Wisconsin engineer. Volume 94, No. 1 October, 1989

Madison, Wisconsin: Wisconsin Engineering Journal Association, [s.d.]

https://digital.library.wisc.edu/1711.dl/7P3DBZ6M5SIJV8I

Volume 94, No. 1 October, 1989

wisconsin engineer

Inside:
Centennial Photo Essay
Women in Engineering
Technology and the Marketplace
and much more...

Wisconsin Engineer Magazine
Mechanical Engineering Building
1513 University Avenue
Madison, Wisconsin 53706

Nonprofit Organization
U.S. Postage
PAID
Madison, WI
Permit No. 658

wisconsin engineer

PUBLISHED BY THE STUDENTS OF THE UNIVERSITY OF WISCONSIN-MADISON, OCTOBER 1989

TABLE OF CONTENTS

The *Wisconsin Engineer* magazine, a charter member of the Engineering College Magazines Associated, is published by and for engineering students at UW-Madiosn. Philosophies and opinions expressed in this magazine do not necessarily reflect those of the College of Engineering. All interested students have an equal opportunity to contribute to this publication.
Publisher's Representative: Cass Communications, 1800 Sherman Ave., Evanston, IL 60201-3715. (312) 475-8800
Publisher: Community Publication, McFarland, WI 53558
ECMA Chairperson: Lee Atchison, Hewlett Packard, Ft. Collins, CO 80525
Correspondence: Wisconsin Engineer Magazine, Mechanical Engineering Building, 1513 University Ave., Madison, WI 53706. Phone (608) 262-3494. The *Wisconsin Engineer* is published five times yearly in October, December, March, May, and July by the Wisconsin Engineering Journal Association. Subscription is $10.00 per year.

EDITORIAL

Webster's Dictionary defines an engineer as "one who is skilled in the principles or practice of any branch of engineering." It doesn't say, "a **man** who is skilled..." However, if you were to ask an average group of people to describe an engineer, as long as they didn't try to impress you with their brilliance by saying "a guy who drives a train," they would probably begin their explanation with "he" and describe pictures of a man at a drafting table designing building plans or under the hood of a car examining engine parts.

But wait a minute. There are women engineers too, right? So what is the reason for such a stereotypical view of an engineer?

A large part of the answer is tradition. Men have been engineers for over 200 years, and people have grown to know and accept engineering as a male-dominated profession. The remainder of the answer is a lack of information. There are many people who don't really understand what engineering is. These people are exposed to doctors, lawyers, and teachers everyday, but they seldom have the opportunity to interact with engineers. They don't realize that things they take for granted, such as driving a car to work, watching a program on television, or entering data on a computer wouldn't be possible without the work of engineers. As a rapidly growing, technologically dependent society, the public needs to have a more complete understanding of what engineering is and what its capabilities are.

As it stands now, there are over 500,000 engineers in the U.S. work force, and only about 11% of these professionals are women. Likewise, here at UW-Madison, there are over 200 faculty in the College of Engineering, and only 3% of these are women.

The main reason for these low numbers, however, is not the refusal of industry and academia to hire women engineers, but rather the lack of women engineers available. At UW-Madison, of 692 engineering graduates in the past year, only 77 were women.

Because of this tradition and this lack of information, engineering is hardly considered an option for many women. Looking at the number of graduates, it is clear that there are very few women engineering role models for young women to look up to and to pattern a non-traditional career after.

To increase the prospects of women in the engineering profession, people need to gain a better understanding of what an engineer does and what kind of person can be an engineer. Young students in school should have at least a basic idea of what an engineer does. Ideally, when asked about an engineer's job, they should be able to explain that "an engineer designs mechanical devices", as easily as they would explain that "a doctor takes care of sick people." This type of education through career awareness needs to begin at the primary level and extend to high school and beyond.

At the college level, universities also need to play an important role in promoting engineering. The College of Engineering at UW-Madison works to increase public knowledge and awareness of engineering and research every two years with its Engineering Expo, a three-day event promoting engineering through displays of the College's and industry's use of technological research. The Expo provides a chance for the public to see engineering in action.

The College of Engineering also sponsors a high school outreach program in cooperation with its student engineering council and the Madison Chapter of the Society of Women Engineers. This outreach program brings engineering into the classroom with a student presentation, a videotape, and a scientific demonstration which illustrate the diversity and opportunity available in engineering, for both men and women.

The College is making strides, but more institutions have to join in its efforts. They have to take steps to promote women in engineering and engineering in general. They need to work to form a realistic impression of engineering on young minds before traditional stereotypes set in.

This type of education for the present public and for future generations is the first step toward altering a "tradition." People need to realize that engineerig is a technical, diverse, and challenging career open to both men and women. For only through such an increased awareness of the engineering profession itself will the public's image of engineering as an obscure, male-dominated profession begin to change. ■

-by Nancy Hromadka, Co-editor
Wisconsin Engineer

Dean's Corner

A Student's Impressions of Dean John G. Bollinger

I met Dean John Bollinger once before— at a business meeting about funding for the *Wisconsin Engineer*. It was interesting to see him work. In that brief time, I got to know him as I'm sure many other engineering students know him— as the discerning distributor of funds. However, that one meeting was enough to invoke curiosity in me. What is Dean Bollinger really like?

It may surprise some to hear this, but Dean Bollinger once wanted to be a professional musician playing the trumpet. Like many of us, he decided that he would be better suited to a technical field than to music . What exactly was it that got Dean Bollinger into engineering? While growing up, his father encouraged him to learn. Bollinger's father, a professor of vocational education, got his children interested in learning through doing. In the late forties/early fifties, as many people around the U.S. were buying their televisions, Bollinger was making his own television from a kit his father brought home one night. Besides a television, Bollinger has also built a sailboat practically from scratch, and his first car was fixed-up in a similar manner.

Bollinger was once a student here at the UW. He said he chose the UW because Wisconsin has a great campus, and it is his father's alma mater. While a student here, Bollinger was very active in student organizations—the *Wisconsin Engineer*, Engineering EXPO, and the sailing club, just to name a few. When asked what he remembers most about his university career, he named two aspects: extracurricular activities and the faculty.

With extracurricular activities, "You had the opportunity to really develop your personal skills and find the satisfaction in areas that were non-academic. What I liked about Madison... were all these niches where you found these personal associations..."

The other aspect Bollinger named was the faculty. He found that the UW had "a very demanding faculty, but a very thorough faculty." He felt that,"if you put your effort in, you sensed that you were getting something out." Well, Dean Bollinger must have put in a lot of effort, and gotten something out of the school, because in 1960, he became one of the "demanding faculty". In 1981, he became Dean of the College of Engineering.

As Dean, what does Bollinger do? Well, the position of dean was created in order to relieve growing administrative duties on the faculty. Some of these duties include fund-raising (two thirds of the College's budget is raised through private funding), distribution of funds, and overseeing various programs in the College of Engineering.

Even with all his power as dean, certain things are still beyond his control. When asked for one thing that the University needed to change, the Dean replied," We need to start winning some football games. That way the administration will be able to concentrate on other important things that need to be addressed."

What one word does Dean Bollinger think describes him best? " Dedicated."

A very fitting description. ■

- by Sharon Chen, Co-editor
Wisconsin Engineer

Statistics

Born: May 28, 1935 in Grandforth, North Dakota; raised in New York City until third grade, when moved to Manhassette, New York

Schooling:

High School- Manhassette High
Bachelors- University of Wisconsin-Madison; ME and EE
Masters- Cornell University
Doctorate- University of Wisconsin-Madison; EE and IE

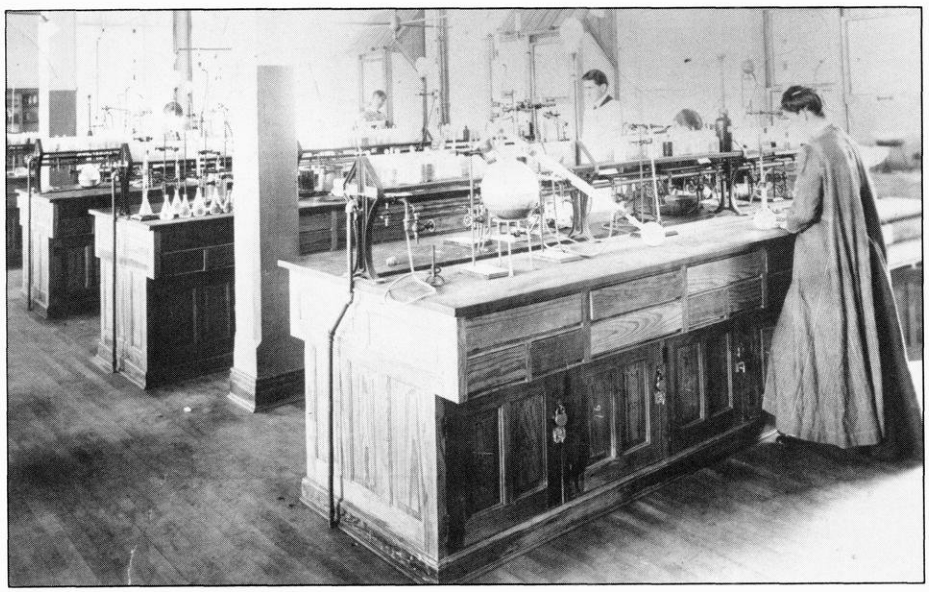
Hobbies: sailing, skiing, music

LADIES, WOMEN, AND ENGINEERS:

A BRIEF HISTORY OF WOMEN IN THE UW-MADISON COLLEGE OF ENGINEERING

"Although women have always been a part of the engineering student body, their numbers have been small. Historically, a high percentage of the women students studying engineering have played an important part in the life of the engineering campus. They have been active in professional societies, the engineering magazine, and in student government. Recently their numbers are increasing and we intend to see further, more significant increases in the number of women preparing for the engineering profession. This year we hired more new women faculty than have been employed throughout the history of the College of Engineering. This is important because we are now developing a significant number of role models for young women to relate to in engineering. Our goal is to increase our total number further as our resources to do so permit."

Dean John G. Bollinger, UW-Madison College of Engineering



A female engineer works in a chemistry lab. Female engineers broke the mold largely due to the impact World War I and World War II had on the work force.

In the sea of engineering freshmen at UW-Madison this fall are a few female faces–about 17% to be exact. Many have fathers who are engineers. Few can say, as Simon & Garfunkel did in one of their songs, "My mother was an engineer."

That's because women and engineering have historically been strangers. To combat discrimination, they have repeatedly had to demonstrate creative thought to overcome challenging obstacles that have been both similar and different from those encountered by men. Adapting to the changes of time, women in engineering have made significant advances, but are still underrepresented in all technical fields.

Without much in the way of analysis of the many related complex social issues, this article chronicles the pioneering efforts of women in engineering, both nationally and here at UW-Madison.

Unfortunately, only a crude summary can be related. Many statistics pertaining to women in engineering are poorly documented. Histories of women in engineering contain many unanswered questions and puzzling references. The curious reader gets the impression that many unacknowledged contributions from women engineers lurk within the past.

In an overview of women in engineering, there were three main national events that took place which

influenced women in engineering: World War I, World War II, and the Feminist Movement of the 1960's. Certainly these three events stand out in data for the UW-Madison College of Engineering.

World War I

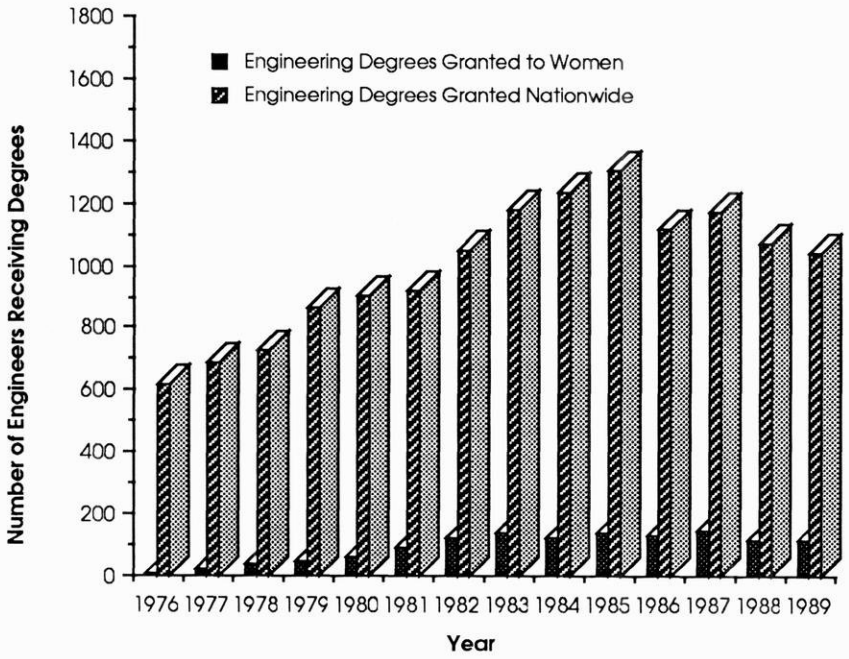
During World War I, women left their traditional roles and replaced men in the male-dominated work force. As Alice Goff, a 1915 graduate, wrote, "By an irony of fate; war, always bitterly denounced by women, has advanced them in their engineering profession." Women engineers had an opportunity to prove their intellectual and technical abilities. Still, nation-wide only 11 women engineers graduated in the years from 1915-1919, eight women engineers graduated in 1920, and 5 women engineers graduated in 1921.

