Greetings from Agricultural and Biological Engineering

Welcome to the latest issue of ABE@Illinois—this one featuring then and now. Since assuming the position of interim head this year, I have learned a great deal more about the amazing work in which our faculty are currently involved. Our new dean, Dr. Kim Kidwell, who joined us in November 2016, is a strong proponent for ABE. She has challenged us as individuals and as a department to articulate what we do and why it matters. Our faculty were asked to document both of those, and it is uplifting to see the wide scope and depth of activities in which we are making a difference both locally and internationally—nearly representing the now.

The department’s almost 100 years of incredible accomplishments are documented in two books (abe.illinois.edu/about/history). Their narratives offer a remarkable record of activities that underpin this great department—a reflection of the many. Some of the articles in this issue likewise document activities and achievements of our past.

My own path from then to now featured three six-month sabbatical visits from the University of Kwa-Zulu-Natal in South Africa to the ABE department at Illinois. The visits, which took place at five-year intervals starting in 1987, sowed the seeds that facilitated my applying for a position in ABE in 1999, and ultimately my being chosen to fill it. As you will discover from reading through ABE@Illinois, other faculty and alumni have had interesting and diverse paths from then to now.

One of our current students is even reaching for the moon! Among the stars, Prasanta Kaita has been a professor in the ABE soil and water division since 1999. In 2016, he took on the position of associate dean of academic programs for the College of AACES. Prasanta will continue to teach Water in the Global Environment, a Campus Honors Program course.

One of our new faculty members joined our department this academic year. Girish Chowdhary is an assistant professor in Off-Road Equipment Engineering and director of the Distributed Autonomous Systems Lab. His research interest is in theoretical insights and practical algorithms for adaptive autonomy, with a particular application focus on field robotics and unmanned aerial systems. Neslihan Akdeniz is a clinical assistant professor in Bioenvironmental Engineering. Her extension and research interests include livestock manure management, catastrophic animal mortality management, odor and air emissions from animal buildings, and animal agriculture and climate change adaptation.

Scott Brethourner, since 2003 an extension specialist with the department in aerial application technology, led the Pesticide Safety Education Program (PSEP) until 2016, when he left ABE for work in the private sector. Matt Gill began an internship with Scott in 2010. Matt’s freshman year as an agricultural engineering student. He worked as an intern throughout his undergraduate years and received his bachelor’s degree in 2014. He will receive his master’s in late 2017. Matt was hired this year as an outreach specialist and will head the PSEP program for the department.

Best regards,

Interim Head
Roscoe Pershing, M.S. ’64 AgE, Ph.D. ’66 AgE

Roscoe Pershing has the distinction of receiving the first Ph.D. that the U of I granted in agricultural engineering. The year was 1966. Pershing already had two degrees in the field, a bachelor’s from Purdue and a master’s from Illinois, but the Illinois Ph.D. was a near-miss. “There was no Ph.D. program in ag engineering at that time,” Pershing says, “so I was studying for a doctorate in theoretical and applied mechanics [TAM]. I was one or two courses short when the Ph.D. in ag engineering was established.” He transferred his coursework and continued his study of field data to predict tractor behavior on roadside slopes from a mathematical model.

Computer modeling was much different in the mid-’60s, and Pershing would carry boxes of them to north campus to run a program. “It was an overnight process, sometimes my program would say ‘AbEnd’—abnormal end. If I made one mistake or misspelling or forgot a comma, the whole thing failed, but I didn’t know it until the next day. It was pretty annoying.”

After finishing his doctorate, Pershing received multiple employment offers from industry and academia, including Ford, Deere, GE, Texas A&M, North Carolina State, Minnesota, and Illinois. Two paid internships with Deere and Company during his undergraduate years influenced his decision to accept a position as a senior research engineer. He spent 19 years at Deere in research and development, service, marketing, and corporate management.

In 1985, Pershing was asked to consider applying to be department head in agricultural engineering at Illinois. He threw his hat in the ring.

“I knew I had a great job back at Deere, so when I came to Illinois to interview, I was pretty relaxed,” he says with a laugh. “I was amazed at their offer. I’d done some part-time teaching at Black Hawk College while I was at Deere, but I didn’t really have an academic background. They were going to give me tenure as a full professor. That was pretty hard to turn down.”

