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Volume 95, No. 1

October 1990

wisconsin engineer

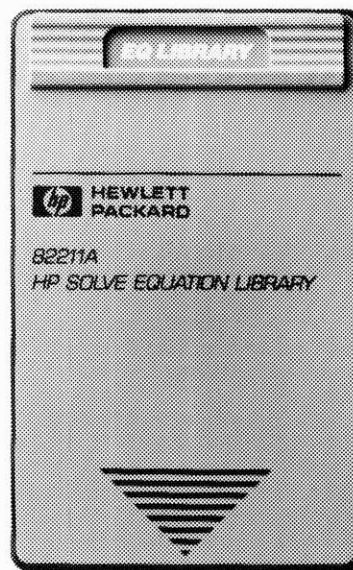
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wisconsin engineer

PUBLISHED BY THE STUDENTS OF THE UNIVERSITY OF WISCONSIN-MADISON, OCTOBER 1990

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Cover: Students returning to the university for the fall walk under the Camp Randall Arch to get to and from the engineering campus. Photo by Shelly Hoffland

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EDITORIAL



Shelly Hoffland, Production Editor
Wisconsin Engineer

What if I don't want to be an engineer after all? I am studying for a degree in mechanical engineering and I'm not even sure what a mechanical engineer really does.

This is my seventh semester—the first as a senior—and so far, I have done very little hands-on work. The theory and number crunching is getting boring. But I can wait until I know more about mechanical engineering as a profession to decide whether or not I like it.

Wait?! Wait for what? Why can't I just find a major that I *know* I will enjoy. I should not waste my time earning a degree (and spending what seems like \$3 million doing so) if I don't like the field. I need to decide what to do with my life.

Not necessarily.

I never said I didn't like mechanical engineering—just that it isn't super exciting yet and I feel unsure about what a mechanical engineer does. I may as well give mechanical engineering as a career a chance.

So what happens if I get a job after graduation only to find out that I don't like it. I guess I can find something else to do.

Is this attitude normal? Maybe not for most college students, but career changes, either from one company to another or from one field to another, certainly are not uncommon.

Richard Bolles, a former Episcopal priest and now a well-known career-change advisor, says that on average, a job lasts 3.6 years. In his popular annual guide to the career change, *What Color is Your Parachute*, Bolles also states that on average, people tackle the job hunt eight times in a lifetime.

Why do people change careers?

According to Linda Schilling, a counselor and career advisor for the College of Engineering, people change careers for a number of reasons.

First, students tend to major in a field that someone else, often a high school teacher or a friend, suggested on the basis of *you'd be good at that*. Schilling notes, "Most freshmen come here with no idea about what engineering is, or about the differences among the disciplines." Gender roles are also a factor. Individuals who grew up with their parents' attitudes that only girls become nurses and only boys become doctors often find dissatisfaction with their career choices. In addition, as people grow older, tastes, needs, and goals naturally change. A field may seem less interesting or become limiting and a change is desired. Another major reason for career change, especially in intense fields like engineering or computer science, is burnout.

For students who worry about whether or not their career choices are right, Schilling recommends, "Don't get hung up on whether or not this is the perfect career for you. You don't really know anything until you try it."

Keith Johnson, a corporate staffing manager for Hewlett Packard, suggests some ways to help the first job after college be a springboard for the future. The key is to consider the immediate along with the long range factors of a certain position. Johnson compares such factors as the type of work to the opportunity for growth, the training process to the continuing education policy, and the work environment to the company values. Johnson points out, "Because immediate factors are more concrete, they can unconsciously become a bigger part of your decision. The longer-range factors, however, are really the key to determining whether you will be happy with your choice for at least the first several years." This attitude assures that opportunity is always open for the future at a particular job.

So, this is why I will wait. I may have some potential as a mechanical engineer. I will co-op next semester (I hope) and learn more about this profession and return to school to finish my degree. In five years, give or take a couple, if I am unhappy with my career choice, I can find something else to do.

No rush. No big deal. ■■

DEAN'S CORNER

I viewed the July full moon in the Atlantic off the south coast of Nova Scotia. The bright glimmer of the sea as we coasted down the ocean swells at six knots during the 10:00 p.m. to 2:00 a.m. watch simulates thought and contemplation. In a week we will be in Beddeck where we will leave our sloop for the winter. A quick flight from Sydney to Madison will bring us back to prepare for the fall semester.

At the same time, I suspect many of our new students saw the full moon from points all over Wisconsin, the U.S., and a few from around the world. They, too, may have been contemplating their first day on the Madison campus after the summer break of vacations and work.

All of you who will be on campus together this semester will share a special opportunity to embark on a voyage of learning and building for a productive professional future. Your educational experience is very much like a voyage at sea. Before you embark, you must know where you are going, understand the potential conditions you will encounter and be prepared to meet the challenges that develop as they occur.

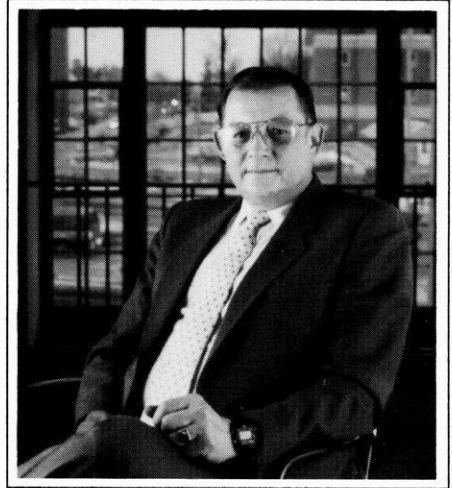
You have already chosen a starting point — one of the best engineering colleges in the country. You will meet many distinguished faculty and staff who have made the voyage before you. They are dedicated to helping you find your way through storms and calm. Be sure to seek their advice, get to know them, and remember, they are seasoned navigators of their professions. You will learn from faculty who are not only good teachers, but outstanding researchers with international reputations in their field. They have made a commitment to provide you with a basic understanding of science and mathematics and the practice of engineering.

Consider your destination carefully. Whether it is a professional career in engineering or some other field like law, medicine or business, your engineering studies will provide you with a sound technical foundation on which to build a career. In sailing, setting goals and studying the charts before you leave on your journey help to assure a successful trip. Your studies in a college are no different. But, like any passage, the charts must be kept close at hand, and you must establish way points and measures of performance to assess your progress along the way. Your journey in college is a long one. It should be one of the most memorable experiences in your lifetime. The resources in Madison are in place to make your trip a diverse experience. At sea, I look for diversions — some fishing, watching the dolphins, whales, the many birds, and studying the shoreline, if there is one. In college you can participate in a host of activities. Plan to participate in your new environment. You can join professional societies, athletic teams, music groups, sports clubs, fraternities and sororities, and numerous informal social groups. These are all important diversions from riding one wave after another.

Near exam times the waves rise, sometimes to breaking stage. It is important to know the capabilities of your ship and your crew. Adequate preparation is essential to help you weather whatever storm may come. Knowing your strengths and weaknesses will help you prepare for both the best and the worst. This requires honest assessment of where you are, what will come, the potential result and what preparation is needed to assure success. Your books, the resources in our library, and the faculty and staff are your assets for preparation. Practice, however, with problem solving is the final step in learning to assure satisfaction in meeting your expectations.

Most of your experiences in college will focus on individual performance. Sailing single-handed is analogous. A good sailor can do it, but a great sailor knows how to work with a crew. Life in the professional world is a teamwork environment. The success of interpersonal skills and collegiality will therefore be of paramount importance. Practice these skills in groups and learn to be a team player. Your ultimate grade in life may depend on teamwork as much or more than your mastery of a subject.

If you are a new freshman or a continuing student, welcome aboard, have a good trip and stay clear of the reefs. ■■



*John G. Bollinger,
Dean, College of Engineering*

HELPING OTHERS HELP THEMSELVES

Outdoor plumbing, thatched-roof huts, and no cable TV may seem like a nightmare to some people, but for one former UW graduate it was a dream come true. James Smith, a 1987 graduate, was honored this spring for his success as a Peace Corps volunteer by being named one of five recipients of the 1990 John F. Kennedy "Representative Volunteer of the Year" Award.

Months before graduating with a bachelor's degree in astronomy physics, James Smith began the application process to join the Peace Corps. Why the Peace Corps...? Well, it wasn't a last minute decision to escape from the academic horrors of the university. Six or seven years earlier, Smith read *The Ugly American* by William J. Lederer and Eugene Burdick, a fictional novel describ-

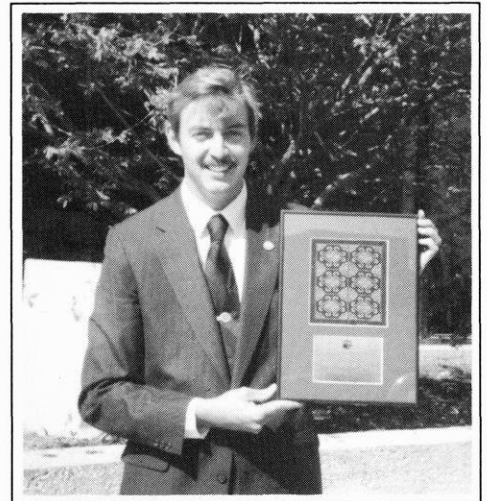
"The Ugly American" opened Smith's eyes to the unnecessary hardships faced by people in third-world nations...

ing the often "inappropriate" assistance given to developing countries by the U.S. government. *The Ugly American* opened Smith's eyes to the unnecessary hardships faced by people in third-world nations, and thoughts of this unfortunate reality stayed with him during his years at the UW. After initially considering a degree in history or political science, Smith changed his mind and his major to make himself more appealing to the

Peace Corps. Smith chose astronomy physics because technical skills are highly demanded by the Peace Corps.

After completing the lengthy application process, Smith began his Peace Corps service in December of 1987 in Liberia, a mid-African country on the Atlantic coast. He learned quickly just how difficult it can be adjusting to a completely different culture. "When you go into a foreign culture, it's different in so many ways. You can think you're prepared for it, but there are things that you never even thought of," Smith comments. Naturally, he encountered daily disappointments as a result of his own cultural expectations. He learned the hard way that time has little importance in Liberia, occasionally waiting hours for people to keep appointments they had made with him.

Overall, however, Smith enjoyed the "laid-back" Liberian lifestyle. He was immediately accepted by the people. He was even *gowned* the honorary town-chief-for-a-day and given gifts of rice, chickens, and a goat. Smith described the workday as a "party-like" atmosphere surrounded by the beating of drums. A few people would work while the rest stood around watching and



Smith displays the John F. Kennedy Representative of the Year Award for his work in the Peace Corps.

drinking "palm wine" (which Smith describes as a good "beer substitute"). Smith especially enjoyed bathing in the evening and relaxing with friends, drinking palm wine, and talking. Many Peace Corps volunteers are required to learn a new language, but Smith was fortunate that English is the national language of Liberia.

Smith's first project was literally at the "grass roots" level, digging wells with simple hand tools. The objective of the project was to improve the quality of the water supply and thus decrease the likelihood of water-borne illnesses. Later, Smith helped initiate a project to allow the people to produce uniforms for their school children, rather than travel 250 miles to purchase the uniforms.

Smith also introduced the idea of having a community planning session. Such sessions served a dual purpose, allowing the people to identify their needs and set goals for themselves while simultaneously assuring Smith that the assistance he provided was "appropriate."