Responsible for that slow progress may have been the negative and sarcastic attitudes that many universities showed toward women entering into an engineering curriculum. In 1919, an assistant professor of sanitary engineering at

"Dear Lady: Up to the present, women students have not been admitted to Georgia Tech..."

North Carolina University, Throndike Saville, wrote ". . .I would state that we have not now, have never had, and do not expect to have in the near future, any women students registered in our engineering department." But lack of vision on the part of engineering educators may have been the least of the barriers women were up against. In a letter written to an interested woman student, J. S. Coon, professor of mechanical engineering at Georgia School of Technology, wrote,

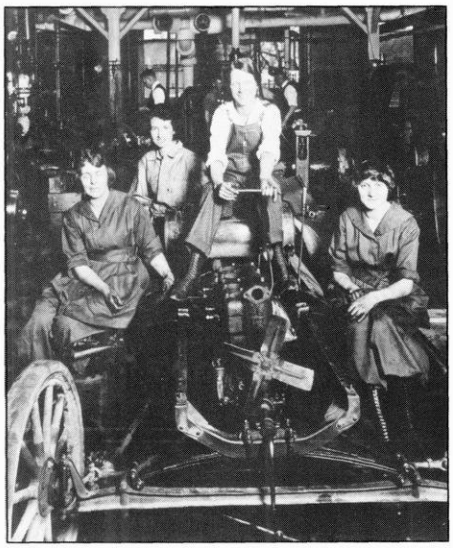
Degrees Granted to Female Engineers Nationwide



"Dear Lady: Up to the present, women students have not been admitted to Georgia Tech. Yesterday the City of Atlanta conferred suffrage on women in City affairs, so no knowing what may happen!"

World War II

Between the two world wars, the enrollment of women engineers stabilized until the beginning of World War II. Women were called upon from all across the country to support and prepare the United States for war. More engineering degrees were sought by women than ever before. Unfortunately, when the war ended, women either returned to their traditional home duties or suffered a cut in pay, status and responsibility with their former jobs once men returned to the workforce.



Four female engineering students take time out for a historical picture.

At the University of Wisconsin-Madison, fewer than five women had enrolled in engineering until World War II. At that time, Pratt & Whitney Aircraft Corporation of East Hartford, Connecticut offered scholarships to recent women graduates. Nine women students from UW-Madison were chosen for the program. These students were required to complete a twelve-month course focusing on skills required to become an engineering assistant. Unfortunately, most of the women enrolled in the program had no intentions of completing an engineering degree once the war ended.

Technological advances made during this war sparked excitement in the scientific field. More people returned to college to pursue continued education. In the 1950's, more doctoral degrees in science and engineering were awarded than had been given out in the three preceding decades. More women earned advanced technical degrees, too, but there were still not enough of them to make an impact. It took a global change

Notable UW-Madison Female Engineers

Mildred Wadsworth Campbell was the first woman student enrolled at the University of Wisconsin-Madison College of Engineering. She was listed as a civil engineering special student in 1896-1899. There is no record of her thereafter.

Lillian Moller Gilbreth was a visiting professor of management at the University of Wisconsin-Madison College of Engineering and received the honorary degree of Doctor of Science in 1955. She is perhaps the most well-known woman engineer in UW history. Her efforts brought American women into the nation's defense industries. Her major contributions lie in two areas: 1) the incorporation of psychological considerations, time-and-motion thought and study, and 2) the establishment of an industrial engineering curricula in engineering schools. It was remarked that "she must be ranked not only as the world's foremost woman engineer, but also as one of the truly great American women of all time." She has received a B. Litt. degree and M. Litt. degree from the University of California in 1902, Master of Engineering degree from the University of Michigan in 1928, and a Doctor of Engineering degree from Rutgers University in 1929, Stevens Institute of Technology in 1950, and Syracuse University in 1952. In 1935, she was chosen as one of the ten most outstanding women in the United States. In 1944, the American Society of Mechanical Engineers presented her with the Washington Award. In 1966, she was awarded the Hoover Medal. In addition, she was Professor of Management at Purdue University (1935-1948), chaired the Department of Personnel Relations at Newark College of Engineering (1941-1943), and was elected member of the National Academy of Engineering. Also, she lectured on management technology and human relations in Asia, Australia, Canada, Europe, and Mexico.

Emily Hahn was the first woman engineer to graduate from the University of Wisconsin-Madison College of Engineering in 1926. She received a B.S. in mining engineering. In 1976, she received an honorary Doctor of Humane Letters and was cited as "a true pioneer in establishing the right of women to have their own careers." She has written

"Science is not more important than equality for women. In fact, if there is no equality for women, pretty soon there will be no science."

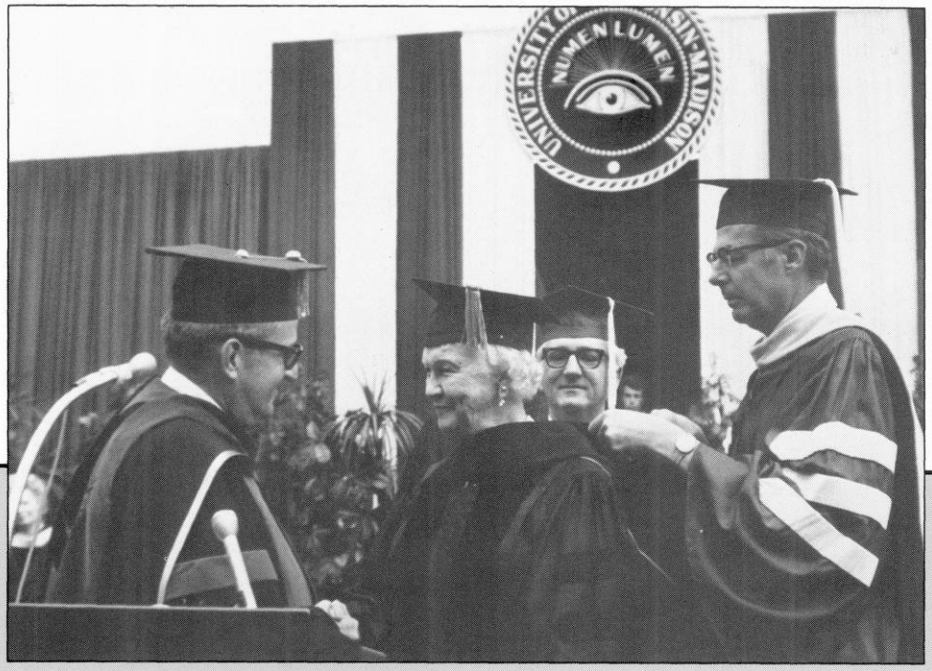
-Sarah Griswold

in women's aspirations to make a difference. That change came with the Feminist Movement of the 60's.

Feminist Movement

The Feminist Movement began an era which changed politics, business practices, child rearing ideologies, laws governing personal rights, and social thought. Women were tired of the stereotypes which oppressed them. Both the private and public sector changed radically in the face of issues that women of the 60's insisted on confronting.

While some women engineers and scientists at this time were liberal, radical feminists, many were not. However, it was the liberal, radical feminists who fought political battles for women scientists and engineers. Sarah Griswold, scientist turned feminist, says "Science is not more important than equality for women. In fact, if there is no equality for women, pretty soon there will be no science. The profession *must* change. To this I am committed as I once was to asking scientific questions." Even though few engineers have become feminists, Vivian Gornick in *Women in Science* remarks, "They call knowledgeable attention to the position of women in science; they keep the issue alive, force the question on everyone, cause discom-



Emily Hahn, the first woman to graduate in engineering (1926) from UW-Madison, receives and honary Doctor of Humane Letters on May 29, 1976.

many books, including studies of China in the 1930's, travel books, biographies, novels, and cookbooks. In addition, she is a creative writing instructior.

Emily Jackson McLean was the first woman to receive a Distinguished Service Citation in 1973. These awards have been given to outstanding alumni and engineers or other distinguished persons associated with the state of Wisconsin since 1948. In 1954, she received a B.S. in civil engineering. She served as Assistant Commissioner for the Department of Public Works in Chicago, Illinois. In addition, she served with Chicago's City Planning Commission, Department of Structures and Sanitation, and is a member of the U.S. Committee of Transportation Quality, Commission of Urban Area Government, American Society of Public Administration, Institute of Traffic Engineers, and National Housing and Redevelopment Association.

Thelma Estrin was the second woman to receive a Distinguished Service Citation in 1975. She received her B.S. in 1947, M.S. in 1948, and PhD. in 1951 in electrical engineering from the University of Wisconsin-Madison. After earning her degrees, she worked as a biomedical research engineer in the Electroencephalography Department of Columbia Presbyterian Medical Center in New York, as a computer engineer at the Weizmann Institute of Science in Israel, as an instructor in engineering at Valley College, and is currently Director of the Data Processing Laboratory at the Brain Research Center of the University fo California-Los Angeles. She was a Vice-President of the Institute of Electrical and Electronics Engineers Group on Engineering in Medicine and Biology, and is a member of the Board of Directors of the Biomedical Engineering Society. In 1977, she was the sixth female elected a fellow of IEEE and was cited "for contributions to the design and application of computer systems for neurophysiological and brain research."

fort, defensiveness, denunciation, and inquiry. They add osmotically to an atmosphere that pulls together feminism, science, and social ideas, to an insistence that all are related. These people do not have direct influence today but they are being heard by those who will have power tomorrow."

On the other hand, there were the "dedicated" scientists who did not want to publicly activate their inner attitudes but who wanted to study science for the sake of studying science. As stated by a woman engineer, "All my life, when I've been asked my opinion, I've said, 'I feel...' And so has every other woman I've known. And that's all right. We haven't done so badly with 'I feel.' But I went into science because I wanted to be able to say 'I think!'...I *need* to think."

Conclusion

Women engineers have worked in relative obscurity and isolation for over one hundred years and continue to do so today. That the College has recently hired so many women faculty shows that things are changing. Achievements are continually being made by persistent women, so that women and engineering are no longer strangers. ■

AUTHOR

Kimberly Fish, a senior in Mechanical Engineering, keeps herself busy as a writer for the *Wisconsin Engineer*, co-founder and president of Alternative Engineering Opportunities, and Social Chairperson of the Society of Women Engineers.

Sources

Evanich, Peggy L., "American Woman in Engineering"

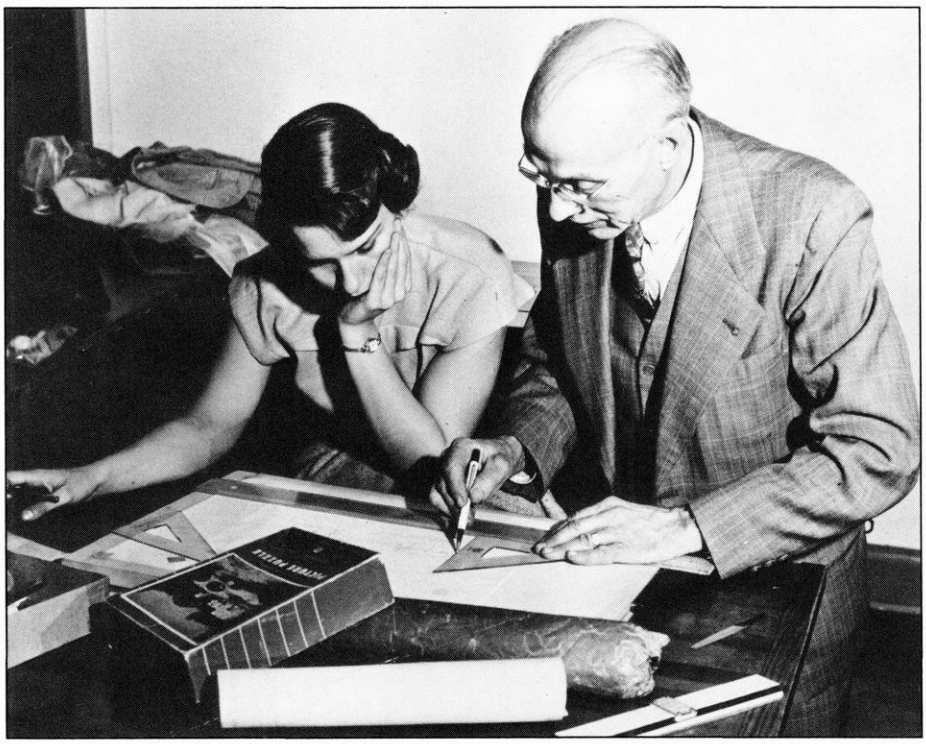
Gornick, Vivian, "Women in Science", 1983