When Pershing began as department head, there was no introductory course for ag engineering, so he developed AgE 100 and taught the class himself. “The students were surprised when the department head showed up to teach, but I wanted to get to know them. I wanted to use my industry background to help them understand engineering from the outside.”

One issue Pershing faced as head was the floundering agricultural mechanization program. “I was told to kill it or fix it. I decided to fix it. I asked everyone I knew, ‘Who’s the best guy in ag mech?’ The answer was always Phil Buriak. So I recruited Phil, and he more than doubled the number of students. Now it’s called ‘Technical Systems Management’ [TSM] and it’s an amazing program.”

Other projects Pershing tackled included setting up a computer lab for students—and holding seminars to teach faculty to navigate the fairly new technology.

Pershing left the department in 1993 to become associate dean for academic programs in the College of Engineering, where he remained until his retirement in 2004. Pershing’s interest in computing continues. “I meet with other computer experts for whatever life might throw at you.”

“If I made one mistake or misspelling or forgot a comma, the whole thing failed, but I didn’t know it until the next day. It was pretty annoying.”

Punch cards were the technology of the day, and Pershing would carry boxes of them to north campus to run a program. “It was an overnight process, sometimes my program would say ‘AbEnd’—abnormal end. If I made one mistake or misspelling or forgot a comma, the whole thing failed, but I didn’t know it until the next day. It was pretty annoying.”

Through the years

Alumni from the last six decades give glimpses into the changes in life at Illinois—from then . . . ’til now.
Steve Ford, B.S. ‘87 AgM

“The advent of the personal computer was the major development in the mid-to-late 1980s,” Steve Ford says. “Even small companies in the agricultural equipment manufacturing sector had access to affordable CAD [computer-aided design] programs and CNC [computer numerically controlled] tools.”

“However,” he continues, “the computers and programs of that time were pretty much standalone, in contrast to today’s ‘connected’ society.”

Ford points to a change in the student population since his time as an undergraduate. “Fewer ABE and TSM students have farm backgrounds today,” he says. “And movies streamed on a computer or phone were far in the future. ‘At that time, showing movies was a way the Ag Mech club to make money. Student organizations could reserve a large lecture hall on campus and rent a film to be shown on Friday or Saturday night. To Catch a Thief with Cary Grant was one I remember watching.”

After graduation, Ford worked with GSI–Grain Systems in engineering product development for three years. In 1990, he returned to the department to manage the BESIIS (Bioenvironmental and Structural Systems) Laboratory.

“The BESIIS Lab is to agricultural ventilation fans what the Nebraska ‘tractor test Lab’ is to tractors,” Ford says. “We measure airflow and energy efficiency of fans used in livestock housing and publish the data for end users. I meet and work with people from all over the U.S., Europe, Asia, and Central and South America. ‘It’s what I enjoy most about the job.’

When asked for a favorite memory of his time as an undergraduate in ABE, Ford had a quick answer. “Getting married to my great wife between my junior and senior years!”

Christopher Behme, B.S. ‘94 AgM

“Most significant in agriculture and the economy are the exponential changes in technology and how we manage it,” says Chris Behme. “The advent of the personal computer was the major development in the mid-to-late 1980s, and to understand how regulation impacts application of new technologies.”

After graduating from Illinois, Behme earned a master’s degree in agricultural engineering from Texas A&M University. Today he is a partner and managing director at the North America KPMG AEC Group, based in Chicago.

“Recall the Department’s ‘show and tell’ visits?” Behme asks. “If so, then you might recall Roscoe Pershing, who was a professor and department head, and Phil Buriak, who was the department’s assistant professor.”

Behme says, “The camaraderie in the department. Roscoe Pershing was the department head, and Phil Buriak led the ag mech section. Those two men made sure every single student felt like they had a home here. It was very easy to connect with faculty and other students in ABE.”

In fact, Behme says, a fellow ABE alum was present on one of the ‘show and tell’ visits. The bicycle the student was carrying was a bike that Behme’s girlfriend had owned since she was a child.

“When I was a student I was taught structures and environment, power and machinery, soil and water, and food processing. I did specialize in a field, but I really wasn’t an ‘expert’ in only one area. I didn’t realize how important it was for me to learn those basic principles in other areas until I was out working with farmers. They always have questions that require me to use all the basic engineering principles taught in those classes. I work with other ag engineers who graduated in the ’70s and ’80s, and it’s great to see how well-rounded and versatile they are.”