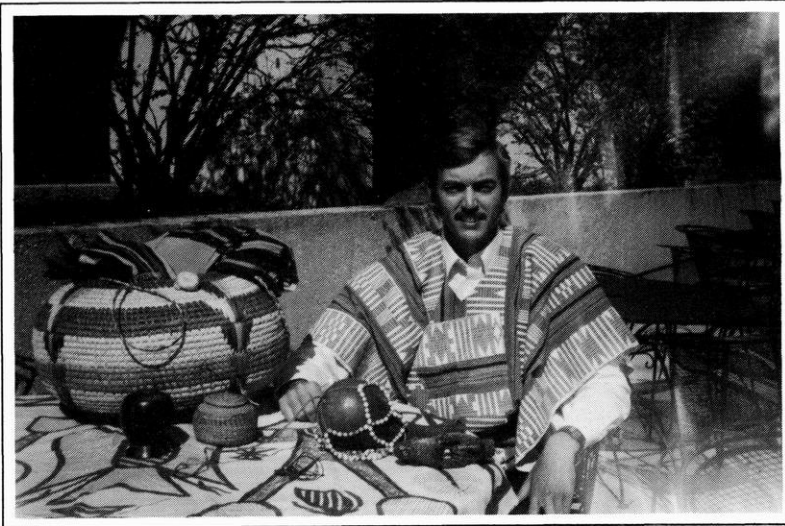
Smith was careful not to take on all of the responsibility for these projects himself. His role, as he saw it, was to help the people help themselves. "Volunteers have the 'Western' drive to finish the projects, but then after the project is completed, the people look at it as the volunteer's project rather than as their own... It's better to leave an unfinished project than it is to leave a finished project that the people don't feel ownership of," Smith comments.

The normal term of service in the Peace Corps is two years, but Smith asked for a third-year extension to assist in the completion of the projects he helped initiate. At least that was his "practical" reason for wanting to stay. Smith's "personal" reason for staying

"... One of the most important things I learned was how much inside myself was actually me and how much was the Western culture I was brought up in."

was that he really enjoyed the culture.

Smith described his Peace Corps service as an on-going learning experience. "There are things you assume are human but are actually attributes of Western culture... One of the most important things I learned was how much inside myself was actually me and how much was the Western culture I was brought up in," Smith explains. Al-



James Smith shows a few of the items he collected while working in Liberia.

though the Peace Corps is designed to help others, Smith believes that he benefited most from his experience, citing noticeable improvement in his interpersonal skills and overall self-confidence.

The John F. Kennedy "Representative Volunteer of the Year" Award, named for the president who established the Peace Corps in 1961, is given annually to representatives of each of the three regions of the world that the U.S. Peace Corps serves. Smith believes he was chosen for the award because of his successful projects and his ability to work effectively with the Liberian people.

In order to receive the award, Smith was flown to Washington, D.C. in late April. Smith and the other recipients were honored during a special White House ceremony hosted by President Bush as a part of National Volunteer Week. Smith had the privilege of chatting briefly with Bush about Liberia. This week filled with praise also brought great disappointment to Smith. During that same week, he learned that he would be unable to return to Liberia due to the outbreak of civil war. Smith's greatest regret was that he never got a chance to say goodbye to the many friends he made and to thank them for their incredible hospitality.

Due to this unfortunate turn of events, Smith found himself in need of a

job. Ideally, Smith says, he would like to go to graduate school to get a master's degree in urban and regional planning and become a Peace Corps professional in Liberia after order is restored there.

In addition to having the best collegiate hockey team in the country, the UW is also the nation's number one producer of Peace Corps volunteers. For those of you who are pursuing technical degrees and are uncertain about what you want to do after graduating, the Peace Corps may be just what you're looking for.

Currently, 6100 Peace Corps volunteers and trainees are working on development projects in needy countries around the world. This summer, the Peace Corps sent its first volunteers to Eastern Europe. Anyone with questions about the Peace Corps can contact the Madison campus recruiter at 262-1121. ■■

AUTHOR

Mike Waters, a sophomore in engineering mechanics, enjoyed a multi-cultural experience of his own last summer: running with the bulls in Pamplona, gazing at topless figures on the French Riviera, and drinking beer everywhere else.

DID YOU MISS US THIS SUMMER?

The *Wisconsin Engineer* staff did not take a vacation this summer, but we did not produce a summer issue, either. Instead, in hopes of improving our finances, we produced the Placement Guide for the Career Planning and Placement Office.

If you are a subscriber, please do not worry. We will extend your subscription to include a fifth issue. Maybe, if this next year goes well for us, we will be able to give you that summer issue next year. (That's a big hint for you to send us big checks)

Of course, we apologize for any inconvenience, lost sleep, or feelings of desertion. We really meant no harm. In the meantime, please enjoy this October issue.



UW-MADISON 1991 ENGINEERING EXPOSITION



WHAT WILL I GET OUT OF EXPO?

Students who exhibit at Expo will have the opportunity to:

- Acquire practical experience in design, problem solving and presentation skills.
- Receive independent study credits or technical elective credits for their work on projects.
- Compete for \$4,850 in cash prizes.
- Exhibit next to practicing engineers from major companies and organizations.
- Meet informally with representatives from many of the companies that interview on campus.

HOW DO I GET INVOLVED?

UW-Madison students can get involved by developing and exhibiting a display related to any technical or engineering discipline.

The special exhibits theme is sports in engineering. It is not necessary to follow this theme; it is primarily to spark ideas. A list of project ideas is available in the Expo office and in the ME lobby.

Students may exhibit in any one of these categories:

- Individual Projects
- Small Group Projects (2 or more participants)
- Student Organization Projects
- Graduate Student Projects

Students can also assist in the planning and organization of Expo. Expo is entirely student run. Benefits of helping the executive committee include:

- Meeting students and faculty from all engineering disciplines.
- Promoting, through your own work, a well known event aimed at demonstrating the quality of a UW-Madison engineering education.

WHO TO CONTACT

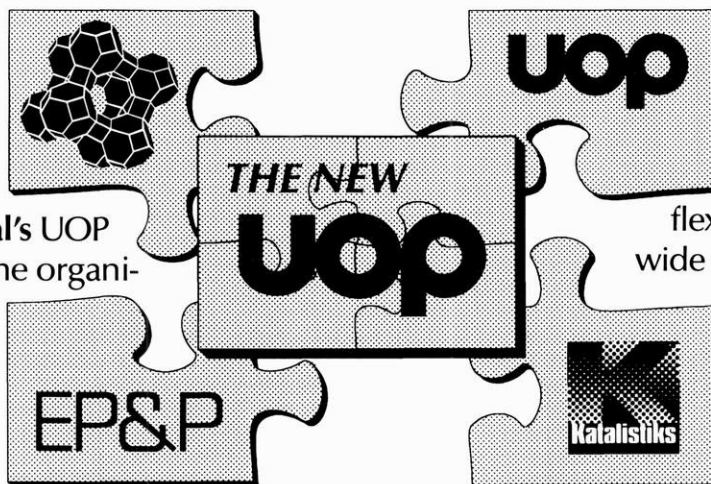
If you need an idea for a project, information about exhibiting, or people to help with a project, contact Jennifer Meinz, Student Exhibits Coordinator. If you would like to help plan and organize, contact Lynn Graber, Promotion and Personnel. 262-5137.

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personal skills and abilities in a variety of assignments before deciding on a specific career direction. Our flexible program provides a wide sampling of engineering experience and diverse options at its completion. It truly affords the opportunity to quickly move into positions of responsibility.

Alternately, for the engineer who has been working and striving to obtain a specific goal, we offer positions that will allow you to enter directly into your chosen career.

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1800 E. President St. Savannah, GA 31404	Mfg. (Catalyst) Process/Project Eng.	BS				
Saw Mill River Road Tarrytown, NY 10591	Materials Research & Development	BS MS				
P.O. Box 11486 Chickasaw, AL 36611	Mfg. (Molecular Sieves) Process/Project Eng.	BS				
Drawer C Riverside, IL 60546	R&D, Process Dev. & Project Engineering	PhD				BS
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New Department Chairs

Professor Peter Monkmeyer has replaced Professor James L. Clapp as the chairman of the civil and environmental engineering department. Before his promotion, Monkmeyer spent many years as associate chairman of the Graduate Affairs office in the same department.

In addition, Professor Bahaa Saleh is the new chairman of the electrical and computer engineering department.

Wisconsin Engineer Welcomes New Faculty

Dr. Thomas F. Kuech joins UW-Madison from IBM. Kuech is an Associate Professor specializing in thin film deposition.

Dr. Kevin L. Bray, of the University of Illinois, is an Assistant Professor specializing in materials science, particularly characteristics of materials under high pressure.

ENGINEERING BRIEFS

Professor McNeary Retires

Wisconsin Engineer bids farewell to Professor James McNeary. McNeary's specialty is teaching graphics, and he developed and taught ME 151-152: Descriptive Geometry Via the Microcomputer. McNeary says he is "up to his ears in home projects" that have been put off for 20 years. He also says he is working very little with his computer, but is working a lot with his tools. He says that it will take "ten years to catch up" with all of his projects and plans around the house. He enjoys his retirement because he can work a little, rest a little, and take a nap. His only regret is that he has gained some weight in his first 31 days of retirement. Good luck, Professor McNeary. We hope everything is still *slicker than cat fur*.



SWE Chapter Wins Regional Award

The University of Wisconsin-Madison chapter of the Society of Women Engineers (SWE) received the Award for Best Student Section in the Midwest Region at the SWE National Convention in New York City.

The award fund raising success, career development activities, and activities with Girl Scouts. The award comes after a three-year re-organization period for the UW-Madison chapter that involved becoming more active in the community and on campus.

Congratulations to all of the SWE members who have helped to earn this award.

**EXPO '91
APRIL 19-21**

Presidential Young Investigators Award

The Presidential Young Investigator Awards are presented by the National Science Foundation (NSF) to encourage contributions and advances in engineering, physics, chemistry, and other sciences. This year, six assistant professors in the UW-Madison College of Engineering received this prestigious award. Front row, left to right: Regina Murphy, Chemical Engineering; Jeffrey Russell, Civil and Environmental Engineering; Roxann Englestad, Mechanical Engineering. Back row, left to right: Jake Blanchard, Nuclear Engineering; and John Booske and Ned Tabatabaie, Electrical Engineering. Congratulations to these outstanding young faculty.



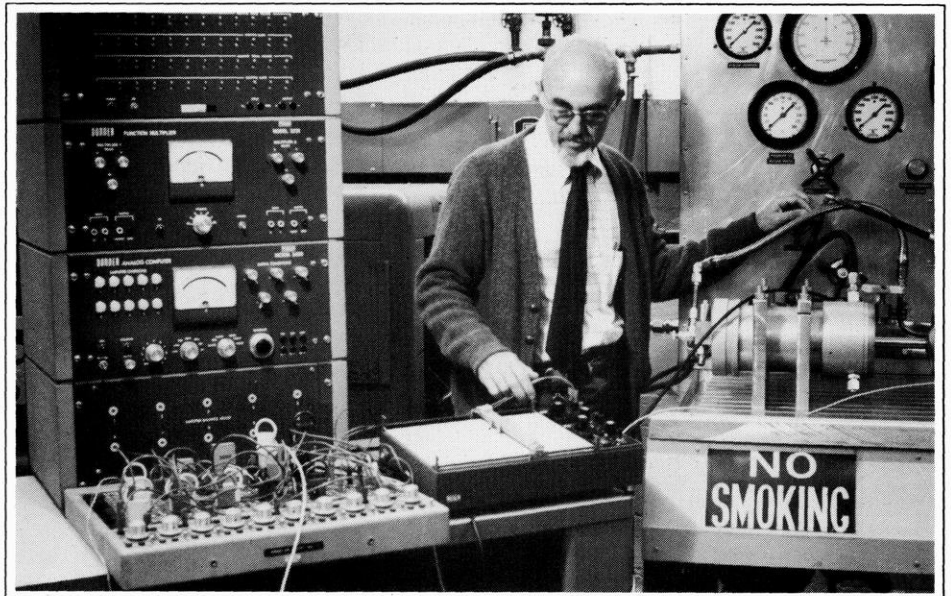
PROFESSOR OTIS: SUN, SAND, AND DATA

If you think all mechanical engineering professors were cast in the same die, you have never met Professor David Otis.