Greenfield, Lois B., "Women in Engineering"

Haas, Violet B. and Carolyn C. Perrucci, "Women in Scientific and Engineering Professions", 1987

Krenzer, B. K., "Our Greatest Achievement", U.S. Woman Engineer, January/February 1989

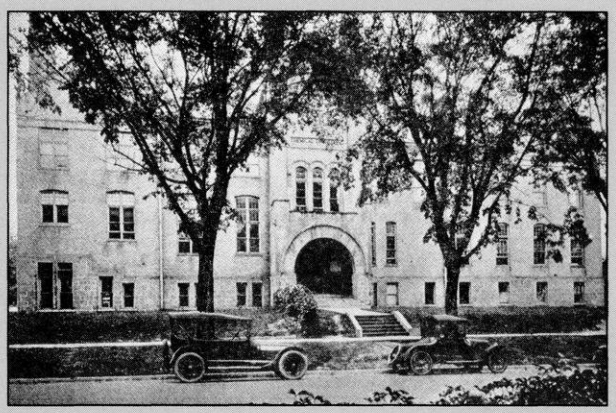
Changing America: The New Face of Science and Engineering, an interim report, Washington, D. C., September 1988

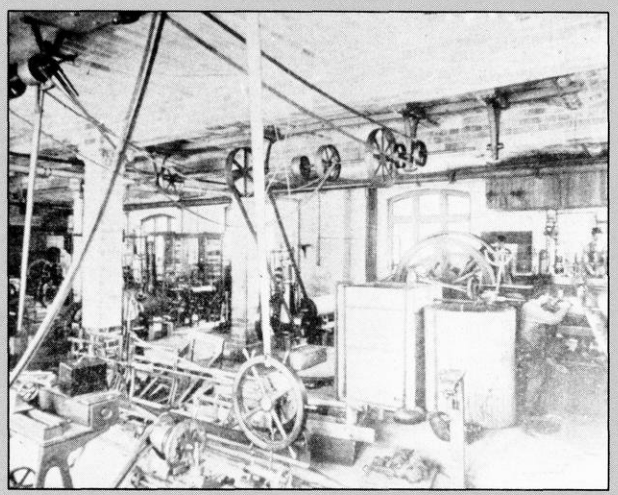


The feminist movement of the 1960s saw an increase in the enrollment of women in engineering.

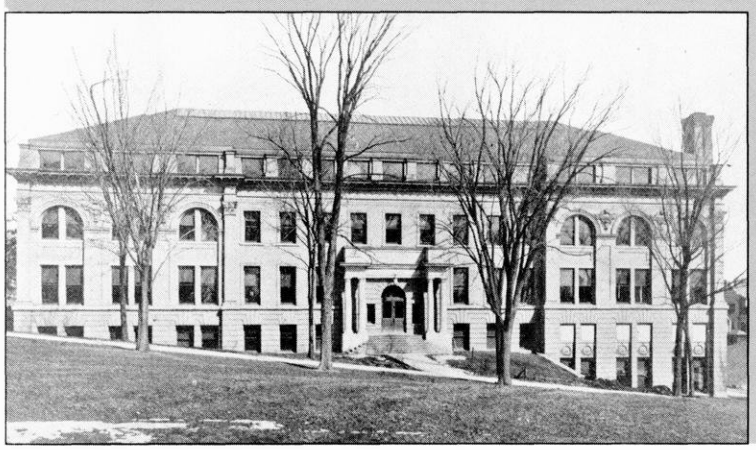
The Agriculture and Engineering College was formally established in 1868 under provisions of the Merrill Land Grant Act of 1862. By the late 1800's, as engineering enrollment increased to 200 students, the College of Engineering and Mechanics separated from the School of Agriculture, and thus began...

The Evolution of the College of Engineering Campus

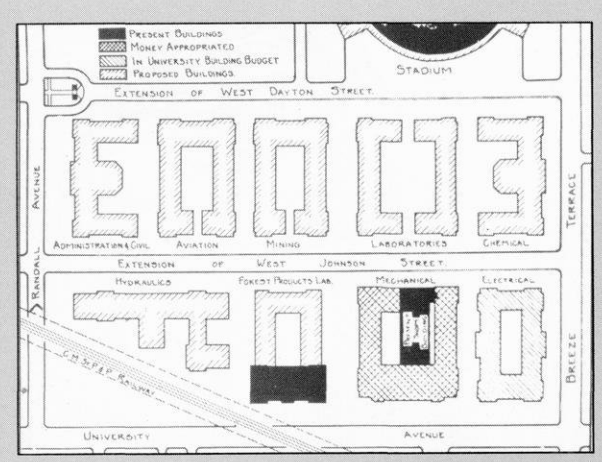




The first classes were held in a few rooms of Science Hall, the old Chemical Engineering Building (above), located at 600 N. Park St., and a handful of engineering shops such as the steam engineering lab (right).



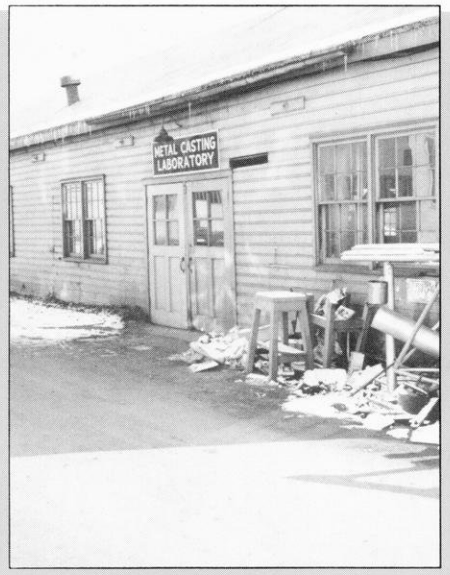
On Bascom Hill, turn of the century engineering student went to classes in the old Engineering Building (left), which is the present day Education Building. Inscriptions were etched on the facade of the building to honor the names of great engineers such as Bessemer, Reynolds, Ericsson, Kelvin, and Telford. Interestingly, the old Engineering Building's across-the-hill neighbor was the Law School, and for many years engineering and law students regularly marched up and down the hill, in hot debate, each discipline claiming St. Patrick to be its patron saint.



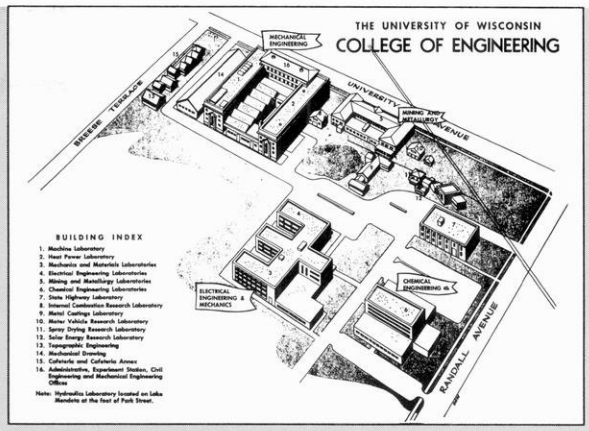
Circa 1919, the westward expansion and building of the Forest Products Laboratory and the Mechanical Engineering building represented the planting of the seeds, into new soil (also referred to as the "marsh across the tracks"), which would later on grow into the engineering campus we have today.

During the 1930's, the enlarged Mechanical Engineering building (left) was the heart of the engineering campus. The building housed most of the classes and a library.

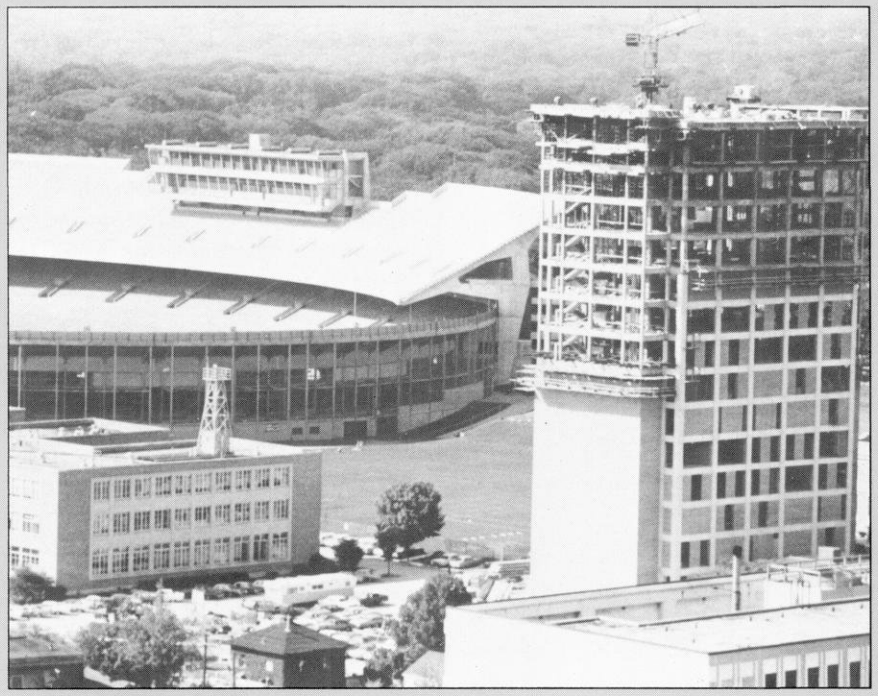
What happened to Camp Randall? In a way, it became a huge trailer park in the post WWII years when servicemen returned to college to pursue an engineering education. The numerous temporary buildings and trailers functioned as teaching and living quarters, in an attempt to accommodate the sudden rise in the engineering population.



This temporary building (left), known today as a T-building, resembles one of the few ghosts that "haunt" the western end of the campus.

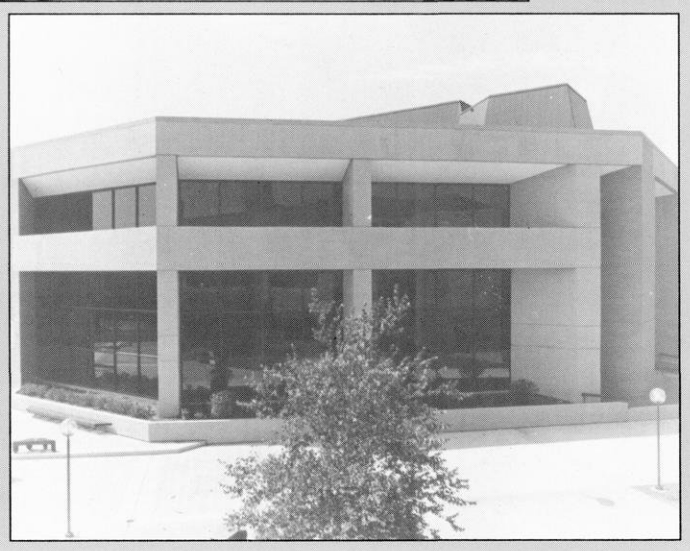


In the early 1960's, formation of the Electrical Engineering and Mechanics and the Chemical Engineering buildings (above) was just the prelude to today's main engineering building, or the back-to-back "E's," characterized by its labyrinthine corridors. Previous plans to nestle an auditorium/ library complex between the "E's" were aborted. Today you might note the miniature park complete with benches where a weary student could pause for a rest from a busy schedule.



The construction of the Engineering Research Building (left) in 1969 gave meaning to the Experiment Station. It was regarded as a PLACE in addition to being an organization and idea where research could benefit industry and the education system.

The engineering library, often confused with its twin building - Union South - was built in 1976 and was dedicated to former Dean of Engineering Kurt F. Wendt on Engineering Day, October 8. This 4-story, modified triangular building contains over 250,000 books and documents and serves as an invaluable source of information in engineering and the physical sciences. ■



AUTHOR

Winnie Teng is a sophomore in Chemical Engineering. This is Winnie's second year as a writer for the *Wisconsin Engineer*.

GARBAGE ALTERNATIVES:

YOU CAN'T JUST THROW IT AWAY ANYMORE

I cleaned out my car the other day when I got back to Madison after a weekend in the Northwoods. I could not believe the amount of garbage in the front seat from the few stops along the way. I started to think about the amount of garbage I had accumulated in the round trip. I wondered if I had collected this much garbage on a weekend, how much did I really throw out each week, each month, each year?

I started to pay attention to the tissues I cleaned my glasses with each morning, the beer and pop containers I drank from, the sheets of newspaper that became old, and a bunch of other things. I thought to myself, "If I threw out this much stuff, how much stuff was thrown out by others in Madison or anywhere else.

I thought "What a great topic for an article in the *Wisconsin Engineer*." I started collecting information from people involved with solid waste and realized that there was too much information to write an article on all of it. The more people I talked to, the stronger impression I got that there is a real need to reduce our **need** for landfill space.

An employee inspects garbage that will be recycled at Recycle World in Madison, WI.