Away from the job, Robert volunteers with the local Knights of Columbus Council, and for the last 11 years he has done the Polar Plunge to raise money for Special Olympics.

Matt Robert, B.S. ’96 AgE, M.S. ’00 AgE

“The biggest innovation coming out of ag engineering when I was in college was GPS-driven tractors and equipment,” says Matt Robert. “It’s what everyone was talking about. Today GPS equipment can be found on every farm.”

“The improvements of gas detection and the measurement of air quality had the most impact on my career.”

Robert says being a problem solver is his favorite part of the job. “When I was a student I was taught structures and environment, power and machinery, soil and water, and food processing. I did specialize in a field, but I really wasn’t an ‘expert’ in only one area. I didn’t realize how...”

Brian Jacobson, B.S. ’10, TSM

Brian Jacobson has seen progress continue in automation in manufacturing and ag production after coming to Illinois. “As a freshman, I worked at a company helping set up automated production equipment in a manufacturing facility,” Jacobson says. “I also remember seeing experimental ‘miniature aircraft’ and helicopters on the first floor of the ag engineering building.”

“Today, production automation is almost required to be competitive,” he continues. “Those aircraft—now known as drones—are everywhere, serving important commercial uses in agriculture and other fields. Automation has even entered people’s personal lives through ‘smart home’ devices that you can speak to.”

Another area Jacobson is excited about is using biological material for energy and consumer product production. “While corn ethanol has been around for some time, new patents are being filed and projects developed every day that greatly expand our ability to use biomass as a production input.”

Jacobson works in ACES as the manager for the FISHN (Food Science and Human Nutrition) and IBRL (Integrated Bioprocessing Research Laboratory) pilot plant facilities. His responsibilities include overseeing renovation and construction activities.

“The pilot plants are flexible facilities for teaching and for research and development, so I’m constantly working on different problems and projects, with different people, for different stakeholders. That change keeps me motivated, and the large expansion in capabilities we will have after all the construction is complete is very exciting.”

Jacobson spends his time off work with his wife and their two-year-old son, sometimes traveling west to visit friends on extended camping trips in Wyoming. He also enjoys cooking for friends and family and does a whole hog roast at least once a year.
“Big data,” is changing the world of agriculture as we know it, says Chris Harbourt, ABE alumnus and CEO of Agrible, Inc. “Minute by minute, day by day the landscape for growers and food companies is adjusting and reacting based on data that companies like ours are presenting. We help both growers and companies utilize that information.” Harbourt has been working since the mid-’90s to transform ‘Big data’ – making sense out of ‘big data’ is changing the world of agriculture.

Rain Gauge, Pocket Spray Smart, and Pocket Drone Control.

“Rain Gauge provides accurate location-specific rainfall measurements. Pocket Spray Smart assists growers in applying crop protection products where they are needed most. Pocket Drone Control allows farmers to fly drones for crop monitoring and yield predictions.”

Agrible’s predictions are impressive in their accuracy. “We’re limited only by the accuracy of the weather forecast, but even in outside cases, we come within five percent,” Harbourt notes. “When we get to the end of a season and all the weather has occurred, our models are almost an exact match with the yields growers see coming out of the field.”

Agrible has more than 6,000 clients in 69 countries and 44 states, with a large presence in both the U.S. and Brazil. The company began with two people and now has more than 60 employees. “There’s an interesting social piece to the company,” Harbourt says. “I have employees that are 16 and all the way up to 70. One of our app developers is 16—a brilliant kid. Then we have employees who are the same age as the average grower today—they’re really interested in staying engaged in new technology and want to have fun.”

Harbourt received his master’s degree and his Ph.D. in agricultural engineering from the department in 1999 and 2002, respectively. The black-and-white photo shows Harbourt as a graduate student working on a computer that he said had less power than the average tablet used today. “I’m sitting there pulling data together and trying to analyze one day of storm information. It took me a year and a half. That was my whole master’s program. Now Agrible’s Pocket Rain Gauge gets 30,000 to 40,000 uses a day and at each of those locations, it’s doing more calculations than I did in my master’s degree. And it’s free. The democratization of technology has been quite amazing.”

Preparing students for ‘big’ futures

Scientists will tell you that the importance of big data isn’t how much data you have, it’s what you do with it that matters. While it’s true, examining and analyzing large and varied data sets is a skill that continues to increase in importance.

