

Summer 2003

Volume 2002-2003 - Issue 3 - Summer, 2003

Echoes Staff

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Echoes

ROSE-HULMAN INSTITUTE OF TECHNOLOGY

Summer 2003

Vol. 2002-2003, No. 3

Academic Evolution

*Three degree programs and a MEMS
lab added to curriculum*

ALUMNI ACHIEVEMENT

Career Achievement Award winners

NATIONAL SPOTLIGHT

Students achieve at the national level



heard in the halls of Moench

“

When it comes to creating wealth, speed saves. It saves time, and time is money, and money is jobs, prosperity, and national success.

It is the fast feet of American businesses, innovators, and investors that give us a vital edge on the rest of the economic world.

”

— Mitch Daniels, former director of the federal Office of Management and Budget
(Speaking during the Rose-Hulman Oscar C. Schmidt lecture this spring)

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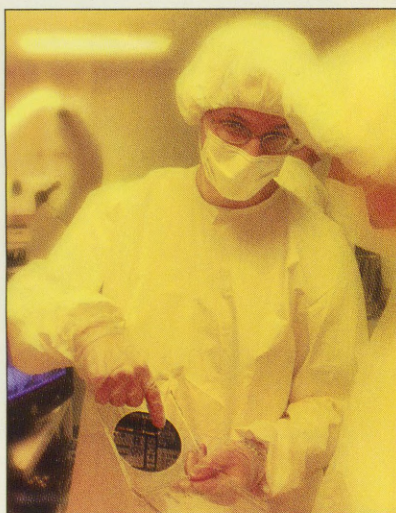
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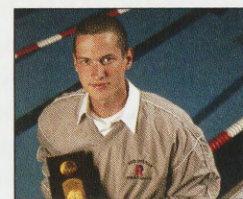


ON THE COVER

One of the newest additions to campus is a new clean-environment MEMS lab in Moench Hall. Photographer Shawn Spence donned a disposable “bunny suit” to capture the cover photo for this issue. You can read more about the lab and other academic program updates in this issue of Echoes. The yellow tint in the photo is the result of special lighting required in the lab.



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Great Days

A LETTER FROM THE PRESIDENT

FINANCIAL AID (OR THE LACK THEREOF) IS THE LARGEST PROBLEM FACING ROSE-HULMAN AT THIS TIME

As I prepare this column, spring is coming to an end and summer looms. Spring is a bittersweet time for me as president of Rose-Hulman. While the season reflects hope and promise, it also is a time that brings concern to prospective students and their families. For spring is when financial aid packages are awarded to next year's freshmen, and many families come to the conclusion they will not be able to afford sending their son or daughter to their college of choice – Rose-Hulman.

Rose-Hulman's inability to meet the financial aid needs of our students is the largest problem weighing on me as president. Almost daily in the spring, I receive a letter, a phone call or a visit from a family who is distraught over the financial aid package they have received from us. Many inform me they will be attending another college that has put more financial aid money on the table. It's hard to argue against that logic.

On average, Rose-Hulman falls short of meeting the demonstrated need of prospective students. Our average award package is \$16,400, including gifts, loans and work. Gift aid (support that does not have to be paid back) ranges from \$3,000 to \$15,000. When all of the support is factored, the average unmet need is \$7,000 short of meeting a student's need as demonstrated by the federal government through the Free Application for Federal Student Aid (FAFSA). The FAFSA is the form used by all colleges to determine a student's financial need to attend college. Our average freshman has a demonstrated annual need of \$25,000.

The importance of financial aid is reflected in the students who do attend Rose-Hulman. Ninety-two percent of our students receive financial aid, probably one of the largest percentages in the Midwest. More than half of our students work using work-study or work-opportunity programs. When our students graduate, they carry, on average, \$28,000 in student loans. That figure does not include what parents may have borrowed to help pay for their child's education.

Financial aid discussions are packed with statistics, but there are faces and names attached to the numbers. The reality of the problem is brought home through the disappointed families who have to make some tough decisions in the spring of their child's senior year of high school. When they visit campus in the fall, they're excited. They meet students, sit in on classes and see our activities. They've captured the Rose-Hulman vision of personalized undergraduate education and want to be a part of it. That excitement fades quickly to disillusionment when the financial aid packages come up too short.

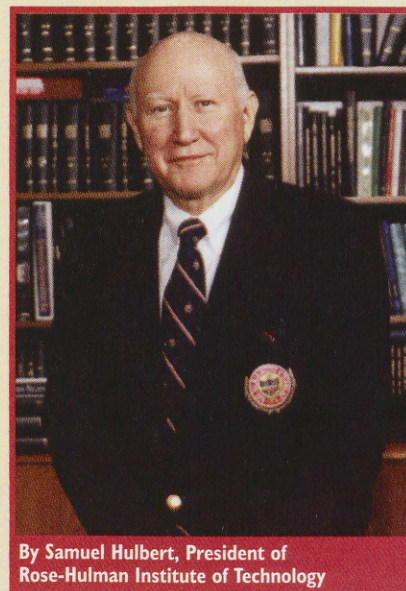
I don't want to paint such a gloom and doom picture that

says these students' lives will come crashing down because they cannot attend Rose-Hulman. It is sad for the short term, but they do move on. They are bright individuals who have the potential to be successful in any college. That potential will be developed at another institution because they were unable to afford the college of their first choice.

As we look to solutions, one of the first areas we address is costs. I'm pleased to report we are among the most cost-efficient colleges of our type. Benchmarking shows we are among the lowest in per capita expenditures in several areas. Two of our biggest cost factors are salaries and equipment. We pay fairly well and I'm not embarrassed about it. Many of our faculty could make more money plying their skills in the private sector. Our people are important; they're the best and they need to be if Rose-Hulman wants to maintain its position as one of the best undergraduate engineering and science colleges. On the equipment side of the ledger, our students are able to use some state-of-the-art equipment that is available only to graduate students at other colleges. Rose-Hulman spends \$2 million annually just to stay even with the changes in technology in our labs, classrooms and information technology infrastructure.

Some older alumni will remember working their way through college and question why our students cannot do that today. While most of our students do work, their earning potential has been outstripped by rising costs of higher education. What worked four decades ago is not applicable today.

As we look to solving the problem, the main answer lies in obtaining more financial aid dollars. Our long-term plan calls for Rose-Hulman to meet 80 percent of a student's need through cash scholarships and 20 percent through self-help such as loans and work study. We continually strive to raise such support from alumni, friends, corporations and foundations. Rose-Hulman has many generous benefactors who have joined in with our vision to be the best and they provide a strong foundation on which to build scholarship support in the future. I hope you will consider helping Rose-Hulman tackle this ever-present problem. ■



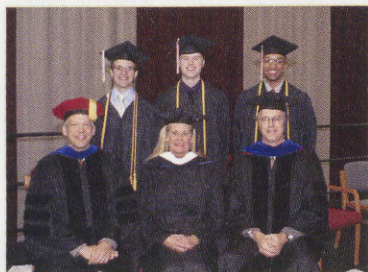
By Samuel Hulbert, President of
Rose-Hulman Institute of Technology

CAMPUS News Notes

RECORD NUMBER OF DEGREES AWARDED DURING 125TH COMMENCEMENT

A record 393 degrees were presented at Rose-Hulman's 125th commencement on May 31, and the event marked the first live broadcast of the ceremony on the Rose-Hulman Web site.

