</table>

**METALLURGICAL ENGINEERING/METALLURGY, MECHANICS, & MATERIALS SCIENCE/MATERIALS SCIENCE & MECHANICS**

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<tr>
<th>Year</th>
<th>Name</th>
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<tbody>
<tr>
<td>1948–1949</td>
<td>R. L. Sweet (Department of Metallurgical Engineering)</td>
</tr>
<tr>
<td>1949–1962</td>
<td>Austen J. Smith (Department of Metallurgical Engineering)</td>
</tr>
<tr>
<td>1962–1964</td>
<td>Austen J. Smith (Department of Metallurgy, Mechanics, and Materials Science; also acting chair of Department of Chemical Engineering, 1962–63)</td>
</tr>
<tr>
<td>1964–1965</td>
<td>William A. Bradley, acting</td>
</tr>
<tr>
<td>1966–1971</td>
<td>Donald J. Montgomery</td>
</tr>
<tr>
<td>1974–1975</td>
<td>William A. Bradley, acting</td>
</tr>
<tr>
<td>1975–1978</td>
<td>Robert W. Summitt</td>
</tr>
<tr>
<td>1978–1979</td>
<td>George D. Mase, acting</td>
</tr>
<tr>
<td>1979–1984</td>
<td>David L. Sikarskie</td>
</tr>
<tr>
<td>1985–1998</td>
<td>Kalinath Mukherjee (department changes name to Department of Materials Science and Mechanics in 1992)</td>
</tr>
<tr>
<td>1998–2000</td>
<td>Nicholas J. Altiero</td>
</tr>
<tr>
<td>2000–2001</td>
<td>Bruce Dale, acting</td>
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</table>
50 years ago . . .

... during post-war construction, civil engineers were building the infrastructure we know today—highway systems, roads, bridges, city projects—and environmental engineers were primarily in the business of sanitary engineering. Today, civil engineers are faced with the upkeep of that infrastructure through rehabilitation, maintenance, and sustainability, while environmental engineers are focused on the problems of industrial contaminants and pollutants.

“What makes the field of civil engineering unique compared to the other engineering disciplines,” says Ronald Harichandran, chairperson of the Department of Civil and Environmental Engineering, “is that a lot of the work is directly related to the public welfare. If you make a mistake with a bridge or a building, you’ve got a huge problem; you can’t just tell the public to go get a refund on the product if they don’t like it. There must be a lot of evaluation and reevaluation to make sure things are right before deployment. This means that the research-to-implementation time is much longer in civil and environmental engineering than it is if you’re producing cars, or electronic devices, or new software.”

within the next 50 years . . .

... new technologies and new materials will influence the way that civil and environmental engineers work. And much of that work will be through collaborative research projects.

“There is no question that a lot of the new challenges can be overcome only by working in an interdisciplinary way,” says Harichandran. “The challenges are in the fringes.”

Civil and environmental engineers may find themselves working with chemical engineers and materials scientists in developing composite materials, with computer engineers in the areas of pattern recognition and image processing, and with electrical engineers in sensor development and intelligent transportation systems.

In the area of composites, says Harichandran, “new materials are struggling a bit to find a strong foothold in the regular commercial construction market. But enhanced cement-based materials—where composite fibers are added to cement to enhance its properties—have found broader use because they can be used more regularly and adopted into the construction process.”

Together with electrical engineers and computer scientists, civil engineers are working on new developments in intelligent transportation system technology including autos with cruise control mechanisms that sense the car ahead and slow down automatically to keep a certain distance between the two vehicles; a variable message sign that changes the speed limit according to traffic flow or current weather conditions; a system that detects ice on the road; a system that broadcasts accident locations to notify drivers of potential problems on the road ahead; and advance control of traffic signals based on traffic density.

“Radar technology is being used to design ‘collision warning’ and ‘collision avoidance’ systems,” says François Dion, assistant professor of civil and environmental engineering. In a collision warning system, an alarm would go off to alert the driver if he or she was too close to the vehicle ahead; in an avoidance system, the vehicle would actually brake for the driver.

Taking technology one step further, Dion is also collaborating with faculty in the Department of Electrical and Computer Engineering on future projects that would use wireless communication to pass information from vehicle to vehicle. “For instance, you’re not supposed to be stopped on a freeway,” says Dion. “With this new technology, if a vehicle stops, information is sent from that vehicle to the vehicles behind and around it.” The information could be displayed visually—like the navigation maps already in use in some vehicles—or in audio form. Or both.
Working together, civil and electrical engineers have also developed new technology known as “structural health monitoring,” which uses sensors to detect the condition of a structure. Sensors could have been useful in the World Trade Center disaster by detecting the condition of the building following impact so that firefighters and others entering the building would have been able to know if and when the structure would fail, giving them a chance to determine whether—and for how long—it was safe to be in the building.

Environmental engineers are working with researchers in the biological sciences to develop new technologies like “gene chips” and other sensors that allow us to study microorganisms used to remediate contamination. Such technology could be used to detect contamination in the environment—specifically drinking water. New methods for water filtration and purification are constantly being devised, and researchers are working on modeling and computing the flow of contaminated water, both through the ground and in the Great Lakes. These developments will all have a profound impact on homeland security issues.

“Recently, when hiring faculty, our focus has been on these emerging areas of new materials and new technologies, as opposed to traditional areas like designing structures or enlarging roads to deal with traffic congestion,” says Harichandran. “This creates a tension because some of the agencies that fund research in civil and environmental engineering are not as able to allocate resources to emerging areas. For example, if you look at departments of transportation, they need to solve the immediate problems.” And because of the lag time between research and application, a significant challenge in civil and environmental engineering across the country is the disconnect that can develop between faculty—who are working in the cutting-edge areas—and the industry practitioners, who are still looking for students who are trained in traditional civil engineering.

“It’s a challenge for engineering schools because the daily bread and butter is in the more traditional areas,” says Harichandran. “If you hire faculty who are all on the cutting edge, they could soon be on the ‘bleeding edge’ because they may not be able to secure research funding! We need researchers who are at the forefront in emerging areas, but we also need faculty who continue to work in the traditional research areas in order to serve current needs. It’s a tough balancing act.”

— Ronald Harichandran, chairperson

"For the first time in 20 years, the GPA required for students to enter civil engineering has risen to 3.0 due to increased demand. It’s not quite clear why, but our gut feeling is that part of this demand is because students fear outsourcing and they find some security in the field of civil engineering. Some of the work—like detailed design—can be outsourced, but the conceptual design and actual physical construction can’t be.”

— Ronald Harichandran, chairperson

Department Milestones
1858 Civil engineering class offered
1890 Department of Mathematics and Civil Engineering established (We found some earlier references to the “Department of Mathematics and Engineering.”)
1901 A series of classes in civil engineering are offered for the first time
1903 14 seniors become first graduates from civil engineering option
1909 Department of Civil Engineering is established when the Department of Mathematics and Civil Engineering was divided
1949 Department renamed Department of Civil and Sanitary Engineering and Mechanics
1951 Name changed to Department of Civil and Sanitary Engineering effective December 1
1956 Department renamed Department of Civil and Environmental Engineering
1998 18 students participate in the new study abroad program in Volgograd, Russia
2002 Civil Infrastructure Laboratory established
2003 National Center for Pavement Preservation established
2004 More than 70 students participate in the study abroad program in Volgograd, Russia
2004 Senior capstone design course—CE 495—offered for the first time

Department Heads/Chairpersons
1875–1890 Rolla C. Carpenter, professor
1891–1924 Herman Klock Vedder (headed the Department of Mathematics and Civil Engineering, 1895–1909; thereafter headed the Department of Civil Engineering)
1925–1949 Chester Lawrence Allen
1949–1951 Charles O. Harris
1951–1956 John R. Snell
1956–1969 Charles E. Cutts
1972 Orlando Andersland, acting (March 1–June 30, 1972)
1972–1986 William C. Taylor
1986–1987 Francis X. McKelvey, acting
1987–1990 William C. Taylor
1990–1995 William E. Saul
1995– Ronald S. Harichandran
50 years ago . . .

“. . . computer science as a field didn’t even exist,” says Laura Dillon, acting chairperson of the Department of Computer Science and Engineering. “Everything was in its infancy.”

In the early to mid-50s, the first compiler was being written for FORTRAN. In 1956, the Computer Laboratory was established at MSU. It wasn’t until 1968 that the Department of Computer Science was founded at MSU.

Initially, the department was traditionally oriented, starting out with a very strong computer engineering focus. By 1997, the department had established strengths in the areas of AI, robotics, pattern recognition, image processing, formal methods, and high performance computing. But few fields have undergone such rapid change as computer science and, by the late 1990s, the transition toward networking, distributed systems, and software engineering had already begun.

Today, with all of the sophisticated tools available, it is too easy to become dependent on these tools and not understand the science behind them. “We cannot afford to lose that expertise,” says Dillon. “Not everyone needs to know how to build a compiler, but somebody had better stay facile with the underlying science. Somebody has to understand how those algorithms work and design new ones for the next generation of computers. Core areas of computer science are of fundamental importance.”

While the field was necessarily focused inward in the early stages, computer scientists across the country and at MSU are nowadays turning their focus outward, embarking on a number of innovative interdisciplinary projects.

within the next 50 years . . .

. . . the department will see an even stronger move toward multidisciplinary research.

“The potential for biggest impact seems to be at the boundaries, where computer science intersects with other disciplines,” says Dillon.

“With the strong criminal justice program here at MSU, for example, it makes sense for us to build bridges between us, to work jointly in the area of cybersecurity,” says Dillon. “We are also working with linguists to understand natural languages and human gestures; collaborating with computational biologists in making fundamental discoveries about evolution; and partnering with MSU’s MATRIX—the Center for Humane Arts, Letters, and Social Sciences Online.”

One of the areas most urgently in need of computer scientists’ expertise is the protection of our technology infrastructure—our telecommunication, power, transportation, and defense systems—against attacks by terrorists and criminals.

According to a report recently released by the President’s Information Technology Advisory Committee, the federal government does not provide an adequate level of funding...
to support cybersecurity research. The report further states that there are fewer than 250 faculty members in the United States actively involved in cybersecurity research. The presidential advisory committee calls for an increase in government funding to support long-term research projects and a push to recruit more faculty and students to the field.

Anthony Wojcik, professor of computer science and engineering, is director of MSU’s CyberSecurity Initiative, a team of researchers from seven different colleges on campus working collaboratively with industry and government entities. And computer science faculty members were key participants in a Cyber Infrastructure Workshop held February 19 on the MSU campus. William A. Wulf, president of the National Academy of Engineering, visited on February 17 to kick off the workshop.

A collaborative philosophy has taken hold in the faculty-hiring arena as well. “When we hire faculty, we’re no longer looking for people who are strictly good computer scientists; we want them to have some other expertise as well,” says Dillon. The interdisciplinary angle spills over into the classroom too. In 1993, the department offered nine courses in conjunction with electrical engineering. In 2004-2005, eight courses are being offered with electrical engineering, but there are also courses with the departments of linguistics, zoology, philosophy, and psychology. “And there are more coming,” Dillon promises. In the works are specializations in cybersecurity and a dual PhD degree option in computer science and biochemistry.

Dillon warns that students should not be narrowly focused. “You don’t want to just know how to write programs. Those are the things that can be shipped overseas.” All students are now required to have a cognate, with choices including business, criminal justice, telecommunications, natural science, statistics, music, law and computers/privacy, libraries, and medicine. This interdisciplinary education will ensure that computer science grads have an edge in the job market. And Dillon predicts a healthy job outlook for the foreseeable future.

According to the Job Outlook survey for 2005, released in late 2004 by the National Association of Colleges and Employers, American employers expect a 13.1 percent increase in hiring over the previous year. And students earning degrees in computer science, computer engineering, electrical engineering, and mechanical engineering are expected to fare the best. Starting salaries are also expected to rise 3 to 7 percent.

“Considering the extent to which computing has pervaded our society, and our world—it just gets bigger and bigger and bigger—how is it possible that there are not going to be jobs?” says Dillon. “It’s not going to go away.”

**Department Milestones**

- 1955: Computer work starts at MSC
- 1956: Computer Laboratory established within the College of Engineering to serve the entire campus
- 1957: MISTIC (Michigan State Integral Computer) became operational on October 18
- 1963: Acquired the CDC 3600
- 1965: Computer science program established
- 1967: Bachelor’s degree authorized
- 1968: Acquired the CDC 6500 in September (An internal document states that it was installed in January 1969.)
- 1968: Department of Computer Science established effective December 1
- 1970: Graduate program approved
- 1998: Department is renamed Department of Computer Science and Engineering as of July 1

**Department Heads/Chairpersons**

- 1965–1969: Richard J. Reid, director of computer science program
- 1999–2001: George C. Stockman, acting
- 2003: Laura Dillon, acting

Disassembling the MISTIC (November 1963) are Julian Kateley (upper left), professor emeritus, computer science, and associate director emeritus of the Computer Laboratory; and Leslie K. Keith (lower right), computer engineer. The three cabinets in the background to the left housed the magnetic core memory.
50 years ago . . .