To meet this need, Luis Rodriguez, an associate professor in ABE, has developed the Food and Agriculture Big Data (FAB) Fellowship Program. “Before now, our ability to create people who were ready to work in the area of big data was limited but growing. The FAB Fellowship expands on that growth. It will be an effective credential that demonstrates the depth of a student’s training in food and agriculture, big data, and the ability to analyze complex systems,” Rodriguez says.

The program is recruiting first- and second-year students who will take courses in computing, statistics, and data analysis as well as participate in laboratory research, pursue study abroad opportunities, and participate in international industrial immersion. The FAB Fellowship is part of a USDA National Institute of Food and Agriculture grant that funds the DIFM—Data-Intensive Farm Management—program. The interdisciplinary DIFM uses precision agriculture technologies to run full-field, on-farm agronomic trials that change application rates of nitrogen fertilizer. David Bullock, a U of I agricultural economist, is the project’s principal investigator, and Rodriguez is one of 26 researchers and extension personnel from six universities who coordinate the on-farm experiments across 100 fields in Illinois, Nebraska, Kentucky, Argentina, and Uruguay.

Because of this study will generate substantial data, Rodriguez and his colleagues felt it was important to have a strategic and more holistic approach to preparing students to work with big data. He has recruited five first- and second-year students who have expressed an interest in developing their computational skills as well as their understanding of food and agriculture.

“Somewhere along the line, they picked up the idea that there are real opportunities here,” Rodriguez says. “This program will bolster their undergraduate education in a way that will put them in a better position down the line to contribute to the field at an entry level, whether that’s graduate education or industry.”
In 2017, we mark the sesquicentennial anniversary of the University of Illinois. The Department of Agricultural and Biological Engineering has been an integral part of our university’s 150 years—albeit under several names. Let us share just a few highlights…

1867 The Illinois General Assembly passes a bill authorizing the creation of the Illinois Industrial University. John Milton Gregory is the first regent.

1867 The first building on the Illinois Industrial University campus.

1867 Time line photos (left to right): a) First building on the Illinois Industrial University campus. b) Ag engineers demonstrate surveying skills in 1913. c) Engine short cuts in 1920. d) A. James, Ed Hansen and Art Malby discuss plans for the Moorhead Research Farms. e) Emeritus professors conduct their own groundbreaking as the AESB project gets underway on May 26, 1981. f) Roar Irgens led the way in the aerobic research program. g) Carroll Goering adjusts a dual fuel tractor engine that burns either ethanol or diesel fuel. h) Architectural drawing for IBRL.

1867 The department name becomes Agricultural Engineering.

1878 Roger R. Yoerger is named the third department head of Agricultural Engineering.

1900 The Division of Farm Mechanics (the original name for our department) is formed in the Department of Agronomy in the College of Agriculture.

1921 The discipline of agricultural engineering separates from the Department of Agronomy as part of a new Department of Farm Mechanics. The first head of the new department is Emil W. Lehmann.

1934 The Illinois Student Branch of the American Society of Agricultural Engineers holds its first meeting on October 9.

1934 The first Bachelor of Science degree in Agricultural Engineering is awarded to H. Paul Bateuman, who joins the faculty and serves until his retirement in 1968.

1948 Barbara Jordan is the first woman to receive a bachelor’s degree in the Department of Agricultural Engineering.

1948 Frank B. Lanham is named the second department head of Agricultural Engineering.

1955 Roscoe Pershing becomes the first Ph.D. recipient in the Department of Agricultural Engineering.

1955 The degree in Agricultural Mechanization is renamed Technical Systems Management.

1960 The Illini Agricultural Mechanization Club is established.

1963 The department moves to the new Agricultural Engineering Sciences Building at 1304 W. Pennsylvania, Urbana.

1960 Time line photos (left to right): a) Ag engineers demonstrate surveying skills in 1913. b) Biotechnologists discuss plans for the Moorhead Research Farms. c) Emeritus professors conduct their own groundbreaking as the AESB project gets underway on May 26, 1981. d) Roar Irgens led the way in the aerobic research program. e) Carroll Goering adjusts a dual fuel tractor engine that burns either ethanol or diesel fuel.

1966 Roscoe Pershing becomes the first Ph.D. recipient in the Department of Agricultural Engineering.

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1966 Roscoe Pershing becomes the first Ph.D. recipient in the Department of Agricultural Engineering.