The reasons should be obvious. Landfills are becoming full. Unfortunately, the cost of new landfills is phenomenal because they are engineered and regulated to meet stringent standards. Also, it takes a long time to develop a state of the art landfill.

A typical person living in Wisconsin throws out more than 7.5 pounds of garbage per day. Wisconsin as a state throws out more than 6.5 million tons per year. That is enough to pile a typical city street six feet deep from Superior to Chicago.

What can be done to reduce needed landfill space?

REDUCTION. New designs in packaging could reduce the amount of packaging material. For example, the typical plastic ketchup bottle cannot be recycled. It consists of seven different layers of plastic, each with a different melting point. There is no way to break down and reuse this product. Most plastics used for food packaging cannot be reused for food items. The plastic, when recycled, cannot be sterilized well

because of the low melting point of plastics. A bill has been introduced into the Wisconsin State Legislature to reduce the amount of packaging allowed on consumer goods purchased in the state. This should help to eliminate the non-essential packaging on consumer goods.

REUSE. Many things can be reused to get more lives out of products. For example, soda bottles, clothes, tires, and some appliances can be reused. Oil can be reused because it does not wear out, it just gets dirty. Also, recycling used oil requires less than half the energy needed to refine crude oil. For many articles, however, it is more economical to throw them away and buy new. This type of attitude must be changed.

RECYCLE. Glass, aluminum, paper, and some plastics and other items can be recycled. Glass from jars (clear, brown, and green) can be recycled. Aluminum from beer and pop cans can be made into new cans as well as other items. Paper can be recycled into more paper and paper products. Some plastics can be used for new non-food containers, fiberfill in coats, and fan blades.

COMPOST. Organic wastes can be composted into rich humus that can improve soil fertility and texture. These wastes can be resold to recover some of the cost of recycling.

RECOVER. Energy can be recovered from wastes by incinerating items. Industry can burn anything from saw dust to tires in order to make steam to power factories. Municipalities sell steam from incineration to companies for heat and energy.

Currently, there are many things going on that will reduce the need for more landfill space. Plastics are being marked and coded which will allow for easier identification and separation of the many different kinds of plastics.
A section of the City of Madison is currently cooperating in a curbside recycling program. Residents are asked to segregate certain items from the rest of their wastes. A city employee collects these items and takes them to a recycling company where the different materials are sorted for resale.

Many areas have source separation where residents and businesses are required to separate recyclables into individual containers. All non-recyclables are picked up weekly, along with one of the recyclable goods.

Studies are currently being conducted on the possibility of burning tires

Recycling Bill Highlights

Materials Banned From Landfill Disposal

Effective Date	Recyclable Material Discarded	Percentages of Wastes
January 1, 1991	• White Goods	1.8%
	• Waste Oil	0.9%
	• Automobile Batteries	0.5%
January 1, 1993	• Yard Wastes	20.1%
January 1, 1995	• Corrugated Paper or Boxes	8.1%
	• Glass Containers	7.6%
	• Newspapers	6.3%
	• Plastic Packaging	4.0%
	• Office Paper	3.7%
	• Magazines	3.1%
	• Steel Containers	1.9%
	• Tires	1.2%
	• Aluminum Containers	0.5%
	• Foam Polystyrene	0.3%

Ban on the Sale of Non-Recyclables

Effective Date	Non-Recyclable Materials
January 1, 1991	• Food or beverage containers made of: - Polyvinyl Chloride - A combination of steel and aluminum - "Plastic cans" with metal tops • Any plastic bag for carrying consumer goods • Bottles made from a combination of two or more types of plastic
January 1, 1993	• Other containers from PVC

Incineration Ban by January 1, 1995

- Aluminum containers
- Glass containers
- Office paper
- Steel containers
- Corrugated paper or boxes
- Newspapers
- Plastic packages
- Magazines

*Source: *Recycling Bill Highlights* from Joseph Strohl, Majority Leader, Wisconsin State Senate

for fuel. Some estimates indicate that tires can release 15,000 Btus per pound when chipped. Currently, two paper companies, Fort Howard in Green Bay and Nekoosa Paper in Tomahawk, are burning two inch tire chips with their coal to produce steam.

These are just a few of the many different ways that waste reduction is being achieved. Certainly, a reduction in the quantity of wastes is needed. Items need to be reused, material recycled, wastes composted, and energy recovered to reduce our need for landfill space.

People need to realize where their garbage goes after they throw it away. Remember, it does not just vanish. ■

AUTHOR

Frederick Hegeman is a senior in Civil and Environmental Engineering. This is Fred's first semester on the staff of the *Wisconsin Engineer.*

The Wisconsin Engineer extends its thanks to State Representative Spencer Black for the information he provided for this story.

Real Engineers Don't Drink Decaf

Everybody wants to be an engineer, and why not? All those fun-filled hours debugging in the computer lab, and that wonderful sensation of studying for physics exams until your eyes bug out bigger than two over-inflated volleyballs— who in their right mind wouldn't want to be an engineer?!?! Contrary to popular belief, not all students classified as engineers are real engineers. It takes that certain quality, probably best described as masochisim, to make it as a real engineer. Some of you are probably wondering if you have that special stuff to make it as a real engineer. Well, today is your lucky day! Outlined below is a comprehensive self-quiz developed through no research whatsoever. Take it and see if you're one of those special few that can be truly called a real engineer.

All questions are 'true', 'false', and 'I don't know' (i.e. you have a 1 in 3 chance of getting each answer right). Mark your answers according to whether the statement correctly identifies you. When finished, compare your score to the answer column on the next page (and don't cheat). The quiz is not timed, so take as much time as you would like. Good Luck!

1) Your diet consists of Cheez-whiz, potato chips and decaffeinated coffee.
   True O False O I don't know O

2) When a L&S student says to meet them at 'the Union', you head straight for Union South.
   True O False O I don't know O

3) You've never had the awesome pleasure of watching an entire episode of Star Trek.
   True O False O I don't know O

4) When asked ,"What's new?" your response is, "Planck's constant over the speed of light."
   True O False O I don't know O

5) The molecular formula for the beer molecule is $C_8H_{15}O\text{-}NH_3$.
   True O False O I don't know O

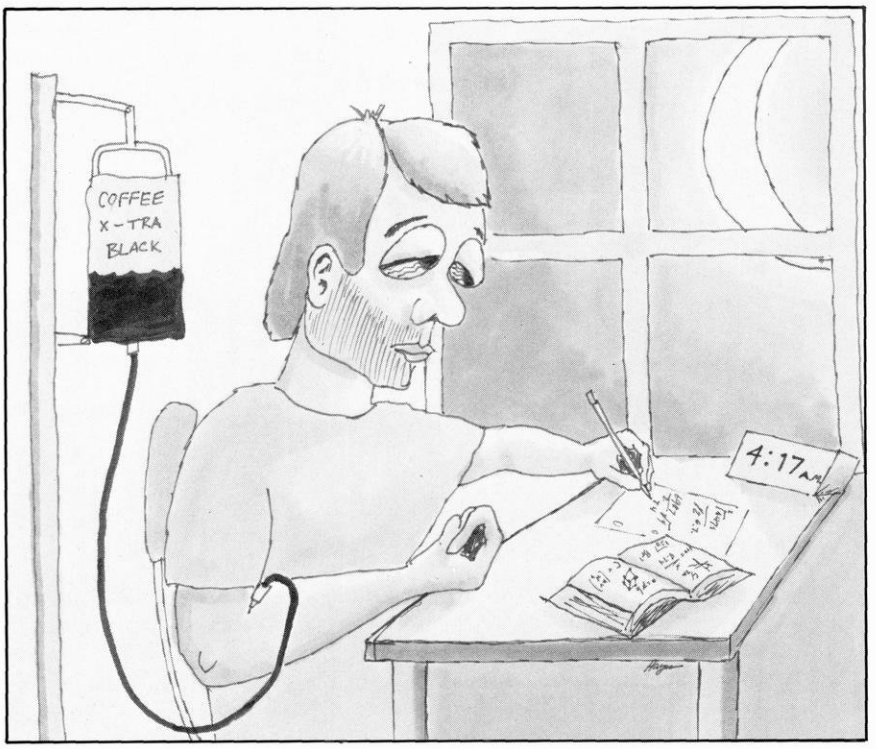
6) No one you know pays to get cable.
   True O False O I don't know O

7) You have a pony tail, wear a tie-dyed t-shirt with sandals and tube socks, and have several dangling peace symbol earrings.
   True O False O I don't know O

8) You have slept in either the MACC or CAE at least once.
   True O False O I don't know O

9) You haven't missed a single issue of the Wisconsin Engineer since 1950.
   True O False O I don't know O

10) You think the Engineering Building is the ultimate in architecture.
   True O False O I don't know O



Answers to *Real Engineer* Self Quiz

1) ***False***. Real engineers know that a balanced diet will improve their mental capacity. They won't settle for wimpy food like potato chips and most importantly of all, *real engineers don't drink decaf.* In general, a real engineer's diet consists of something from the five food groups. e.g. cheez-puffs (dairy), Cap'n Crunch (whole grains), jelly filled doughnuts (fruit and vegetable), hot dogs (meat), and black coffee (caffeine).

2) ***True.*** Real engineers consider Union South *the Union* because many of them have not been to the other union since their first campus tour. The primary reason for this is because the energy expended to get to Memorial Union greatly outweighs the benefits.

3) ***True.*** Real engineers would prefer to spend their time on shows that complement their education. For example, *Pee Wee's Playhouse* provides new vocabulary every week, and the chance to see a foil ball evolve from a single sheet to the boulder size mass it is today.

4) ***False.*** C'mon! Real engineers aren't geeks. Anyways, any real engineer knows that nu is equal to c over lambda.

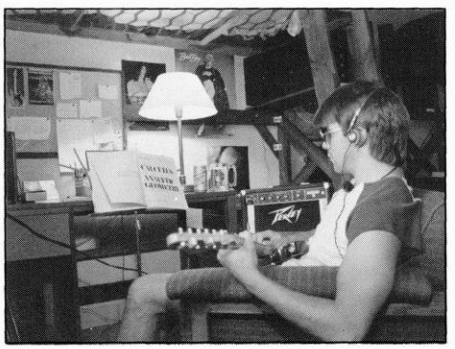
5) ***False***. Real engineers, regardless of their discipline, know that beer is just ethanol in a really cool container.

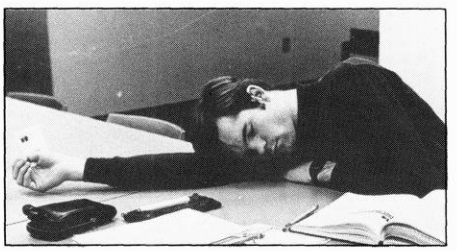
6) ***True***. Real engineers are either able to rig the television up themselves, or they are able to find an ECE that is willing to do it for a six-pack of ethanol in a really cool container.

7) ***False***. This is the give-away question on the quiz. Real engineers realize that ponytails are not time efficient, tie-dyed t-shirts are not cost-efficient, sandals with tube socks are ugly, and wearing any sort of peace symbol will not bring back Woodstock.

8) ***False.*** Real engineers know better than to waste their time sleeping in a lab. They realize that it's more comfortable to sleep at home, and that keyboard waffle marks on ones face are about as becoming as toilet paper hanging out of one's slacks.

9) ***True***. Real engineers know that the *Wisconsin Engineer* is not only enjoy-





Can you tell which one of these engineers drinks decaf?

able to read, but a great source of information on the engineering campus.

10) ***False.*** The building just screams the fact that it was built for riot control. Only a real engineer could figure out how to get out of that labyrinth. Rumor has it that the floorplans of the building were created in such a way that any student who didn't have the mind of a laboratory rat would never find the way to classes.

— — — — — — — — — —

SCORE ANALYSIS (per number of **correct** answers.)

0-2 You have the engineering prowess of Roseanne Barr. Give up, it's futile.

3-5 You are definitely not a real engineer. Don't despair, there's always custodial engineering!!

6-8 Well, you may still have a chance. If you start now and work really hard, you may still be able to reach the level of engineering greatness known as the *real engineer* by the time you're sixty-four.

9-10 You're a real engineer. Congrats!! You're definitely one in five-trillion (or you're a cheater, in which case, see the 0-2 score range). ■

AUTHOR

Sharon Chen is a sophomore in Chemical Engineering. This is an exciting issue for Sharon, as it is her first as Co-editor. Good luck, Sharon!

FROM THE LAB TO THE MARKETPLACE:

FINE TUNING THE TRANSFER OF TECHNOLOGY

The University of Wisconsin-Madison's rank among the finest research facilities in the nation is irrelevant unless new research developments are moved out of the lab and into the marketplace via private industry. This is the concept of "technology transfer" advanced by the University-Industry Research Program (UIR). The program serves as a starting point for business and industry to access the vast resources of the entire University, including research activities and facilities, educational programs, libraries, and research consortia.