“. . . it was possible for us to sit in our own communities and not be terribly worried about what was going on outside of our neighborhoods,” says Satish Udpa, chairperson of the Department of Electrical and Computer Engineering. “For the most part, we were insulated from what was happening. Today, that’s no longer true.” Partly due to the work of the engineering community these past five decades—especially in the area of communications—the world has shrunk. “It’s become a much smaller world today, which means that the problems of the world outside become our problems.”

We’ve come a long way. “Just 20 years ago, computers were not as ubiquitous as they are today. Cell phones have become modern contraptions that we can’t live without. The medical world has changed too. We have MRI, CAT scans, and PET scans, all part of a new vocabulary that did not exist before. There are not many fields where electrical engineers and computer engineers have not had an impact in the last 20-30 years,” Udpa says.

within the next 50 years . . .

“. . . we will be working on solving the difficult problems; the easy problems have already been solved,” says Udpa. “And in order to solve the difficult problems, we have to transcend boundaries. It’s no longer enough just to be a good electrical engineer. You have to know something about other fields in order to make contributions.”

Only about 10 percent of the research in the department now involves ECE faculty solely. Most of it is interdisciplinary and includes work with researchers in the College of Human Medicine and the Department of Natural Science. “In many institutions, ‘interdisciplinary’ is a buzzword,” says Udpa. “Here, we take it seriously.”

As in other fields of engineering, the area of security-related issues is of utmost concern to electrical and computer engineers. “While putting strict security measures into place can be an intrusion on our own privacy, it offers opportunities to engineers. What can engineers do to minimize intrusion into people’s lives and yet offer the level of security that we need in order to survive and thrive as a society? How can we keep the ‘bad guys’ out and yet manage to lead a lifestyle that we have come to love and cherish?”

Udpa says that electrical and computer engineers are uniquely positioned to change the face of the automotive industry. “In this day and age when we can send a man into outer space, it’s unconscionable to see the number of accidents that we have on our highways.”

On January 12, 2005, dense fog contributed to a 50-car pileup and a series of smaller pileup accidents on I-96 near Lansing, involving nearly 200 vehicles, including about 75 semis. Two people died. All eastbound and westbound lanes of a 7-mile stretch of the interstate were closed for almost 10 hours. Visibility ranged from 0 to 10 feet at one point in the day and motorists involved in the accident said the fog was so dense they could not see what was going on around them; they could only hear vehicles crashing into each other.

“We have technologies today that could have prevented such a pileup,” Udpa says. “Faculty in our department are collaborating with those in civil engineering to develop systems that can improve safety and warn motorists of impending road conditions. Wireless communication technologies have leapfrogged in recent years and we can do
much to improve the quality of life in an automobile.

“Michigan State can take a leadership role in developing information technologies for the automobile industry—to cut down accident rates, to make vehicles more ‘driver friendly,’ and to increase fuel efficiency by producing hybrid and fuel cell based cars.”

Other areas in which electrical engineers will assume major roles include nanotechnology, the biomedical field, MEMS (microelectromechanical systems), and the convergence of computing and entertainment. Electrical engineers will also be involved with new technologies to combat disease and poverty around the world, and will need to work on issues related to serving industry.

“But for us to be real players, our footprint needs to grow,” says Udpa. “I’m hoping that in a few years, we will see a department that is twice our present size, with productivity four times as high, and with the ability to offer every undergraduate student an opportunity to work in a research lab.

“Part of our strategy is to make sure that the next generation of students is prepared for what’s happening in the marketplace. The economic scene has changed—we have competition coming out of Western Europe, China, India—it’s no longer just Japan and Russia. All of these countries are emerging and we need to stay competitive,” Udpa says.

“We need to train our students in ways that they can survive. I want our students to be able to go into the workforce and be leaders in their professions. By the time a student graduates here, he or she will have worked on solving problems of interest to industry, problems that are at the cutting edge. As educational institutions, we have our work cut out for us.

“I think the next 15 to 20 years are going to be substantially different from the 15 to 20 years that just passed,” says Udpa. “I truly believe this department is on the threshold of something really big.”

Department Milestones

1893 First course in electrical engineering, offered under the Department of Physics
1901 Department of Physics and Electrical Engineering established
1915 Department of Electrical Engineering separated from Physics Department on July 1
1969 Department renamed Department of Electrical Engineering and Systems Science effective March 1
1988 Name changes to Department of Electrical Engineering effective November 1
1998 Department becomes the Department of Electrical and Computer Engineering
2002 Fraunhofer Center for Coatings and Laser Applications established

Department Heads/Chairpersons

1901–1904 Martin D. Atkins (physics and electrical engineering)
1904–1917 Arthur Rodney Sawyer (physics and electrical engineering)
1916–1924 Arthur R. Sawyer (electrical engineering)
1924–1947 L. S. Foltz
1947–1957 Ira B. Baccus (Baccus was on leave 1957–58.)
1957–1965 Lawrence Von Tersch
1965–1968 Harry G. Hedges, acting
1968–1976 Herman E. Koenig
1976–1987 John B. Kreer
1987–1989 Harriett Rigas
2001– Satish S. Udpa

“Each year, MIT publishes a special journal issue listing the 10 most exciting research areas. In the past 3 or 4 years, 8 or 9 of the top 10 ‘most exciting areas’ listed are in the field of electrical engineering—MEMS devices, nanotechnology, biomedicine . . . we are working in the most exciting areas here.” — Satish Udpa, chairperson

Pileup on Interstate 96 on January 12, 2005. Electrical engineers often collaborate with civil engineers to develop technologies that could prevent such disasters.
50 years ago . . .

. . . mechanical engineering was one of the major engineering fields as the post-war economic and technological expansion had begun, says Ronald Rosenberg, past chairperson of the Department of Mechanical Engineering. “Big machinery was in, big cars were coming, energy was cheap and people were learning how to exploit it. Then, as now, mechanical engineering was pretty much everywhere. It didn’t matter which industry you looked at.”

At that time, it was very heavily an “experimental” field. “There were no computers to support analysis with computations,” says Rosenberg. “It was ‘slide rule days.’ “Then the post-Sputnik era drove engineering from its heavy experimental bent toward much more mathematical analysis, and a much stronger scientific basis,” he says. “Computers were emerging as useful tools, not just as curiosities. It was possible to make designs and test their probable success much more thoroughly than in the past.”

Between 1985 and 1990, engineers began to focus on design; as environmental concerns began to surface, there were “increasing demands on design methods and more stringent conditions on design,” says Rosenberg. “What to do with the byproducts of manufacturing processes became an important issue, whereas in the old days . . . you just dumped it!”

The department now encompasses thermal engineering, fluid dynamics, and system dynamics (vibrations and control), with design being common to all of the areas. “We maintain and develop increasing strength in the undergraduate program in design; today it’s a nationally recognized program—certainly one of the top 10 across the country,” says Rosenberg. “Our department has stayed focused on that for a number of years and has a truly outstanding senior design program.” (See related article on page 21.)

It used to be said that “Nothing moves without a mechanical engineer.” Being in a core engineering area, mechanical engineers have a broad range of opportunities to collaborate with just about every discipline—within the engineering college but also in fields like natural science and the medical sciences. For example, research in the area of energy involves chemistry, chemical engineering, electrical engineering, and mechanical engineering.

within the next 50 years . . .

. . . the main challenge for mechanical engineers is going to be energy,” says Eann Patterson, new chairperson of the Department of Mechanical Engineering. “And using up irreplaceable energy resources is the real issue.

“As engineers, we supply what society wants,” says Patterson. “And society wants more and more gadgetry. They want to be able to go places faster and in more comfort. They want bigger homes and they want to have more things in their homes that do things for them. That all consumes energy.”

Projecting about 10 years into the future, Rosenberg believes that the critical areas will be the so-called “o’s”—bio, nano, info.

For instance, the fields of biological engineering and biomedical engineering are growing. The single largest granting agency in the United States, says Rosenberg, is the National Institutes of Health, which includes an engineering institute. “Engineers—including mechanical engineers—play supporting roles in many, many of the institutes.”

Regarding nanotechnology, says Rosenberg, “The scale of many critical things has been moving down from person size, to millimeter size, and now to nano size—things that you can’t see without instruments.” And in the area of information technology, he says, “In the auto industry, we are seeing a shift to building higher fidelity math models of vehicles, and testing designs and modifications using computers so they don’t have to ‘build and crash’ so many expensive vehicles.”

He sums up, “Engineering continues to play a role in translating these ideas and phenomena into economically important technological devices.”

In order to remain competitive in our
In the ever-expanding world, the department plans to increase its emphasis on globalization, says Patterson. For example, mechanical engineering faculty are immersed in an ongoing program known as INTEnD, International Networked Teams for Engineering Design, an engineering education program initially created in 1997 by educators at MSU and various international campuses.

“The program links multidisciplinary research groups from institutions around the world for the purpose of studying and practicing how dispersed engineering product design and manufacturing teams can function more effectively,” says John Lloyd, University Distinguished Professor of mechanical engineering and one of the faculty leaders. “Each semester, students select an industry-sponsored project, and then multi-university student teams are formed to innovate the solution and market it. The teams include engineers from different disciplines plus cultural anthropology students and sometimes communications students, so that cultural aspects of the product design and manufacture—as well as IT issues—are addressed. Usually students from only two universities participate on a team, but we have formed three-university teams for an around-the-world, 24-hour product design experience. These student teams truly reflect the ‘real world’ global teaming that is found in the industrial setting.

The program recently received one of four 2004 Curriculum Innovation Awards from the American Society of Mechanical Engineers.

“We believe that our INTEnD program will be an important foundation for keeping U.S. engineering and manufacturing competitive in the global economy,” says Lloyd. “According to the recent National Academy of Engineering report, The Engineer of 2020, we are on target with what engineering education needs to keep our engineers leading the global profession of engineering.”

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**Department Milestones**

1858 First “mechanics” course offered
1885 Four-year course in mechanic arts offered for the first time; sometimes referred to as the “department of mechanic arts”
1888 First undergraduate degrees in engineering granted to three students: Paul Mellen Chamberlain, ME (Cornell Univ.) 1890, consulting engineer, Chicago; William James Hinkson, BS Civ. Eng. (Univ. of Mich.) 1891, civil engineer for M.C.R.R., Detroit, Mich., died October 26, 1891; and Charles L. Lawton, general manager of Quincy Mining Co., Hancock, Mich.
1906 Department identified as Mechanical Engineering Department
1907 George W. Bissell appointed first dean of engineering on June 18
1952 Name of Department of Engineering Mechanics changed to Department of Applied Mechanics, effective in October
1994 Student Design Conference launched (today known as Mechanical Engineering Design Day)
2002 Design/Manufacturing Learning Center established
2004 Mechanical Engineering Design Day celebrated 10-year anniversary

**Department Heads/Chairpersons**

1885–1887 Lewis McLouth
1888–1891 William F. Durand (professor of mechanics and director of the shops)
1891–1893 Lester P. Breckenridge (professor of mechanical engineering and director of the shops)
1893–1906 Charles L. Weil (director of the mechanical department)
1906–1907* Charles L. Weil (first chair of official Mechanical Engineering Department)
1907–1924 George W. Bissell
1924–1935 H. B. Dirks (Appears to be department head; listed at top of department in MSU Directories, but no other official records indicate this.)
1935–1948 Lorin G. Miller
1949–1959 Leonard C. Price
1959–1960 Louis L. Otto
1960–1962 Lisle A. Smith, acting
1972–1977 Robert W. Little
1977–1982 John A. Brighton
1982–1983 Charles R. St. Clair, Jr., acting
1983–1992 John R. Lloyd
1992–2002 Ronald C. Rosenberg
2002–2004 Manoochehr M. Koochesfahani, acting
2004– Eann Patterson

*Arthur R. Sawyer (physics and electrical engineering) referred to having “extra duties in charge of the mechanical department” in his June 30, 1907, Report to the State Board of Agriculture, for the year July 1, 1906–June 30, 1907.
RESTORED MSU
STEAM LOCOMOTIVE
GOES TO HOLLYWOOD
Randy Paquette may not aspire to be the next Tom Hanks, but he certainly has something in common with him—a connection with the former Pere Marquette steam locomotive 1225 (PM 1225).

When Paquette (electrical engineering ’71) joined the MSU Railroad Club as a student and began to help restore Locomotive 1225, little did he know that it would become the model for the now-famous locomotive in *The Polar Express*, the computer-generated movie starring Tom Hanks and based on the book by Grand Rapids, Michigan, author Chris Van Allsburg.

It all began in 1957 when the retired locomotive was placed on display at MSU.

Paquette recalls one of the early meetings of the MSU Railroad Club in 1969. “I was the one who first came up with the idea of trying to get the locomotive operating again. The concept was met with general enthusiasm by all the attendees—about ten—except for one, who stated that the 1225 could never run again. That’s all it took to fire up the others to prove him wrong.”

MSU administrators were skeptical as well. Restoration of the locomotive was not viewed as an ideal engineering project because the technology was antiquated. “Administrators saw this group of students who had no money, no skills, and this huge locomotive on their hands,” Paquette says. “But we had the desire and the youthful exuberance—along with an interest in locomotives and trains.”

Paquette’s interest in trains began early. He grew up in Saginaw, Michigan, “one house away from the railroad tracks.” He says their “playground” included the Grand Trunk Western Railroad Co. facilities.