1978 The Department of Agricultural Engineering achieves its first #1 national ranking in a survey published by U.S. News and World Report. The department goes on to earn the #1 ranking four more times and remain in the top five nationally.

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1994 Roscoe Pershing is named the fourth department head of Agricultural Engineering.

1996 The degree in Agricultural Mechanization is renamed Technical Systems Management.

1996 Time line photos (left to right): a) First building on the Illinois Industrial University campus. b) Biotechnologists discuss plans for the Moorhead Research Farms. c) Emeritus professors conduct their own groundbreaking as the AESB project gets underway on May 26, 1981. d) Roar Irgens led the way in the aerobic research program. e) Carroll Goering adjusts a dual fuel tractor engine that burns either ethanol or diesel fuel. f) Architectural drawing for IBRL.

1996 The degree in Agricultural Mechanization is renamed Technical Systems Management.

2000 Agricultural and Biological Engineering is adopted as the new department name to reflect changes in the discipline as food, environmental, and energy systems begin to play a significant role in our economy.

2004 K.C. Ting, Ph.D. ’80 AgE, is named the sixth department head of Agricultural and Biological Engineering.

2004 Time line photos (left to right): a) First building on the Illinois Industrial University campus. b) Biotechnologists discuss plans for the Moorhead Research Farms. c) Emeritus professors conduct their own groundbreaking as the AESB project gets underway on May 26, 1981. d) Roar Irgens led the way in the aerobic research program. e) Carroll Goering adjusts a dual fuel tractor engine that burns either ethanol or diesel fuel. f) Architectural drawing for IBRL.

2011 Loren Bode is named the fifth department head of Agricultural Engineering.

2011 The Technical Systems Management program offers students their first opportunity to earn a master’s degree.

2011 Time line photos (left to right): a) First building on the Illinois Industrial University campus. b) Biotechnologists discuss plans for the Moorhead Research Farms. c) Emeritus professors conduct their own groundbreaking as the AESB project gets underway on May 26, 1981. d) Roar Irgens led the way in the aerobic research program. e) Carroll Goering adjusts a dual fuel tractor engine that burns either ethanol or diesel fuel. f) Architectural drawing for IBRL.

2012 Yuanhui Zhang, professor in ABE, is invested as the Innoventor Professor in Engineering, the first named chair in the Department of ABE.

2012 Time line photos (left to right): a) First building on the Illinois Industrial University campus. b) Biotechnologists discuss plans for the Moorhead Research Farms. c) Emeritus professors conduct their own groundbreaking as the AESB project gets underway on May 26, 1981. d) Roar Irgens led the way in the aerobic research program. e) Carroll Goering adjusts a dual fuel tractor engine that burns either ethanol or diesel fuel. f) Architectural drawing for IBRL.

2013 The state’s Capital Development Board designates $20 million to build the Integrated Bioprocessing Research Laboratory (IBRL) on the ACEs campus. ABE professor Dr. Vijay Singh is later named director of IBRL.

2013 Time line photos (left to right): a) First building on the Illinois Industrial University campus. b) Biotechnologists discuss plans for the Moorhead Research Farms. c) Emeritus professors conduct their own groundbreaking as the AESB project gets underway on May 26, 1981. d) Roar Irgens led the way in the aerobic research program. e) Carroll Goering adjusts a dual fuel tractor engine that burns either ethanol or diesel fuel. f) Architectural drawing for IBRL.

2017 Angela Green is the first tenured female professor in the Department of ABE.

2017 Time line photos (left to right): a) First building on the Illinois Industrial University campus. b) Biotechnologists discuss plans for the Moorhead Research Farms. c) Emeritus professors conduct their own groundbreaking as the AESB project gets underway on May 26, 1981. d) Roar Irgens led the way in the aerobic research program. e) Carroll Goering adjusts a dual fuel tractor engine that burns either ethanol or diesel fuel. f) Architectural drawing for IBRL.

2017 Time line photos (left to right): a) First building on the Illinois Industrial University campus. b) Biotechnologists discuss plans for the Moorhead Research Farms. c) Emeritus professors conduct their own groundbreaking as the AESB project gets underway on May 26, 1981. d) Roar Irgens led the way in the aerobic research program. e) Carroll Goering adjusts a dual fuel tractor engine that burns either ethanol or diesel fuel. f) Architectural drawing for IBRL.