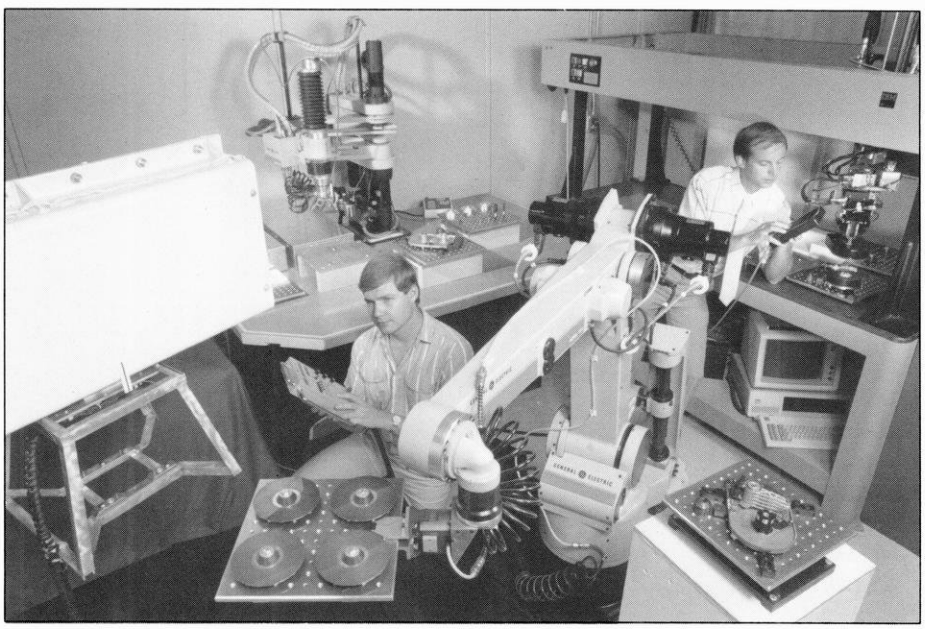
UIR, a program of the Graduate School, was established in 1963 to aid technology transfer in the physical sciences, but more and more fields have moved into the high-tech spectrum over the last 25 years. Today UIR represents the entire University and most often handles requests pertaining to complex problems in business, biotechnology, medicine, agriculture, and engineering. These fields, experiencing the most rapid technological advancements at the moment, exhibit the greatest potential for practical applications.

"Matching new firms with the appropriate faculty is a dynamic process in the high-tech areas," says Robert M. Bock, UIR Director. "Participants are changing all the time. Many companies in high-tech business and industry were not players in high-tech 10 years ago. We offer assistance at the interface between industry and the University as that interface continues to change."

Support from the business world helps keep University research and teaching facilities up to contemporary, competitive standards, but the impact is far more significant.

The activities of UIR, however, do not interfere with the Outreach programs of the individual colleges on campus.

"We try to complement each other's activities. For example, UIR does not



Engineering Professor Neil Duffie (right) is co-director of the Wisconsin Manufacturing Automation and Robotics Consortium.

offer credit for courses in continuing education but we often see the topics we cover with industry ending up in Engineering Professional Development (EPD) courses a year or two later," says Bock.

To enhance communication between UIR and Engineering Outreach activities, the two programs jointly hire a faculty member to serve as a bridge between them. Harold Steudel, a professor of Industrial Engineering, is UIR's current liaison with the College of Engineering. Steudel is an associate director of UIR who is very actively involved in EPD and outreach activities, according to Bock. Two additional faculty members from the College of Engineering, Don Novotny and Jerry Saeman, also serve as Associate Directors of the program.

Related industries contribute financial support to a research program in exchange for the opportunity to share in the research results

UIR answers most inquiries the same day they are received using a computer database to match clients with more than 2,700 UW-Madison faculty and research members. UIR quickly identifies the specialists that best fit a client's needs. After a company locates the appropriate faculty, the next step is as varied as the problems the clients bring to the program. UIR staff have learned that no single mechanism can serve all the needs of business and industry, according to Bock.

The link between UIR and the private sector may begin with a "com-

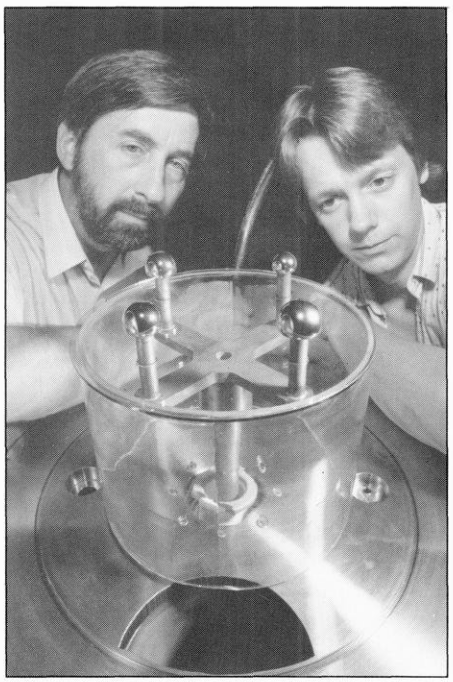
pany briefing." Research directors and executive officers of of a single firm meet with University researchers to discuss mutual interests. In 1988, UIR arranged briefings for several Midwest firms as well as some foreign firms.

For problems that revolve around a single industry, UIR offers Touchstone Seminars. Selected UW-Madison researchers provide technical presentations, emphasizing the industrial applications of their work. Speakers from industry also give presentations on related topics.

UIR welcomes suggestions for seminar topics. Due to the rapid advancement in high-tech areas, individual companies often have the best knowlege of where technology transfer is lagging. In 1988, parts suppliers to the manufacturing industry relied on UIR services to arrange a seminar entitled "Becoming A Certified Quality Vendor." As manufacturers reduced materials inventory to increase production efficiency, they began relying on certified suppliers and many non-certified suppliers fell behind. Professor Steudel helped several firms achieve the essential certification and remain competitive. One company that participated, Richland Center Foundry, more than doubled annual sales as a result of the seminar and consultation with Steudel.

UIR encourages private firms to develop industrial consortia with UW-Madison researchers. While briefings and seminars offer solutions to one-time problems, consortia offer the opportunity to establish a long-term working relationship with faculty. Related industries contribute financial support to a research program in exchange for the opportunity to share in the research results. The nature of the consortia poses a challenge to UIR staff but results of the partnership are often worth the extra effort.

"These companies are competitors with each other so it takes some intense discussion to lay out an agenda. We have to find a way for the University and the different groups to work together on problems that are generic to the industry. Everyone involved has to



The research of engineering professor John Conrad has significant applications in industry. His patented ion implantation process extends the life of industrial tools.

A One-stop Information Center

The Information Services Division (ISD), jointly sponsored by UIR and UW-Madison's Kurt F. Wendt Engineering Library, is the information arm of the University. With access to over 400 databases, ISD can provide business and industry clients with nearly any kind of information in the public domain. ISD staff can quickly search the holdings of the entire UW-Madison library system, 50,000 journal titles, five million books, government documents including standards and specifications, and a complete collection of U.S. patents.

Frances Wood, ISD Program Director and Associate Director of UIR, refers to the diverse materials as "competitive information."

"This is a one-stop information center," says Wood. "Consider someone from business or industry who might need current literature on a specific product, an engineering standard, a U.S. patent and a French patent. The library search would be overwhelming. We'll put a package together that includes all this information and mail it out within 24 to 48 hours."

Every year ISD handles about 20,000 requests from more than 600 companies. Although ISD answers requests from 30 to 40 different states, Wood estimates that about two thirds come from Wisconsin firms.

"This service is especially helpful to the smaller companies located throughout the state. Many firms don't have access to a good library much less a corporate librarian," says Wood.

ISD rates are also feasible for smaller companies. Wood often gives clients a cost estimate before beginning a search or tailors a search to stay within a given price range. In addition, clients always pay the lowest possible rates for each search because ISD operates on a cost-recovery basis.

Established more than 20 years ago, ISD has become a national leader in scientific and technical information. Wood estimates that only about 10 other information centers in the U.S. match the caliber of ISD.

cooperate in a manner that doesn't give an unfair advantage to one or the other. Once a consortium is under way, however, it can be very beneficial to the industry as a whole," says Bock.

Bock stresses that Wisconsin and the University also benefit from rapid technology transfer and working relationships with the private sector. Support from the business world helps keep University research and teaching facilities up to contemporary, competitive standards but the impact is far more significant.

"We are living in a 'no-debt' state. If the economy sneezes, we get sick," says Bock. "If the tax revenue declines because of an unsound business econ-

"We offer assitance at the interface between industry and the University as that interface continues to change."

omy, pressures put great demands on the state's budget. Because the University is a major consumer of tax dollars for educating students, it is very important that we keep this state economically sound. Anything we can do to help is really an investment in the University as well as the rest of the state." ■

Photographs, by Bruce Fritz of Engineering Publications, are courtesy of the UIR program.

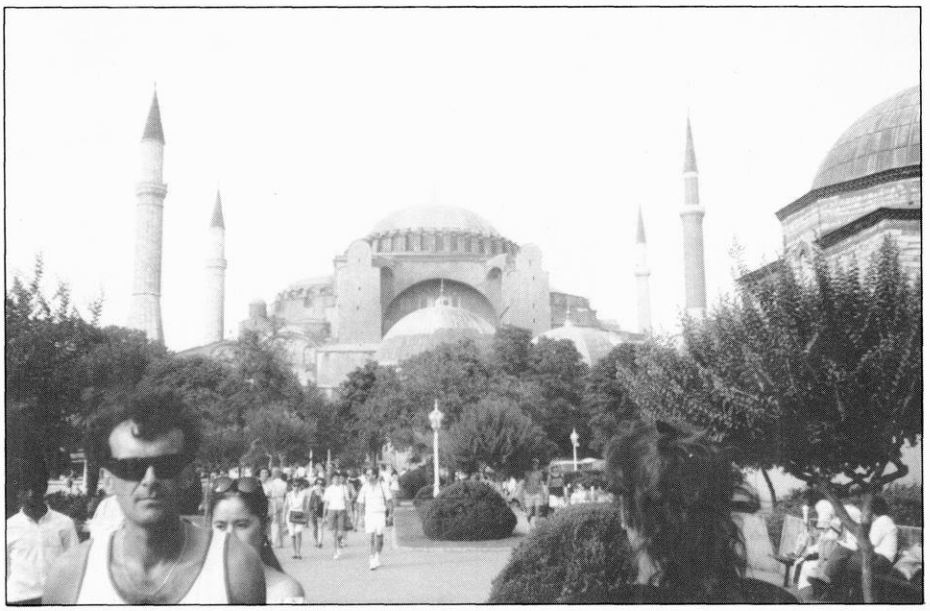
AUTHOR

This is Ann Tomasko's first contribution to the *Wisconsin Engineer*. Ann will graduate in December from the School of Family Resources and Consumer Science with a Bachelor's of Science degree in Family and Consumer Communications.

ENGINEER ABROAD:
A SUMMER IN TURKEY

It was a summer of many things–how can I begin to explain? I spent it in Turkey. As a student there, I learned many things about the language, culture, country, foods, customs,fashion–you name it. To sum it up seems an enormous task, but here goes...excellent.

I attended a two month program at the Bosphorus University in Istanbul, Turkey. It was an intense course in the study of the Turkish language, as well as the perfect opportunity to try out what I had learned by simply stepping out of the classroom. I was born in Turkey, yet came to the States when I was very young, so this summer also gave me an opportunity to visit my relatives. The language barrier, as I had expected, was a struggle (my cousins still tease me about my accent), but I hadn't anticipated the culture shock.



The Ava Sophia, a church turned into a mosque, then into a museum.

Turkey is unlike any other`European country because it is an Islamic nation. At every turn there is a mosque with its minarets towering high. From my room I could hear the Muslim call to prayer five times a day from the mosques throughout the city. Their loud speakers sang prayers, early and late, and a dog in our backyard used to even howl along. I learned fast that the best place for my miniskirts was back in my suitcase. It took a while to get used to not making eye contact with men on the street, as well as behaving in an overall sedate manner. Also, Turkey is the main tourist destination for travelers from Arab nations such as Saudi Arabia and Kuwait. Therefore, seeing an occasional harem parade by in black, with their white robe-clad husband, wasn't uncommon.