“During the summer, several of us would pester the local repair crew in charge of about a twenty-mile stretch of track.” Paquette recalls. “We would ride the small yellow track inspection car and were often allowed to ‘help’ install ties, tamp the gravel ballast around them, and attempt to drive rail spikes.”

An American Flyer electric train, given to Paquette’s older brother by their father, further fueled their love of trains; Paquette’s brother still has the train today.

Efforts to restore Locomotive 1225 began in 1970, but the actual hands-on restoration did not start until spring 1971. Paquette was the only engineering student in the MSU Railroad Club at the time. He estimates he put in about 10,000 hours working on the project, but says it was really an effort of many dedicated students. “Many other fine people contributed to its final success, including Norm Burgess (civil engineering ’75), who later joined the project; and Donald Childs, former supervisor of the engineering building machine shop, who was “a cheerleader and a mentor,” teaching the student members the practical aspects of the mechanical work. Paquette says, “We were fortunate enough to get a momentum built up to help make this really happen.” The locomotive was finally fired up in October 1975.

“Even though I don’t work on it now, the engine is a part of me,” says Paquette. “And as the years have passed, I better appreciate how the project helped me professionally and how the MSU Railroad Club
became a fraternal organization where life-long friendships were made.”

The club was so influential that it led to Paquette’s election to the board of directors of the Tourist Railway Association, Inc. (TRAIN)—a trade association of railroad museums, tourist railroads, and endeavors like Project 1225. He was also active with the Michigan State Trust for Railway Preservation, Inc.

In fact, Paquette’s interest in trains and restoration seems to be a family affair. He took his infant daughter Lauren to the fire-up of Locomotive 1225 in 1975, his sister is involved in the restoration of the former Pere Marquette depot in Saginaw, and his brother is a long-term member of the Blue Water Chapter of the National Historical Railway Society.

After the mid-1980s, Paquette was no longer formally involved with any railroad or restoration organizations; but his interest in trains did not die. On September 3, 1996, he had an opportunity to operate Locomotive 1225 as part of a program called “Engineer for an Hour.” After completing an hour-long class, he received a “24-hour student engineer” license and was given a one-hour time slot and a two-mile section of track to traverse. (Paquette is quick to point out that the engineer license is rescinded after 24 hours!)

This special program, which usually runs every other year, may run again in 2006. The cost to “operate 450,000 pounds of steel” is around $475.

Paquette says that back in 1969 he never would have believed he might someday have a chance to actually operate Locomotive 1225. “It is an experience I will never forget,” he says. And seeing The Polar Express brought those 1996 memories back to life.

“Watching the cab scenes in the movie was a treat,” he says. “The animators took some liberty with the controls, but had the gist of it covered. Of course, the physics of an operating train were violated in the movie; few trains can climb a grade of over 4 percent without a helper engine (just don’t tell the kids!).”

Paquette, who also completed an MBA at MSU in 1977, is currently director of design and construction at Wayne State University in Detroit, where he supervises a 22-person division in the design/construction process for all university projects.

He now lives in Otisville, Michigan, with his wife, Betty. And it’s quite fitting that from his home in the country, Paquette can hear the steam whistle from the locomotive at Crossroads Village, a Genesee County park that operates a narrow gauge steam locomotive on an old Pere Marquette right of way.

On May 26, 1981, Locomotive 1225 relocated to its new home with the Steam Railroading Institute in Owosso, Michigan, where it remains today. It is now used for educational purposes, excursions, and, most recently, as the North Pole Express.

“The organization doesn’t waste the engine; it’s secure in its operating future,” says Paquette. “If cared for, the 1225 should be around for many, many more decades. It may not be ‘modern’ engineering, but we can’t afford to lose touch with the past.”

—Laura Luptowski Seeley

**RELATED ARTICLES**


(As of press time, all URLs were accessible.)
See Locomotive 1225 “Up Close and Personal”

Visit the Steam Railroading Institute, 405 S. Washington St., Owosso, Michigan. Winter hours are 10:00 A.M.–4:00 P.M., Friday–Sunday. Summer hours (Memorial Day–Labor Day) are 10:00 A.M.–5:00 P.M. daily.

Group tours are available Monday–Sunday; call (989) 725-9464 or e-mail mstrp@shianet.org to arrange a tour.

For more information, visit http://www.mstrp.com/index.html.

Events Featuring Locomotive 1225

- May 21–22, 2005: Steam Train Excursion to Cadillac. Lake Central Rail Tours operates this excursion from Owosso to Cadillac behind the 1225 steam locomotive. Call (866) 608-0746 for reservations and more information.
- November 26–27; December 3–4, 10–11, and 17–18, 2005: North Pole Express. Ride behind the Pere Marquette 1225 for an evening of Christmas fun for the whole family. Riders depart from the Steam Railroading Institute in Owosso, Michigan. The train arrives at Santa’s Village at the North Pole for a visit with Santa and his elves before returning to the Steam Railroading Institute.
- For more details and a complete schedule of events, visit www.mstrp.com/schedule.htm.

STATS PERE MARQUETTE 1225

Builder: Lima Locomotive Works, Lima, Ohio
Date: October 1941
Builder’s number: 7839
Type: 2-8-4 (Berkshire)
Gauge: 4’ 8 1/2”
Weight of locomotive: 221 tons
Weight, locomotive and tender: 400 tons
Overall length: 101 feet
Driving wheel diameter: 69 inches
Bore and stroke: 26 x 34 inches
Cylinder horsepower: 2979 hp
Boiler pressure: 245 p.s.i.
Grate area: 90.3 square feet
Fuel: soft coal
Coal capacity: 22 tons
Water capacity: 22,000 gallons
Coal consumption: 12 miles/ton
Water consumption: 150 gallons/mile

How Locomotive 1225 Got to Hollywood

When the moviemakers began looking for a working locomotive that would resemble the one in Chris Van Allsburg’s book, they first called the Smithsonian Institution in Washington, D.C., and the Baltimore and Ohio Railroad Museum before they were directed to the Steam Railroading Institute in Owosso, Michigan, where the PM 1225 is housed. The Institute’s executive director, Dennis Braid, provided detailed drawings and high-resolution videos, and acted as technical adviser to the film crew. He also mailed lumps of coal and a 1946 passenger schedule to the art team.

In the summer of 2003, a sound crew was dispatched to Owosso, where they spent three hours at a dirt crossing recording the sounds of the locomotive—the whistle, the shoveling of the coal, the wheels moving back and forth on the tracks, and the cars lurching to a stop. (To view photos of the recording session, go to http://www.mstrp.com/soundcrew.htm.)

“It has been a real pleasure to manage this museum and work with Warner Bros. the past three years,” Braid says. “The Polar Express was an amazing experience and I am thrilled to have had the rare opportunity to play a role in a major motion picture.”

The Magic of The Polar Express

The Polar Express author, Chris Van Allsburg, grew up in Grand Rapids, Michigan, when the PM 1225 was in service. He recalls the time his father took him on a train trip as a small boy. “Our locomotive could have been there when he took that train ride,” says Dennis Braid, executive director of the Steam Railroading Institute.

“Chris and I also had some time to chat at the world premier of The Polar Express in Grand Rapids,” Braid says. “He said that when he was a boy, his father would take him to MSU football games, where one of the highlights was to play on the locomotive displayed near the practice field. As we spoke, Chris came to the realization that the locomotive he had enjoyed playing on was our PM 1225—and what a coincidence that this locomotive was selected as the image for the magical Polar Express in the movie! He also marveled that the number it was assigned when built just happened to be 1225—as in the numeric representation of Christmas day. I told him that it appears he started the “magic” of Polar Express long before he wrote the book!”

The Polar Express Movie Trailers and Flash Site

- To visit a flash site, go to: http://pdl.warnerbros.com/wbmovies/polarexpress/flashsite/index.html
- To view movie trailers, go to:

(As of press time, all URLs were accessible.)
Alum Bill Simons (chemical engineering ’68), didn’t just distribute handouts to students in CHE 433, he passed out Pringles! In his October 15, 2004, presentation to Professor Martin Hawley’s Process Design and Optimization class, Simons alerted students to the importance of patents, as well as to job opportunities in patent law. A patent attorney himself, Simons invited students to examine the Pringles™ cans for patent information. Having also distributed copies of the original Pringles patent, he directed students to the last page, where the assistant examiner—W. A. Simons—was listed, saying, “That’s my claim to fame. I examined the patent in 1970. I was about 23 years old, right out of school.”

After graduation from MSU, Simons attended Georgetown University Law Center in Washington, D.C. He worked in the U.S. Patent Office by day and attended school by night. “The smartest thing I ever did was to work at the patent office while going to law school,” he says. The patent office paid his tuition and a salary, but above all, he gained several years of practical experience that greatly facilitated his finding work as a patent attorney later on. He encouraged students to keep in mind that an engineering degree can lead to an interesting and lucrative career as a patent attorney.

According to Simons, each of the 3,000 patent examiners in the United States has a particular specialty. He adds with a smile, “When I was in the patent office, they gave me potatoes, maybe because I was from Michigan State. During the better part of two years, I examined about 100 patent applications on potatoes.” He later examined vegetable protein and, finally, beer-making patents. He says, “Other people had organic chemistry or electronics—I got beer. It was fun!”

After graduating from Georgetown in 1972, Simons worked at Olin Corporation for 17 years in intellectual property law relating to Olin’s chemical and electrochemical businesses. Currently, he is a partner in the Wiggin and Dana law firm in New Haven, Connecticut, where he co-chairs the patent practice group. His work has involved many technologies, including electronic chemicals, photochemistry, polymer chemistry, electrochemistry, crop protection chemicals, surfactants, water treatment chemicals, and food chemistry.

Simons says, “A U.S. patent is a contract between a person and the U.S. government. Both parties benefit. The public can immediately see the invention disclosed and thereafter quickly make improvements. Technology thus moves ahead faster than by the alternative ‘trade secret’ route. In exchange, patent owners gain the right to exclude others from making, using, or selling their products or processes for 20 years.”

Simons pointed out that engineering students can expect to become inventors who need to understand how patents work. “Aside from the obvious benefits in obtaining patents,” Simons

Walter H. Meyer (Chem Egr ’48), 1922–2004, spent his career at Procter and Gamble developing such products as Pringles and Prell shampoo and reinvigorating Crisco, whose market lead was waning. As associate director of food product development, he was involved in the earliest commercialization of Pringles. His name appears, not on the original Pringles patent, but on subsequent patents.
JEOPARDY CHALLENGE
CATEGORY: SNACK FOODS

[They are prepared] by admixing comminuted raw potatoes, amylopectin, egg albumen, stearyl monoglyceride citrate, shortening, and, optionally, sugar and potato starch to form a homogeneous dough. The dough is formed into thin, substantially elliptical or oval wafers which are frozen to facilitate handling. The wafers are baked to provide a crisp, tasty, edible [object].

What are Pringles?

—Lynn Anderson

Design Day Celebrates 10 Years

The Department of Mechanical Engineering Design Day celebrated its 10th anniversary on December 10, 2004.

More than 1,600 graduating seniors have passed through the program since it was launched in 1994 as the Student Design Conference. That first year, 86 students worked on only 2 industry-sponsored projects. Today, more than 20 industrial sponsors—from the automotive, food processing, plastics, energy distribution, and medical fields—provide projects each semester for the student teams. And nearly every semester since December 1998, the program has designed and built a cycle for an individual in the community who has special needs.

Over the past decade, student design teams have completed more than 400 projects, assisting more than 100 businesses in Michigan, Indiana, Iowa, Minnesota, Missouri, and Ohio. Most of the design solutions developed by the students are in use by companies today and are saving them thousands of dollars.

In 1997, the program expanded to include hands-on activities for pre-college students and now hosts more than 600 young people and their teachers annually.

—Lynn Anderson

Nearly 1,000 people attended Design Day’s 10th anniversary celebration.

LEFT TO RIGHT: Craig Gunn, communication program director; Brian Thompson, design program coordinator; Houston Brown, recruiter from Shell Oil Company; Eann Patterson, department chairperson.

In 1997, the program expanded to include hands-on activities for pre-college students and now hosts more than 600 young people and their teachers annually.

ME 371 junior design team (left to right: Michelle Kimball, Dmitry Kats, Kyle Kremien, and Joseph Konratak; not pictured: Brianna Jablonski) demonstrates their “That’s Cheesy” project, which cooks a toasted cheese sandwich.
Out of the Ashes

BEGINNING AT UPPER LEFT: The mechanical building, built around 1885, was sometimes called the mechanical lab or mechanical shops and later referred to as the engineering shops. The Engineering Building was built in 1907 and formally dedicated on June 22, 1908. Both the engineering building and the mechanical building were destroyed in a fire in the early morning hours of Sunday, March 5, 1916. (Pictured to the right of the Engineering Building is Wells Hall, a dormitory.) The R. E. Olds Hall of Engineering (center of photo) was built on the old foundation of the former Engineering Building. Inside and out, it was a near replica of the original structure. Olds Hall was formally dedicated on June 1, 1917, along with the new engineering shops (a two-story, fire-proof shop building, located to the left of Olds Hall). Wells Hall is to the right of Olds Hall in the far distance. The College of Engineering occupied Olds Hall until 1962. On December 28, 1960, groundbreaking ceremonies for a new engineering building on Shaw Lane took place. Standing, left to right: Dean John D. Ryder; Carl I. Mensendick, assistant to the dean; Maria Z. Krzywoblocki, professor of mechanical engineering; Agnes McCann, assistant to the dean; Charles E. Cutts, professor and head of civil engineering. Kneeling: Siegfried M. Breuning, associate professor, engineering research. Construction was completed in 1962. In 1989, the building was renovated and expanded. The $34.5 million, 77,000-square-foot addition was dedicated on October 11, 1989. On October 4, 1995, a cornerstone ceremony was held at the site of the future Herbert H. and Grace A. Dow Institute for Materials Research. That $14 million, 46,000-square-foot addition, known as the Dow Wing, was formally dedicated on April 11, 1997.