Professor David R. Otis earned his Ph.D. in mechanical engineering in 1964 from University of California-Berkeley. His specialties at the mechanical engineering department at UW-Madison are energy storage, heat transfer, and fluid mechanics. Otis has been with UW-Madison since earning his Ph.D., although not all of those years were spent on the Madison campus.

Before starting work on his Ph.D. in 1959, Professor Otis spent about six years in the aerospace industry working on the Atlas Missile Project, various aircraft programs, and some nuclear shielding projects in Oak Ridge, Tennessee.

The time he spent in Saudi Arabia seems to over shadow much of the rest. Professor Otis spent six years in Saudi Arabia spanning the years between 1974 and 1988. From 1974 to 1976, Otis and his family were living in Saudi Arabia while Otis taught at what is now known as The King Fahad University of Petroleum and Minerals. During one summer there, the Otis family packed up and drove from Saudi Arabia to Switzerland and camped along the way. They drove through Jordan, Syria, Turkey, Greece, Yugoslavia, Austria, and Bulgaria meet-



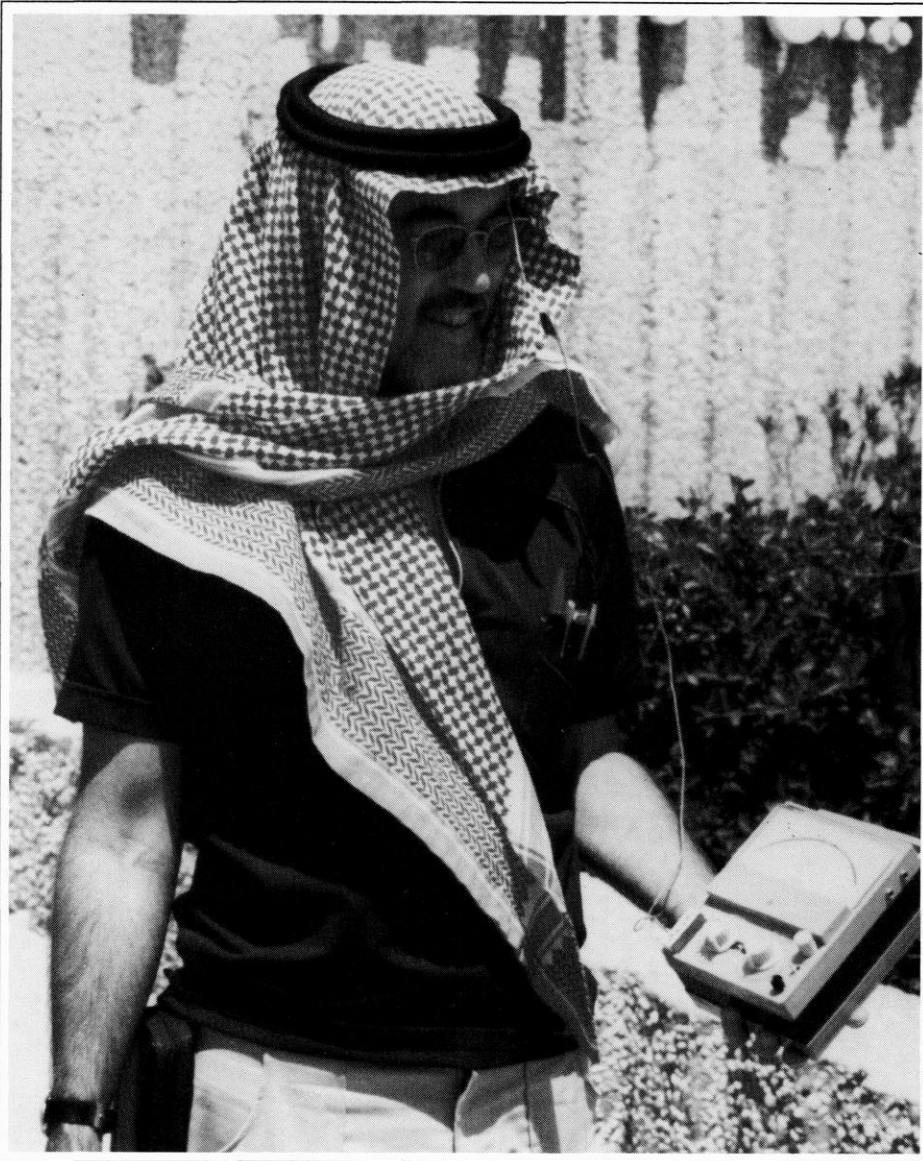
Professor Otis works on an experiment, something he enjoys about engineering.

ing the people, discovering their cultures, and communicating with what Otis termed his "survival" knowledge of German, Spanish and Arabic.

Two years after coming to the University, Professor Otis became a Christian, and considers his faith an important part of his life. He comments that intelligence "doesn't mean you can't believe." Over the years he has been involved in various Christian organizations in the area, such as Navigators and Campus Crusade for Christ, but he is not currently involved in any such groups.

The Otis family consists of five children (two boys and three girls) and as professor Otis says, "only one wife."

Three of the five children chose to follow their father's career choice. His two sons are both mechanical engineers. One works at Trek, a bicycle manufacturer in Waterloo, Wisconsin. The other is working toward a Ph.D. at MIT. The third ME is one of twin daughters, currently a graduate student in industrial engineering at UW-Madison. Of the other two daughters, one lives in Baltimore and works as a registered dietitian



Otis conducts an experiment with the traditional Arab headdress he wore in Saudi Arabia.

and the youngest is earning her undergraduate degree at the University of Minnesota.

While teaching at UW-Madison, Otis can be seen wearing the traditional Arab headdress, which he wore while working in Arabia. The garb consists of a small white cap covered with a large red and white band or cloth, held together with a black rope. Otis was the only westerner who wore the headdress at the University and it became his trademark. This had its advantages and disadvantages. With his small beard and mus-

tache, along with the Arab headdress and western clothing, Otis resembled a Jordanian and was often mistaken as such. He used this to his advantage, as he could mumble a few words in Arabic and be on his way.

At UW-Madison, Professor Otis dons the Arab headdress because he likes to wear it and uses it as protection against the sun. A recent situation prompted Otis to wear the headdress for other reasons. Having lived and worked in Saudi Arabia for six years, Otis was distressed by the fact that George Schultz

would not grant Yassir Arafat a visa to enter the United States to speak his piece. Professor Otis wore the headdress in silent protest.

Otis also came to appreciate other advantages of wearing this native apparel. He discovered that not only could you wrap the band about your shoulders for warmth or as a shield from the heat, but it also could be piled on top of the head to help keep you cool. He also noticed that, while wearing the headdress, his head temperature seemed to remain quite constant. To test this hypothesis, Otis took measurements of his head temperature and sure enough, the temperature remained fairly constant whether in air-conditioned buildings or in blazing 100 plus degree heat. Otis planned to write a paper on the subject, but was not able to collect sufficient data.

Professor Otis can be found in his office, working on one of his experiments or discussing one with a colleague. If you visit Otis in his office, you may find one or two things from Arabia, such as the calendar on his door. He can also be found teaching two classes this semester, ME 349 and ME 572. He would, however, prefer to be "where the data is being taken."

Three research projects currently have Professor Otis' attention. The first of these projects involves air cylinder actuation. He and a graduate student are modeling and taking experimental measurements of the functioning of these air cylinders. They will record data and de-

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scribe the valve, the cylinder, and seal friction, as well as the thermodynamics involved in the experiments.

The second project, at the Wisconsin Center for Space Automation and Robotics (WCSAR), is part of a series of NASA projects being conducted on the UW-Madison Campus. Otis is involved in a one-month project using wind-tunnel tests to study humidification and dehumidification. He hopes to determine if it is possible to both humidify and dehumidify with one "box" or piece of machinery.

Finally, Otis is taking part in a project with his colleague, Professor Ragland. This project uses thermo-plasmas (ionized gases) to dispose of small quantities of chemical waste. The two professors are studying what the thermo-plasmas do to the chemicals in hopes of perfecting a small device capable of disposing of various chemical wastes.

When Professor Otis is not teaching or involved in research, he enjoys camping and skate sailing, which he describes as "wearing ice skates and holding a sail." Otis also enjoys music and plays a variety of instruments.

If you are an engineering student in need of direction or need to take ME 349 or ME 572, Professor Otis may be just the man you are looking for. If you can spot his tan Chevy truck with the camper cab you will usually find he is not far away.

■

AUTHOR

Barb Kauffold, a BA-2, is a full-time technical writer and part-time student. She is hell on wheels when it comes to desktop publishing.

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HOPE IN BADGERLAND: ALVAREZ WORKING HARD FOR BUCKY

At the conclusion of last year's dismal football season, it didn't take an engineering degree to see that some changes were needed somewhere.

Drastically sagging attendance at football games translated into an athletic board that was observing more red in the balance books than in the stands.

Why the sagging attendance? Let's face it, Wisconsin fans do not expect dominance and perfection like other fans in the Big Ten. In fact, first-year head coach Barry Alvarez's son Chad has probably accompanied his Dad to more bowl games than all of Badger history provides.

Win or lose, our fans are known for having a good time and keeping football what it is, a game. The Fifth Quarter is proof of this. However, even Wisconsin fans can take only so much. Yes, Don Morton & Co. were having considerable trouble selling the offense, completing passes and getting touchdowns.

However, more than that is necessary to kill the loyalty of tenacious Badger fans. Other problems fed the fire: the infamous dismantling of the student section coupled with a boost in the legal drinking age; the unfortunate timing of a new football facility that cost millions while the athletic department was mired in debt; NCAA violation investigations; rumors of unhappy players; a \$10 tuition increase to help the athletic department; and even an attempt to ban the "Bud Song." These problems, along with three years of terrible football, started to turn fans off in droves.

The one bright light in all of this was Bucky's Marching Band. The band provided the majority of the entertainment and kept what fans there were in the stands for the Fifth Quarter and continued to play the "Bud Song." Finally, Chancellor Shalala lowered the boom on Morton. Changes were made in the athletic department as well, with the resignation of athletic director Ade Sponberg and the hiring of former Badger great Pat Richter to take the vacancy. Barry Alvarez is the new coach and a new wind is blowing.

"My number one goal for this first season is to have a team out on the field that people in the state of Wisconsin can identify with and be proud of."

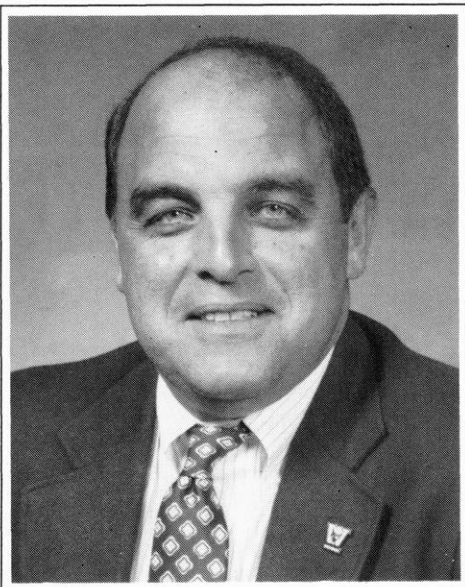
With Alvarez comes a feeling of renewed excitement. After just over six months on the practice fields and around the football offices with the Badgers' new coaches, Alvarez and his high-powered staff have already made a profound impact on the program. There is a sense of eagerness and optimism among both the coaches and players.

Throughout his initial spring practice session, coach Alvarez was both a teacher and a student. He worked his

first Wisconsin team like a conductor works an orchestra. He made the rounds every day, shifting his attention from the linebackers to the offensive backfield, from the defensive secondary to the punt return units. He stood back and observed, registering what he liked and disliked for future staff and player meetings. He took charge, moving into the center of play. He offered constructive lessons, praise if deserved, and disgust when necessary.

"My number one goal for this first season is to have a team out on the field that people in the state of Wisconsin can identify with and be proud of," explains Alvarez. "I just want them to go out and play as hard as they can, know what they're supposed to do, have fun playing and be excited about it."