The speaker was Tim Solso, chairman and chief executive officer of Cummins, Inc. He received an honorary degree along with Anton Hulman George, president and chief executive officer of the Indianapolis Motor Speedway; Eric Mooney, plastic surgeon, Bassett Healthcare, Cooperstown, N.Y. and member



Receiving honors at Rose-Hulman's commencement were (front row, from left) Mark Yoder, Susan Smith and David Stienstra. In the back row (from left) were Ben Giant, Scott Green, and Rashad Gold.

of the class of 1982; and Joy Sacopulos of Terre Haute for her leadership as a volunteer for local and state organizations.

Senior Rashad Gold received two of the seven special awards presented to faculty, staff and students. Gold and Scott Green were presented with the Heminway Medal, which is given to a graduate who earned the

highest grade-point average. In their cases, that GPA was a perfect 4.0. Gold also won the John Tuller Royse Award in recognition of his outstanding leadership, academic achievement and participation in extracurricular activities.

Ben Giant received the Herman Moench Distinguished Senior Commendation, and Mark Jaeger was named the winner of the Outstanding Graduate Thesis Award.

Faculty and staff receiving awards were:

- David Stienstra, associate professor of mechanical engineering, the Dean's Outstanding Teacher Award;
- Mark Yoder, professor of electrical and computer engineering, the Board of Trustees Outstanding Scholar Award; and
- Susan Smith, director of the Rose-Hulman Learning Center and the Homework Hotline, the President's Outstanding Service Award presented for staff performance.

Bachelor of science degrees were presented to 347 graduates, and 46 received master's degrees. A crowd estimated at 4,400 attended the ceremonies in the Sports and Recreation Center.

Solso told the graduates to: enjoy and feel passionate about their work; make a positive difference in their communities; operate with integrity; and try to understand all people and treat them as they would want to be treated. ■

5,565 MILES ON A LAWN MOWER RAISES \$150,000

He was very glad to see the finish line. After 79 days and 5,565 miles riding on a Yard-Man lawn mower coast-to-coast, Rose-Hulman Men's and Women's Soccer Coach Brad Hauter achieved his goal to increase awareness about the need to clean up our environment.

His adventure began March 19 in San Francisco. It ended June 5 at Battery Park in New York City. It was his second cross-country trek to increase support for Keep America Beautiful's Great America Cleanup. In 1999, he rode a Yard-Man just over 4,000 miles from Atlanta to near Los Angeles. Traveling with him was a support crew with a large trailer equipped with tools and spare parts.

At the finish line, Hauter presented a \$150,000 check to Keep America Beautiful officials. In addition, Hauter recruited hundreds of new Keep America



Hauter mowing at the Alamo in San Antonio, Texas

Beautiful volunteers who participated in 18 cleanup events along his route.

"The enthusiasm for our efforts was overwhelming the entire trip," said the 38-year-old Hauter. "I know we've made a difference by increasing awareness about the need to clean up our cities and neighborhoods." Hauter sent the Keep America Beautiful message to millions of people through more than 1,000 media interviews he conducted with national

and international reporters during his trip.

Hauter averaged 24 miles each day on his modified riding mower. Among the lawns Hauter mowed were those of ordinary citizens and grassy areas in front of the Alamo in San Antonio, Texas, and near the Washington Monument in the nation's capitol.

Weather along the route varied from mild and sunny conditions to 50 MPH sand storms in the southwest to days of steady rain through North Carolina and Virginia.

The Rose-Hulman community conducted several fund-raising events to support Hauter's efforts. Projects included an adopt-a-plant campaign, a weeklong recycling initiative that expanded the ongoing campus recycling program, and Mow Across America t-shirts were sold in the campus bookstore with proceeds given to Keep America Beautiful. ■

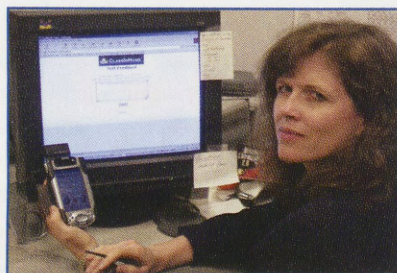
\$220,500 GRANT FROM HP HOPES TO ACCELERATE CREATION OF "CAMPUS OF THE FUTURE" WITH MOBILE TECHNOLOGY

Rose-Hulman students and faculty will be able to utilize cutting edge tablet and pocket personal computers in classroom projects thanks to a \$220,500 advanced mobile technology grant awarded by the Hewlett-Packard Company that hopes to accelerate creation of "the campus of the future."

The grant also extends Rose-Hulman's leadership role in using technology in the classroom and exposes undergraduate students to the most current mobile technologies available, making them competitive in today's technology-driven job market.

Rose-Hulman is one of 11 U.S. colleges and universities receiving new grants this year.

HP will provide Rose-Hulman with hardware and software products, including 85 iPAQ H5450 pocket personal computers and 70 TC1000 tablet personal computers (valued at \$200,009); \$20,500 in monetary support for students implementing the educational programs and travel to attend an HP grant forum; one HP digital



Professor Luanne Tilstra demonstrates a handheld computer

camera; consulting expertise; and increased direct contact with HP employees.

This state-of-the-art technology will support the creation of teaching-and-learning test beds that incorporate HP mobile technology solutions, according to Arthur Western, Rose-Hulman's vice president of academic affairs.

There are two major projects of the Rose-Hulman program: Amplifying interactions in the classroom and amplifying interactions in the laboratory. Both projects involve a variety of disciplines (humanities, physics, computer science, and chemical, electrical, computer and

software engineering) and a variety of learning models and settings (traditional and studio classrooms, laboratories, collaborative learning, and project-based learning).

"Mobile computing and wireless connectivity create learning environments not previously possible," stated Western, pointing out that student project groups can meet through the Internet, at different locations throughout campus, without the hassle of having to get the group physically together.

The grant also offers opportunities to investigate technology "beyond the laptop" initiative that has already proven so successful at Rose-Hulman, according to Louis Turcotte, vice president of instructional, administrative and information technology.

In 1995, Rose-Hulman became one of the first colleges in the world to require all incoming undergraduate students to purchase an institute-selected laptop computer and an associated suite of software. ■

STUDENTS SET TO WORK ON WEAVER UNDERGRADUATE RESEARCH PROJECTS

Seven Rose-Hulman students and six professors will explore a wide range of science and engineering projects through a collaborative undergraduate research program supported by Joseph and Reba Weaver.

The projects began this summer and must be completed by May 2004. The \$2,000 awards cover student wages, campus residential costs, and supply and material expenses. No faculty salaries or major equipment expenses are allowed.

Studying the seasonal effects of natural lighting on structural light adaptation in the American horseshoe crab are Chad Zarse, a junior applied biology major, and Applied Biology and Biomedical Engineering Professor William Weiner.

Kevin Backfish, a junior mechanical engineering major, joins Chemistry Professor Mark Brandt in a study of the effects of mutations on protein-protein interactions for the human estrogen receptor.

Junior chemical engineering majors Matthew Baumgart and Michael Lindley are joining Chemical Engineering Professor

Mark Anklam in a study of solubilization and separation using polymer gels and oppositely charged surfactants.

Researching the numeric solution of Poisson equation, using enhanced Virtual Electromagnetic software, are Graeme Mason, a senior electrical engineering major, and Electrical and Computer Engineering Professor David Voltmer.

Justin Milks, a junior electrical engineering major, is joining Physics and Optical Engineering Professor Elaine Kirkpatrick in studying the carbon arc synthesis of alloyed fine particles having dissimilar vapor pressures.