RIGHT, MAIN PHOTO: Wells Hall starts to burn. The fire purportedly started about 5:00 A.M. Sunday, March 5, 1916, in the cement labs in the southeast corner of the Engineering Building basement. Fire quickly spread through the building and to the engineering shops. The fire then leapt to the roof of Wells Hall (left), a dormitory near the Engineering Building, but it suffered only minor damage. According to the 1916 Wolverine (the yearbook), “... the ruins had scarcely ceased smoking before a new schedule of classes ... was formulated” for the 400 engineering students. “When sessions began on Monday morning ... not a class was missed.”

R. E. Olds, in a letter to MSU President Frank S. Kedzie dated April 29, 1916, confirmed his intent to contribute $100,000 toward reconstruction of the engineering building. The April 25, 1916, issue of The M.A.C. Record had reported: “The story goes that in the early days of M.A.C., Dr. Kedzie’s father, Dr. R. C. Kedzie, was in a position to do a great favor to the father of Mr. Olds. These men were warm friends and their sons have continued this friendship. Hence Mr. Olds finds this a very opportune time to help Dr. Kedzie out of the first real worry of his college administration.”

On June 5, 1917, The M.A.C. Record reported: “R. E. Olds was present in person [at the dedication of R. E. Olds Hall on June 1, 1917] and, in turning over the keys of the building to Dean Bissell, he said, ‘It is my observation that the students turned out of this college are better fitted on the average than those from any other college in the country.’”

Fire spread to the engineering shops.

Ruins of Engineering Building on March 5. Wells Hall (on right) received only minor damage.

Ruins of Engineering Building on March 11.

To view additional photos of the fire, visit our Web site http://www.egr.msu.edu/egr/
Jack Rutherford of Burr Ridge, Illinois, could have had a successful career without Michigan State University. After all, he already had experience in manufacturing as a plant manager before he enrolled in MSU’s Advanced Management Program and earned his MBA in 1978. But MSU, according to Rutherford, “gave me a chance to prove myself. They gave me an opportunity, and I took advantage of it.”

And how. Jack went on to serve as chairman and CEO of Clarion Technologies and ICM Industries, as well as vice chairman of International Harvester, all after spending 25 successful years with Ford Motor Company. Now retired, Jack and his wife, Marilyn, have turned their success into a generous bequest for MSU.

The Rutherfords have pledged $875,000 to establish the Jack D. and Marilyn Rutherford Endowment in Business, $350,000 to establish the Jack D. and Marilyn Rutherford Endowed Fellowship in Engineering, $175,000 for the Michael J. Rutherford Memorial Scholarship in Criminal Justice, and $100,000 for the James B. Henry Center for Executive Development. Funded through generous bequests in their will, these gifts totaling $1.5 million, in addition to their previous contributions, place them in MSU’s Kedzie Society, one of the most prestigious donor societies at the university.

The gift for the Eli Broad College of Business will create an endowed scholarship fund for undergraduate and graduate students. “The Rutherfords are really great at listening to the needs of the college and responding to them,” says Robert B. Duncan, The Eli and Edythe L. Broad Dean of Business. “That is exactly what they’ve done with this latest and very significant contribution.”

The College of Engineering gift will endow a fund in support of graduate students in the college, recognizing the important role outstanding graduate students play in helping the college maintain strength in both its research and educational endeavors. This portion of the Rutherford’s commitment is made in honor of MSU’s former vice president for research and graduate studies, Dr. Robert Huggett.

“I served on the MSU Foundation Board, and I worked very closely with intellectual property issues in the engineering community,” Jack explains. “I could see first-hand what they were doing. Dr. Huggett was a strong influence on me while I was on the board, and that’s why we decided to create the scholarship in his honor.”

Both of these gifts are established as endowed funds. “I think endowed funds are important because they will continue in perpetuity,” Jack says. “It’s important that we build a base at our university so that a gift is not for four, three, or two years but rather is something that can grow and take care of people for a much longer time. That is what an endowment can do.”

The Rutherfords’ contribution for the scholarship in Criminal Justice is in memory of their son, Michael. The Rutherfords established the scholarship long ago, but this latest contribution will bolster its effectiveness significantly.

Jack’s appreciation for the leadership of former Broad Dean James B. Henry was the impetus for the Henry Center gift. The terrace of the center will be named in their honor.

Jack and Marilyn are both loyal to MSU and have been recognized as such. Jack received a Distinguished Alumni Award in 1997 and Marilyn received an Honorary Alumni Award in 2001, both from the MSU Alumni Association. In addition to Jack’s role on the MSU Foundation Board, he is also a member of the President’s Campaign Cabinet and knows why The Campaign for MSU has been successful so far.

“We’ve got a very dedicated group of people coming out of MSU,” Jack explains. “Marilyn and I wanted to try to lead the way and do our part. We could have waited another couple years, but we didn’t want to do that. What has been best so far,” he adds, “has been the determination of our friends and graduates to give something for the greater success of the university.”

— Rick Seguin, University Development

If you would like more information on making a gift to any of the same areas supported by the Rutherfords or an area of the university that holds personal importance to you, contact the Office of Engineering Development at (517) 355-8339, or egrdevel@egr.msu.edu.
NEW ENDOWMENTS

- **Eva Bertolin Endowed Scholarship.** Established by Robert Bertolin (CEE BS 1974).
- **Cummins and Barnard, Inc. Endowed Fund in Engineering.** Established by Cummins & Barnard, Inc.
- **Richard and Marilyn Erratt Endowed Excellence Fund.** Established by Richard (ChE BS 1951) and Marilyn Erratt.
- **Marybelle C. Hoggatt Endowed Fellowship in the College of Engineering.** Established by John Hoggatt (ChE BS 1959).
- **The Kirby Fellowship in Chemical Engineering and Materials Science.** Established by Herb (ChE BS 1956) and Joan (Communication Arts BA 1956) Kirby.
- **Leonardo Da Vinci Design Endowment.** Established with donations from individuals and industry partners.
- **Lifeline Club Endowed Scholarship in Chemical Engineering.** Established by Herb (ChE BS 1956) and Joan (Communication Arts BA 1956) Kirby.
- **Thomas L. and Ellen E. Maleck Endowed Excellence Fund in Civil Engineering.** Established by Thomas (associate professor of civil engineering, CEE BS 1966; MS 1972; PhD 1980) and Ellen Maleck.
- **Mechanical Engineering Design/Manufacturing Graduate Student Fellowship Endowment.** Established with donations from individuals and industry partners.
- **Mechanical Engineering Graduate Student Fellowship Endowment.** Established with donations from individuals and industry partners.
- **John E. Milne Endowed Excellence Fund.** Established by John Milne (Metallurgy BS 1950).
- **The Patrick Moran Undergraduate Endowed Memorial Scholarship in Electrical and Computer Engineering.** Established by the estate of Metta Lee Moran in memory of Patrick Moran (ECE BS 1971).
- **David and Melissa Riggs Endowed Scholarship/Fellowship Fund.** Established by David (ChE BS 1985) and Melissa Riggs.
- **Lawrence A. and Alma M. Turner Endowed Fund of Excellence.** Established by Lawrence (ME BS 1951) and Alma Turner.

**Park-Deaver Endowment**

On March 1, 2004, electrical engineering professor emeritus Gerald L. Park (left) presented Dean Janie Fouke (center) with a check for $100,000 to add to the $100,000 endowment that was established for undergraduate student scholarships in 1999 by the Marion Park Deaver and Harry Gilbert Deaver Foundation. Nicholas Brake (right), a junior in civil engineering, the 2004–05 recipient, said, “This scholarship has taken a huge burden off my shoulders. I can spend more time studying.” Engineering students from Florida, Minnesota, or Wisconsin are eligible for the scholarship. Park said, “We seldom get a chance to steer large amounts like this to a deserving university. There’s a friendliness about MSU—a ‘down-homeness’ that isn’t true of all universities.” ☺
Dennis Nyquist (elec. eng. PhD ’66; faculty emeritus) recently documented a $1,500,000 charitable bequest to support the Dennis P. Nyquist Electromagnetic Research Discretionary Endowment in the College of Engineering’s Department of Electrical and Computer Engineering. This endowment was originally created in 2001 by one of Dennis’s former students, John R. Gulick (elec. eng. BS ’99, MS ’01; Math MS ’01), in honor of his professor. Dennis was able to add his bequest to the endowment, which will generate more support for electromagnetic research at MSU.

“I believe supporting endowments is critical to the future success and growth of the College of Engineering, especially endowments that support research and graduate studies,” says Nyquist. “I directed this gift to the Dennis P. Nyquist Electromagnetic Research Discretionary Endowment to give the Department of Electrical and Computer Engineering much-needed research and graduate fellowship support.” This generous gift qualified Dennis for the Frank S. Kedzie Donor Society.

“Professor Nyquist has always been a trailblazer,” says Satish Udpa, department chairperson. “As a scholar, his studies on electromagnetic radiation were truly seminal. As a teacher, he nurtured and guided a whole generation of students who have gone on to become leaders in their own right. His generous bequest continues that tradition as a citizen, and exemplifies his commitment to furthering the reputation and standing of a research group that he helped establish.”

Dean Janie Fouke adds, “We are grateful to Dr. Nyquist for his gift and especially for his thoughtfulness in using his gift to support an endowment. Endowments assure that the superb educational experience that Dr. Nyquist provided for generations of past students will be available for generations of future students. It is a visionary form of giving, by a professor whose vision contributed to the careers of thousands of students.”

— Linda Dunn, University Development

This article first appeared in the fall 2004 issue of Developments, University Development’s newsletter highlighting significant gifts and activities associated with The Campaign for MSU. For more information about supporting the College of Engineering, contact the development office at (517) 355-8339, or egrdevel@egr.msu.edu.
The Campaign for MSU College of Engineering Update

- As of December 6, 2004, the College of Engineering has raised $176,412,364 in cash, gift and in-kind support toward The Campaign for MSU. This represents 84% of the College of Engineering’s overall campaign goal of $209 million, and accounts for nearly 20% of total MSU dollars raised.
- During fiscal year 2003/2004, the College of Engineering raised $6,489,970 in new gifts and pledges from 4,033 donors. The College of Engineering increased its gift activity by 26% over FY02/03, and by 37% since FY01/02. The number of donors rose by 2% during fiscal year 2003/2004.
- The College of Engineering saw a significant rise in planned gift commitments, with $3.4 million in newly documented commitments. This represents a 69% increase in planned gift activity over the previous fiscal year.
- The College of Engineering raised an additional $3.75 million in cash and future gift support for endowments during fiscal year 2003/2004. Giving toward endowment represents 58% of all dollars raised; it also represents an increase of 51% in endowment giving over the previous fiscal year. A record number of 17 new endowment agreements were signed, an increase of 40% over the previous year. As of the end of the fiscal year, $14.3 million—or 40%—had been raised toward the college’s $36 million endowment goal.
- Nineteen gifts and pledges of $100,000 or more were received from alumni, friends, corporations, and foundations.

Have you remembered the College of Engineering in your will?

By making us aware of your future gift intentions, you...
✔ provide us with an opportunity to appropriately thank you for your vision and generosity
✔ become affiliated with the Linda Landon Society and enjoy the benefits associated with applicable MSU donor recognition societies
✔ ensure that your future gift is directed to the area(s) of greatest importance to you and used in accordance with your wishes
✔ help shape the future of the college by participating as a donor in The Campaign for MSU, the largest capital campaign in MSU’s 149-year history

Documenting your charitable bequest is easy to do!

To request a Statement of Support form:
☎ call the Engineering Development Office at (517) 355-8339
✉ e-mail Kristin Bradley at kbradley@egr.msu.edu
✔ download a form at www.egr.msu.edu/egr/development/statementofsupport.pdf
A lton L. Granger, P.E. (civil engineering ’54) and James Von Ehr II (computer science ’72) received Distinguished Alumni Awards at a ceremony October 14 in MSU’s Kellogg Hotel and Conference Center.

Alton Granger is chairperson of Granger Construction Company in Lansing, Michigan, which he founded with his father and two brothers in 1959. They have constructed more than 32 facilities at MSU and many other well-known structures throughout Michigan, which have been admired for their endurance, safety, beauty, and innovation. Granger and his company have won numerous state and national awards, including the AGC Build America Award, the AGC Build Michigan Merit Award, and the AGC Marvin M. Black Excellence in Partnering Award.