2017 Time line photos (left to right): a) First building on the Illinois Industrial University campus. b) Biotechnologists discuss plans for the Moorhead Research Farms. c) Emeritus professors conduct their own groundbreaking as the AESB project gets underway on May 26, 1981. d) Roar Irgens led the way in the aerobic research program. e) Carroll Goering adjusts a dual fuel tractor engine that burns either ethanol or diesel fuel. f) Architectural drawing for IBRL.
While many new university students spend their first year largely adjusting to college life, Alex Darragh, a freshman in ABE, decided to shoot for the moon. Literally.

Darragh and Matt Steinlauf, a freshman in mechanical engineering, entered the Lab2Moon Challenge, an international competition sponsored by TeamIndus, an aerospace research organization. The competition required students to design and build an experiment that would help develop sustainable life on the moon. TeamIndus would manufacture the winning design and include it on a voyage to the moon in December of 2017.

The aspiring engineers designed a miniature greenhouse enabling humans to grow crops in lunar soil. About the size of a beverage can and weighing less than half a pound, the galactic greenhouse has an Archimedes’ screw that drills into the ground, lifts lunar soil (also called regolith), and drops it into rotating cups inside the device. When the screw retracts, the hole closes, and the device pressurizes, heats up, and exposes the regolith to atmospheric gases including oxygen and nitrogen. Tubes deposit seeds, water, and fertilizer into the cups, and once a plant starts to grow, it is monitored by sensors and a camera.

Because lunar soil lacks nitrogen, the team chose to grow blue lupine, a bean that takes nitrogen from the air. The idea is to introduce nitrogen and other fertilizers at various levels and gather data to determine which fertilizers will be the most effective. Regolith Revolution, the Darragh/Steinlauf team, grew the bean in regolith simulant, a form of crushed volcanic ash.

“We tested different fertilizer solutions to find the one that worked best with lunar soils and plants to minimize the amount of nutrients you would have to bring to the moon,” Darragh says. “The blue lupine grew extremely well.”

TeamIndus is one of five privately held companies traveling to the moon in December, hoping to win the Google Lunar XPrize, a global competition to challenge and inspire engineers and entrepreneurs to develop low-cost methods of robotic space exploration. To win the $30-million prize, a privately funded team must successfully place a robot on the moon, travel at least 500 meters, and transmit high-definition video and images back to earth.

To increase opportunities for lunar research, TeamIndus developed the Lab2Moon Challenge, which spurred entries from more than 3,000 teams in 15 countries. The second phase of the competition narrowed the field to 25 teams. Regolith Revolution was one of three teams from the United States to make the cut. Several teams were from India, and the United Kingdom, Italy, Spain, and Mexico were also represented.

Of the 25 teams, 15 traveled to Bangalore, India, in March to present their designs to TeamIndus. Judges narrowed the field to seven teams qualified to join the mission—including Regolith Revolution.

The final challenge for each of the seven teams was to raise $750,000 to pay for the experiment. Darragh says he and Steinlauf were unsuccessful in securing the required funding by the deadline.

Prasanta Kalita, a professor of agricultural engineering and associate dean of academic services in the College of ACES, was a sponsor for the team. He gave the competitors laboratory space and connected them with a lab assistant and other Illinois professors. He has nothing but praise for the young inventors.

“We live in a world where our greatest problem will be feeding nine billion people by the year 2050,” Kalita says. “We won’t have enough food, so here are two students who come up with the idea of growing food on the moon. They have never faced hunger, yet they wanted to do something. They had the background and the ability, and they were totally dedicated. I think it was a remarkable effort.”

Although Darragh had hoped for a different outcome, he concludes, “This has been an amazing experience as an aspiring engineer. It was great to be part of a project that has so much potential.”

The state-run Indian Space Research Organization will launch the TeamIndus spacecraft from Andhra Pradesh in late December.
Loren Maxey – Paying it forward

This year, with a desire to help others “move on to that engineering future,” Maxey established the Loren R. Maxey Scholarship, which will give tuition assistance to third-year students in ABE.

“Then was when the best thing happened. Dr. Lehmann wanted to know if I would be interested in staying on during the summer to turn a small, older farmhouse at the back of the property into living quarters for me and my bride-to-be.”

Lehmann during the professor’s absence and taking over management of the nursery.