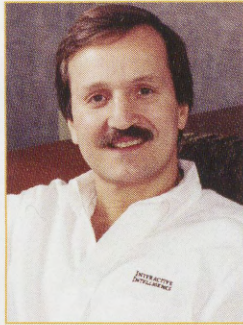
Mike Tranter, a senior applied biology major, is teaming with Applied Biology and Biomedical Engineering Professor Christine Buckley in an evaluation of PRIMM as a scaffold for cell culture.

Joseph Weaver was a 1935 Rose-Hulman chemical engineering graduate who received an honorary doctorate in engineering from the college in 1985. He died in 1988. His wife, Reba, lives in Indianapolis and established the Weaver Undergraduate Research Award program in memory of her late husband. ■

INTERACTIVE INTELLIGENCE CHAIRMAN ELECTED TO BOARD OF TRUSTEES

Dr. Donald Brown, chairman of the board, president and chief executive officer of Interactive Intelligence, has been elected to the Rose-Hulman Institute of Technology Board of Trustees.

Brown founded his third software company, Interactive Intelligence (NASDAQ ININ), in 1994. The Indianapolis-based company is a global developer of software for IP telephony, contact center automation and unified communications. Interactive Intelligence has more than 1,000 customers worldwide. Recent awards received by the company include Software Magazine's 2002 Top 500 Global Software and Services companies, and the Deloitte and Touche 2002 Technology Fast 500.



Donald Brown

He was co-founder of Software Artistry, a developer of customer support software that was acquired by IBM in 1998. His first software company was acquired by Electronic Data Systems in 1987.

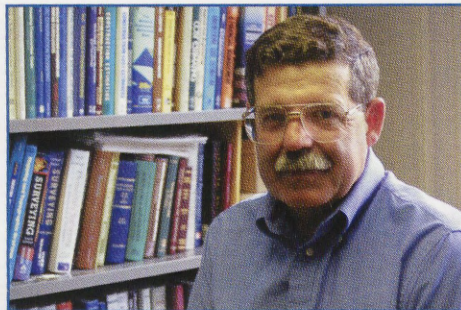
Brown has also co-founded, with his wife Kyle, the Interactive Academy, a new private K-12 school in Zionsville, Ind., that features a high-tech curriculum focusing on a small number of core courses.

"Rose-Hulman will benefit greatly from Don Brown's technical expertise, leadership and intense interest in creating exceptional educational programs," stated Rose-Hulman President Samuel Hulbert.

Brown graduated from the Indiana University School of Medicine, and has earned the bachelor's in physics and the master's in computer science at Indiana University. ■

MCKINNEY NAMED INDIANA ASCE'S CIVIL ENGINEER OF THE YEAR

Rose-Hulman civil engineering professor James McKinney was named Civil Engineer of the Year by the Indiana section of the American Society of Civil



James McKinney

Engineers at the section's spring conference in Lafayette.

McKinney, a member of the Rose-Hulman faculty since 1980, was honored for his career achievements, service to ASCE and loyal support to the civil engineering profession.

"Jim has always been an excited supporter of civil engineering, the Indiana section of ASCE and Rose-Hulman's role in training future engineers," stated Ali Abufaras, Indiana section ASCE president.

McKinney served as Rose-Hulman's Civil Engineering Department head from 1982

to 2001, was president of the 1,300-member ASCE Indiana section in 1987-88, helped establish the Asphalt Quality Assurance Program that benefits the paving industry and Indiana Department of Transportation, has earned the American Council of Engineering Companies' Public Service Award, and has advised several state and local government agencies on engineering issues. He currently is the R.C. Hutchins Distinguished Professor of Civil Engineering, the college's first endowed faculty position.

PROFESSORS PUBLISH EDUCATIONAL TEXTS AND MANUALS

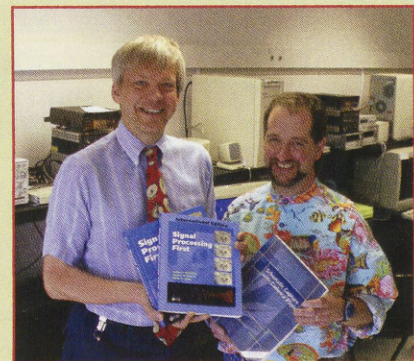
Rose-Hulman electrical and computer engineering professors Marc Herniter and Mark Yoder authored textbooks and educational manuals this spring to

assist the exploration of engineering, engineering technology and digital signal processing.

Herniter, an associate professor, authored "Schematic Capture with Electronics Workbench MultiSIM," the first book on the market that teaches how to use the Electronics Workbench MultiSIM computer software.

Another Herniter manual, "Schematic Capture with Cadence PSpice, Second Edition," is designed for use throughout the continuum of freshman through senior-level electronics courses in engineering and engineering technology.

Yoder, a tenured professor, is co-author of "Signal Processing First," a textbook designed for introductory courses in digital signal processing, and signals and systems. The book is derived from "DSP First: A Multimedia Approach," published in 1997.



Mark Yoder, left, and Marc Herniter

COMPUTER SCIENCE AND SOFTWARE ENGINEERING DEPARTMENT TO HAVE NEW FACILITIES

The Department of Computer Science and Software Engineering will soon have facilities that match its growing stature on campus when it moves into new offices, laboratories and meeting/conference rooms in space formerly occupied by the Moench Hall Auditorium.

The \$1.8 million renovation project was provided by funds raised from the Board of Trustees and the Lilly Endowment's special matching gift program. The opening of Hatfield Hall theater last fall freed up the former Moench Hall space for this academic project.

"We're going from the basement (of Logan Library) to the penthouse," said Cary Laxer, CSSE department head. Offices are scheduled to be moved in July.

The 8,207-square-foot space will have 14 faculty offices, two laboratories each with 24 computer workstations, four senior thesis workstation areas, student project meeting areas, a conference room, a computer systems administrator's office and a copy room.

All of the labs and offices are equipped for wireless and hardwire computer connections.

The CSSE department had only one lab with 17 computer workstations and 10 faculty offices in the Logan Library.

The old office area in the library will be renovated for the Army ROTC Department and an expansion of the Learning Center. Future plans call to renovate former Army ROTC Department offices on the top floor of Moench Hall for additional office space and student laboratory areas.

"The new space allows for our department to be one cohesive educational unit, instead of having faculty offices scattered through the basement and students crammed into one small computer lab," Laxer said. The department's basement space covers only 3,950 square feet.

The renovation will heighten the department's campus profile and help build on the department's strong relationship with the computer engineering and mathematics departments.

Computer science now is Rose-Hulman's fourth largest academic major, with 220 students enrolled during the fall quarter of the 2002-03 school year. A new major in software engineering will begin this fall. (See pages 14-15.) ■

HOMEWORK HOTLINE ANSWERS MORE THAN 22,000 CALLS; SETS SIGHTS ON SOUTHERN INDIANA

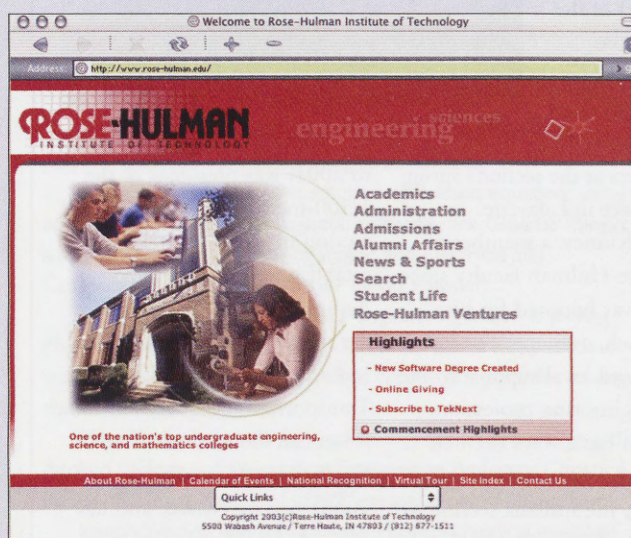
Rose-Hulman students answered 22,654 calls this school through the Homework Hotline mathematics and science tutoring service, more than doubling the 10,305 calls received in 2001-2002. The prospects are even greater when the free telephone service expands to help middle- and high-school students across southern Indiana next year.