Granger currently serves as chairperson of the labor relations division of Associated General Contractors (AGC), on the Granger Foundation’s board of trustees, and as chairperson of the church council for Mt. Hope United Methodist Church. He is also a member of the university president’s cabinet for The Campaign for MSU and a campaign consultant for the College of Engineering. He served for 24 years as a member and president of the Holt Public Schools Board of Education, helping to guide the school district in working through numerous issues, including embracing diversity, educational excellence, staff development, and fund raising. Colleagues speak of his “infectious optimism and great sense of humor” and his “focus on the Golden Rule as a guiding principle.” He and his wife, Jan, a registered nurse (College of Nursing 1980), raised five children together. The couple now lives in a remodeled barn in Dimondale, Michigan, with their two Bichons, Jack and Jill. Granger says, “My faith and my family are the most important things in my life.”

James Von Ehr is the founder, chairman, and CEO of Zyvex Corporation in Richardson, Texas, the first molecular nanotechnology company. Their innovations are blazing new trails for space exploration, semiconductor development, and energy production. Praised by colleagues as “a creative leader,” Von Ehr’s visionary goal is to apply the principles of computing and precision chemistry (rather than bulk chemistry) to micro- and nano-fabrication. In 2001, he founded the Texas Nanotechnology Initiative, a nonprofit organization dedicated to establishing Texas as a world leader in nanotechnology. His $3.5 million contribution to the University of Texas at Dallas (UTD) established their NanoTech Institute and endowed the James Von Ehr Distinguished Chair of Science and Technology held by Nobel Laureate Alan G. MacDiarmid. Von Ehr serves on the Nanotechnology Technical Advisory Group to the U.S. President’s Council of Advisors on Science and Technology. He was named Ernst & Young Entrepreneur of the Year in the newly created “Pioneering” category in 2003. A committed internationalist, Von Ehr serves on the International Advisory Panel of the National University of Singapore’s National Nanotechnology Initiative. He has served on the Strategic Partners Council for the MSU Department of Computer Science and Engineering since 1997 and also served on the College of Engineering’s Alumni Board of Directors from 1997 to 2000. Prior to founding Zyvex, Von Ehr was founder and CEO of Altysys Corporation, the developer of FreeHand (the first Postscript drawing program) and Fontographer (the first font creation program). Business associates describe him as having “bottomless curiosity” and being “uniquely ethical and honorable” with an “unwavering sense of social responsibility.” Von Ehr and his wife, Gayla, live on a 26-acre wooded estate, where the couple occasionally hosts Texas barbecues and chili fests for friends and co-workers. Von Ehr enjoys collecting art, especially the works of M. C. Escher.
NEW FACULTY

Carl Boehlert, assistant professor of chemical engineering and materials science, received his BS in agricultural and biological engineering at Cornell University and his MS and PhD in materials science and engineering at the University of Dayton, where he studied the physical metallurgy of advanced titanium alloys and their composites. While working on his PhD, he was employed as a contractor for UES, Inc., at the Air Force Research Laboratory at Wright-Patterson Air Force Base, where he worked on several projects with the Metal Matrix Composite Team. After completing his PhD, Boehlert worked on the physical metallurgy of TiAl intermetallic alloys for two years as a postdoctoral fellow at Johns Hopkins University. He then joined Los Alamos National Laboratory as a postdoctoral research associate in the Nuclear Materials Technology group, where he worked on the physical metallurgy of plutonium and cerium alloys. Boehlert joined the New York State College of Ceramics at Alfred University as an assistant professor in 2001.

Shantanu Chakrabartty, assistant professor of electrical and computer engineering, received his BTech degree in electrical engineering from Indian Institute of Technology, Delhi, India, in 1996 and his MS and PhD degrees from the Johns Hopkins University in 2001 and 2004, respectively. From 1996–1999, he was an engineer for Qualcomm Incorporated, San Diego, working on development and commissioning of CDMA systems. His research interests include design and implementation of ultra-low-power mixed signal VLSI systems, adaptive architectures with learning on silicon, biometric hardware, pattern recognition algorithms, and non-linear signal processing.

Niell Elvin, assistant professor of civil and environmental engineering, received his PhD in structural health monitoring from the Massachusetts Institute of Technology. Before joining MSU he worked on the design of adaptive structures at Midé Technology Corporation. He has also worked as a research fellow at the Harvard Medical School, where he developed self-powered implantable sensors. His research interests are in self-powered sensors and sensor networks for intelligent infrastructure.

Alfred Loos, professor of mechanical engineering, received his BSE, MSE, and PhD in mechanical engineering from the University of Michigan. He taught at Virginia Polytechnic Institute for 22 years before coming to MSU. His current research interests include heat transfer and flow phenomena in materials processing, mathematical modeling of manufacturing processes, mechanics of materials, finite element analysis, materials characterization and testing, polymeric composite manufacturing, and mechanics of composite materials.

Vladimir V. Tarabara, assistant professor of civil and environmental engineering, received his PhD in environmental engineering and computational science and engineering from Rice University in 2004. Tarabara’s expertise is in the area of membrane separation processes for water treatment and quality control. Research topics include desalination, membrane-based pathogen separation and detection, and nanoscale design of optical sensors for water quality monitoring. He is a member of the American Institute of Chemical Engineers, American Water Works Association, and the Association of Environmental Engineering and Science Professors.
Christina Chan, professor of chemical engineering and materials science, was one of 86 individuals selected from a field of more than 170 applicants to participate in the National Academy of Engineering’s 10th Annual Frontiers of Engineering symposium held September 9-11 in Irvine, California. The meeting provided an opportunity for young, top-notch engineers from industry, academia, and the government to learn about cutting-edge developments in fields other than their own and establish cross-disciplinary and cross-sector contacts.

Lawrence T. Drzal, director of the Composite Materials and Structures Center and University Distinguished Professor of chemical engineering and materials science, has been awarded the rank of fellow in four professional societies since 2002 for his research contributions.

In September 2004, he was named a fellow of the American Society for Composites, of which he is a founding member, in recognition of research and development to advance the state of the art in composites science and technology. The designation of ASC fellow has been given to only 26 individuals in the society’s 20-year history.

He was also elected a fellow of the Society of Plastics Engineers (SPE) in May 2004, in recognition of research that has led to a scientific and engineering basis for the adhesion of reinforcing fibers to polymers in composite materials. Only 227 of SPE’s 20,000 members have been elected to fellow status since the organization was founded in 1984.

Drzal previously was named a Robert Patrick Fellow of the Adhesion Society in 2003, and a fellow of the American Institute of Chemists in 2002.

Erik D. Goodman, professor of electrical and computer engineering and mechanical engineering, was named a senior fellow of the International Society for Genetic and Evolutionary Computation (ISGEC).

“The current class of fellows are leaders of a new global field in which thousands of computer scientists, engineers, and physical, biological, and social scientists now participate. The methods they have invented are having increasing impact across the spectrum of human endeavor from the arts to the sciences and in commerce,” said David E. Goldberg, founding chairman of ISGEC, at the induction ceremony June 30, 2004, held during the society’s annual conference (GECCO-2004) in Seattle, Washington.

Richard J. Enbody, associate professor of computer science and engineering, explains his patent—Nanocapsules Containing Charged Particles, Their Uses and Methods of Forming Same—during a reception held on November 23, 2004, in honor of MSU engineering inventors who had patents issued between January 2001 and September 2004. In all, about 50 patents were issued.
Fang Z. Peng (*left*), associate professor of electrical and computer engineering, and Edward J. Rothwell (*right*), professor of electrical and computer engineering, have been named fellows of the Institute of Electrical and Electronics Engineers (IEEE). Peng is recognized for his contributions to multilevel power converter topology, control, and applications. Rothwell is recognized for his contributions to the development of radar target identification, discrimination, and detection schemes. Of the IEEE’s 400,000 members worldwide, only 0.1 percent receive the prestigious designation of fellow, in honor of their extraordinary records of accomplishment in their fields.

Percy A. Pierre, professor of electrical and computer engineering, has been selected as one of “50 Most Important Blacks in Research Science” for 2004, according to *Science Spectrum* magazine, published by Career Communications Group, Inc. The 50 individuals, featured in the September edition of the magazine, are recognized for the important contributions they make on a daily basis as a small but influential cadre of African Americans in research. A colloquium and awards luncheon was held September 18 in Nashville, Tennessee, during the Emerald Honors Conference for Research Science.

**Engineering Faculty and Staff Honored at University Awards Convocation**

Engineering faculty and staff received five university-wide awards at the 2005 Awards Convocation, held this sesquicentennial year in conjunction with a Founders’ Day Celebration. The February 11 ceremony at the Wharton Center’s Great Hall included the installation of Lou Anna K. Simon as the 20th president of Michigan State University.

Robert Hubbard received the Distinguished Faculty Award in recognition of a sustained record of scholarly excellence in research and creative activities, instruction, and outreach. Hubbard has received international acclaim for his bioengineering research on human spinal mechanics and for developing unique enabling technologies in human biomechanics, including office and automotive seating and a life-saving head and neck device for racecar drivers.

Richard Lyles received the Quality in Undergraduate Teaching Award from the MSU Alumni Club of Mid-Michigan in recognition of high-quality teaching and substantial continuing involvement in undergraduate education. Daniel Lee received the Distinguished Academic Staff Award for extraordinary academic achievement and exceptional contributions. Graduate teaching assistants Shirish Karande and Brian Olson received Excellence-in-Teaching Citations for demonstrating exceptional care and skill in meeting classroom responsibilities.
With this feature, we invite you to come alongside five engineering students as they learn and grow at MSU. In each issue, for the next several issues, we will give you updates on each of these students as they progress through their programs. Six students were first featured in Currents Magazine, Volume 2, Number 2, Winter 2003. This is the fifth installment. (Back issues are available upon request; or view previous installments online at http://www.egr.msu.edu/egr/publications/archives.php.)

Eboni Harper
SENIOR (DETROIT, MICHIGAN)
COMPUTER ENGINEERING

What were your highlights/challenges during summer 2004?
Over the summer, I was conducting research at MSU with the help of McNair/SROP.* The title of my research project is Math Education: Analyzing the Transition from High School to College Mathematics. I conducted personal interviews with a number of college students around Michigan State University. The interviews included questions about their mathematical experiences during high school and college.

What were your highlights/challenges during fall semester 2004?
During fall semester, after taking courses in microprocessing and digital systems, programming, and electronics, I gained an appreciation for the structure of electrical engineering—as well as for the importance of research and the difficulty in conducting research.

I am also a teaching assistant with the Math Enrichment Program for MTH 1825.

As MSU celebrates its 150th birthday in 2005, we are looking back at where we’ve been and where we’re headed. From your perspective, where do you see the field of engineering in 50 years compared to where it was 50 years ago and where it is today?
Looking at the developments made over the last four years alone, it is hard to speculate exactly where electrical engineering will be in 50 years. Therefore, I can only hope to be a small contributor to the increasingly large amount of knowledge within the field.

Jacob Kirshman
JUNIOR (LINDEN, MICHIGAN)
MECHANICAL ENGINEERING

What were your highlights/challenges during summer 2004?
There were many highlights over this past summer. In June I went skydiving! It was an amazing experience to jump out of a plane at 11,000 feet. I would recommend that everyone try this at some point in his or her life! I also took numerous weekend trips—to our cabin near Alpena, to Lake Michigan, to Cedar Point Amusement Park, and camping around Michigan.

The main part of my summer was working another term at DENSO. This was my third rotation. I was moved back to the process side of the molding department. Since I had spent one term in the process side and one term in the mold/die design side, I was able to combine projects and do some of both aspects. I did spend most of my time on the process. During the semester, some of my projects included designing cooling fixtures for p-tanks and EOAT (End of Arm Tooling) for the p-tank, blower fan, and lever robots. I created floor layouts to move equipment to new locations in the plant, and contacted vendors to order new equipment. I will be returning to work for a fourth term in the spring semester of 2005. As of right now I am planning on that being my last co-op work term.

What were your highlights/challenges during fall semester 2004?
Fall semester of 2004 I was back at MSU taking four classes—Introduction to Combustion, Fluid Mechanics, Electronic Instrumentation and Systems, and Mechanical Engineering Analysis. It has been a challenging semester but it’s very interesting because I am no longer taking my basic university requirements; I am now enrolled in all my core classes.

A major highlight this fall was running the Chicago Marathon on October 10, 2004.

*The Ronald E. McNair Post-Baccalaureate Achievement Program/Summer Research Opportunity Program—McNair/SROP—focuses on preparing students for intensive research and the competitive graduate school admissions process. McNair is funded by the U.S. Department of Education and encourages first-generation, minority, low-income college students to pursue doctoral study. McNair runs simultaneously with SROP, which gives minority students the opportunity to acquire the research skills necessary to be successful in graduate school. SROP is funded by the Committee on Institutional Cooperation (CIC) and Michigan State University. McNair/SROP scholars engage in research in the academic fields of study in which they wish to pursue graduate studies. This helps them develop the skills and student-faculty mentoring relationships critical to success at the doctoral level.
There were 40,000 runners and more than 1,200,000 spectators. It was amazing running through Chicago with that many people. The streets were lined with people throughout the entire race, and each one of them would cheer you on as you ran by. The race route allowed us to see most of the city; we started in Grant Park, then went through Old Town, Greektown, Little Italy, and Chinatown before ending back at Grant Park. It was an incredible feeling crossing the finish line after months of training. A truly memorable moment.