Maxey began work on the house in June, taking two weeks off for a honeymoon in July. The newlyweds came back to Urbana and rented a small apartment for six weeks. By the start of the school year, the lower level of the house was insulated, the outer walls were finished, appliances were in, and the bath was functional. “We moved in with sheets on the inside walls and a bed in the unfinished living room. When we moved out, the house, the yard, and the garage were finished and ready for the next occupants.”

Because of his friendship with the Lehmans, Maxey says he was able to meet and interact with many other staff and faculty members, including Frank Lanham, a future ag engineering department head; Ben Jones, a faculty member who would be with the department for 40 years; and Doyle Funke, the research engineer who supervised Maxey’s senior project; and Frank Andrews, the ag engineering extension specialist in farm electrification. “It was a fantastic three years,” Maxey says.

Maxey graduated with a degree in agricultural farm mechanization in 1958. Over the next 10 years, he worked as a draftsman for an airplane manufacturer, national customer service manager for an arc welder manufacturer, and engineering manager of a sugar beet equipment company. He started his own manufacturing company in 1969 to build irrigation sprinklers for turf grass farms. Maxey Companies evolved over 45 years, building truck bodies, equipment trailers, and snow grooming equipment for ski areas and snowmobile trails.

This year, with a desire to help others “move on to that engineering future,” Maxey established the Loren R. Maxey Scholarship, which will give tuition assistance to third-year students in ABE.
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ger 100 years, agricultural and biological engineers around our country and the world have looked to their professional society for leadership and support. Founded in 1907 by J. Brownlee Davidson, the American Society of Agricultural and Biological Engineers has over 9,000 members in more than 100 countries. Contributors to the organization’s long and distinguished history include 11 from our department who have served the society as presidents.

These are alumni Doug Bosworth, M.S. ’64, Larry Huggins, M.S. ’62, and Robert Gustafson, B.S. ’71, M.S. ’72. Bosworth was president of ASABE in 1993–94, Huggins in 1999–2000, and Gustafson in 2003–2004. Each took time to share some of their experiences as president and their thoughts on changes in their discipline over the years.

Q: What was new in the discipline at the time of your tenure? Bosworth – “The early 1990s had seen the increased use of electronics and satellite technology that was being labeled ‘precision farming.’ The growth in this part of agricultural engineering has been phenomenal in increasing productivity, safety, and efficiency of agricultural production. Members of ASABE are leaders in this technology, and many are graduates of our programs.”

Huggins – “The big issue was about the future role of biological engineering and how to integrate it into the profession without offending the ‘traditional’ subspecialties. In particular, changing the society’s name was becoming a major, multyear issue. And the rapidly emerging availability of low-cost, powerful computers was the major technology impacting not only our professional practices, but every aspect of society.”

Gustafson – “I think the way we accessed information, and other people, affected how we practiced engineering. Electronic access to information and people via the Internet was an amazing resource. But it came with a higher level of responsibility to be able to interpret and apply the information. I think this made the practice of engineering more dynamic, interesting, and even more fun.”

Q: What was your most significant achievement and your greatest challenge during your tenure? Bosworth – “In my position at John Deere, we were moving from a traditional hierarchical organization to a team-based organization. My initial goal in ASABE was to develop a team environment at headquarters. I took several Deere workshops to ASABE headquarters for staff development and training. The result was favorable, and the staff self-developed into a team structure. This was also the time when the organization changed from a semianual to annual meetings. Since this broke with tradition, there were obstacles, but one excellent meeting per year was accepted as a good model.”

Huggins – “I had the benefit of having served on and chaired the Finance Committee before becoming president, so the most significant achievement was improving the financial undergirding for the society. Growing our foundation’s endowment was a significant long-term component of the improvement. Challenges we faced included struggles with building our international membership and recognition. The society also grappling with how to help academic departments increase enrollments.”

Gustafson – “I think the biggest challenge we faced [and successfully addressed] during my term was a name change for the society. A name reflects many things to current members and projects a significant message to potential members and the public. Although we considered a number of names that would reflect the current and desired nature of the society, I was pleased that members rallied around picking a name that would best serve the future of the society.”

Q: What role do you see for ag and bio engineering in addressing some of the problems society faces? Bosworth – “The entire scope of production agriculture and the industries that serve agriculture has little resemblance to that of 20 years ago. The incorporation of the biological sciences is natural for our programs and has brought the expertise of our researchers to nanotechnology levels. It’s exciting to see the research and development of our professionals in industry and academia. There will be no ‘leveling off’ of engineering in this field as population growth continues, demands for more nutritious foods grow, and resources to produce food, fiber, and energy become limited.”