Alvarez certainly has the necessary resume to fulfill his number one goal. A native of Burgettstown, Pennsylvania, Alvarez came to Wisconsin after three successful seasons as a coach under Lou Holtz at the University of Notre Dame. He first joined the Notre Dame staff in March of 1987 as outside linebacker coach and was quickly promoted to defensive coordinator and inside linebacker coach for the 1988 season. That season the Irish went on to attain the No. 1 ranking in the final national polls with a 12-0 record. Last year, Alvarez served as assistant coach as well as defensive coordi-



Badger football coach Barry Alvarez is creating a "whole new animal".

nator while Notre Dame attained a No. 2 national ranking and finished 14th in both rushing defense and total defense.

From 1979-86, Alvarez served as an assistant coach at the University of Iowa with Hayden Frye. Alvarez coached in six post-season bowls at Iowa, including the 1982 and 1986 Rose Bowl games.

Fortunately, Alvarez will not have to build the Wisconsin program from scratch. This fall he will greet 39 returning Badger football lettermen - 21 on offense and 18 on defense. Sixteen

of those lettermen - eight on each side of the ball - were starters in the 1989 finale against Michigan State.

Several notable developments have taken place under the new coaching regime. At quarterback, Tony Lowery returns after missing the 1989 campaign. Lowery, who led the Badgers in passing in 1987 and 1988, came back strong last spring and emerged as the team's clear-cut No. 1 signal-caller heading into the fall. Quarterback Lionell Crawford has been moved to wide receiver and figures to provide the 1990 Badgers with a bona fide offensive threat. Rafael Robinson, a letterman monsterback, which is a position very similar to defensive safety, has switched to his originally recruited running back and returns to that position with a fresh outlook and a new confidence. Robinson was a standout all spring long and heads into the fall as the team's No. 1 ball carrier.

Also, Wisconsin's kicking game shapes up on a solid note with the return of last season's leading scorer in placekicker Rich Thompson and No. 1 punter in Brad Brekke.

"We play our first four games in Camp Randall," says Alvarez. "I'm excited about it because I think I sense a feeling of excitement in the state. I think we'll put people back

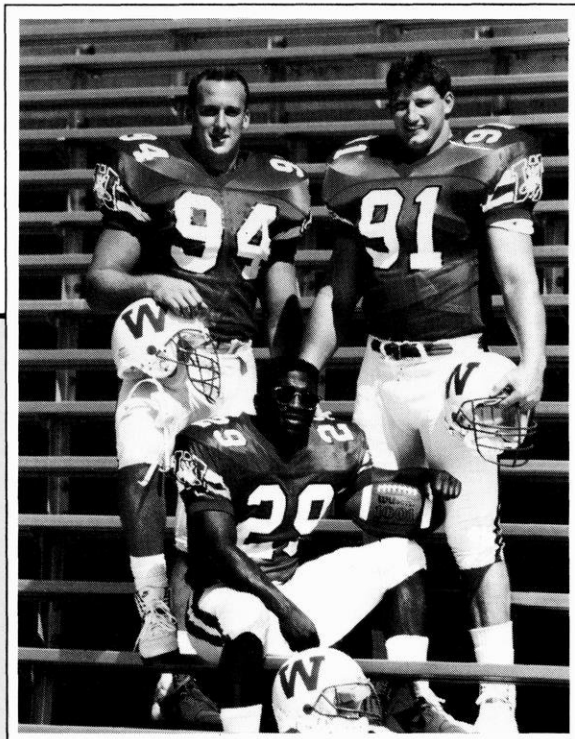
in here and I think this will be a tough place to play again. You can't beat a home field advantage and that's what I anticipate us having."

So to borrow from Bob Dylan, "Oh the times, they are a-changin'." Let's give Coach Alvarez, his staff, and the players the support they deserve. The phones are ringing so get your tickets now, and GET THE RED OUT! ■■

Editor's Note: As of press time, the Badgers have played their three non-conference games with a loss to California-Berkely, a big win over Ball State, and a heart-breaking loss to Temple. The fans are still excited. Cup fights are under control. And the team looks much improved.

AUTHOR

John Rooyackers graduated in August 1990 with a BS in mechanical engineering. John wanted to make sure everyone knew that his favorite ice cream is chocolate chip.



Football players and mechanical engineering majors Dan Batsch, Fred Owens, and Don Davey

1990 Badger Football Schedule

September 8	California Golden Bears	(H)	
September 15	Ball State Cardinals	(H)	Band Day
September 22	Temple Owls	(H)	
October 6	Michigan Wolverines	(H)	
October 13	at Iowa Hawkeyes	(A)	
October 20	at Northwestern Wildcats	(A)	
October 27	Illinois Fighting Illini	(H)	Homecoming
November 3	Minnesota Golden Gophers	(H)	Parents' Day
November 10	at Indiana Hoosiers	(A)	
November 17	Ohio State Buckeyes	(H)	W-Club Day
November 24	at Michigan State Spartans	(A)	

All 1990 Wisconsin home football games will kickoff at 1:05 pm. (times subject to change with television scheduling)

BADGERS ROW TO VICTORY IN NCAA CHAMPIONSHIPS

Jabo knows crew.

Everyone has probably heard it a hundred times: **BO KNOWS FOOTBALL**. This year, in trying to promote a rejuvenated football program, the athletic department is borrowing the same jingle, only their version claims: **BARRY KNOWS FOOTBALL**.

Well, **JABO KNOWS CREW**, but how many of you have even heard of Jabo? For those less informed, Randy Jablonic (Jabo, as he is called) is the head coach of the 111-year old (that's older than UW football) Badger rowing program. And he's been doing it for 22 years.

The Wisconsin men's rowing program consists of nine separate competitive crews which are based on how many members are in the boat and if a coxswain (stroke signal caller) is present. Currently, the Badgers race a Freshman Eight, a Freshman Four with coxswain, a JV Eight, a Varsity Four with and without coxswain, a Varsity Pair without coxswain, an Open Four (any combination) with coxswain, and two Varsity Eight boats, both with coxswains.

The best Varsity boat races at all events and represents the fastest Badger crew.

If you don't know Jabo, you probably don't know that the Badger Varsity

Eight captured its second national crew championship - the 1990 Herschede Cup - on June 16th at the Cincinnati Regatta. The Badgers captured their first national championship in 1986, but haven't been able to taste the same victory in the last three years.

"We've always been bridesmaids, essentially," Wisconsin senior Pat Wolf said. "For me and the five seniors in the boat, it's great because we finally were

"You can get me wet any day of the week with a championship like this."

able to win. Personally, it's just incredibly exciting."

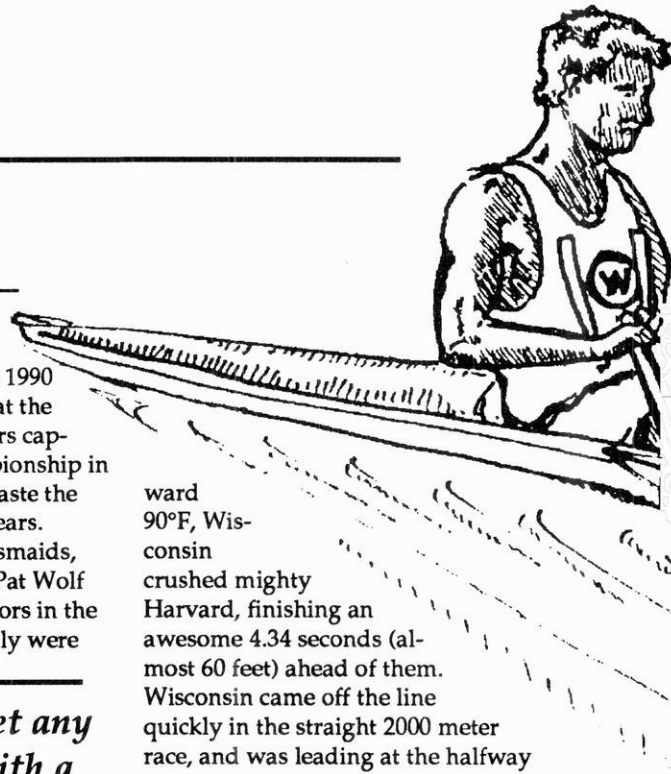
Winning required outrowing heavily favored Harvard. The Harvard Crimson must be the bride Wolf was referring to. The Crimson had won the Varsity Eight title at the previous three Cincinnati Regattas, and five of eight national championships since its inception in 1982.

But not this time; it was the Badger's turn. On Harsha Lake in a five-boat field, as the temperatures climbed to-

ward 90°F, Wisconsin crushed mighty Harvard, finishing an awesome 4.34 seconds (almost 60 feet) ahead of them. Wisconsin came off the line quickly in the straight 2000 meter race, and was leading at the halfway point. But with only 600 meters left, all five crews were tight. That's when coxswain Mark Sniderman called for a Rude Red 20, and the Badgers pulled ahead for good. In a Rude Red 20, the team tries for heightened velocity by concentrating on putting all of the strength and synchronicity possible into each stroke.

"We expected to be down half a length at the thousand (meter mark), and then take our big push at the 800, which we usually do," said Wolf. "We were set for a dogfight in the last 500. We weren't expecting to be out like we were.

"It felt really good the whole race," Wolf said. "We got into some good





Wisconsin's 1990 varsity eight. Kneeling, Coxswain Mark Sniderman and Coach Randy Jablonic. Standing, left to right, stroke Fitz Dunn, 7-captain Todd Hinrichs, 6-Patrick Wolf, 5-Jim Almquist, 4-Matthew Dahl, 3-Dean Olson, 2-Paul Stevens, and bow Nicholas Donovan. Photo courtesy of Sports, News, and Information

Engineering Oars

The College of Engineering was well represented at the championship, with three rowers in the Varsity Eight. Oarsmen Jim Almquist and Dean Olson are seniors in engineering mechanics, while oarsman Matt Dahl is a senior in civil and environmental engineering.

Asked why he joined crew, Almquist says, "I knew I wanted to be in some kind of sport in college, and I wanted to do something new. I tried out for crew and found out I liked it, that's all."

It's remarkable that we have a national champion in crew, considering the three practice lakes - Mendota, Monona, and Wingra - are

frozen for five months of the year. But that's where Jabo comes in. Jabo has devised a creative training schedule for the winter months that he changes in order to keep it interesting.

Does this sound interesting to you? Rope runs - you and the rest of the team (about 50 people) hang onto a rope and trudge through waist-high snow across frozen Lake Mendota. Deer tails - for one to three minutes without pause, whatever Jabo feels is appropriate, you jump high enough to touch a sock which hangs nine feet from the boathouse floor. Hour of Power - 60 minutes of running up and down the steps of Camp Randall Stadium while coach plays polkas on his boom box.

All the hard work paid off in Cincin-

nati, and Jablonic was more than willing when his crew threw him in the lake for the traditional dunking of the coach. "You can get me all wet any day of the week with a championship like this," he said.