As MSU celebrates its 150th birthday in 2005, we are looking back at where we’ve been and where we’re headed. From your perspective, where do you see the field of engineering in 50 years compared to where it was 50 years ago and where it is today?

The field of engineering has made large advances from 50 years ago. The engineering field has worked hard the past 50 years to improve and create products that are safer, better, and more convenient for the consumer.

Engineers today continually learn from past designs and tests of products. This allows them to see what has worked well and what has not. Compared to engineers in 1950, we now have more than 50 years of research to learn from. I think for the next 50 years the sky is the limit. Engineers will continually learn from past mistakes and achievements and apply that knowledge in new designs. If you look at the advances in cars, planes, bridges, computers, etc., each design has been refined and improved over the years. The car, for example, has been made safer, faster, cleaner—and recently, more fuel efficient. I am truly looking forward to seeing the advances that will be made throughout the next 50 years. (Hopefully I will be part of one of these major advances!)

Greg Kehrier
SENIOR (BAY CITY, MICHIGAN)
CHEMICAL ENGINEERING & MATERIALS SCIENCE

What were your highlights/challenges during summer 2004?

This past summer I interned at Eli Lilly in Indianapolis, working in bioprocess research and development. The experience was a great complement to the internship I had in summer 2003 at Pfizer in Kalamazoo, Michigan. At Pfizer, I supported manufacturing-scale operations for products synthesized using organic chemistry, and at Lilly I supported pilot plant-scale operations for products made by bioprocesses. I was glad that the position I had at Lilly placed me in a different role than I had at Pfizer. From the two internships, I’ve gained quite a bit of understanding about almost every area where chemical engineers work in the pharmaceutical industry. It’s given me terrific insight into the type of department where I would prefer to work.

What were your highlights/challenges during fall semester 2004?

This semester has been terrific so far. On November 20, I marched in my last football game with the Spartan Marching Band; I’m still coming to terms with the fact that it’s all over. It’s been my passion for five years, and now I have to pass the torch down to the next group. I’ve watched the seniors go through the same thing for the last four years, so I had a little bit of an idea of how emotional it would be. I never cried so hard in my life! Aside from marching band, I’ve been working with the AIChE (American Institute of Chemical Engineers) on the E-board this semester. I’m glad I have the opportunity to be a board member this year. It’s something I wish I had been more involved in earlier in my college career.

When will you be graduating? Any job offers yet?

I’ll be graduating in the spring. I had enough credits to graduate after the fall semester, but since I know I want to go into the pharmaceutical industry, I decided to take some extra classes spring semester that are relevant to that. I’m either going to complete the Biochemical Engineering option and add that to my chemical engineering degree, or I might enroll in one or two chemistry classes like advanced organic chemistry. I don’t have any job offers yet, so I am still an eligible bachelor (of science in chemical engineering)!

As MSU celebrates its 150th birthday in 2005, we are looking back at where we’ve been and where we’re headed. From your perspective, where do you see the field of chemical engineering in 50 years compared to where it was 50 years ago and where it is today?

I think by the time another 50 years have passed, chemical engineering’s big focus will have taken a turn back to where it started—providing energy for the world. Chemical engineering was born from petroleum production, back when cars were becoming popular and people started to need a lot of gasoline. Now that we’re reaching the end of the usefulness of that energy source we’re going to need to find something else. Whatever the next energy source is going to be, chemical engineers will have the task of producing it. I also have a feeling that at some point in my career there will be another big breakthrough in cancer research.
The last one was way back in the ’70s when Cisplatin was invented.* No one has found another blockbuster cancer treatment since then, so we’re overdue for inventing the next one. The drug discovery process is getting smarter and more efficient all the time, so maybe chemical engineers will start manufacturing the next cancer treatment before I retire.

Tracy Kamikawa
GRADUATE STUDENT (HONOLULU, HAWAII)
BIOSYSTEMS ENGINEERING

What were your highlights/challenges during summer 2004?

I spent this summer completing an internship in the Washington, D.C., area, which was a part of my commitment to the Department of Homeland Security. Along with supporting our education, DHS wanted to expose us to the field and provided many possible internship sites to this end, from California to Tennessee to New York. Most of these were labs involved in breakthrough research in the biotechnology and bioterrorism fields, and I was excited to work at any of them.

I ultimately decided to travel to Arlington, Virginia, to work as an intern at ANSER Analytic Services, Inc., where many of the top scientists in the D.C. metro area converge to defend homeland security. ANSER, the site of the new Homeland Security Institute, has the support from the government that is necessary to fund significant research and technological advances.

I was lucky enough to find an apartment in Pentagon City, steps away from the mall and a five-minute shuttle ride to ANSER. Upon entering the internship, I was under the impression that I would contribute to an existing project. However, I was largely given complete freedom in performing research that would serve as a foundation for my own doctoral work. I used literature reviews to cement my background concerning Bovine Spongiform Encephalopathy (BSE), also known as Mad Cow Disease, and the existing methods for the rapid detection of the disease. My doctoral research will involve fabricating a biosensor for this purpose, and I was able to make significant headway in my studies.

The most valuable aspect of the experience was being in such close proximity to the action in our nation’s capital. Working in defense of the homeland is made exponentially more significant and seems all the more imperative and essential when it is set against the backdrop of the Capitol, the Pentagon, and the conglomeration of our nation’s most important leaders. I was able to meet and work with some of the brightest minds in the country, from everywhere—from the Pentagon to Johns Hopkins Applied Physics Lab. Describing my research to these scientists and receiving their input and opinions was extremely helpful in giving me the proper perspective. I am very thankful to have had this singular experience and am positive that it will help me in my future research.

What were your highlights/challenges during fall semester 2004? You are currently a doctoral student, not a master’s student, correct?

I chose to pursue my doctorate immediately after undergrad because I knew that was where I was eventually headed. Many programs, including Biosystems and Agricultural Engineering, offer both master’s and doctoral degrees, which differ only in that the doctoral program requires more independent thinking. Master’s degree programs allow students to find themselves in terms of their research and career interests with more guidance and mentorship, while doctoral programs are more suitable for those with already established goals. Since I have been interested in biosensors for the rapid detection of food-borne pathogens throughout my undergraduate career, my mentor, Dr. Evangelyn Alocilja, worked with the biosystems and agricultural engineering department chair, Dr. Ajit Srivastava, to tailor a doctoral program to my interests directly after my undergraduate studies. I am indebted to them for making my ambitions feasible.

Thus far, I have not found my life much different from that as an undergraduate. I share classes with many of the same students and have already formed lasting relationships with the faculty and staff. I have not yet undertaken massive research, but I am sure when that time comes my workload will become much greater.

I have spent a large amount of time this semester organizing a partnership with MSU and the National Institutes of Health in Bethesda, Maryland, which offers a program for doctoral students in which they complete coursework at their home institutions and perform research at the NIH’s federally funded labs. Ever since my experience in D.C. this summer, I have been anxious to return to the area for the advancement of my research. I hope that I can establish this relationship, as I believe my research would greatly benefit.

As MSU celebrates its 150th birthday in 2005, we are looking back at where we’ve been and where we’re headed. From your perspective, where do you see the field of engineering in 50
years compared to where it was 50 years ago and where it is today?

Engineering will be important for as long as consumers demand better technology and more comfortable lives. We are constantly expanding our bounds, and have come a long way from the first days of the engineer. The modern engineer knows no limits and I am confident that in the 50 years to come we will be constantly amazed by even more revolutionary ideas.

As for biosystems engineering, this relatively young field has recently seen immense progress. The collaboration between the rigid characteristics of engineering and the transient aspects of biological species gives biosystems engineering a unique vision. Especially in light of the current state of national security, I am certain that this field will only increase in importance and prominence, and I am excited to be involved in the upswing.

Nicole Danielson
(RIVER FALLS, WISCONSIN)

What were your highlights/challenges during summer 2004?

The biggest highlight (and challenge) of my summer was getting married to my now-husband, Mitch Bartelt. I spent almost three weeks in River Falls, Wisconsin (our hometown), getting ready for the wedding and visiting. We were married on July 24, and it was a wonderful day. The weather cooperated, and we had a great time with lots of family and friends. After that, Mitch and I headed to San Diego for our honeymoon for a week. We had an awesome time; neither of us wanted to leave the 75-degree-and-sunny-everyday weather, but we had to get back to Michigan. As always, trying to stay on task and finish my project was a challenge this summer!

You started work in the Lansing office of the Michigan Department of Transportation (MDOT) in August. How is that going?

Work is going really well. I started as a rotational engineer in the Local Agency Programs Unit, which is in the Design Support Area in downtown Lansing. I had a lot of training opportunities, and worked with great people who didn’t mind answering all of my questions—and I know I had a lot of them. Recently I moved to the Hydraulics Unit (same office); I am looking forward to learning about a new area of design, and trying to remember some of the info I learned in those hydraulics/hydrology classes. This is exciting, as this area is closer to my master’s program emphasis.

Do you miss being a student—or is it nice not to have to worry about classes, grading, etc.!

I miss the student schedule and being on campus at MSU—the fall is just too beautiful on campus! However, I love having my nights and weekends much more open to travel and visit with friends and family. And I of course love getting a steady paycheck! I guess right now work is still pretty new, so I don’t miss the student life quite yet.

As MSU celebrates its 150th birthday in 2005, we are looking back at where we’ve been and where we’re headed. From your perspective, where do you see the field of engineering in 50 years compared to where it was 50 years ago and where it is today?

I think one of the biggest differences between now and 50 years ago is the emphasis on effective communication for practicing engineers. The old stereotype of an engineer sitting behind a computer and not working with anyone has become obsolete. Most employers seem to be looking for people who can get the job done, but who are also able to work together in group situations. I think that trend will expand in the next 50 years, especially as we become more global. It looks like communication across a variety of media (such as Web conferencing) will be crucial to stay competitive.

This will be your last installment in Currents Magazine, although I will ask you for periodic updates to let our readers know how you are doing. Is there anything you’d like to share with us about your experience as a “regular columnist” in Currents?

I really loved how these “articles” seemed more like conversations. I don’t think that I would have been able to tell about all of my experiences in a more formal manner without losing some of the fun! I hope this type of feature continues, because I know that I really enjoyed reading the other students’ articles too and seeing what experiences they had; just reading about the study abroad makes me wish that I had gone. Also, thanks to all of the alumni for following all of us through a couple of years! I would like to thank Laura Seeley, the editor of Currents Magazine, for putting this feature together.
In 1929, when Wall Street was about to crash and employment became a vanishing commodity, Ethel Violet Lyon set out from Charlotte, Michigan, to become an engineer. She enrolled in what was then Michigan State College of Agriculture and Applied Science and lived in Morrill Hall with other women, mostly home economics majors.

“I just pushed myself. It took courage,” she said. “When I began, there was talk—not mine—of my going into general science. That was not what I wanted. I planned to be a chemical engineer and I meant to be one.” Through her assertiveness, and with help from Aggie McCann, Lyon began classes.

The chemical engineering faculty consisted of the chairman, Harry S. Reed, associate professor, and three graduate assistants. Lyon worked as a secretary to Reed during her last two years to pay her tuition of $35.00 per semester.

During the first few years after she received her degree in 1933, Lyon worked in public utilities, with papermakers, and in chemical companies. In 1943 she enrolled in the library school at Western Reserve University in Cleveland to pursue her interest in develop-

... There are a total of 41 female graduates from the College of Engineering. The alumni office . . . lists the total number of MSU engineering graduates at well over 11,000. At the moment, there are 90 females enrolled in the engineering curriculum here.”

—excerpt from Currents No. 7, 1972

Editor’s Note: As of spring semester 2005, 585 women were enrolled in the College of Engineering, out of a total enrollment of 3,300.
First Woman Engineering Graduate

Lyon retired during the 1970s. Her last known address was in Jackson, Michigan. She would have turned 93 on November 11, 2004. Having been unable to determine whether or not she is still living, we welcome further information from our readers.

—Based on Currents No. 24, 1977; and No. 47, 1985

“I was enrolled in mechanical engineering in 1942, and had to have special permission from Dean Dirks and Dean Conrad [dean of women] to matriculate. . . . At that time the R. E. Olds engineering building had no restroom facilities for women, and my dressing room for Forge and Foundry Class was the glassed-in Heat Treat lab. . . . I also had to have special permission from Dean Conrad to wear slacks on campus. The dress code at that time required skirts and hose . . .”

—Jeanne Eleson Wanhainen in Currents No. 24, 1977

ing ways to use the accumulation of scientific knowledge. She worked nights in an analytical lab on magnesium aluminum alloys, ceramic materials, and wartime chemicals.

After graduating with a second bachelor’s degree in library science in 1944, Lyon began her 30-year career in library and information services in engineering research laboratories. During World War II, she worked at the NASA Aircraft Research Labs in Cleveland, and saw the development of jet engines and rocket fuels. She went on to the Institute for Air Weapons Research, operated through the University of Chicago and involving management of highly classified military security data.