The Hotline is in the midst of a three-year expansion throughout Indiana, after becoming a valuable resource for teachers in Indianapolis and West Central Indiana. Fort Wayne, Anderson and Muncie were target cities this year.

Ninety-seven percent of callers surveyed found that Rose-Hulman tutors helped them understand how to find the right answers to their problem. The Hotline number is 1-877-ASK-ROSE, and it is available from 7 p.m. to 10 p.m. Sundays through Thursdays from early September to late May. For more information, visit the service's web site at www.askrose.org. ■

KEEP UP WITH THE LATEST NEWS AT ROSE-HULMAN

Visit our web site | <http://www.rose-hulman.edu>



APARTMENT-LIKE RESIDENCE HALL TO MEET DEMAND FOR ON-CAMPUS HOUSING



Artist's drawing of new hall's exterior.

Living on campus has always been popular among Rose-Hulman students. That popularity now exceeds the space available in residence halls. In order to meet the demand and requests from students who want apartment-style residence hall living, Rose-Hulman has begun construction of a \$13.5 million residence hall that will accommodate 240 students.

Scheduled for occupancy in the fall of 2004, the 75,000 – square foot residential complex is being built west and slightly north of the upperclass residence halls. The complex will consist of two, three-story, brick buildings connected by a single-story commons area. The commons will include a convenience store, Subway restaurant, coffee house and dining area.

Each 850-square foot apartment will include two bedrooms, a kitchen, living area and a bath for use by four students. Each apartment will have its own heating and cooling system and control. Ten apartments will be located on each floor. The building exterior is designed in a more contemporary style to be complementary to the neighboring campus buildings.

The residence hall will usher in a new type of on-campus living environment, says Pete Gustafson, vice president for student affairs and dean of students. "A survey of students and vis-

its to new residence halls at other campuses indicated that this is the type of living environment most appealing to students," he said. "The architect designing the buildings researched residence hall construction nationally for the past three years and couldn't find a campus where a 'traditional' room design was used," Gustafson noted.

Juniors and seniors will occupy the new halls, according to Gustafson.

Additional parking is being provided west of the Sports and Recreation Center and west of the new buildings. Improved landscaping will create a courtyard between the new facilities and the upperclass residence halls.

As part of its planning process, the Rose-Hulman Board of Trustees last year approved an enrollment ceiling of 2,000 students.

Last fall's official enrollment was a record 1,812 students. Excellent student retention and successful recruiting of freshmen continues to create slow, planned increases in enrollment.

"The additional housing couldn't have come at a better time. The new facilities will increase our on-campus housing capacity, not including students living in fraternities, to 1,100 students," Gustafson stated.

The expansion will provide students with additional living and meal options. Floors will include study lounges, and a resident assistant staff similar to other on-campus housing units. ■



Proposed lobby area in the new hall.

HABITAT HOUSE DEDICATED

A unique community service project that started when Rose-Hulman students arrived on campus last fall ended on the last week of the school year with the completion of a Habitat for Humanity house for a single Terre Haute mother.

Erin Crews and her four sons received the keys to their new 1,200-square-foot, four-bedroom home, located in Terre Haute, on May 18. The event was witnessed by Rose-Hulman students, faculty and staff that had helped construct the home – from scratch – at a campus



Celebrating the blessing of a Habitat for Humanity house were (from left) Sara Page Podolsky, officer of Rose-Hulman's Habitat for Humanity student chapter; Mario Simoni, chapter faculty adviser; Erin Crews, new homeowner; Rob Carruth, officer of the student chapter; and Caroline Carvill, director of Rose-Hulman's service learning program.

site. The home was moved approximately four miles in February and set on its present foundation.

"This was a very rewarding project. It was nice to see the campus community work together to help others," stated Professor Caroline Carvill, director of Rose-Hulman's service learning program.

Rose-Hulman's Habitat for Humanity student chapter helped organize the construction work schedule while Wabash Valley Habitat for Humanity supervised the project.

LANDSBAUM GIFT TO ESTABLISH SCHOLARSHIP FUND

A \$934,878 gift from the estate of the late Morris Landsbaum of Terre Haute has established the Landsbaum Scholars Fund to benefit Rose-Hulman students. The fund will award scholarships on an annual basis with a priority given to students from Vigo County.

The number of scholarships to be awarded annually will be determined by the number of applicants and the revenue generated by the fund, according to David Haynes, Rose-Hulman director of planned giving.

Rose-Hulman President Samuel Hulbert said the gift from Landsbaum is significant because increasing scholarships to deserving students is one of the college's top fund-raising priorities.

"Finding resources to provide additional scholarships to deserving students is one of our biggest challenges," Hulbert said.

During a successful career in commercial real estate development, Landsbaum managed the creation of shopping centers, restaurants and a variety of other large and small real estate projects. His first major gift to Rose-Hulman was a donation of real estate in 1996.

In 1997, Rose-Hulman presented Landsbaum with an honorary doctor of humane letters during commencement.

"I first met Morris in 1978," remarked his attorney and 1974 Rose-Hulman alumnus Bill Olah of the Wilkinson, Goeller, Modesitt, Wilkinson and Drummy law firm in Terre Haute. "He believed we could never do too much to nurture and encourage young people to succeed, no matter what their field of endeavor."

"Morris steadfastly believed that while life's experiences alone could teach a person a great deal, it was a formal education that would open doors and provide more opportunities than would otherwise be available," Olah noted. "Morris' will bequests to create and endow the scholarships merely manifest how deeply rooted that belief actually was."

A lifelong resident of Terre Haute, Landsbaum supported educational and medical services in his hometown. He served on the boards of directors of Terre Haute Regional Hospital, the Terre Haute Center for Medical Education and Union Hospital.

PARENTS' GATEWAY PROJECT CONTINUES



The Parents' Gateway Project continues with 436 parents donating nearly \$30,000 to help improve the safety of the campus entryway. The project goal is \$125,000 and the project will continue until the goal is met.

The plan calls for the following:

- addition of a stoplight along U.S. Highway 40 at the campus entrance;
- widening of the main drive to allow for a turning lane;
- extension of the stone gateway featuring Rose-Hulman's name; and
- replacement of directional signage throughout campus.

This year marks the best year in the history of the Parents' Project. The previous top annual Parents' Project total was \$12,714 in 1999. ■

A CHANCE TO LEAVE A LEGACY

Alumni, students, parents, faculty, staff and friends of Rose-Hulman have an opportunity to leave a legacy on campus by purchasing a brick that will be part of the new Reflection Plaza. The personalized bricks will surround a large reflecting pool that features a new sculpture called the Flame of the Millennium. The sculpture was erected on the front lawn of campus this spring, and the schedule calls for laying the first round of bricks by spring 2004.

Three sizes of bricks available for purchase are: 4 x 8 inches for \$150, 8 x 8 for \$500 and 12 x 12 for \$1,000.