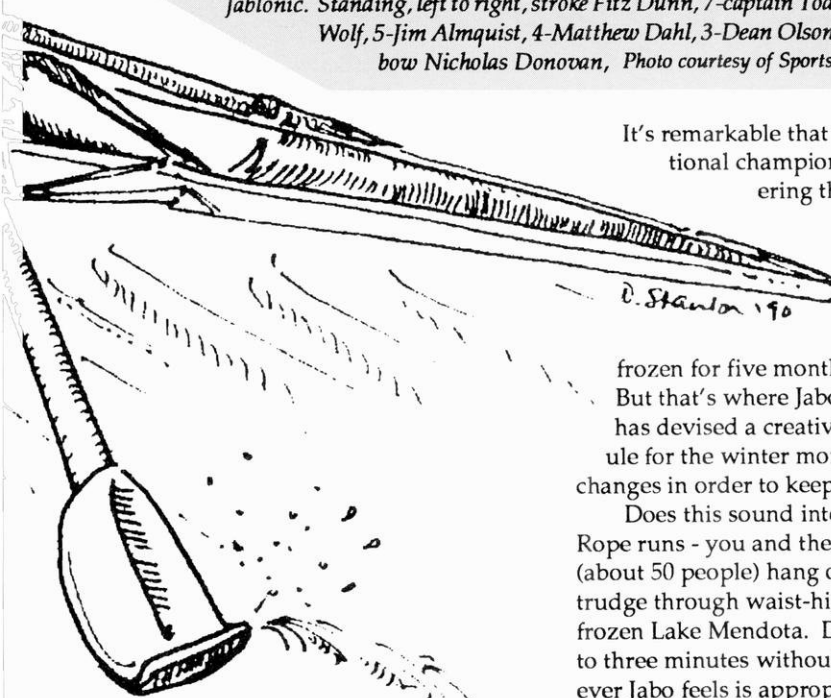
"We did what we planned to do and nobody went with us," Jablonic said. "That was what was stunning for us. We made our moves and nobody came with us, so we rode away with it."

The rest of the field finished in this order: UCLA third, Syracuse fourth, and Washington fifth.

Congratulations to the 1990 Men's Collegiate Crew Champions! ■■■

AUTHOR

John Rooyackers graduated in August with a BS in mechanical engineering. The *wisconsin engineer* wishes John luck in his future as an engineer and thanks him for his contributions to the magazine.



rhythm off the start. With 700 meters to go, I felt that nobody was going to catch us. I was waiting for Washington or Harvard to make a big push, and when that didn't happen, we had it locked up."

TEN FASCINATING ENGINEERS

This spotlight on Fascinating Engineers is just a sampling of the diverse talent found on the UW-Madison engineering campus. In the search for fascinating engineers, the Wisconsin Engineer asked students and faculty for nominations of engineering students with exciting or unusual interests and experiences. We found unique talents and attitudes in all disciplines. Though the final decisions were difficult to make, we feel this collection of articles represents a diverse and ambitious group of students who may easily disprove the stereotypical view of an engineer.

From sailing instructor to moon gardener, from skydiving to marathon racing, from volunteer tutoring to national racing competitions, and from homecoming court stars to crew team members, these engineers are out there. They are in your classes, taking lecture notes, solving homework problems, and writing midterm exams right beside you. But outside of those classes, they each seem to find a little extra time to spend on things they enjoy. Read on and decide for yourself.

Kimberly Fish ME 4

"Prince is very humble... and an awesome dancer," reveals Kimberly Fish, a senior in mechanical engineering who has appeared in *Purple Rain* and other major movies including *Back to School* and *Personal Foul*. In *Purple Rain*, Kim played a fill-in dancer, an extra, and a half of a fantasy couple. She played a sorority girl and an extra in *Back to School*, and in *Personal Foul*, she served as a production assistant and an extra.

"I had to be very assertive and persistent," says Kim of obtaining these roles. During her freshman year, she heard about openings in *Purple Rain* while attending the University of Min-



Kimberly Fish has acted as an extra in many Hollywood films.

nesota-Minneapolis where she was a theater major. A theater professor at the University told Kim about auditions for *Back to School*. She landed a part and ended up filming the movie during final exams. "I remember taking my books to the set and studying when we weren't shooting. We stayed on the set all day long," she recalls.

Personal Foul, a story about a high school basketball player, is Kim's most recent movie, which she appeared in three years ago while co-oping in Illinois.

Despite the fact that Kim began her college career as a theater major at the University of Minnesota-Minneapolis, she changed to engineering and transferred to the University of Wisconsin-Madison after only one year of study. She explains, "I wanted to keep theater as a hobby and I feared if I chose it as a career I would lose my creativity. And, I yearned for the science and math... I needed something more." Why engineering? "Because I wanted to know how and why everything works the way it works, and mechanical engineering was the most versatile for me. I love the challenges of math and science," says Kim.

Kim will be graduating in December of 1990 after five years of school here at Madison and five terms of co-oping. She's worked in areas from plant engineering and product engineering to technical writing, sales, and market engineering. "My favorite work term was with GE Motors in technical sales in their industrial marketing department," notes Kim of her co-

Anne-Laurie Capelli

ECE 3

Anne-Laurie Capelli, 22, feels that there are fewer women in engineering because they are threatened by the fact that it is difficult to pursue. Currently a senior in metallurgical engineering, Anne has been encouraged during her academic career by the fact that women are minorities in engineering. Thus, it is not surprising that she is an active member of the Society of Women Engineers (SWE).

The 101 pound, 4'10" Kenoshan has found many ways to alleviate the stresses of engineering life. For example, she served as the coxswain for the UW crew team where she was named Senior Co-captain. For those who are less informed, a coxswain is responsible for steering the boat and advising the crew as to the position of the other competing boats. The coxswain also helps in motivating the crew. Anne admits that her duties as coxswain involved much more mental work than physical work.

After spending three chaotic years in General Engineering, Anne finally opted for metallurgical engineering after taking a material science course. Since then she has come a long way in that area, having joined the American Foundrymen Society (AFS) and worked at the UW Foundry with Professor Bradley. Anne has also worked at the Department of Natural Resources



Anne-Laurie, right, celebrates a crew victory with a teammate.

dealing with solid and hazardous wastes. There she conducted surveys with autodealers to determine how much hazardous output was being produced. "It was very challenging," reflects Anne.

While eating pasta and listening to the music of the Italian singer, Anna Oxa, Anne contemplates the future. She hopes to earn a graduate degree in engineering and eventually find a management position in the metallurgy industry. □

- by Monis Ur-Rahmaan

op experience. Marketing and technical sales are the type of work she'd prefer after graduation, and she'd like to be involved in an international industrial market.

When she's not engineering, Kim's two favorite activities are playwriting and skydiving. She has already written two plays, *Guardian of Secrets* and *Inside the Outside*, the latter of which she soon hopes to get published. Providing a brief description for *Inside the Outside*, Kim explains, "It's about how people only see what they want to see and hear what they want to hear, and once they see and hear they still believe what they want to believe. I express this attitude through a family situation." These plays are stepping stones for Kim's ultimate goal of writing and directing her own movie.

Kim is president and co-founder of the student engineering group, Additional Engineering Opportunities, which is a group for engineering students who want to utilize their engineering degrees in areas outside research or design. The group brings in speakers to familiarize members with the other opportunities engineering can offer, such as law, medicine, business, and technical sales. The group was started in February of 1989. Kim has also been active as an officer in the Society of Women Engineers, a Wisconsin Student Association Senator, a math tutor, and a National Representative for the Multiple Sclerosis Society.

When asked why she would consider herself a fascinating engineer, Kim responds, "Because I have a lot of energy and



Kimberly hopes to further develop her skills in skydiving.

enthusiasm and I'm very inquisitive by nature... And, I live by 'Once you're dead, you're dead for a long time, so do as much as you can while you're alive!'"

A native of Hibbing, a small iron-mining town in northern Minnesota, Kim enjoys biking, camping, canoeing, fishing, and dancing with friends. She affirms, "I like to do something new all the time." Her music interests encompass several areas from house music (dance mix) and jazz to blues and classical. Her favorite foods are crab legs, Italian and Chinese foods, but she laughs and says, "I think I was put on this earth to eat ice cream...Kemp's Lite Chocolate Chip." □

- by Nancy Hromadka

Russell Grimm
BS ChE, CEE Grad

"This spring, as soon as the water broke open, I put on my wetsuit and went for it," says Russell Grimm, referring to his favorite summer sport of windsurfing. This chemical engineer loves adventure and all kinds of outdoor sports, from canoeing, camping and biking to swimming, sailing and waterskiing. He explains, "Without trying to sacrifice academics, I try to get involved with as many different things as possible outside the engineering curriculum."

Russell received his B.S. degree in chemical engineering from UW-Madison this August and is remaining here at the university to earn his master's degree in environmental engineering. At age 24, Russell is already earned his second undergraduate degree. His first was a B.A. in biology from Grinnell College in Iowa. He says, "I came into engineering in a round-about way with a liberal arts degree. I think it gives me a different perspective."

When he first started school, Russell recalls, "I knew I was going into a technical field, a science, but I didn't know which. During my junior year at Grinnell I decided on engineering. I liked solving problems and creating things. In engineering you create something of value. Engineering gives you a chance to use your science aptitude in a professional setting and have a chance for a good career."

Because of Russell's combined science and engineering background, he was chosen as a summer intern supervisor for NASA last year at the Kennedy Space Center in Cocoa Beach, Florida. He learned about NASA's Space Life Sciences Training Program (SLSTP) while working in the horticulture department of Biotron here at the UW.

While in Florida, Russell worked with the Controlled Ecological Life Support Systems (CELS) investigators, learning about their research and coming up with a series of research projects of his own to parallel theirs. After developing these

Because of Russell's combined science and engineering background, he was chosen as a summer intern supervisor for NASA.

project ideas and setting up detailed time-lines, equipment needs and budget proposals, Russell was responsible for leading 36 nationally selected undergraduate student interns through the research and experimentation of these projects over a six-week period.

Russell supervised four projects for NASA. The first was a microgravity nutrient delivery system. Suction, tubes, and liquid nutrients were used to grow wheat plants without soil or gravity. For the experiment, wheat seeds were deposited in slits along a flexible tube. Varying amounts of suction were used to pull a thin liquid film of nutrients along the outside of the tube. As the plants grew, their roots simply encircled the tube, taking nutrients from the liquid film.

Russell's second project concentrated on the micropropagation of wheat. This experiment, which was Russell's favorite,



Russell Grimm, a senior in chemical engineering, displays his wind surfing talents.

involved reproducing wheat plants from tissue instead of from plant seeds. According to Russell, NASA liked this project so much that they decided to continue it after Russell and his students left.

Project number three, the light delivery system, used a light pipe with internal reflection as a solar growth chamber. The experiment tested the quality and quantity of light transmission.

The fourth project dealt with the breakdown of inedible portions of plants. Microorganisms were used to turn waste products of the plant into useable food products. The experiment focused on converting unuseable cellulose of a plant into necessary glucose.

Russell believes that he really improved his interpersonal skills during his co-op time in Florida. He says, "It was quite an experience down there dealing with people. The technical knowledge comes and goes, but technical communication and organization are the biggest things I learned."

Because of his background and his interest in outdoor sports, Russell is very concerned about the environment. He states, "There are a lot of trends and exploitation that are occurring now in the world that have to be corrected - rainforests, greenhouse effects, toxic and nuclear waste accumulation, and landfills. Things have been out of balance for a long time and they need to be straightened out. I'm confident that technology can right the situation... Since I do like the outdoors, I feel strongly about that."

Who does Russell look up to? He smiles and says, "Arnold Schwarzenegger, because he's a self-sufficient guy. He's a millionaire in real estate and a former Mr. Olympia winner. He has accomplished a lot in many areas and is more multidimensional than most people think." □

- by Nancy Hromadka

Jennifer Meinz
ChE 3

"You would totally forget that you were in college. It was a different world with the little kids... It was a good way to start the week," remembers Jennifer Meinz, a junior in chemical engineering at UW-Madison and a religious education teacher at St. James Catholic Church in Madison. During the school year, every Monday night, Jen and a friend ventured off campus to the nearby St. James Church to share their understanding of the Catholic faith with a class of third graders.

Besides sharing her religious knowledge, Jen also finds time to share her engineering and computer knowledge. As Girl Scout Outreach Programmer for the Society of Women Engineers, Jen put together a computer skills workshop to help area Girl Scouts earn their computer badges. The workshop teaches the girls about computers, exposes them to the BASIC programming language, shows them how to count in binary with a 'Granny's apples in a basket' concept, and entertains the girls with a graphics presentation. Jen also tutors students in first semester calculus through Guts/Hash Tutorial.