Huggins – “I believe our role must continue to be the unique focus on how to best produce, store, and process agricultural/food products. This will utilize our unique engineering-based educational programs having a biological emphasis to innovate applications that make a positive difference.”

Gustafson – “We are well positioned to practice engineering in a way that creates sustainable and applied solutions to some of the most challenging problems of food, water, energy, and environmental health locally and worldwide. We can collaborate across other disciplines that share our passion for seeing an abundance of food and water resources, in a world where energy is used in a sustainable manner and the environment is protected or maybe even improved.”

Q: Any words of wisdom for today’s graduates? Bosworth – “Find a career that can benefit mankind, provide a great vocational opportunity for yourself, and have personal satisfaction.”

Huggins – “One’s attitude and how well one respects and works with other people will be the keys to ultimate personal success and impact.”

Gustafson – “The need to be professionally affiliated with an organization like ASABE is critical to continued professional success. It is both a resource and a means for making contributions well beyond what we can do as individuals.”

“From the top 100 years, agricultural and biological engineers around our country and the world have looked to their professional society for leadership and support. Founded in 1907 by J. Brownlee Davidson, the American Society of Agricultural and Biological Engineers has over 9,000 members in more than 100 countries. Contributors to the organization’s long and distinguished history include 11 from our department who have served the society as presidents. These are alumni Doug Bosworth, M.S. ’64, Larry Huggins, M.S. ’62, and Robert Gustafson, B.S. ’71, M.S. ’72. Bosworth was president of ASABE in 1993–94, Huggins in 1999–2000, and Gustafson in 2003–2004. Each took time to share some of their experiences as president and their thoughts on changes in their discipline over the years.”
Many ABE alumni and friends of the department stay connected to our department through participation in the External Advisory Committee (EAC). Members bring their unique understandings of our department, their experiences in the workplace, and their knowledge of the industry to the table. Their contributions have been significant and instrumental in the growth of our program.

Chad Yagow, B.S. ’01 AgE, and Kay Whitlock, B.S. ’70 AgE, are past members of the committee who began their six-year appointments in 2007. Yagow continues to serve the department as the ABE representative to the ACES Alumni Board. Here the two offer both reflections on the past and advice for the future of the department.

Whitlock begins: “During my tenure, the Ag Mech major morphed into Technical Systems Management [TSM], and the department name was changed from Agricultural Engineering to Agricultural and Biological Engineering. Those changes were more than just words. They are a better fit for some of the challenges in our society.”

Yagow says later changes made in TSM aided funding efforts for the department. “Since we opened up our programming in TSM, transfers from other departments were able to take some of the core curriculum classes we offered. That helped generate the instructional units we needed to get funding to allow growth in the department. It also allowed students to see what else we had to offer from the standpoints of teaching and hands-on research. TSM has blossomed, and the department has doubled in size.”

With the name change to Agricultural and Biological Engineering, Yagow says, there has been a definite shift in the emphasis of the department. “We’ve done some strategic hiring in the biological area, and there has been more growth than in the more traditional disciplines like power machinery and off-road equipment. The change has made the department much more diverse than when I was a student,” he says. “And that’s a good thing. I do think we have to be careful to balance the swing of the pendulum. Even in those years, almost all our undergraduate students were white, Christian, Illinois family farm boys.”

Today when she walks into the ag engineering building, Whitlock says, “I see diversity in every sense of the word. I know we’re delivering a well-educated and diverse group to take on the challenges of the future.”

Yagow agrees: “Agricultural and biological engineers are going to play a critical role in the challenge of feeding the world’s population in the future.”

Among the things that the department can do to prepare students: “We need to transfer information, through writing or speaking, to people who need it will be paramount in importance.”

In April, the current External Advisory Committee met to address needs and challenges faced by today’s department. Topics included the value of creating a non-thesis master’s in engineering, finding a focus for the department’s diverse research, increasing engagement with our alumni, and defining clear goals in our fundraising efforts.

The department looks ahead to a challenging and exciting future, and we would like to express our gratitude to all the men and women who have served on the EAC. Your commitment to our department is appreciated more than we can say, and your contributions have made, and will continue to make, our program one of the best in the nation.
The Tractor Laboratory in the late 1920s

We want your feedback about ABE@Illinois. Please send your comments to Leanne Lucas at llucas@illinois.edu.