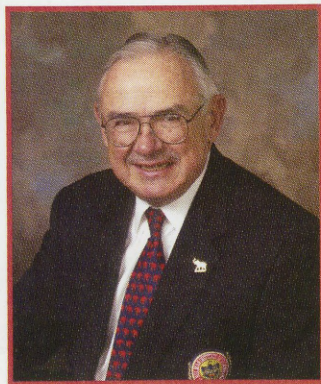


People can have their names or their company's name inscribed on a brick that will be placed in the Reflection Plaza. The project will be open-ended so bricks will be available for purchase by future generations of engineers, mathematicians and scientists.

The sculpture by noted artist Leonardo Nierman was donated to the college by alumnus Glen Raque, class of 1969.

For more information or to order a brick, contact Karen O'Rourke in the Office of Annual Giving at 800-248-7448, ext. 8159, or via e-mail at karen.orourke@rose-hulman.edu.

ALUMNI PLAY VITAL ROLE THROUGH TIME AND TALENT



By Clyde Willian, Chairman of the
Rose-Hulman Institute of Technology
Board of Trustees

As an alumnus I have always been impressed (and somewhat boastful) about the strong support Rose-Hulman alumni provide to their alma mater. We receive tremendous financial assistance from our graduates. Our alumni giving rate of 42 percent puts Rose-Hulman among the tops in the nation. Not too many schools can claim such a loyal alumni body. While the financial giving is important, my time on the Board of Trustees has provided me with a deeper understanding of the various other ways alumni can play a role in the life of their college. It's not all about money.

Time and talent are other major ways alumni can give back to the college. From assisting with job placement to recruiting freshmen to serving on the Homecoming committee, there are numerous places alumni can plug in and help Rose-Hulman. To keep Rose-Hulman at the forefront of engineering, science and mathematics education requires all of us to lend a hand. It requires some time and effort, but not only will Rose-Hulman benefit...so will you. There is a great reward of personal satisfaction in playing a role in the developing of our future engineers and scientists.

I provide the following list as examples of areas where you can play a role.

- **Mentoring** – Alumni have experiences they can share with a current student. As a mentor, you are teamed with a student so you can provide advice on

careers and what the real working world is like. You also can inform them of all the good options their degree can provide such as management opportunities, entrée to graduate school, starting their own business or as a stepping stone to another profession such as medicine or law. Mentors are not required to promise jobs...just guidance. Our Student Alumni Association has tackled mentoring as one of its major projects. Alumni mentoring is sought by our students and we need to be there for them.

- **RARE** – This acronym stands for Rose Alumni Recruiting Engineers. Working with the admissions office, alumni represent the college at various events targeted at recruiting students to attend Rose-Hulman. This gives our admissions effort an edge. RARE volunteers attend college fairs, and contact admitted students through letters, e-mails and phone calls. Prospective students like to hear from those who have actually graduated from the college, and moms and dads get to see our graduates leading successful lives.

- **Student Projects** – A major academic emphasis for Rose-Hulman is the real-world student project. Our students learn engineering by doing engineering. A real-world project is an important part of that learning process. If you or your company has a project that could be solved by one of our student teams, let the college know. Not only will your company benefit, so will the students who learn about deadlines, resource limitations and the joy of seeing a concept become reality.

- **Classroom Lectures** – Our faculty are excellent teachers and realize that students learn much from those who have "been there and done that." Alumni speaking to classes about their fields of practice provide an invaluable educational resource for faculty and students.

- **Career Recruiting** – Alumni already are strong in this area, but I list it as a reminder. You can be a real asset to Rose-Hulman by helping place our graduating seniors. Maybe you can arrange for a

recruiting visit by your company to campus, or you know of an opening for an entry-level engineer with your company. Alumni already dominate our Career Fair and recruiter visit schedules, but we cannot have too many alumni carrying the placement banner for us. The ability of our students to obtain employment in their fields of study upon graduation is an important drawing card for prospective students and it makes for happy alumni as well.

- **Meeting and Greeting** – Social events hosted by alumni can help play a role in the advancement of the college. When new alumni take jobs in your area, you can host a reception to welcome them to the area. In the same way, some alumni have volunteered to host send-off parties for freshmen from their hometowns. Having some familiarity with alumni and fellow freshmen can take some of the edge off of making the major life transition from high school to college. It's a great way to introduce students and their families to the Rose-Hulman family.

- **Advisory Board** – The Alumni Association continually seeks volunteers to serve on the Alumni Advisory Board. There are several subcommittees that need chairs and members to carry out the mission of the association. Areas include homecoming, continuing education, alumni clubs, career services, student recruitment, young alumni, and awards and recognition.

- **Networking** – As the alumni ranks continue to grow, so do networking opportunities across the country. Networking can be of great value to the college and alumni.

As you can see, there are many ways to help. Philanthropic support is important, and we need those checks to keep coming, but we also need your time and talent. If you have questions, get in contact with me or with Alumni Director Brian Dyer at 812-877-8359 or via e-mail at brian.dyer@rose-hulman.edu. Together we can make a great college even better. ■

WINTER SPORTS WRAPS

BASKETBALL TEAMS BUILD FOUNDATION FOR THE FUTURE

The Rose-Hulman men's and women's basketball programs went through a youth movement during the 2002-03 season, laying the groundwork for success in future years.

The men's basketball team finished 9-16 and qualified for the inaugural Southern Collegiate Athletic Conference Tournament held in Memphis. Senior Jon Query led the team in scoring at 13.0 points per game, capped by a career-high 34 points in his final college game. Sophomore Philip Griffith contributed 12.4 points per game, while freshman Munchie Muskeyvalley added 8.9 points per game and had a team-high 92 assists on the season.

The women compiled a 3-22 record, highlighted by an 80-20 victory over CalTech at Hulbert Arena. Freshman Anna Hall led the squad in scoring (14.3 points per game) and rebounding (6.5), while fellow freshman Karyn Kost averaged 8.0 points per game.

RIFLE TEAM NATIONALLY RANKED AGAIN

The Rose-Hulman rifle team finished the 2002-03 season ranked 21st nationally among NCAA Division I, II and III colleges after its effort at the National Rifle Association Qualifying Sectional at the University of Wisconsin-Oshkosh.

Rose-Hulman shot a team score of 5,979 to rank in the top 25 for the seventh consecutive year. That score placed third among NCAA Division III rifle programs. Only the U.S. Coast Guard Academy (15th) and Norwich University (17th) finished above the Engineers among Division III institutions.

SWIMMING TEAM SETS RECORDS AT SCAC MEET; MATT SMITH WINS NATIONAL TITLE

The Rose-Hulman swimming team enjoyed a breakthrough season in 2003, highlighted by a national championship in the 100-yard breaststroke by senior Matt Smith (See page 17 for a feature about Smith.)



NATIONAL TIPOFF

For the second consecutive year, Rose-Hulman hosted the NCAA Division III National Women's Basketball Championship. Trinity University won in a 60-58 thriller over Eastern Connecticut State University. The championship brought thousands of visitors to campus and to the Rose-Hulman Web site, and it garnered the national sports spotlight for the campus.

The Engineers set five school records, swam four NCAA Division III Championship provisional qualifying times, and won the first relay conference championship in school history to place fourth in the men's SCAC competition. The women's squad placed seventh in the meet.

Smith won three individual SCAC titles and combined with junior David Breiding, junior Ryan Mackos and senior Phil Isom to win the 200-yard individual medley relay championship. Breiding earned three all-conference honors for Rose-Hulman.