Jen doesn't spend quite all her time teaching others, though. She manages to squeeze in a couple hours for her own classes. Her favorite course here at the university was *History of Science*. She notes, "It had a lot to do with astronomy, which I enjoy. The class paralleled the history of science with astronomy. It was interesting to see where everything originated and how it started out as a philosophy. Religion and society played an important role."

Jen seems to enjoy history in general, for one of her favorite authors is James Michener, whose novels she describes as having fiction, romance and adventure intermixed with an abundance of historical information. She recommends Michener's novel *Space* to anyone with similar interests.

Although Jen's flawless grade point average would never reveal it, there were some classes she found more difficult than others. She cites her worst class as *Physics 202*. "I hate circuits. Electricity does not light up my life," she says with a laugh.

Chemistry, however, is more to Jen's liking. She recalls, "I spent two summers working in a chemistry lab for Wisconsin Public Service, a utility in Green Bay. I worked in an environmental lab where they tested coal and water samples for sulfur, ash, and energy content... I liked water chemistry the best. It was a lot of fun determining elements and the other properties of water. It was very practical in terms of analytic chemistry."

This summer Jen is working for Procter and Gamble in her home town of Green Bay. She is a student intern working in the Raw Materials Department. Her work involves paper chemistry and developing and running bench scale tests of treated water systems and recycled fibers. She is also a project manager coordinating the design, structure and set-up of an acid transfer system.

Jen owes a lot of her drive and determination to her parents. She says, "I have a lot of respect for my parents." Another person Jen admires is her neighbor, Deb Bienert. "She's an engineer and has two kids. She's really a neat person, and I use her as my role model for raising a family and having a ca-



Jennifer Meinz is a junior in chemical engineering.

reer," says Jen, who plans to earn a master's degree in chemical engineering, work in manufacturing somewhere in the mid-west, and raise a family of her own someday. □

- by Nancy Hromadka

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NOT GOOD ON DAYS OF U.W. SPORTS EVENTS

Phil Lenius
M'E Grad

After seven and a half years, Philip Lenius is leaving Madison for a job with Ford Motor Company in Detroit, Michigan. There he will be working in the Specialty Cars Division of the Car Program Development Section. He will deal with the prototype and development of the Thunderbird, Cougar and Mark-7. Basically, he will be in charge of the whole car, from future time scales and assembly line aspects to changes made up to five years in the past. Phil is leaving Madison with a bachelor's and a master's degree in mechanical engineering.

Originally from the Lake Michigan town of Sturgeon Bay, Wisconsin, Phil says he came to Madison for two main reasons. "One, because it was a very respected school for the money and two, because of the band." Phil tried out for the UW Marching Band in the Fall of 1983 during his freshman year. He recalls, "There were 15 guys trying out for one alternate position on the snare-line. I could march well, but my technical playing wasn't as good as one of the other guys. I really wanted to be in the band, no matter what I played, so I switched to the base drum."

"The base drum is not technical like the snare, but you have a lot more responsibility. You're Mike's right-hand man. You get yelled at a lot, but if you do your job well you get a lot of respect. It's more of a leadership position. It was a lot of fun," he comments. Phil was with the band for seven years total, marching for five years, and serving as Field Assistant for two. As Field Assistant, his responsibilities included running practices when the director, Michael Leckrone, was not present, answering questions, chaperoning on road trips, directing the band, helping with the charts, and handling miscellaneous problems. Describing his experience as Field Assistant, Phil says, "I was able to enjoy the fun of band without quite the time commitment, and I was able to be in a different role."

He continues, "The best part of it is, once you join band, you basically have 250 friends you can call on for help or fun.



Phil Lenius shows his pride about the UW Marching Band.

It's almost a frat of its own. We're very protective of our own. That goes for alumni too. It's amazing - there are alumni band groups all over. At a big university, you can get lost, but coming in and being in band is great!"

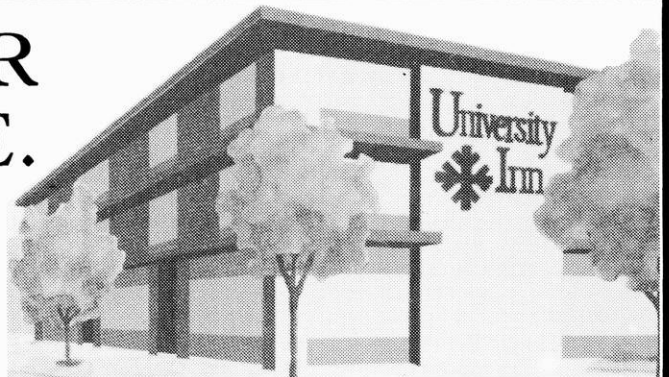
Phil's research area for his master's degree was computer modeling using finite elements. During his years of study at the UW, he worked as a lab assistant in the Engine Research Center, a Research Assistant at the SEMATECH Center for X-ray Lithography (CXrL) and a Teaching Assistant for a mechanical engineering class called *Advanced Vibrations of Mechanical Components*.

For two summers during his undergraduate work, Phil worked for an engineering firm in Sturgeon Bay, assisting in the design of hydraulic steering systems, performing structural cal-

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culations, creating working drawings and sketches, and calculating weights of structural assemblies.

During his free time, Phil says, "I try to do almost everything, a lot of sports - sailing, wind-surfing, scuba diving, water-skiing, down-hill skiing, softball, fishing, basketball, volleyball, and hunting." He thinks one of his favorite sports is telemarking or mountaineering, which is "a cross between downhill skiing and cross-country skiing. I was bored with downhill skiing, so I took up telemarking which is harder than downhill." Phil has been telemarking for 20 years.

Enjoying the summer sunshine and the beauty of Lake Michigan, Phil also worked as a sailing instructor for two summers in Sturgeon Bay. He ran a sailing program for ages nine to adult, teaching everything from basic sailing techniques to Olympic racing tactics. "It was a lot of fun, good pay, good hours, and outside," recalls Phil happily. Someday, he'd like to sail around the world. "That'd be a kick. I'd like that," he says with a laugh, "It would be hard to get enough vacation to do that though." This summer Phil is going to Alaska to backpack in the Kenai Peninsula and the Denali National Wilderness (where Mt. McKinley is located) with some of his old roommates.

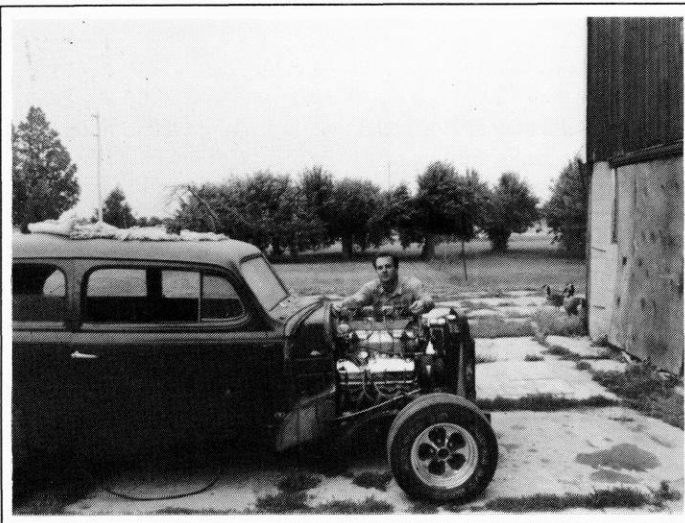
Phil credits a lot of who he is to the town he grew up in, citing his love of water sports, his fondness of fresh salmon, and his choice of engineering as a career, saying, "My father was a mechanical engineer, and the city I grew up in had boat building and a lot of structural stuff... Engineering is the way I like doing things. I like challenges, physical and mental. Engineering is a challenge to create something better or new. It's trying to be creative."

Looking back on his years at Madison, Phil expresses his philosophy for survival, "You have to keep your nose to the grindstone and work hard, but don't work all the time. Be sure you set some time aside to have fun. You can't work 24 hours a day. You don't survive that way." □

- by Nancy Hromadka



One of Phil's talents is drumming in awkward positions.



Kurt Thomas sits with his newly rebuilt engine.

Kurt Thomas

M'E 4

Imagine sitting behind the wheel of a 1956 Chevrolet anxiously waiting to push your 327 engine to its maximum capabilities at Union Grove Dragstrip in Union Grove, Wisconsin. A split second after getting the green light you punch it so hard that not only do your tires light up but you pick up the front end of the car about a foot and a half. Things happen quickly and surroundings move fast as you complete the quarter mile in a mere 11.7 seconds. Is this the makings of a fascinating engineer? Maybe.

Now imagine following the mechanical engineering curriculum while also trying to help support a family with a part time job. Could this be the makings of a fascinating engineer? Certainly.

(See Kurt Thomas on following page)

Farah Merchant
ChE 3

"So few people know that caffeine deprives the body of calcium," argues Farah Merchant, trying to explain the Science Fair project she won second place for. After graduating from Brookfield Central, Farah came to Madison as a Pharmacy major because of her love for chemistry. Soon bored with theoretical *garbage*, Farah switched to chemical engineering where she was fascinated by practical applications.

Farah's extra-curricular activities range from serving as a member on the Multicultural Council (MCC) to exploring new levels of the arcade game, Tetris. Her involvement with the Asian American Student Union (AASU) was responsible for her election as one of the two Asian American members of the MCC. The MCC consists of 10 office holders, two from each of the five minority groups. It receives \$100,000 every year from the university to allocate as funding for campus minority programs. Farah was on the council from October '88 to October '89.

In addition to the MCC and AASU, Farah is also an active member of the Pakistani Students Association (PSA) and the Society of Women Engineers (SWE). Farah is a proponent of the view that being active in campus life is essential for maximizing the college experience.

It is surprising that with all this distraction, Farah still manages to maintain an overall 3.52 grade point average. She has been on the Dean's list for every one of the four semesters that she has been at Madison and is a member of the Phi Eta Sigma honor society.

This fall Farah will be co-oping with Exxon in Baton Rouge, Louisiana. She says, "At first I didn't want to work for Exxon because of the damage they've done to the Environment." Farah is doing chemical engineering with an emphasis on the



Farah Merchant is a junior in chemical engineering.

environment. She later decided, however, that Exxon is now more environmentally conscious because of their previous oil spills and that they would pose more of a challenge to work for.

After chemical engineering, Farah is aspiring to get a degree in environmental law and eventually work for the Environmental Protection Agency (EPA) or some large private corporation. "I'm pretty ambitious," admits Farah.

Orange-custard chocolate-chip is Farah's favorite flavor in ice cream and she hopes one day to analyze its ingredients to determine what makes it taste sooo good. □

- by Monis Ur - Rahmaan

(Kurt Thomas continued)

With this in mind, let me introduce Kurt Thomas, a returning adult mechanical engineering student, age 31, married with a one year old son. Kurt and his wife Theresa, along with their son Garrett, live on the east side of Madison approximately seven miles from campus. Quick to make it clear that living off campus has its disadvantages, Kurt says, "I get plenty of parking tickets, and at \$10 a crack I probably average \$30 dollars a week in fines."

If it is not already obvious, Kurt's hobbies include building and racing small and big-block Chevrolet engines. Although he currently does not race, he continues to build racing engines for friends. As to why he stopped racing, Kurt explains, "It just basically got too expensive, it adds up buying new parts and replacing broken ones." His 1956 Chevrolet, which he recently sold to concentrate his efforts on restoring his rare 1968 SS-RS 396 Camaro, consistently dominated the 1955-1957 bracket at the dragstrip in Union Grove. When asked whether he had any other hobbies Kurt replies, "It would have to be taking my son to Dairy Queen."

In addition to receiving an associate degree from MATC in automotive technology, he belongs to the National Hot Rod

Association. The NHRA serves a very important purpose in that it informs drivers of the latest safety regulations required for various racing time brackets. For example, drivers like Kurt who run the quarter mile in 11.7 seconds are now required to wear a fire suit when racing.