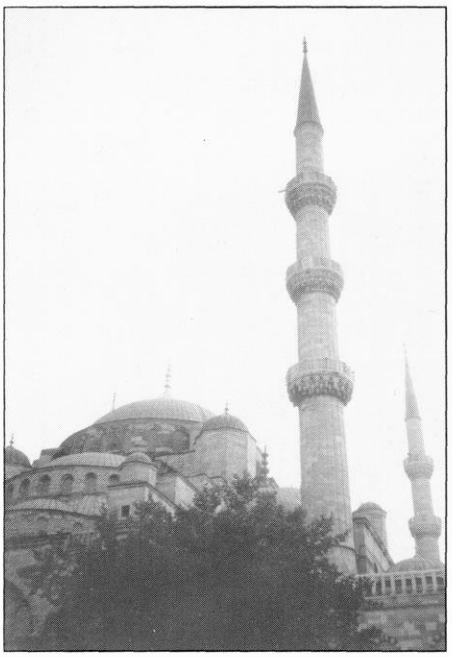
Istanbul is an amazing and beautiful city. It lies on two continents, Europe and Asia, with the Bosphorus Strait between the two. From my dormitory window I could see the beautiful view over the water. Transportation between

the two sides consists of boats, car ferries, and two bridges. Each side of the city has its own distinct character. The European side is the older of the two and more concentrated with old museums, mosques, churches, and synagogues. The most common sight visited is the Sultan Ahmet Cami (or the Blue Mosque), which is the only mosque in the world with six minarets. It is second in fame only to the Taj Mahal, yet there are many other places to visit. The Asian side is newer and houses most of the people. Although there are many places to visit there, it attracts fewer tourists.

Everyday, the city offered so much to do such as walking along the Bosphorus (very romantic), drinking tea in the

Turkey seems such a delicate mixture of the old and the new

cafes scattered around town, shopping at the bazaar where the most common sentence heard is, "Let me help you spend your money" (in a thick accent), strolling down to the nearest pastry shop to get some baklava (a delicious Turkish dessert with approximately one million calories), and visiting museums. If you're feeling particularly suicidal there are the soccer matches, with the most excitable and dedicated fans in the world. The list goes on, but the common theme remains–cheap. The exchange rate for the American dollar is so good I found it difficult to spend all my money. On a night out, dinner, disco, and even taxi fare comes to about ten dollars. A delicious corn-on-the-cob or ice cream cone on the street is about 25 cents.



The Sultan Ahmet Camii, also known as the Blue Mosque

In the program I was in, our weekends were free to do with as we pleased. Most students took the opportunity to travel to various places outside of Istanbul. Turkey is a very large country and throughout its borders are climates to suit everybody's tastes. From the rugged mountains and dry flatlands, to the beautiful beaches of southern Turkey's Mediterranean and northern Turkey's Black Sea regions, there is so much to see. Turkey is also a very old country, so nearly anywhere you travel you can find ancient ruins whose dates range from different periods in history.

Outside of Istanbul and some of the southern beach areas, Turkey is a country still untouched by tourism. My family is orginally from the south-central region near Syria, so I had the opportunity to travel there, as well as other places. I found the people extremely hospitable, especially along these less traveled byways. Near Iraq we stayed at a monastery where barely a word was spoken. The nuns fed us and prepared our beds for the night. I remember bumpy bus rides into the middle of nowhere. The people around us were so eager to talk with foreigners that they would gladly sit through your life story. Once I visited a village in central Turkey. With my meager Turkish skills, I tried to communicate with a group of covered Muslim women. Although I was hesitant as to their response to an American woman, I was showered with hugs and kisses as the first words spilled from my lips . They had been so thrilled that I had even made an attempt. It's amazing how warm the people are. Even a shoe-shine boy or clothing store manager will beg you to stay and have tea for the sake of politeness.

Inevitably, when I think of Turkey I will always have great memories of the people, the friends I made, my relatives, the food, and how different the whole experience was. Turkey seems such a delicate mixture of the old and the new. There are familiar sights like shopping malls, Pizza Hut, McDonald's, or Kentucky Fried Chicken, and yet on the next street over lies an old mosque with its grey bricks and beaten look. Turkey is also a dynamic place. Tourism is increasing and the country becomes more European every year. To this, I have mixed emotions, but overall my memories of this summer will always be fond ones. When I go back it all may be changed, but Turkey will always , deep down, be a wonderful place. ■

AUTHOR

Deniz Ayaz is a sophomore in Electrical Engineering. She has been writing for the *Wisconsin Engineer* for two years.

The Suleymaniye Mosque

Steve Czarnecki
Advisory Systems Engineer
Owego, NY

Alisa B. Eaker
Manager
Software Design/
Development
Research Triangle Park, NC

Ana Cruz Gonzalez
Marketing Representative
Hartford, CT

John W. Webster
Development Manager
Research Triangle Park, NC

At IBM... there are lots of people like us.

We chose IBM because we know our ideas will be heard and put into action. Today IBM is a leaner, more streamlined operation that reacts more quickly . . . takes more risks . . . is closer to the customer . . . shares its blueprint for the future with both staff and competitors . . . and even develops products that easily hook up with systems outside the IBM environment.

Today's IBM encourages its people to speak up, challenge old ways of thinking and initiate new ideas. Right from the start you'll get all the responsibility you can handle. Work in small project teams with the newest computer-aided equipment, apply the latest information technology, and be exposed to multiple projects.

There's plenty of room to grow and get ahead because we're a company that promotes from within. IBMers have the option to move from one area to another . . . to relocate to a variety of sites and to follow a career track along purely technical lines or into management.

Our educational programs are tops, too. At every location, we hold training sessions, workshops, seminars, symposiums and lectures. IBMers are also encouraged to continue their formal education.

Never has there been a more exciting time to join IBM in development, programming, research, manufacturing or marketing. So come and be one of us.

An Equal Opportunity Employer

IBM®

Information for Study and Work Abroad

The International Programs Office is sponsoring information meetings for international engineering study and work programs. The meetings are on October 24 and 25 from 5:00 pm to 7:00 pm in Room 11 General Engineering Building. Any engineering students interested in studying or working abroad should attend this meeting. For more information, call 263-2191 or go to the International Programs Office in Room 1018, Engineering Research Building.

Trek Bicycle Contest Winner

Doug Ross, a Pre-Engineer from Madison, won the Trek bike contest sponsored by the Materials Science and Engineering Department. Ross answered five questions out of seven correctly on the Materials Science and Engineering Quiz at SOAR. Ross's name was then selected at random from everyone who had at least five correct answers on the quiz. Ross received a new Trek aluminum frame bicycle. The Materials Science and Engineering Department has been doing this promotion at SOAR for the past two years.

wisconsin engineer

Engineering Briefs

-by Steve Peters

Ryan Scholarship Deadline

The deadline for applying for the *George P. Ryan Award for Returning Adult Students in Engineering* is December 1, 1989. This award is for undergraduates selected on the basis of academic performance, clear education or career goals, an interruption in formal education, and financial need. A number of awards of varying amounts will be given to applicants who will be enrolled in a College of Engineering department in January, 1990. Accepting the award obligates the student to continue studies in engineering through the semester. Application forms may be picked up at the following locations: Room 22, General Engineering Building; Room 266, Mechanical Engineering Building; the Office of Continuing Education Services, 905 University Ave.; and the Office of Student Financial Aids, Room 231, 432 N. Murray.

Application to Engineering Departments

The deadline to apply for admission from Pre-Engineering into a degree granting department for the Spring semester of the 1989-90 school year is November 15, 1989. To be eligible, you must have completed by the end of the fall semester: (a) English 101 or be exempt by the placement test, (b) a minimum of 24 credits and a maximum of 54, (c) a minimum of 17 credits in mathematics, statistics, chemistry, computer science, statics, and physics needed for engineering, (d) a minimum 2.50 GPA in the categories listed in c, and (e) a minimum 2.00 GPA in all other classes. Apply in person at the Pre-Engineering office in Room 22, General Engineering Building.

ENGINEER'S DAY
October 20, 1989

AEO Nation Bound

Additional Engineering Opportunities (AEO) faces a challenge–a challenge of becoming an established, creditable, professional society at a local and national level. AEO was co-founded by Steve Young and Kimberly Fish at the University of Wisconsin-Madison in February 1989. AEO is a professional society for engineering students interested in utilizing an engineering degree in areas other than research and design. Interests include technical sales, market engineering, technical writing and communications or pursuing continued education in business, law, or medicine.

By-laws are currently being approved and logos copyrighted by legal assistance from lawyer Robert Caflisch. AEO will be incorporated as a non-profit corporation which then will charter chapters that meet the national criteria. Also, necessary measures are being done to meet the Internal Revenue Code covering the society on a local and national level.

The next meeting will be held the week of October 23, 1989 at Union South, University of Wisconsin-Madison. All are welcome to attend any of the presentations sponsored by AEO.

Purpose

- Unite all engineering disciplines for the central interest in continued education, technical sales, market engineering, or technical communications.
- Inform students of career and educational opportunities utilizing an engineering degree.
- Promote interaction with other student organizations, professional societies, and companies.
- Develop interpersonal, motivational, communication, and business skills.
- Strengthen and focus career goals.

AEO Outreach Strategy

- *Wisconsin Engineer* Magazine
- Student Organization Newsletters
- Engineering Expositions
- Banquets
- Student Organization Fairs and Welcome Weeks
- Industrial Liaison Council
- National Engineering Student Council
- Company Communications/ Newsletters

Future Chapters

- Boston University
- Michigan State University
- Purdue University
- University of California-Berkeley
- University of Michigan-Ann Arbor
- University of Minnesota-Minneapolis
- University of Wisconsin-State Extension Schools

AEO is actively seeking student, company, and community support. If you are eager to participate or have any questions, please contact President Kimberly Fish at 608/251-5215 or Vice-President Mike Ries at 608/238-5934.

AEO is in search of people interested in additional engineering opportunities; AEO is in search of excellence!

ASSISTANT PROFESSOR DENICE DENTON

A new column, Faculty Profile, will feature one member of the College of Engineering faculty in each issue. This column may catch up with a current professor, introduce a visiting or new professor, or say goodbye to a retiring professor. This introductory column emphasized a little of each.

Denice Denton, an assistant professor in the Electrical and Computer Engineering Department, is one of six women engineering professors in UW-Madison's College of Engineering and the only female professor in the ECE department. A graduate of Massachusetts Institute of Technology, she specializes in microelectronics and has been at the college for two and one half years.

Originally from Texas, Denton attended school for ten years at MIT where she earned her BS, MS, and Ph.D. degrees in Electrical Engineering. While in school, Denton took part in undergraduate research programs, rowed on the crew team, worked as a photographer for a student newspaper, participated in the Society of Women Engineers, and sang in the MIT Choral Society. Her favorite classes were microelectronics and music.

When asked why she chose engineering, she quickly responded, "Because I liked math and science." She then related an experience of the summer following her junior year in high school when she attended a three week program at Rice University in her home town of Houston. The program promoted engineering and allowed students to live on campus and attend classes with faculty members to gain exposure to the different disciplines of engineering. Denton says she found the topics discussed in electrical engineering the most interesting and therefore chose it as her own field of study. During high school, she was also a member of the Junior Engineering Technological Society (JETS).

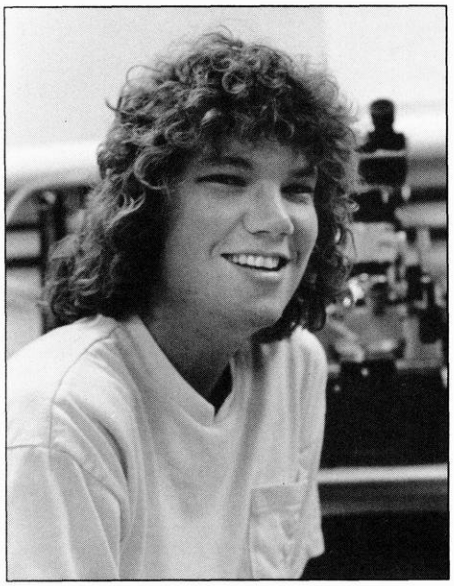
Denton recalls that she "wanted to attend school in Boston," knowing that "MIT has one of the better engineering programs in the country." Conveniently, "things just kind of fell together there."

While working toward her degrees at MIT, Denton co-opped for a company called Fairchild in the Silicon Valley in California. While working there, she designed integrated circuits. Regarding her experiences, she notes, "I found it to be very valuable and I'd recommend it to all the undergraduate engineering students to co-op." Denton co-oped for two summers, followed by a nine-month period during which she worked on a thesis project for her master's degree at the company.

After earning her doctorate, Denton looked at different schools across the country and eventually chose UW-Madison to begin her teaching career. Regarding her decision on Madison she states, "One of the things I really liked was the Materials Science Program." She says the College's microelectronics fabrication facility is very important to her research work.

Coming to Madison was a new experience for Denton, who had lived most of her life on one coast or another. She had been to Wisconsin only once before she decided to make Madison her home. Adding to the reasons for her decision, she invokes a sense of adventure claiming that, for her, "the Midwest was unchartered territory." She feels it is good to be exposed to different environments. Denton also says she really enjoys Madison. Having come from Boston, she views Madison as a "small town" but ascertains that "it's the right size." She notes that the people here are more friendly than in the Northeast. And even compared to her home state of Texas, she admits she liked Madison's weather better, claiming Houston is too

"...I like the autonomy you have with this job. You decide what's important and push it through."



Denice Denton is an assistant professor in the Electrical and Computer Engineering Department.

humid. She also finds Wisconsin's seasons a welcome change.