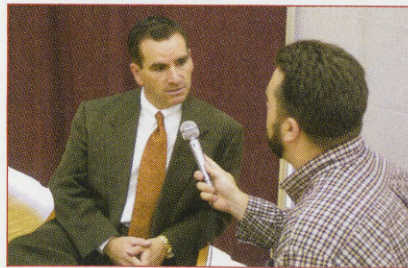
PAIR OF WRESTLERS EARN TOP-FIVE FINISHES AT NCAA REGIONAL

Freshman Tom Aigner and junior Collin Wyse compiled 2-2 records to place fourth and fifth in their respective weight classes and lead Rose-Hulman's efforts at the 2003 NCAA Division III Midwest Wrestling Regional.

Aigner finished fourth in the 197-pound division, while Wyse placed fifth at 165 pounds as the Engineers finished 11th in the 12-team regional. ■

HILL NAMED WOMEN'S BASKETBALL COACH

Tony Hill has been named the fourth head women's basketball coach in the history of Rose-Hulman.



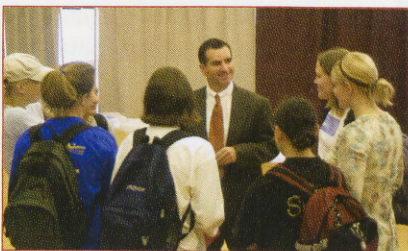
Hill, left, conducts media interview

Hill has served as the women's basketball and softball coach at Lincoln Trail College in Robinson, Ill., for the past two seasons. His basketball teams finished 19-11 in 2002 and 2003 to establish single-season school records for victories.

In the classroom, Hill's squads earned a cumulative grade point average of more than 3.0, highlighted by the first Academic All-American in school history.

Prior to his stint at Lincoln Trail, Hill served as the athletic director of the Bloomfield School District from 1999-2001 after having a similar stint at Eastern (Greene) from 1997-99.

Previously, Hill was the recruiter and assistant basketball coach at Sullivan College (Ky.) from 1996-97; a teacher and girls basketball coach at Louisville, Ky., high schools from 1994-96; and a teacher and boys basketball coach at Butler County High School in Morgantown, Ky., from 1991-93.



Hill visits with team after news conference

He holds a bachelor of science degree from Indiana University, and is working on a master's program in secondary education at IU. ■

Bailey Challenge

By Professor Emeritus Herb Bailey

For your warm-ups we offer two analogy problems.

Mother's day is to fathers day as Christmas is to _____.

Eleven is to equal as eight is to _____.

For the real problem, we update a classic involving a column of foot soldiers and a messenger on horseback.

Problem



An armored column is 1 kilometer long and is traveling at 60 kilometers per hour along a straight path from Kuwait City to Baghdad. A journalist, embedded in a Bradley, starts at the rear of the column, goes to the front of the column and immediately returns to the rear. The journalist travels at a constant speed, and the column traveled 6 km by the time the journalist returned to the rear of the column. Find the speed of the Bradley in km./hr. Hint: your answer should be a tad less than 71 km/hr.

Send your solutions to Herb.Bailey@rose-hulman.edu or to Herb Bailey, Math. Dept., Rose-Hulman, 5500 Wabash Ave., Terre Haute IN 47803.

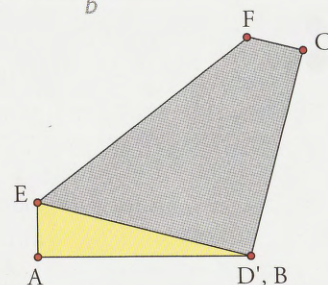
Solvers of the summer problems are listed below:

Alumni: A. Kensel, 1940; W. Barrick, 1941; D. Heath, 1943; W. Soudritte, 1943; H. Payne, 1947; J. Hurt, 1948; P. Gottfried, 1949; C. Cook, 1949; J. Lambermont, 1951; W. Rinker, 1951; A. Sutton, 1952; C. Hirshfield, 1954; D. Camp, 1955; C. Cooper, 1956; J. Moser, 1956; A. Sutton, 1956; H. Brown, 1957; D. Bailey, 1959; J. Tindall, 1961; R. Archer, 1961; J. Snyder, 1962; S. James, 1965; J. Lafuze, 1967; J. Born, 1970; S. Whitesell, 1970; W. Pelz, 1971; A. Mahler, 1971; R. Collins, 1973; D. Ratner, 1974; P. Chilson, 1974; M. Bailey, 1976; C. Tracy, 1977; A. Bailey, 1977; J. Slupesky, 1979; J. Clark, 1985; G. Cullen, 1985; M. Walden, 1986; M. Nigrovic, 1987; B. Seidl, 1987; S. Johnson, 1998; B. Burger, 1991; D. Hector, 1992; J. Rott, 1995; D. Walz, 1997; F. Schlottau, 1999; B. Creel, 2000; P. Switzer, 2001; D. Harrington, 2002; R. Collins, 2002

Friends: L. Gaintner; N. Flatter; D. Templeton; P. Adams; S. Compton; B. Talbot; M. Rosene

Solvers of the winter problems are listed. You found many interesting solutions to the second paper folding problem. Several solved by making an additional fold with C' folded to A resulting in an easy solution. Try it! All methods should lead to the result

$$EF = \frac{a\sqrt{a^2 + b^2}}{b}$$



Students' Bar Code Scanning Prototype May Assist Visually Impaired

By Dale Long

Shawn Dobbs craves being able to prepare his own meals, select his favorite compact disc from the music store or purchase grocery store items on his own, despite being blind.

A portable bar code scanning device, developed by a team of four Rose-Hulman electrical engineering and computer engineering seniors, may open frontiers of independent living for blind and visually impaired persons.

"I would rather use this type of device than to borrow someone else's eyes," said Dobbs, who currently needs to be guided by a personal assistant when shopping.

The handheld device adapts technology found in an advanced Personal Digital Assistant (PDA) with an infrared scanner that converts a product's bar

Pickering, an electrical engineering major from Pittsburg, Kan.; Ryan Horner, an electrical engineering major from Portage, Ind., and Dan Walter, a computer engineering major from Crown Point, Ind. The device's applications for blind and visually impaired persons are endless, according to James Durst, interim superintendent of the Indiana School for the Blind.

"The device allows an individual, when properly trained, independent shopping in any store, since a majority of products have bar codes," Durst said. "This product can relieve the frustration most blind persons have about getting out and experiencing those things that others take for granted. This could be a big step forward and far exceeds our expectations."

"We took on this product because we wanted to help people. That mission just made us more determined to work harder."



From left: Doug Pickering, Ryan Horner, Anna Yokel and Dan Walter

code into a verbal command to alert the user about the type of product selected.

A prototype of the device was demonstrated earlier this year to the news media, Rose-Hulman faculty, and administrators of the Indiana School for the Blind, who originally approached Rose-Hulman to see if students could produce devices to help its students.

The next stage is review of the product by American Printing House for the Blind, a Louisville, Ky.-based company that produces and markets supplies for the blind, and further product development by Rose-Hulman students or faculty.

Proving the conceptual realities of the product, Anna Yokel, a senior electrical engineering major from Cincinnati, Ohio, scanned two identically looking soup cans, one for chicken noodle soup and another for broccoli and mushroom soup.

When scanned, the device produces a verbal command (Yokel's voice) about the item selected: The company producing the product (Campbell's), type of product (broccoli cheese or cream of chicken and mushroom soup) and the product's nutritional value (calorie content). Other commands, like item prices, could become an added feature in the future.

A total of 15 common grocery items, including cereal boxes, crackers and canned vegetables, were identifiable by the prototype, which was developed in 19 weeks as part of the students' Capstone senior design project.

Other members of the team were Doug

Dobbs agreed, giving examples of how the device could help him prepare meals at home or selecting CDs at a music store.