Kurt is currently employed at Nicolet Instruments working with other mechanical engineers designing and building spectrometers. He has also worked on conducting vibration tests on various material samples at Nicolet. Some of his past jobs include working as a machinist for both Ohmeda and Marquip as well as some drafting and design work at Sussex Machine. He says that although his past jobs were not related to the automotive industry, "An automotive career would not be out of the question."

To other mechanical engineering students it may come as no surprise that his least favorite class was ECE 372 Electric Circuits. On the other hand, his favorite, and most difficult classes have been ME 361 Thermodynamics I and EM 202 Dynamics.

When asked how he manages to concentrate on classes in addition to his family he responds, "My wife. Without her support it would definitely be a lot more difficult." □

- by Dan Grellinger

Scott Greene
ECE

"Ever since I was five or six years old, I knew I wanted to be an engineer, or a scientist or a professional athlete," says Scott Greene. The engineer dream seems to have won out, probably in more ways than Scott had originally planned.

Already holding a bachelor's degree in mechanical engineering from Cornell University in Ithaca, New York, Scott is currently enrolled in introductory electrical engineering classes here at UW-Madison. He is preparing for a master's degree in electrical engineering. Scott is classified as a special student and has one more semester of undergraduate classes to complete before he begins work on his advanced degree.

Although he has worked for several years as a mechanical engineer, Scott says he decided long ago that electrical engineering was the field for him. He notes, "I took electrical circuits during my junior year at Cornell. It was my favorite class. That's when I knew I was in the wrong field. It first started to occur to me that the forefront of technology is in electrical engineering. Mechanical engineering is still neat and people continue to refine it and make it better, but electrical engineering is changing how we live now compared to how we lived in the 1800s."

Why did Scott choose to continue his education in Madison? He explains, "I came to Madison because I wanted a change from GE." When Scott graduated from Cornell in 1984,



Scott Greene, a student in electrical and computer engineering, is an avid skier.

he went to work for General Electric in Bridgeport, Connecticut as an application engineer and as an electrical distribution engineer. For the first 18 months he went through training and tasted many different aspects of GE and of engineering.

(continued on following page)

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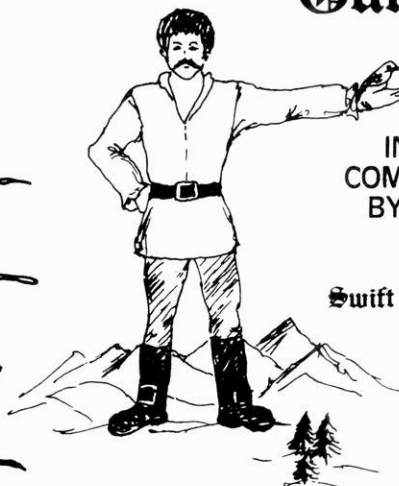
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(Scott Greene continued)

Despite his mechanical engineering background, Scott ended up doing a lot of electrical engineering work.

When Scott came to Madison a couple years ago, he started working for Dries Jacques Associates and then changed to Strand Associates, the company he currently works for. Scott's job with Strand involves doing electrical distribution engineering for wastewater treatment plants. When Scott first began working for Strand, he was the only electrical/mechanical engineer employed at the company which employed mainly civil engineers. Last year, when Scott decided to come back to school to earn his master's degree, the company was very supportive. "I have good freedom, very flexible. I work when I want to work and go to school when I want to go to school." Scott works about ten hours a week during the school year.

Scott says he feels differently about school his second time around, "As a returning adult student I realize the value of education. I want to be a conscientious student. I want to learn."

Learning doesn't take all of Scott's time, however. He states, "I run a lot. I run everyday with at least an hour to an hour and a half of training. At most I run 18 miles a day, but I average between five and ten." Scott runs two marathons every year.

As for other sports, Scott notes, "In college I competed in cross-country skiing and speed-skating." Scott competed on

the varsity cross-country ski team at Cornell. The team played in division one and was one of the top 20 in the country.

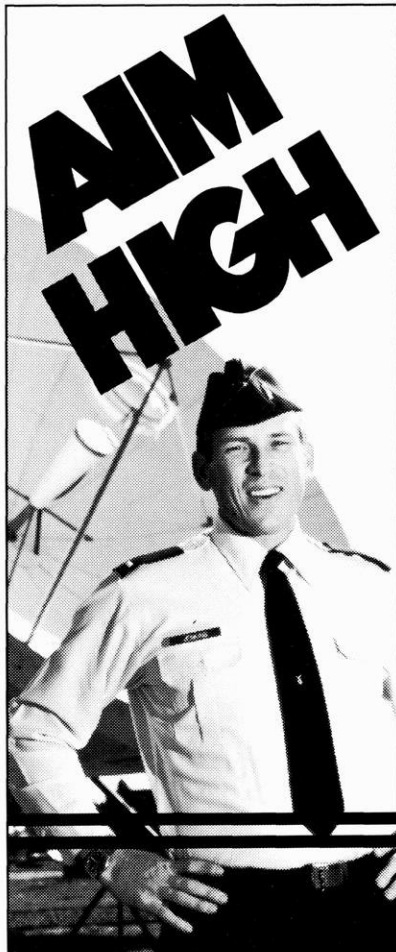
Hockey is another favorite of Scott's, but he admits, "I don't really have any free time. I just consider these things I have to do. Especially the sports." Revealing his preference for the quiet simple life, Scott affirms, "I'd rather travel to small, out-of-the-way places like Billings, Montana. I don't want to go to Rome." As proof of this preference, Scott is spending a few weeks backpacking in Washington this summer.

He continues, "I play the guitar and write music. I have a lot of computer stuff to write music." Scott has a jazz guitar and specializes in free-form jazz, funk and fusion as opposed to mainstream music. "I like listening to all sorts of music - the Talking Heads, Grateful Dead, fusion and rap."

After Scott earns his master's degree, there are a couple more things he'd like to accomplish. He reveals, "I've always wanted to join the Peace Corps, and I'd like to write a book someday." He also expresses an interest in teaching engineering technology courses at a community college or high school.

The most strenuous of Scott's goals is to finish the Hawaiian Iron Man, an athletic event in which the participants swim three miles, run a marathon and then complete a 100 mile bike race. □

- by Nancy Hromadka



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Leanne Wilks

M/E 4

As a member of the 1989 Badger Homecoming Court, former president of Kappa Alpha Theta Sorority, a General Motors Scholar, and a finalist for "Greek Woman of the Year", senior Leanne Wilks seems to have a few more things to do with her time than just study mechanical engineering. She says, "I like to be a part of what's going on, and I like to be busy."

As president of her sorority, Leanne was definitely part of the action as she lead a group of 150 girls to a very active and productive year. "Through my sorority we've made a lot of changes. Our chapter was nominated as 'the most improved chapter.' The Greek System is undergoing a lot of changes. I was a part of the system when some of the initial changes began. I helped get things going, especially within my own chapter," says Leanne.

She explains that her leadership role in the sorority "required a major time commitment and a lot of organization, but it also was a fantastic learning experience for me. I really enjoyed it. And, it gave me the opportunity to be on Homecoming Court this fall."

Members of Leanne's sorority nominated her to represent them in the interviewing process for the 1989 UW Homecoming Court. Leanne recalls, "It was the most fascinating experience... As a part of court, we did service luncheons and visited hospitals where we gave out Badger stickers to the kids. It was really fun. It gave me a chance to see how big the campus really is."

Leanne has taken several opportunities to see the rest of the Madison campus through her involvement in intramural volleyball, Mortar Board, Pi Tau Sigma, and Tau Beta Pi. Referring to Mortar Board, a campus honor society, she notes, "There are so many fascinating people. It's neat to be in a group where not everyone's an engineer."

Along with her numerous outside activities, Leanne still has managed to keep her grade point average above a 3.5 which helped earn her nomination as a GM Scholar. During her junior year of college, Leanne was awarded a full-tuition scholarship and the opportunity to work for two semesters for GM in an engineering capacity. Last summer she worked in Dayton, Ohio in manufacturing. This summer she worked in Milford, Michigan at the GM Proving Grounds. Her work this summer involved applying anti-lock breaks to Asian and European cars.

What does Leanne do for herself in her free time? She says, "I try to run. I'm not very consistent about it, but I try... I like to talk to people... I love to travel... I like the beach... I go out with my friends... I love to rent movies... and I like to cook." Her specialty is Mexican pizza. □

-by Nancy Hromadka



Leanne Wilks, a senior in mechanical engineering, was a finalist for "Greek Woman of the Year".

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Gregg Ireland
ME 4

"We've done all this together. The whole sport is really a family sport," says Gregg Ireland who holds six National Point Championship titles and eight World Championship titles in the World Karting Association. Gregg, a senior in mechanical engineering here at UW-Madison, loves the excitement of zooming around a race track at speeds over 100 miles per hour in a small car known as a kart.

He and his family - his mom, dad, an older brother and a younger brother - have been involved in racing for 12 years. Gregg explains, "There's a track in Dousman, just outside of my hometown. That's where we first got into sprint car racing. Now we're into enduro racing. It's a longer distance race, close to an hour. You lay down in the kart to get better aerodynamics."

Describing the two racing groups, one for ages 12-16, and another for 16 and older, with up to 17 different classes based on engine type, size and racer weight, Gregg states, "Anybody can get into it. Our family is completely involved in it." Gregg and his two brothers race while his dad takes care of the mechanics and helps pay for the sport. Even Gregg's mom participates. He says, "She works on the scoring crew and the registration committee. She loves it. She's been involved in everything we do. That's important to us." According to Gregg, the World Karting Association, which sponsors the races, is fairly small, and that helps make karting more of a family sport.

Karting races are held all across the country, from Florida to New York to Oklahoma. Gregg has even raced in Canada. He claims that one of the best tracks to race on is right here in Wisconsin at Road America in Elkhart Lake.

For a typical race, Gregg and his family usually leave Thursday afternoon and drive all night to get to the race site. Friday is spent practicing, getting a feel for the track and testing out the equipment. The actual races are held on Saturday and Sunday, and then it's back on the road to Madison for Gregg and to Oconomowoc for his family.

Although he likes to travel and to see different places, Gregg admits, "We usually travel during the middle of the night. For the most part, most trips are just the race." Of course, they do occasionally stretch some of the trips out into an actual vacation. Gregg says he has spent Christmas in Florida for the last 12 years because the World Championship race is usually held in Daytona during the last week in December.

Gregg explains that even though the World Championship sounds more important, the National Point Championship is what actually reflects the greatest racing ability. The National Point Championship is determined by points earned by winning races throughout the entire season. The World Championship, although it is the most competitive race, is just one in the National Point Series. Gregg won the World Championship this year. He says there were about 100 karts in each of the four classes he competed in and that there were a total of 1200 entries in the entire race, a new record for the event.



Gregg Ireland holds many titles in the World Karting Association.

Gregg likes to win, but it means more to him when there is a lot of competition. He shares, "In general, the best races - the ones I enjoy the most - are the ones where there is a real close pack, especially me and my brother. Those are definitely the most fun."

What about the competition between Gregg and his brothers? According to Gregg, his younger brother Todd races in the 12-16 year old group, and his older brother Scott, who also happens to have graduated from UW-Madison with an engineering degree, races in the same group as Gregg. Gregg says, "It's a big advantage for us to run together. It's good to know how to set up the equipment... The drafting helps both people. Two together can go faster."

Drafting is a way of lining up two cars, one behind the other, in order to reduce wind resistance. It requires practice and being able to copy the driving style of the lead car, according to Gregg. He explains that when the two brothers are in the lead in a race, they agree that the one who has done the best in the event throughout the season and has the best chance of winning the championship gets to be the lead car. □

- by Nancy Hromadka

AUTHORS

Nancy Hromadka, magazine co-editor, is an ECE-3. When she isn't driving the Mac at the magazine office, you can find her at CAE, where she works as a consultant.

Monis Ur-Rahmaan is also an ECE-3. He enjoyed working with the magazine this summer, but not enough to do it again.