Having been exposed to both MIT's engineering program and UW-Madison's, Denton is able to make some comparisons. Although she finds the engineering courses at both schools to be roughly comparable, she feels Madison's undergraduate research opportunities are limited, "I think there's more opportunity at MIT for undergrads to get involved in research programs." She explains that undergraduate research can be accomplished here at UW-Madison, but there are no organized avenues; whereas at MIT, there is an entire department devoted to promoting undergraduate research. Expressing her feelings on this aspect of learning, Denton says, "It really rounds out an education to have that sort of opportunity."

Denton is actively involved in research here at the University and has her own lab in the basement of the Highway Lab Building. Her research deals primarily with microelectronics and fundamentals in material characterization. The most concentrated area of her research involves looking at how polymers can be incorporated into novel electronic devices, especially sensors and support circuitry for those sensors which can be put on the same sensor device.

As a prominent researcher, Denton makes several contributions to technical journals and various publications explaining and updating her latest findings. The articles keep others in the field informed and also expose her research to the public and to industry in the hopes of eliciting resources. Also included in her role of professor is a fair amount of traveling. She attends numerous conferences to display her research and keep up with developments in other areas. Her travels include visits to Switzerland, Japan, and Poland.

Denton is happy with her work in engineering. "I really enjoy working with students and doing research. I like the autonomy you have in this job. You decide what's important and push it through."

Denton has been recognized both for her research and her teaching, as indicated by her recent awards. She was the 1987 recipient of the *Presidential Young Investigator Award*, which is a five-year funding award from the National Science Foundation. In 1988 she was chosen as ECE Professor of the Year at UW-Madison, and just this year, Denton received the Polygon Outstanding Instructor Award.

As noted previously, Denton is the only female professor in the ECE department. When questioned about her feelings on this point, she smiles and says, "Obviously it's not the optimum situation." She explains that the college is working on changing the numbers and notes, "It's just going to take a certain amount of time."

Denton describes her experiences as a woman in a male-dominated profession. She says, "You have a very high profile. That's a double-edged sword." She explains that any success she obtains is exaggerated because she's a woman. On the other hand, any mistake she makes is also highlighted.

As an assistant professor, Denton has many responsibilities that keep her busy. She teaches classes such as ECE 240 - Electronic Devices, ECE 555 - Electromechanical Energy Conversion, and ECE 904 - a special topics class. ECE 904 is a seminar class for graduate students based on Denton's research dealing with solid state sensors. There is no text for the class because the information is new. She also serves as faculty advisor to the Madison campus chapter of the Society of Women Enigneers (SWE).

To Denton, the hardest part of engineering is keeping up with the literature. She feels the field moves extremely fast. She warns her students that by the time they receive a Bachelor's degree, much of their knowledge will be outdated unless they read current periodicals and keep up with these constant changes.

Her favorite and most rewarding part of engineering is "the fact that you can really make things that work and you can see your technology transferred to use in society." She explains that as an electrical engineer her work has a substantial impact on society and that provides her with a genuine sense of accomplishment. ■

AUTHOR

Wisconsin Engineer Co-editor Nancy Hromadka is a sophomore in Electrical Engineering. This is Nancy's first issue as Co-editor. We wish her a long reign and much enjoyment with her new position.

ASSISTANT PROFESSOR JEFFERY RUSSELL

Jeffrey Russell, an assistant professor in the Civil and Environmental Engineering (CEE) Department, is a new face at the UW this semester. Russell received both his masters degree and doctorate from Purdue University and looked forward to making the move to Wisconsin. He says, "I looked at it as an opportunity to come to a very well-respected engineering school."

Among other things this semester, Russell teaches a class of five graduate students. It is a special topics course entitled, "Analysis of Construction Contractors." This course is an emphasis that lies within Construction Engineering & Management, which is Russell's area of expertise.

Russell explains, "The focus is to develop a Construction Engineering & Management program here at UW. For example, at the undergraduate level we want to try to offer a course in Civil Engineering & Management to give students an overview of what construction is all about so that they become better informed," Russell says.

Russell says that the effects and results of construction engineering and management are widespread. "In almost every civil engineering project ultimately there is a construction aspect to it. . .whether it is a dam, retaining wall, retention pond, high-rise building, school building, or jail. . ." Russell notes, "Construction is typically referred to as the 'manufacturing arm' of Civil and Environmental Engineering."

In addition to teaching, Russell is very involved in research. One of four projects he is currently working on, called "Decision Support System for Evaluating the Implementation of Advanced Technology," is funded by Ohbayashi Corporation in Tokyo, Japan. Although this project was begun at Purdue, Russell continues his research in Madison through a subcontract worth $40,000. Russell has already created a system to manage a fleet of robots for Ohbayashi.

Assistant Professor Jeffery Russell joined the College of Engineering this semester.

...research is essential to any successful university program, especially if it expects to be recognized nationally.

Russell feels research is essential to any successful university program, especially if it expects to be recognized nationally. A good research foundation has "national consequences," he says. "It's important for me to work hard and establish a good solid research foundation and research program and augment that with teaching as well. I'm trying to

bring some of my research into my teaching area...The class I'm teaching this semester is really a result of my Ph.D work."

Despite Russell's devotion to his research and students, he makes time for his family. "It's a matter of being organized," he says. On Saturdays he usually works half the day and then he and his wife, Vicki, often take their seventeen-month old daughter , Nicole, to the zoo. Russell smiles, "My daughter loves the zoo! She likes to feed the goats."

Russell and his wife have a home on the west side of Madison, from which Russell usually takes the bus to work since a parking permit on campus is expensive and he is, afterall, "paying taxes (for bus service) already."

Although Russell is not quite settled in Madison, he plans to "investigate" what Madison has to offer culturally, such as the symphony. He is interested in music and is involved in his church. "I *attempt* to sing in the (church) choir," says Russell.

On behalf of the College of Engineering, the staff of the *Wisconsin Engineer* welcomes Professor Jeffrey Russell. ■

AUTHOR

Kelly Weisheipl is a fifth year senior in the English department. This is Kelly's first contribution to the *Wisconsin Engineer* .

ASSISTANT PROFESSOR REGINA MURPHY

Regina Murphy is the first female chemical engineering professor at the University of Wisconsin-Madison, an achievement that she downplays. "Being a woman hasn't made any difference. I'm happy to have this position. I feel that people make too much of a deal about it." Another achievement is graduating from Massachusetts Institute of Technology with a bachelor's of science and a post doctorate degree in chemical engineering.

This new professor sees chemical engineering as an opportunity to solve socially important problems. "Chemical engineering is not just making chemicals." For Murphy, the idea was to do something "that was not profit-oriented but socially important." Murphy's area is chemical engineering applications toward medicine–particularly neurology. As a graduate student, she worked on a novel treatment for cancer involving a separation process on the blood of cancer patients.

The strength of the research program in the Chemical Engineering department and the college's dedication to undergraduate as well as graduate teaching affected Murphy's final decision to come to UW-Madison. Research is important to Murphy and was the main reason she returned to her alma mater for her Ph.D. after working for Chevron, where her job duties were becoming less technical but more managerial.

The strength of the research in the Chemical Engineering department brought Regina Murphy to UW-Madison.

Murphy loves teaching. She feels her greatest personal achievement as a teacher is helping a confused student to understand a difficult concept. One of Murphy's goals is to get students excited about solving real and practical problems. She wants to present her students with a socially important problem and motivate them to solve it. In ChE 426 (Mass Transfer Operations) Murphy has implemented a design project that encompasses engineering, marketing, and cost analysis and includes an oral presentation about the project.

Murphy is also concerned that her students understand how communication, motivation, and technical skills are important in becoming an effective engineer. Murphy advises engineering students to obtain work experience through summer internships and research labs so that they may see how their education can be applied to solving real-life problems.

This is the first time that Murphy has been in Madison. Although she does miss the crowds and activities of larger cities, she enjoy's Madison, especially its lack of traffic jams. Murphy does manage to balance her work and social activities. She plays softball and basketball. She also enjoys playing the piano and is learning to sail.

Murphy is definitely concerned about her students and the quality of their education. For her, chemical engineering is fun and through many innovative ideas, she wants to make it that way for her students. ■

AUTHOR

Stefanie Smith is a senior in Chemical Engineering. Stefanie is working for the Wisconsin Black Engineering Student Society as an intern for the Technical Communications Certificate Program.

RETIRING PROFESSORS SAY GOODBYE

As students packed up and left last spring, four respected professors of Electrical and Computer Engineering also packed up and left. It seems that Ted Bernstein, Art Tiedemann, William Birkemeier, and Burr Fontaine had retired. But now that they have set aside their boxes of chalk and lecture notes, what do their futures hold?

Professor Ted Bernstein plans on talking to public groups about the subject of many of his publications: Electrical Safety.

Professor Bernstein earned his bachelor's degree in 1949 from the University of Wisconsin-Madison. He recalled that the campus was very crowded then compared to now. Many servicemen returned to school along with many new students. He remembered not experiencing a sense of belonging to the class of 1949. Most students who start college today stay with the same group of people for four or five years until graduation. When Prof. Bernstein came here in 1947, after one and a half years of Army service and one year of schooling in Milwaukee, there were all kinds of people on campus. New freshman could be found in the same class as thirty-five year-old returning servicemen who had families of their own. Only a few students attended four continuous years of college.

In those days, many classes were held in the Mechanical Engineering building and the surrounding temporary structures that had been built during the war. (Some *temporary* buildings are still in use today, 42 years later.) Electrical Engineering laboratories were held near where Helen C. White College Library now stands.

After receiving his degree in 1949, Professor Bernstein worked at Boeing Airplane Company in Seattle for three and one-half years. He worked on the electrical systems of large commercial airliners and B-47 Bombers.

From there, he went to AC Spark Plug in Milwaukee. Through night classes conducted through the University of Wisconsin-Madison in Milwaukee, Professor Bernstein studied and received his Master's degree.

From 1956 to 1959, Professor Bernstein was an instructor at UW-Madison while studying for his PhD. After earning his last degree in 1959, he moved to Los Angeles to work in the Space Technology Laboratories. He was working on Project Mercury, the first manned space flight, and on satellites during his stay there.

Returning to UW-Madison in 1962, Professor Bernstein lectured to thousands of students until his retirement on July 1, 1989.

Although he never lectured at any other university, Prof. Bernstein attended courses on his own to "better himself as a teacher". Also, he has done many public talks on lightning, electrical hazards, and electrical safety including conducting courses for practicing engineers through the University Extension.

Professor Bernstein's favorite class to teach was Electric Field Theory. His reasons? "It really is enjoyable to take a class which is allegedly very theoretical and point out how this so-called theoretical stuff has such beautiful practical applications."

Professor Bernstein plans on taking life easy in the future. He will also be consulting "as long as [his] mind and health hold out." He will still concentrate his public talks and consultations on electric safety.

Any hints for success in the engineering world?

Bernstein says that once a student receives his degree and takes a job, "if he is not learning, then [he should] get away from that job." One must give any job a one or two year chance, and if one is still not learning, then it is time to look elsewhere. As he said, "If you have a choice between two jobs; one with a big salary and a big title, or a lower salary(but don't be a dope and do it for nothing), always go for where you are

(Left to right) Professors Art Tiedemann, William Birkemeier, Burr Fontaine, and Ted Bernstein retired this year.

learning and working with good people." The most important keys to success are working with good people and learning, learning, learning.

Professor Art Tiedemann is another professor who left ECE in May 1989 to begin his retirement. Like Professor Bernstein, he earned his PhD. from UW-Madison while working as an instructor. But he earned his bachelors and masters degrees from the University of Illinois at Urbana.

He first made his appearance on the UW-Madison campus in the fall of 1954. Besides teaching two years at the University of Illinois while studying for his Master's degree, UW-Madison has been the only university to benefit from Professor Tiedemann's knowledge.

Professor Tiedemann's wife is a physician who did her internship in Indianapolis. She was looking for residency at the time he was looking for a place to join the faculty. Because Madison was not a large city and the hospital and engineering campus were relatively close, the couple moved to Madison.

Professor Tiedemann liked the freedom that the UW granted its faculty. It was important to him to be allowed to do what he wished at times.

He taught mostly basic circuitry and basic electronic courses. He enjoyed "seeing the light come on in students' eyes" for thirty-five years.

Professor Tiedemann can still be spotted around campus–now as a student. He is auditing three courses as well as reading a statistics book into a tape recorder for a disabled student. Other than this, he has no particular plans. Ironically, he had always wanted to take a trip at a time that was not tied to the school year. Although he admitted that it would be easier to take off a week when auditing then it would be when teaching, to date, he has no plans of extensive travel.

Professor Tiedemann said that one must enjoy his job to succeed in it. There is nothing worse than when one gets up every morning dreading going to work. The professor also believes that if one enjoys his work, he will try to make it work, and there is a better chance that it will.

Professor Tiedemann recommends retirement. " It's great."