"Now, I just pick up a can and I can't distinguish if it's a can of beans or corn. Ten cans all appear the same to me. However, with this scanner, I could not only find out if I picked up a can of beans, but what kind of bean: Chili, green or lima," stated the ISB's social counselor. "And, I can add the right ingredient to make chili at the right time of the cooking process. This is just great!"

Seeing the reaction of Dobbs and Durst was personally gratifying to the four team members.

"It was an ambitious project. Originally, I thought we had bit off more than we could chew," conceded Pickering, the team leader of the project. "We took on this project because we wanted to help people. That mission just made us more determined to work harder."

Yokel researched the text-to-speech options as well as providing the recorded vocal commands. Horner entered all the bar code data into the programmable PDA's database. Walter was the key programmer for the project.

"This project really sums up my four years at Rose-Hulman," Pickering stated. "You're drawing on multiple disciplines and knowledge garnered from various classes. You fill in areas that you don't know about . . . We had to rely on each other to get the project done on time. Each member of the team was essential to the overall success of the project." ■

Clean Environment Marks a New MEMS Lab

The lab scene on the second floor of Moench Hall is unlike any other at Rose-Hulman. Students and faculty are clothed in white disposable uniforms, hats and boots or shoe covers. Students also wear goggles for protection. No textbooks or paper are allowed in the lab. Undergraduates are working in a "clean" environment. The measurements they're taking are accurate to one micrometer. The accuracy is needed because the patterns they're designing on thin silicon wafers are so small that students must use microscopes to do their work.

The students are in the new micro-electromechanical systems (MEMS) lab which opened at the start of the spring quarter. It supports the MEMS introductory class. The class is so popular with students that even after the course was increased from one to two sections, students were still turned away.

A \$400,000 grant from the W.M. Keck Foundation helped Rose-Hulman establish the MEMS program which is highly interdisciplinary, according to its coordinator, Azad Siahmakoun, professor of physics and optical engineering.

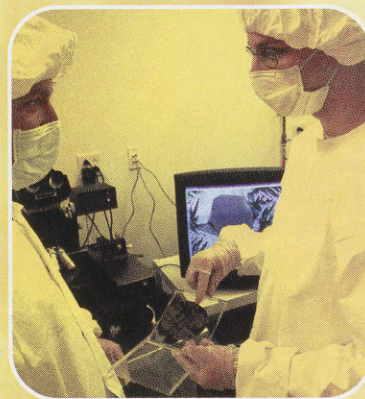
"Ten faculty from six academic departments are involved," he said. "MEMS is having an impact on virtually every area of technology," he stated in explaining the importance of the team teaching approach. The faculty worked with 20 student teams on silicon wafer processing during the spring quarter.

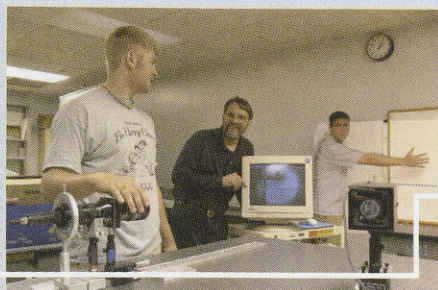
"Teaching MEMS at the undergraduate level is so new that faculty have had to allocate additional time to develop lectures and lab experiments," according to Siahmakoun. The faculty team will create a new textbook for use in the spring quarter next year.

The educational opportunities for students extend even into the summer. Siahmakoun will work with undergraduates on the development of a remotely powered, wireless microphone that would be the size of the tip of a pen.

An advanced MEMS course will be offered during the next academic year. Students will move from fabrication and applications they learned in the introductory course to modeling and packaging MEMS technology. To view a live webcam of activities in the MEMS lab click on

www.rose-hulman.edu/~siahmako/MEMS?index.htm. ■

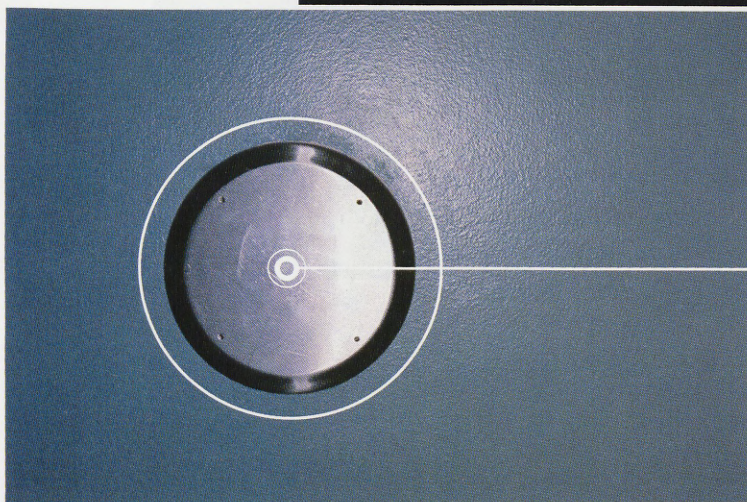




by David Piker

NEW ACADEMIC PROGRAMS

THREE DEGREE PROGRAMS AND NEW MAJOR TO LAUNCH IN NEXT 15 MONTHS



Three new undergraduate degree programs and a new second major will be launched in the next 15 months as Rose-Hulman increases opportunities for students to learn about the latest technical developments.

This September, students for the first time will be able to pursue Bachelor of Science degrees in biomedical engineering or software engineering. A new second major in biochemistry and molecular biology is also being offered. Faculty have approved a new B.S. degree in engineering physics that will begin in the fall of 2004. New laboratories in Myers and Moench halls will support the new programs.

The new biomedical engineering bachelor's degree program is being launched because of student demand and rapid technical advancements taking place in medicine and the biological sciences that are dramatically increasing the need for biomedical engineers.

"An aging population, the demand for new medical services and systems, and increased concern for cost efficiency will increase the need for biomedical engineers in the future," stated Lee Waite, professor and head of the Rose-Hulman Department of Applied Biology and Biomedical Engineering. Job growth areas include computer-assisted surgery, cellular and tissue engineering, rehabilitation and orthopedic engineering.

Waite describes the new program as being interdisciplinary with a strong background in engineering fundamentals. "Biomedical engineering integrates basic engineering science and engineering design with knowledge of biology, physiology and medicine. Students choose to study biomedical engineering because they want to help people and apply advanced technology to the complex problems of medical care."

The undergraduate biomedical engineering degree continues an expansion of the college's biological-related academic offerings. Two years ago, Rose-Hulman launched a B.S. degree program in applied biology. An applied biology minor is also available to students. In addition, a master's degree in biomedical engineering is also offered.

Waite said the applied biology and biomedical engineering programs will complement each other. "It will be common for biology professors and students to work side by side with their counterparts from engineering departments in class and on their research projects," he noted.

"The applied biology program is for those students who want to be scientists rather than engineers," he explained. "Students who want to be engineers will now have the opportunity to earn an undergraduate degree in a field that emphasizes the application of engineering knowledge to advancements in the medical and biological fields," Waite stated.

Students enrolled in the new program will complete a year-long research/design sequence and have opportunities for collaborative research with the Indiana University School of Medicine at the Terre Haute Center for Medical Education.

Graduates Who Can Develop Complex Software Systems

For several years, Rose-Hulman has taught computer science students the general concepts of software engineering. This fall, the emphasis on software engineering is expanding into a new bachelor's degree program. Rapid technical advancements in the business world have created an increasing need for graduates who have an in-depth knowledge of software engineering.

The goal is to educate graduates who have the ability to analyze, design, validate, implement, apply and maintain complex software systems, according to Cary Laxer, professor and head of the Department of Computer Science and Software Engineering. "Our graduates will be prepared to work in at least one application domain," he said.