She began work with the research labs of the Portland Cement Association in 1956 in Skokie, Illinois, providing the engineering knowledge constantly sought through information and library services at the start of new projects or when projects are stalled for lack of data. A large project in which she was involved was the defining of “key words” to be used for easier access to technical data. The result was the Joint Engineering Societies’ Thesaurus of Engineering Terms, a forerunner of computer language to handle technical data.

Lyon (front row, third from right) was an active member of the women’s varsity debating team and Pi Kappa Delta, the honorary forensic society. The 1933 yearbook indicates that she was also a member of the Spartan Women’s League and the Women’s Athletic Association.

VARSITY DEBATE TEAM: Lyon was an active member of the women’s varsity debating team and Pi Kappa Delta, the honorary forensic society. The 1933 yearbook indicates that she was also a member of the Spartan Women’s League and the Women’s Athletic Association.
Obituaries

Richard W. “Bill” Caldwell (BS Chem Egr ’38), of Midland, Mich., died Sept. 28, 2004, at age 89. He was employed by the Dow Corning Corporation, where he became the general manager. Later he headed LePetit S.P.A., a worldwide pharmaceutical subsidiary of The Dow Chemical Co. Bill was a member of the Midland Country Club, the Midland Kiwanis Club, and Memorial Presbyterian Church. He served as president of the board of education, on boards and committees for Michigan State University, and as a board member of the Chemical Financial Corporation. He enjoyed his family, golf, gin rummy, a cottage at Ludington, sailing, and helping others. He believed that people were what counted. He is survived by his wife, Ruth (Putnam); three children, W. David (Sue) Caldwell of Lakewood, Colo., Richard L. (Anne) Caldwell of Midland, and Patricia A. Sutton of Littleton, Colo.; five grandchildren, Corey, Marnie, and Justin Sutton IV, and Tiffany and Richard L. Caldwell, Jr.

Walter H. Meyer (BS Chem Egr ’48) died June 28, 2004. A longtime resident of Amberley Village, Ohio, he served for 22 years on the Amberley Village Council. He served in WW II as a first lieutenant in the U.S. Army. Walt spent his entire engineering career at Procter and Gamble, serving in many capacities, most notably as associate director of food product development, where he was responsible for the safety and regulatory status of food products. He was active in industry organizations that collaborated in health related issues. He was instrumental in developing both Prelt shampoo and Pringles. He was also an avid farmer who loved the land. He and his wife have been active members of Kennedy Heights Presbyterian Church. He was a campaign consultant for the MSU College of Engineering at the time of his death. Walt is survived by his wife, Margaret (“Peggy”), of 60 years; children Steve and Liz; and grandchildren Jessica, Christopher, Erin, and Abby Meyer, D’ann Hoover, and Hannah Smith. He was predeceased by son Walter Jr.

Frank T. Paganini (BS ME ’57, MS Appl Mech ’58) of Grand Rapids, Mich., died Sept. 6, 2004, at age 70. He attended MSU on a varsity swimming scholarship (backstroke) during his undergraduate years and was captain of the 1956 squad his senior year. He was a member of the Porpoise Fraternity and the Tau Beta Pi Engineering Honor Society. After graduate school, Frank completed the General Electric advanced engineering program and then served as either engineering manager, vice-president of research and development, or president of companies including General Electric, Speed Queen, Kitchen-Aid (Hobart), Whirlpool, Lundia, Frigidaire, and Grand Haven Stamping. Frank enjoyed all kinds of sports, spending time with his family, and life in general. He married his high school sweetheart, the former Violet Bliznakoff, who survives. Also surviving are a son, Anthony T. Paganini; a daughter, Monica Lindmark; three grandchildren, Michael and Alana Rose and Jackson Lindmark; two brothers, Joseph Sofia and Charles Paganini; and many nieces and nephews.

Class Notes

1940s

John E. Cooley (BS Chem Egr ’49) went to work in the beet sugar industry at Michigan Sugar Company right after graduation. He was a pilot in the air force from 1951 to 1955, then returned to the beet sugar industry in California for 34 years. After 17 years as a factory manager at three locations, he retired in 1988. He now lives in Fresno, Calif. dbc2@mindspring.com

Richard H. Lennox (BS ME ’48) of Rio Verde, Az., worked as an engineer for 6 years, then went into sales with Gardner Denver for 17½ years, and for the last 20 years has owned a small manufacturing rep operation. He enjoys the climate in Arizona with his wife, Betty, and their French poodle, Pierre. rlennox1@cox.net. Betty M. (Willis) Lennox (BS Home Ec ’44) spent her senior year in the College of Engineering on a Pratt & Whitney full scholarship. Women were needed in industry, because so many men were away at war. Upon graduation, she worked at Pratt & Whitney in Connecticut, taking data on airplane engine tests. Richard was stationed in Texas, and after a year she moved there to marry him. The couple later moved to New Jersey, where Betty worked as a food stylist for magazine and TV ads for 12 years. When they moved to Northville, Mich., she was elected township clerk, then treasurer, then supervisor. She was later hired as finance director for the City of Northville, retired after 10 years, then served again as Northville Township supervisor. Beginning in 1974, she was part of a delegation for friendship among women, working with women in developing countries including South Africa, Egypt, Iran, Kuwait, and China. Betty currently serves on the fire board for her local area. They are in the process of changing the fire department from a metro service to a private entity.

Philip A. Lenton (MS Chem Egr ’43) of Dearborn, Mich., worked on the Manhattan Project during World War II. In 1980, he retired after 35 years at Wyandotte Chemicals (BASF). During retirement he has taught bridge and supervised senior golf leagues. He is an avid fan of MSU sports. His wife, Lois, who worked as a secretary at MSU while he was a student in ’42–’43, died in 2002 after 60 years of marriage. He has seven grandchildren and seven great-grandchildren, all of whom live in Michigan.

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Guy S. Vissing, P.E. (BS Civ Egr ’48) of Derwood, Md., is presently retired from a position as senior project manager with the U.S. Nuclear Regulatory Commission. During his early career he spent 14 years performing design and project management on the development of fossil, hydro, and nuclear power plants for two consulting engineering organizations. That was followed by 10 years as a project manager on the AEC/NASA nuclear rocket program. His career culminated in 32 years with the U.S. Nuclear Regulatory Commission as a senior project manager for several nuclear power plants and many nuclear test reactors. vissing@comcast.net

Gene R. Rose (BS Ag Egr ’57) of Buchanan, Mich., designed heavy construction equipment for Clark Equipment Company in Benton Harbor, Mich. Clark and Volvo created a joint venture known as VME. And later Volvo purchased Clark and became VCE. Gene retired from his position as chief engineer in 2002, after 39 years. He and his wife, Ann, are enjoying retirement. They have two children, Stacey Eaton and Scott Rose; and two grandchildren, Brandon and Amanda Rose. gdirtmover@comcast.net
1960s

Lawrence T. (Larry) Novak (BS ’67, MS ’68, PhD 72 Chem Egr) has lived in Cleveland, Ohio, since leaving MSU with his wife, Donna (Elementary Ed ’68), who is a teacher. They have two grown children, Mark and Nancy. Larry has had careers in academia and the chemical industry. His industrial experience spans catalyst R&D, process R&D, and process engineering. He has over 30 publications and patents covering a broad spectrum of technical work, and he recently developed and published a new theory-based viscosity model for liquid mixtures that also works well for mixtures containing polymers. This model has been commercialized in process modeling and simulation software by Aspen Technology. The Novaks occasionally pass by MSU on the way to visit family in Muskegon, Mich. Larry says, “I am truly appreciative of my MSU education. In particular, Martin Hawley, George Coulman, and Carl Cooper were great teachers and coaches, providing me good approaches for problem solving. My years at MSU were good years, and I hope today’s students see it that way, too!”

1980s

Drew Floyd (BS ’84, MS ’86 Civ Egr) of Rehoboth, Mass., has joined Moretrench Geotec as New England regional manager. Moretrench offers a wide variety of earth retention and underpinning techniques (www.moretrench.com). Drew will oversee the design and execution of geotechnical construction in the northeastern United States.

Roger Reini (BS ECE ’85) of Westland, Mich., was recently appointed senior engineer at Ford Motor Company, Electrical/Electronic Systems Engineering. He currently authors the main system design specification for electrical distribution (wiring) systems as well as several other key specifications for wiring. roger@reini.com.

Karen (Mroz) Urman (BS Civ Egr ’85) of Irvin, Calif., works in traffic engineering design at Wildlan Associates. One aspect of her position is to serve as a consultant to the city of Lake Forest. klurman@cox.net

Christopher J. Nicol, PE. (BS CEE ’94), who opened and managed G2’s suburban Chicago office for the last four years, has returned to G2’s Troy, Mich., headquarters as a project manager. He retains oversight responsibility for the firm’s Chicago operations. Nicol, 33, holds a bachelor’s degree from MSU, is a licensed professional engineer in Michigan and Illinois, and is a member of ACEC. He joined G2 in 1995 as its second employee after the three founding partners. He lives in Milford, Mich. G2 Consulting Group is a full-service engineering firm serving Fortune 500 companies, major utilities, property owners, government agencies, and leading architectural, engineering, and construction firms across the United States. G2 also has offices in Detroit and Wheeling, Ill. Anthony Poisson, PE. (BS CEE ’96) has been promoted to manager of the suburban Chicago office of G2 Consulting Group, an engineering firm providing geotechnical, environmental, and construction engineering services. Poisson, 30, had been a project manager in the suburban Chicago office. In his new position, Poisson will handle G2’s daily operations in metropolitan Chicago. A licensed professional engineer in Michigan and Illinois and a member of the American Council of Engineering Companies (ACEC), Poisson started with G2 in 1997 and lives in Crystal Lake, Ill.

Aseem K. Srivastava (BS ’89, PhD ’95 ECE) of Laurel, Md., is a principal scientist for Axcelis Technologies, Inc. (formerly Fusion Systems), where he has worked since earning his PhD. He designs radio frequency and microwave plasma sources—exactly what he did for Dr. Asmussen and Dr. Antaya at the National Superconducting Cyclotron Laboratory—but getting paid a bit more than he did as a grad student. He was named a distinguished technologist by Axcelis in Sept. 2002. This honor is accompanied by a cash award and stock options, plus recognition through a plaque on the company’s “wall of fame.” seemasriv@earthlink.net

1990s

James Gehringer (BS ME ’91), of Thief River Falls, Minn., is a product team manager for Arctic Cat, Inc., a snowmobile manufacturer. He oversees all engineering on Cat’s touring, utility, and family snowmobiles. He married Elizabeth Hagey of Saline, Mich., in April 2003.

Chen-Chung Liou, PE. (MS CEE ’95), of Mississauga, Ontario, is a geotechnical engineering project manager for Soil-Engineering Ltd.

Qaiser H. Malik, Brigadier (MS ECE ’95) is a director of exams and academics at the National University of Sciences and Technology in the Multan Aviation Cantonment, Rawalpindi, Pakistan. Dea_nust@isb.paknet.com.pk

2000s

Mary Heffner (BS CSE ’00) of San Francisco, Calif., has been an OEM solutions engineer for SurfControl—“the world’s #1 Web and E-mail filtering company”—for three years. mmaryheffner.com

Christopher J. Nicol, PE. (BS CEE ’94), who opened and managed G2’s suburban Chicago office for the last four years, has returned to G2’s Troy, Mich., headquarters as a project manager. He retains oversight responsibility for the firm’s Chicago operations. Nicol, 33, holds a bachelor’s degree from MSU, is a licensed professional engineer in Michigan and Illinois, and is a member of ACEC. He joined G2 in 1995 as its second employee after the three founding partners. He lives in Milford, Mich. G2 Consulting Group is a full-service engineering firm serving Fortune 500 companies, major utilities, property owners, government agencies, and leading architectural, engineering, and construction firms across the United States. G2 also has offices in Detroit and Wheeling, Ill.

Randal Pagel (BS ME ’01) of Macomb, Mich., is a senior sales engineer/construction sales manager for Bumler Mechanical, Inc., in Sterling Heights, Mich. He began his career as an HVAC design engineer/CAD operator for Exelon Services, Inc., based in Chicago. Then in 2004 he became a part owner of Bumler Mechanical, Inc., a full-service HVAC mechanical contractor. He works mainly in the construction sales division and heads up the company’s HVAC design team. He hopes to pass the final test for a professional engineering license in 2005. randal.pagel@bumlermech.com
Greetings from Afghanistan

Joseph A. Sopko (BS ’80, MS ’83, PhD ’90 CEE), a colonel in the U.S. Air Force Reserve on active duty in Afghanistan, wrote September 8, 2004, to Professor Emeritus Orlando Andersland:

Finally got to Afghanistan. It was quite a trip. Finally getting the official deployment order, we met as a unit in St. Louis on August 10th. We flew to Chicago on the 14th, then overnight to London, and from there to Doha Qatar. Once at the big air base there, we sweated in 120º heat for three days waiting for a flight to Afghanistan. The heating system was broken on the C-130. It was like spending six hours in a walk-in freezer.

We arrived at Bagram Air Base in Afghanistan, which has about 10,000 people from all branches of service and several countries, including the UK, Slovakia, Poland, Australia, Egypt, and Korea. Originally established by the Russians in the ’70s, the base has lots of old Russian airplanes, tanks, and trucks just lying around. You can’t walk to the rest rooms without passing a roped-off mine field.