Both professors were drawn to teaching at the University of Wisconsin-Madison because they enjoy the students and the scenic campus. Professor Bernstein said, "Teaching is really a very nice life, but one has to really like the students to enjoy" this type of lifestyle.

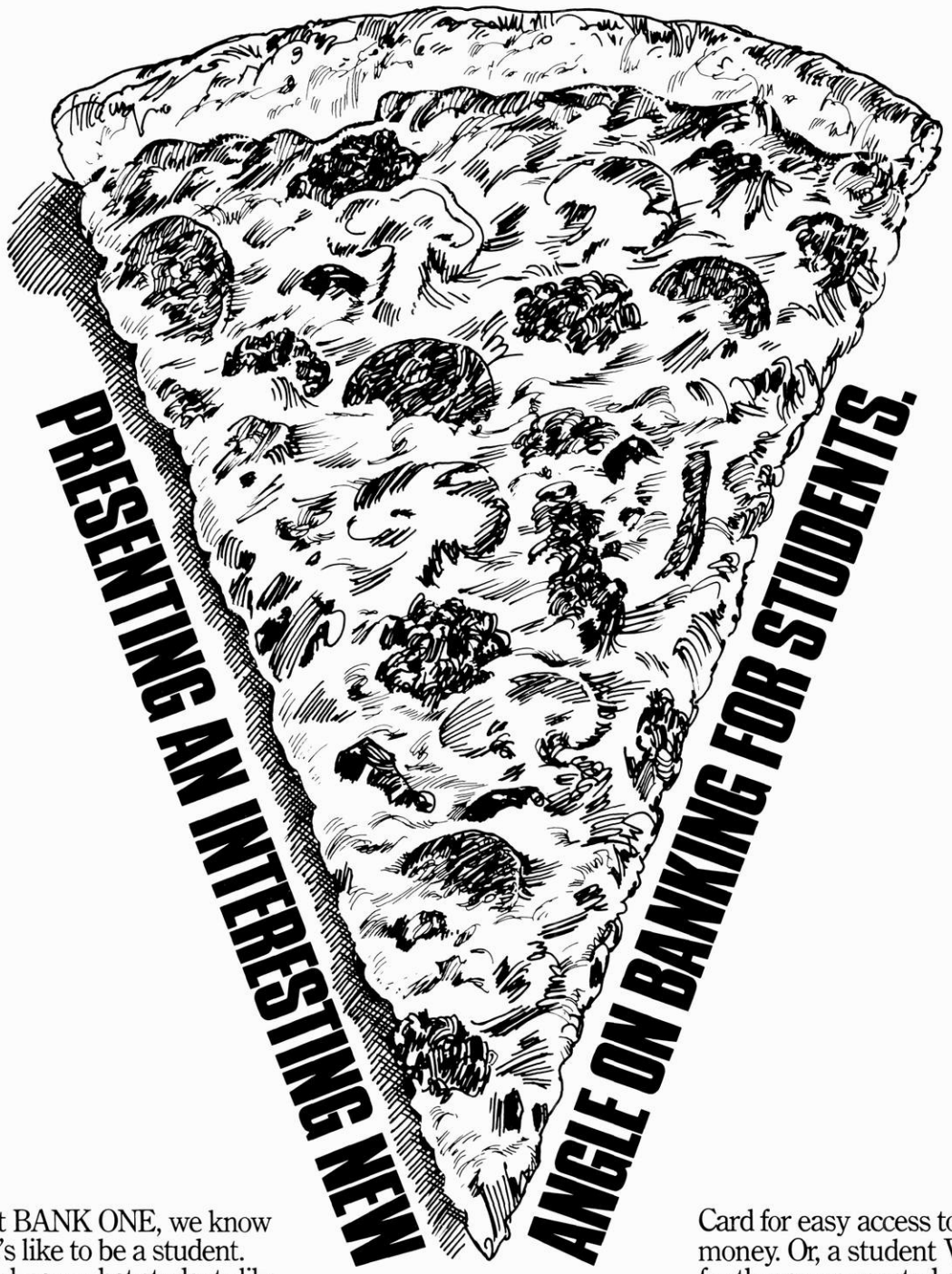
When asked what they would like to change, they both responded with a need for better facilities. Professor Tiedemann also thought it unfortunate that the department restricts enrollment, keeping many potentially good engineers out.

Professor Fontaine and Professor Birkemeier were unavailable for interviews. I would like to thank Professors Bernstein and Tiedemann for their sincerity and helpful advice.

Congratulations to all four gentlemen on their recent retirement and may you touch lives in the future as we know you have touched lives in the past. ■

AUTHOR

Wendy Weinbrenner is a sophomore in Chemical Engineering. Her previous accomplishments include designing the menu for the Dairy Queen in Mineral Point, WI.



At BANK ONE, we know what it's like to be a student. We also know what students like.

So now when you open any checking account, you'll get a free Pizza Hut pizza.

It's our way of introducing you to our Student Banking program. It features money-saving services like our no-minimum-balance Economy Checking account, perfect for today's student.

Low-interest student loans—with approval in 24 hours or less.

Plus a Jubilee/TYME® Card for easy access to your money. Or, a student VISA for those unexpected expenses.

Take advantage of Student Banking by cutting out the coupon below. Then tear into a Pizza Hut pizza at our expense.

BANK ONE
Eighteen Thousand People Who Care.

free pizza!
Pizza Hut

FREE SURVIVAL KIT Yes, I'd like to make the most of my money while I'm at college! Please send me my FREE "College Financial Survival" Kit.

Name_____ Phone_____

Address_____ City_____ State_____ Zip_____

Mail to: "College Financial Survival" Kit, BANK ONE, MADISON, 1965 Atwood Avenue, P.O. Box 7035, Madison, WI 53707-7035 • Or call: **244-2491**

Just One More

Lottery Mix-up:

UW College of Engineering Awarded as Prize!

Artist's rendition of the Mechanical Engineering Builing in its new location on the Ten-Van Doorn farm

Madison, WI - Maynard N. Ten-Van Doorn of Oostburg , Wisconsin, got a big shock two weeks ago when Wisconsin Lottery officials informed him that he held a wining ticket in the Money Game™. But for Maynard, the surprises had only begun. Due to a typographical error, the UW College of Engineering had been inadvertently substituted for the actual lottery prize, a red-and-white "Go Badgers" toilet seat!

Lottery officials are worried how many misprinted tickets are in circulation. "We could have a real crisis on our hands," stated Ade "Ade" Wieselmeyer, Money Game™ spokesman. "If'n it was a car, or boat or somethin' big that got switched, y'know, then we might be able to get away with just having the one. But it got switched with the toilet seat and, well, we got a whole warehouse full of 'em so if a whole mess of those tickets got printed, we're going to be hard pressed to give all the winners their own school."

UW engineering students seem to be indifferent to the whole matter. "Oostburg? Sure, as long as there's some parking," said Fred Schlime, junior in ECE. Chris Aichin, a sophomore in ChE remarked "Hey, Oostburg isn't that bad. Heck, Waldo's okay, too. Just as long as it's not Sheboygan."

But back in Oostburg life is still a surprise a minute for Maynard. "I don't have a clue as to what I'm gonna do with it. To tell you the truth, we could really use that toilet seat…"

-Robert Apthorpe
Just One More News

We're Looking For Engineers Who Want A Career — Not Just A Job!

If you're looking for a career, not just a job, Oscar Mayer has the challenge you need! Oscar Mayer, one of the nation's top meat companies, has 20 plants, sales centers in 30 cities, and employs about 12,500 people in the United States. Brands produced and distributed by the company include Oscar Mayer, Louis Rich turkey products, Claussen pickles, and Louis Kemp surimi seafood products.

Engineers throughout the company are involved with electronics, refrigeration, heat processes, waste and water treatment, power plant operation, architecture, machine design, and sophisticated processing and packaging.

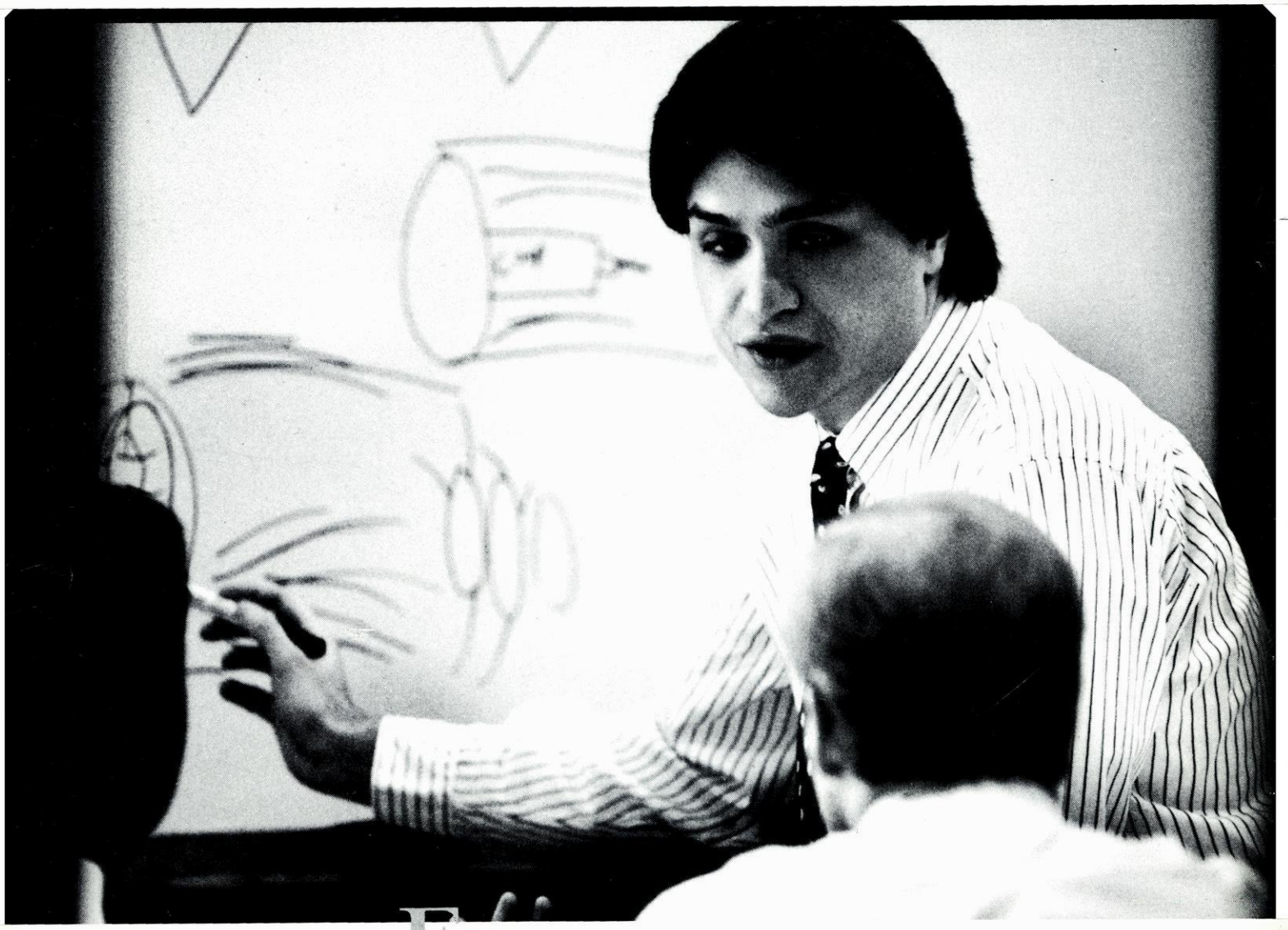
Oscar Mayer established a formal program in 1975 to train new engineers in the company's philosophies, practices, and objectives. The Engineering Management Development Program takes new engineers through a variety of challenging positions to polish their skills and build their leadership abilities.

Candidates for Oscar Mayer's Engineering Management Development Program should have a bachelor's degree in one of the following engineering disciplines: mechanical, chemical, electrical, civil, industrial, or industrial technology/plant engineering.

If you feel ready to be challenged and to grow in your career, and want more information about Oscar Mayer and its Engineering Management Development Program, please write to:

Mr. K. S. Salter
Human Resource Selection - EMDP
Oscar Mayer Foods Corporation
P.O. Box 7188
Madison, Wisconsin 53707-7188

What Joe Johnson wants, Joe Johnson gets.



Even as a young boy, growing up in poverty on a Seneca reservation, Joe Johnson knew he had what it takes to be a success. And with fierce determination he found his opportunity—at GE.

As a member of GE's renowned Manufacturing Management Program, Joe's fulfilling his potential in a big way. From his very first assignment helping to build the top-secret control panel of a nuclear submarine, to his current supervisory role in GE's aircraft engine manufacturing plant, he's had a chance to develop the skills that mark him as a leader.

Less than two years onto his career path, Joe's experienced the thrill of seeing his ideas come to life. His energy and drive have plugged into the kind of global support system most graduates just dream about.

GE wants people like Joe. And people like Joe definitely want GE.

The mark of a leader.

An equal opportunity employer.