Dan Grellinger, is also an ECE-3. That's a coincidence! Dan is an interesting engineer, too, but he won't tell us why.



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The outdoor scenery disappears as the lights in the room come up gradually. You notice that the window through which you were watching the ground coming closer and closer looks more like a television screen than a window. You also notice that there are several people standing next to you and they have been watching everything you have been doing during the entire flight.

What you have just experienced was a high technology flight simulator, and the helicopter that you were flying may be a part of the fleet of helicopters that helps to defend this country in the 21st century.

Although it may seem like a giant video game, the subject of flight simulation is taken quite seriously by the IBM Corporation in Owego, New York. Flight

simulation has two different purposes at IBM. They work on concept validation simulations and future product simulations.

The concept validation simulator is designed and built when a customer, perhaps the military or another aircraft designer, wants to prove that a new theory, design or way of providing information achieves an advantage over previous aircraft. Flight simulation is an ideal method to demonstrate such advantages. Once a simulator is built, the customer, the military and the pilot may be brought in to evaluate the performance of the aircraft using simulations.

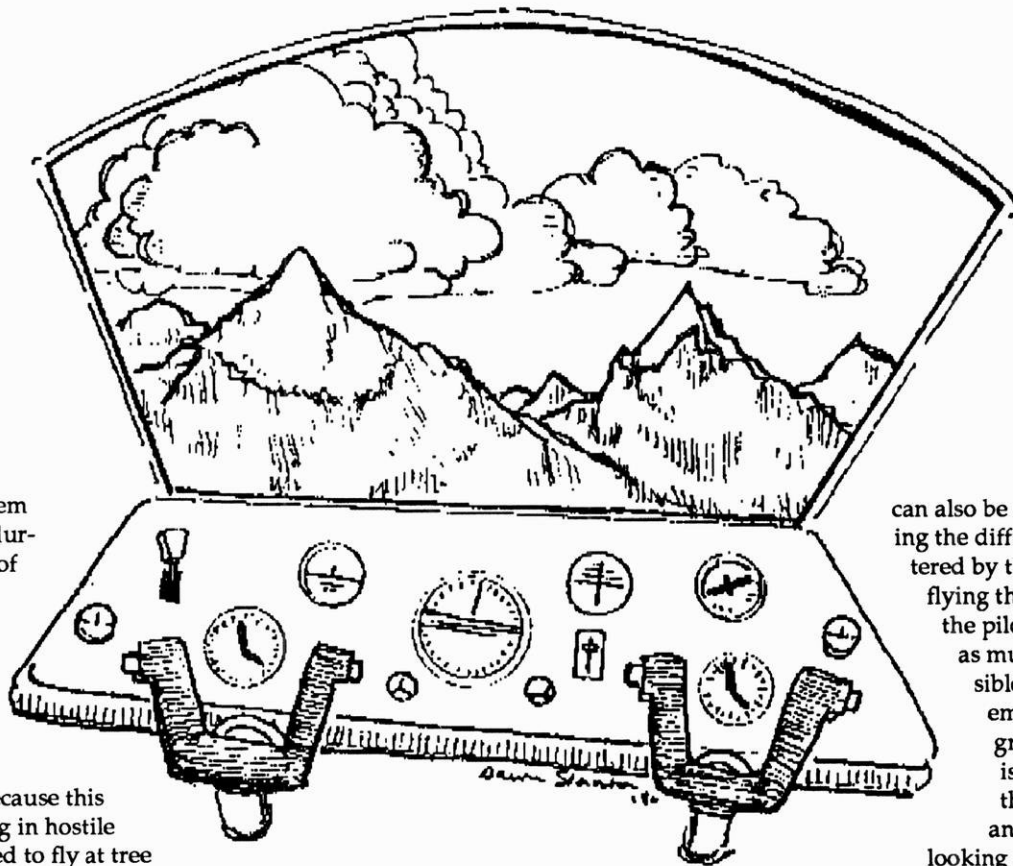
Simulation is also beneficial because the designers of the new system receive pilot feedback about the instrumentation and the overall feel of the system. Flight

simulation offers the freedom of modifying the simulator quickly. If the pilot is flying an aircraft and wants the airspeed indicator where the artificial horizon indicator is located, the simulation engineers modify the simulator so that the pilot can fly under this new configuration. This process will result in a final aircraft which can be flown with maximum efficiency.

The final and most profitable part of concept validation simulation is that it reduces the amount of time an aircraft is required to be flight tested. Because flight test requires the real aircraft to burn real fuel at a real airport, flight test is extremely expensive, and any reduction in flight test time can result in a less

...simulation allows tests to be performed that otherwise would have been considered too dangerous to attempt.

expensive aircraft. Many of the tests that would have normally been performed during flight test are now conducted in the laboratory using flight simulation. This simulation allows tests to be performed that would have otherwise been considered too dangerous to attempt.



Just such a problem was discovered during a simulation of an aircraft which was supposed to retrieve pilots or soldiers who had been lost during battle. Because this aircraft was flying in hostile territory, it needed to fly at tree level. It was discovered that the aircraft would not perform as desired when flying at high speed over cavernous terrain. The problem was easy to correct but might never have been discovered during a conventional flight test.

The second type of flight simulation is the one with which most people are familiar. This is the simulation for potential aircraft. This type of simulation may be for a jet fighter, advanced helicopter, or even a hybrid aircraft which has the best features of both jet fighters and helicopters.

Designing this type of simulator can be much more technically challenging than the concept validation simulators since the final evaluation of the aircraft's capabilities will generally have to be in a simulated combat situation. This combat setup requires that not only the proposed new aircraft be simulated, but also that the enemy aircraft and all of its capabilities

be fully simulated for either human or computer control. In addition, these two simulations must be fully interactive for a simulated dog fight. The simulation may also consist of enemy tanks, ground support fire, or any number of other computer controlled threats.

The customer for this type of simulation is usually the military. When the military recognize a weakness in some part of its defenses, it will determine the type of aircraft needed to correct the problem. Then there is a simulation built to determine how effectively the aircraft can eliminate the problem.

Since it is a simulation, many other crucial aspects can also be studied during the evaluation of the aircraft. These points may include the strategy of the pilot, the maneuvering abilities of the pilot and the position, heading, and elevation information of the aircraft. Data

can also be obtained regarding the difficulty encountered by the pilot while flying the aircraft. Since the pilot should spend as much time as possible looking for enemy aircraft or ground support, it is not desirable for the pilot to spend any significant time

looking at instrumentation. All of this data can be presented to the military and can assist it in determining whether the aircraft is correct for the mission.

On your next mission, it will be reassuring to remember that even if you make the wrong decision and are blown out of the sky this time, the lights will come up, a voice will kindly inform you that you have just died and that in a few minutes you may try the simulation all over again. ■

AUTHOR

Arik Anderson recently graduated with a BS in electrical engineering. Arik wrote *Flight Simulation* as a senior for ECE 350 - Professional Expression.

Just One More

W.E. Staff finds 11th Interesting Engineer



Ezra Z. Oldentimer is the last student in the railroad engineering program. He has just returned from a co-op assignment with the Chicago, Burlington and Quincy Railroad that began in 1930. He's looking puzzled because he can't find the locomotive lab.

Just as this issue was going to press, the Wisconsin Engineer staff identified another interesting engineer. Rather than mess up the layout and redo the title to "Eleven Fascinating Engineers," we decided to use the Just One More page to highlight Ezra Z. Oldentimer, railroad engineer.

A native of Rhinelander, Ezra

feels that his 62 years as a student give him a unique perspective. He remembers the time when military training was compulsory, students actually paid for their copy of the Wisconsin Engineer, and some paint was left on the T-21 building.

Actually, Ezra has only been on campus for 3 of those 62

years. The rest of the time he has been on a co-op term with a Midwest railroad firm. His assignment was to design a microprocessor-controlled cow-catcher. He made good progress once microprocessors were invented in the late 70's. After graduation, Ezra plans to retire and "read the Wisconsin Engineer issues I missed." -Just One More staff



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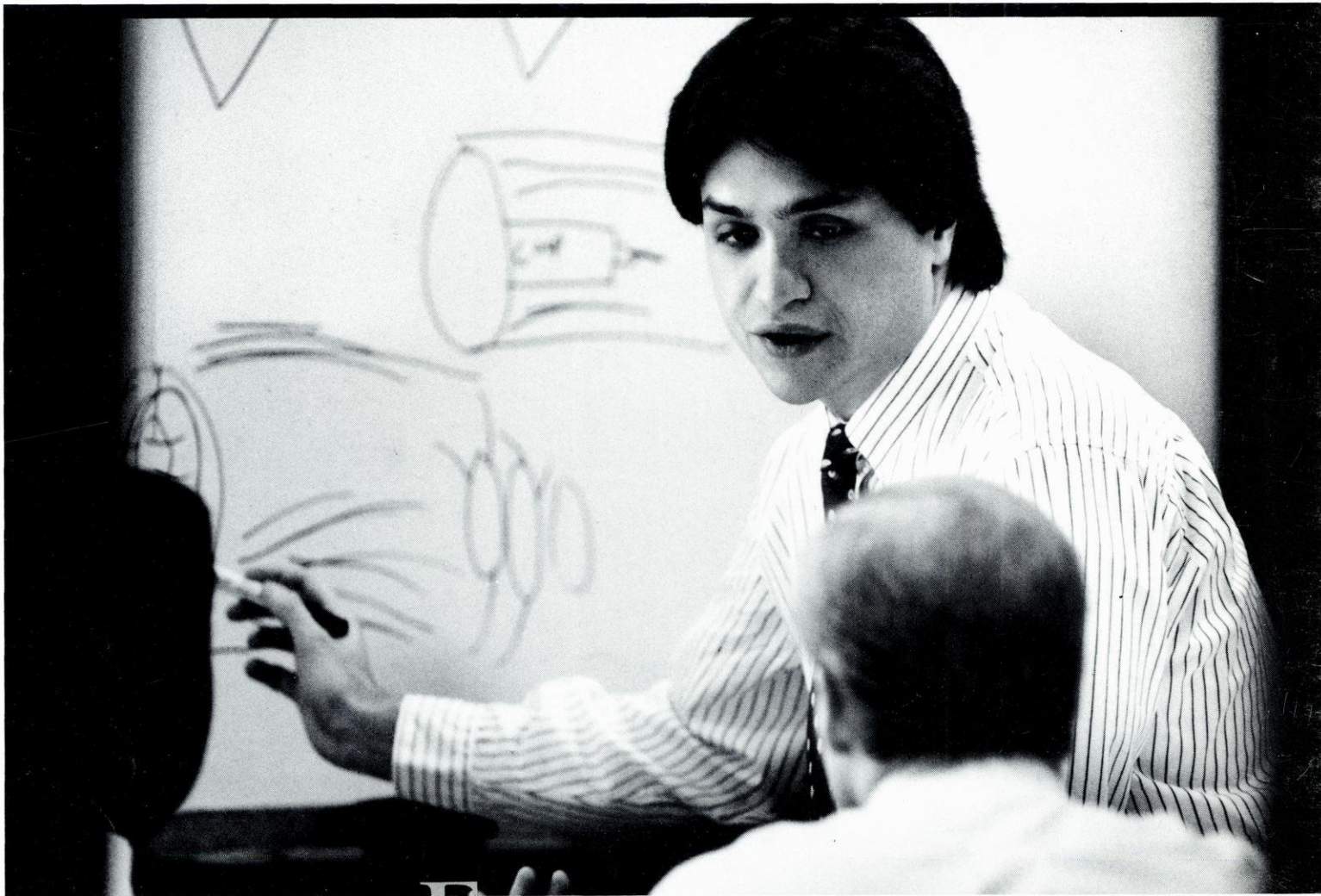
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As a member of GE's renowned Manufacturing Management Program, Joe's fulfilling his potential in a big way. From his very first assignment helping to build the top-secret control panel of a nuclear submarine, to his current supervisory role in GE's 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.



World of opportunity.