The work we are doing is related mostly to forward bases closer to the combat troops’ missions. A lot of the projects deal with water, sewer, electrical, and road building. A few guys are working on jails for prisoners. Every day has been sunny, hot (90s), and very dusty when the wind blows. We stay in little plywood shacks that remind you of summer camp. Food is so-so, but the longer I’ve been here, the more it all tastes the same.

Two nights ago we had a rocket attack on the base. The sirens went off, and we all had to get our helmets, body armor, and weapons, and head for the bunkers, where we sat for about an hour until all was clear.

—Joe

November 2004 Update

I left Afghanistan near the end of September for medical reasons. It was a sobering experience, as our flight had several wounded men on litters. Some were pinned with a purple heart just before we left. There were three flag-draped caskets on board. These casualties had occurred the previous day. We flew into Germany where I spent a week at a medical center, then back to the states for surgery. I’m doing pretty well now, but still recovering.

—Joe
We often focus on the experiences of MSU students who study abroad, but there is also a story to be told from the other side of the equation. Several students from National Taiwan University (NTU) and the University of Kaiserslautern in Germany participate regularly in study abroad programs in the MSU Department of Electrical and Computer Engineering. The Taiwanese students come for a semester in the summer, while Kaiserslautern students typically stay for two semesters, beginning in spring. The NTU program is just a few years old. The Kaiserslautern program has been operating for more than 10 years.

The visiting students are undergraduates, but they work on graduate research projects at MSU. The German students are required to write (in English) what their home university calls a “junior thesis” related to their research project. The thesis must be approved by both their American and German professors.

During 2004, each study abroad student worked with a different professor. Projects included the Internet, heart studies, and ultrasound as it relates to breast cancer. Exchange student expenses are partially paid by the research project they are working on. Taiwanese students also receive support from their own university and from a research endowment funded by electrical engineering alumnus Richard M. Hong (MS ’67, PhD ’70).

Maggie Blair-Ramsey, coordinator of MSU’s Engineering Study Abroad Program, says, “I always felt it was a shame for students to come from as far away as Taiwan and see nothing but our campus, beautiful as it is. Michigan has so much to offer. The field trips give students a chance to appreciate our country and learn about each other’s cultures in a relaxed setting where we have meals together, walk together, and share a lot of things.”

In 2004, five German students visited Mackinac Island, staying overnight at a log cabin–style motel. German student Yves Tabue comments, “I thought the bridge was the most beautiful thing to see in Mackinac. But when we took the ferry to the island, I noted how beautiful the island really was.” The three Taiwanese students took a two-hour boat trip on Saginaw Bay, ate lunch at the Bay Valley Hotel and Resort, then stopped off at Prime Outlets, a factory outlet mall in Birch Run, for some shopping and an ice cream break.

—Lynn Anderson

Traveling to Kaiserslautern in May 2004 with MSU study abroad students, Blair-Ramsey was invited to visit the Berufsakademie—University of Cooperative Education—in Heidenheim, Germany, to discuss exchanging students for placement in cooperative education situations. Soon after, the Berufsakademie was pleased to accept an MSU student who had been studying at the Kaiserslautern, Germany, program. They arranged an interesting placement for him with one of their cooperative partners, an automotive industry supplier in Schwabisch Gmuend.

“To establish a co-op exchange program with them,” Blair-Ramsey says, “We have to identify one or more companies willing to hold an internship position for a German student. One of the Berufsakademie’s primary links is with ZF (pronounced ‘zed-ef’), which makes steering columns, so we are seeking an exchange internship with an American automotive company. This can happen,” she says, “but it will involve only one or two students per year.”
LONE WOMAN ENGINEER AT ESSE BECKONS OTHERS TO FIELD

LINDE—Miss Alice Jacobson of 820 Canton St., Elizabeth, only woman chemical engineer at Esso Research and Engineering Co. has the role of pointing out to other young women the opportunities for them in engineering.

Among those who have been Miss Jacobson’s guests on tours of the Esso Center are Beverly Jurneck of 633 Spruce St., Roselle Park, and Miss Toby Weissbraten, Linden, on tour of research center.

Although there are other women chemists and some engaged in other technical work, Miss Jacobson is Esso Research’s only woman chemical engineer. She joined the company in the summer of 1955 upon graduation with top honors from Michigan State University. She moved to Elizabeth from Lansing, Mich.

One of her engineering projects involves the design of one of the company’s new refining process units.

Alice Jacobson, 1934–2002

Alice Jacobson (BS Chem Egr ’55; MBA Economics ’65) was born in Battle Creek, Michigan. The family later moved to Lansing, where Alice graduated from Lansing’s Eastern High School. Older brother, Carl, says he is glad he didn’t have to follow in her footsteps, because he got more academic awards than he did!

While attending MSU, Alice worked in dress shops to help pay her way. When Esso (now a part of ExxonMobil) recruited at MSU, a representative told Alice it was not practical to hire female engineers, because they have to wear overalls. He suggested she might be a secretary for the company. She managed to convince Esso otherwise, and was hired right after graduation as a chemical engineer for the Madison, New Jersey, research center.

In her younger days, Alice traveled extensively in the United States and Europe. Her love of sports extended to being a member of a synchronized swimming group. She met her husband, Albert Anderson, during a skiing weekend. Married in 1968, they raised two children together, spending time each summer at a family cottage in Clear Lake, Michigan. In 1969, the couple bought a historical home built around 1830 in Whippany, New Jersey. According to Albert, George Washington stayed nearby for a long period during the Revolutionary War. The French army, en route to Yorktown to join forces with Washington, marched right down the street where the Anderson’s house is located.

As a senior chemical engineer with Esso/Exxon, Alice traveled to Europe several times for the company. She took a couple of years off when the children were born, then negotiated with the company to work part-time as a consultant. She eventually stopped work altogether and focused on caring for her family. Daughter Suzanne says, “She made us know that we, her children, were her first priority. She led Girl Scout troops, helped us with homework, attended all our school functions, and still had time to make us homemade cookies! She was a pioneer in the...
field of engineering and a superb role model for my brother John and me.”

Suzanne earned a BS in biomedical engineering from the University of Pennsylvania and currently works for the FDA as a scientific reviewer in the Office of Device Evaluation. John earned a BS (’94) and an MS (’95) in civil and environmental engineering at MSU.

Alice’s husband was a senior construction supervisor for Public Service Electric and Gas Co., involved with building electrical substations and switching stations. He retired in 1991 after 38 years. Around that time, Alice became sick with leukemia. She struggled bravely through years of treatments, but finally died February 8, 2002, at the age of 68. Daughter Suzanne’s husband, Steve Kaiser, says, “Both Carolyn (John’s wife) and I had wonderful relationships with Alice. She made us feel so welcome.”

At the time of her death, Alice did not know that her son, John, had died unexpectedly of a heart attack a few days earlier. She also did not know that Suzanne was pregnant with her first grandchild, who has been named Alison in her honor. The family spent some good times together in the weeks preceding Alice and John’s deaths, especially at Christmas when they told old family stories, John got out his old Star Wars toys, and Albert hooked up his Christmas train. They have many precious memories to cherish.

APRIL 19, 1997—THE WEDDING OF ALICE’S DAUGHTER. Left to right: Alice’s son, John Anderson; groom Steven Kaiser; bride Suzanne Anderson; Alice Jacobson Anderson; Albert Anderson.

LEFT: Alice’s granddaughter and namesake, Alison Elizabeth Kaiser, at age two (October 2004).
Responses to “Looking Back”

■ from William D. Irish (BS Chem Egr ’55): I believe the woman is Alice Jacobson, a graduate of 1955, and the year is probably 1956. The equipment is probably a distillation or fractionation column used to separate various cuts or “fractions” of petroleum. I graduated with Alice. She was one of the better students in our class, and I expected her to go on to advanced degrees. Maybe she did that while employed at Esso. I also interviewed at Esso, and was offered a job there, but I was not fond of the location. I wound up at GE in Louisville, Kentucky, and am still in Louisville.

■ from Robert Charles Hill (BS Chem Egr ’55): I knew right away that the tour guide is Alice Jacobson. I located my 1955 Wolverine Yearbook, and on page 307 under “American Institute of Chemical Engineers,” the photo shows me sitting right next to her! Since I have been a patent attorney for the last four decades, I have no clue as to the identity of the piece of equipment shown in the photograph. Thanks for the memories.

■ from Frank Svetlik (BS Chem Egr ’67): Dr. Leon Robinson, my neighbor down the street here in Houston, is a 44-year annuitant from Exxon Production Research. He had no experience in Clifton or Farnam Park, but I have my feelers out to other Standard Oil of New Jersey employees to see if they recognize this young woman’s picture. [Neighbor Leon Robinson writes, “This picture was taken in New Jersey. I only visited that facility once in the late ’80s. From the hairstyles, this appears to be from around 1950–55. The equipment is not associated with drilling—probably production or refining.”]

■ from Carl Miller (BS Elec Egr ’58): I can’t identify any of the three young ladies. I would say the photo was taken in 1966. It shows a mass spectrometer, which was used to identify components of a sample.

■ from Guy Wirth (BS ’63, PhD ’68 Chem Egr): My guess is that Alice Jacobs or Jacobson is the alum who worked at Esso Research and Engineering. I also guess that the piping manifold beside her was related to controlling the flow of fluidized solids such as catalyst or coke.

■ from David J. Lohse (BS Physics & BS Computer Science ’74): I have worked at ExxonMobil Research & Engineering (formerly Esso) since 1980. So I was able to ask some of the “old-timers” here about your photo from the October “Looking Back” page. The best guess is that this is Marilyn Winters or else Jean (perhaps Jane) Pleiss. The year would be about 1958, and no one could tell the equipment, either. Hope this is close; I look forward to seeing the answer in the next edition, so I can let everyone here know who this was.

■ from T. William (Bill) Brown (MS ME ’75): I would like to submit the name of Margaret Thatcher for the back cover photo. Somebody once told me she worked for us (ExxonMobil Research & Engineering Company), but I have no idea if she graduated from MSU.

Let Us Hear From You!

NAME (INCLUDING MAIDEN NAME)

STREET ADDRESS

CITY / STATE / ZIP IS THIS A NEW ADDRESS? ☐ YES ☐ NO

E-MAIL ADDRESS* TELEPHONE

CLASS DEGREE

OCCUPATION / JOB TITLE

EMPLOYER

BUSINESS STREET ADDRESS

BUSINESS CITY / STATE / ZIP

UPDATE

☐ YES. Publish my e-mail address so classmates can get in touch with me.

☐ NO. Do not publish my e-mail address.
A Giant Leap Forward in Seating

When it comes to developing seating, you could say that Tamara Reid-Bush jumps right in. Reid-Bush, a visiting assistant professor in the Department of Mechanical Engineering, was involved in the development and testing of Steelcase’s Leap seat, an ergonomic chair that conforms to the body and moves with the user. As the occupant’s posture changes, the chair’s back morphs to the spinal motion. The chair’s seat and arms also move as the occupant changes position.

“I performed the evaluation of Leap technology and studied how it interfaced with people to determine whether it met the design goals set forth by Steelcase,” she says.

Retro-reflective targets—22-millimeter spheres coated with a surface that reflects infrared light—were placed on the chairs and on the human subjects, explains Reid-Bush, to capture the motions of both the chair and the body. “The three-dimensional data of each of these target locations were then transferred to a computer where various calculations were performed on the motion patterns. These data, along with measurements of the spinal motions and contact pressures, were used to assess the performance of Leap.”

Each individual has a unique “spineprint.” Like a fingerprint, no two spineprints are the same. Unlike a fingerprint, a spineprint changes as an individual moves. So the challenge was to design a chair that would support an infinite variety of spines in an infinite variety of positions. Never before had Steelcase developed a product that required such a large amount of scientific input. Here’s what it took: 11 studies, 732 test participants, 4 universities, 27 scientists, and 48 patents.

After four years of research, the Leap chair hit the market in June 1999. It is now Steelcase’s bestselling chair. Automotive and airline seat manufacturers are now interested in the seat. “The Leap technology has been incorporated into an automobile seat developed by Johnson Controls,” says Reid-Bush, who helped test that seat as well. It was displayed at the 2005 North American International Auto Show in Detroit in January.


Fun Fact Leap chairs have their day in court—they appear on NBC’s Law & Order. They also appear on ESPN’s Pardon the Interruption.
Looking Back

This image was labeled “1953—Casting Metals.” Can anyone tell us more about this photo?

M.A.C. in a Nutshell

Area of campus, 90 acres.
Value of grounds, $71,775.
Number of buildings, 22.
Value of buildings, $907,200.
Value of laboratory equipment, etc., $900,000.
Number of books in library, 89,586.
Income of College, 1915: Mill tax from the state, $560,000; fees, $180,000; from U. S. government, $179,000. Total, $869,000.
Departments, 4.
Courses, 5.
Faculty: 4 deans, 19 professors, 12 associate professors, 27 assistant professors, 74 instructors.
Enrollment of students, 1914-15, 1,990.
Last graduating class, 1915, 228.
First graduating class, 1861, 7.
Total number of degrees granted, 2,481.