The national engineering accrediting organization requires that students must be able to apply software engineering skills to another discipline. Applications could range from software for accounting systems to safety controls for a jet plane.

Laxer is quick to credit his faculty colleagues for their expertise in creating the new major. "The roots of our curriculum came from two previously created national reports. The lead authors on those reports were professors Mark Ardis and Don Bagert. Since authoring those reports, both have been recruited to Rose-Hulman," he explained.

Bagert, who is serving as director of software engineering, said offering an undergraduate degree in software engineering is uncommon in the United States. "There are less than 25 colleges or universities where a student can earn a BSSE degree," he noted.

Ardis said the new major will significantly increase a student's expertise in software engineering. "Previously, our students learned a little about requirement analysis and specifications," Ardis said. "Now, we'll be offering a complete course on those topics."

Because the first two years of the computer science and software engineering curricula are almost the same, students will not have to decide immediately which major they want to pursue. Laxer says earning a double major in CS and SE will be no more difficult than earning a double major in CS and mathematics.

Merging Physics and Engineering

Students who want a thorough understanding of physics combined with a background in engineering for careers in industries ranging from biomedical to optical technologies will be able to pursue a B.S. degree in engineering physics beginning in the fall of 2004.

Charles Joenathan, professor and head of the Department of Physics and Applied Optics said the new degree program will increase job opportunities for graduates. "Combine a knowledge of physics with the problem-solving and design skills of an engineer and the result is an undergraduate who can meet the increasing demands of the high-tech sector who wants physicists who are also trained engineers," he stated.

Engineering physics majors will choose an area of concentration from among the following subjects: Biochemistry and polymers, materials, or biomedical, civil, electrical, optical, and mechanical engineering. The first year will include the standard courses that are required of Rose-Hulman freshmen. The sophomore year continues the physics and mathematics sequences and begins the prerequisite courses for the engineering curricula. In the third year, students take courses needed for their chosen concentration in addition to the advanced physics classes. The senior year includes two design projects courses supervised by faculty.

Joenathan said the goal is to enroll 20 students majoring in engineering physics. "We'd like to start with 10-12 students. Engineering physics has been successful at other colleges and I believe it will increase the number of students enrolled in our physics program as well," he stated.

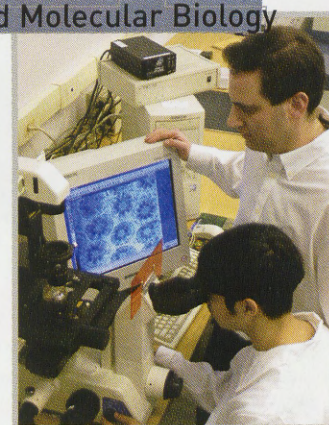
New Major in Biochemistry and Molecular Biology

The second major in biochemistry and molecular biology is a collaborative effort involving chemistry and applied biology faculty, explains Daniel Jelski, professor and head of the Department of Chemistry.

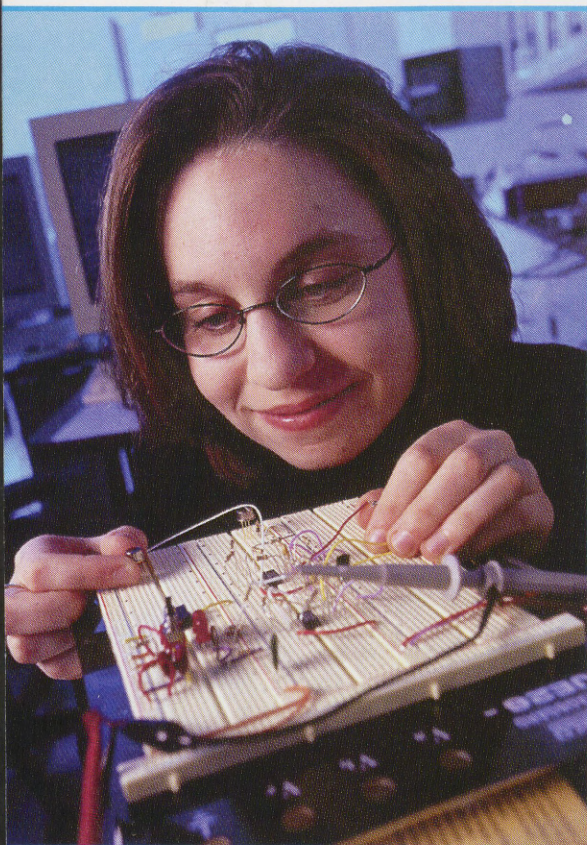
"We need an excellent biochemistry program to support the applied biology and biomedical engineering program," he said. Professors coordinating the program are Ric Anthony in applied biology and Mark Brandt in chemistry.

In addition to revising courses, faculty are creating new undergraduate research opportunities for students, he stated. "Our labs are outstanding facilities for teaching as well as research by undergraduates," Jelski stated. As an example, Jelski noted that a recent research grant awarded by the Research Corporation to chemistry professor Luanne Tilstra will provide summer research opportunities for three students.

Brandt is involving undergraduates in research designed to better understand how small molecules interact with proteins and alter the function or structure of proteins. "We structure the research at a level to ensure that we have the equipment and students have the knowledge so they can do real biochemistry research," Brandt said. "They are uncovering new information. It's an exciting way to learn." ■



National Notice



Lukens selected to 2003 All-USA College Academic Team by Dale Long

Lukens played a significant role in the development of a new breast cancer biopsy Automated Tissue Excision and Collection (ATEC) device for Suros Surgical Systems of Indianapolis. ATEC, which makes biopsy much faster and less painful, earned FDA approval in March 2002, and is currently being used by physicians in 14 cities, including Indianapolis, Atlanta and Miami.

In his letter of recommendation, Suros President and Chief Executive Office Jim Pearson stated: "By taking the initiative to write this one-of-a-kind software, Ms. Lukens offered Suros a way to guarantee that the ATEC disposable handpiece met stringent performance criteria. Not only is this vital for the success of Suros and its product line, but also for the thousands of breast surgeons, radiologists and women across the country who put their trust and confidence in the quality and reliability of the ATEC system."

Work on the project was personally satisfying for Lukens.

"As a young woman, I was especially interested in the device's impact to assist the hundreds of thousands of women every year who require a breast biopsy," Lukens states. "ATEC technology will mean that these women will not need surgery and can resume normal activity shortly after the biopsy."

Each year in the United States, about 1.2 million women undergo a breast biopsy after finding a suspicious lump.

Lukens has also designed electrical products for two other Rose-Hulman Ventures clients: Camile Products and Home Data Source, both of Indianapolis.

"Rachel has it all," states Jim Eifert, Rose-Hulman Ventures president. "She's very intelligent and a superior student with excellent people and communications skills, terrific work ethic, and, perhaps most surprising for her age (21), a very competent professional."

"Her work (at Ventures) has spanned environmental, pharmaceutical, surgical, and geriatric issues; to each of these endeavors she brought her technical talent, unbounded enthusiasm, and creative energy."

On campus, Lukens was editor-in-chief of Rose-Hulman's award-winning weekly student newspaper, *The Thorn*, managing a staff of 15 non-journalism students; served as president of the Spanish Club, planning and promoting club activities; and was an active member and officer of the Delta Delta Delta sorority, serving as vice president of finance for the 61-member organization this year. She volunteered for an on-campus Habitat for Humanity house construction project, and was a member of the Tau Beta Pi national engineering honor society, Society of Women Engineers, Institute of Electronic and Electrical Engineers and Pi Mu Epsilon mathematics society.

"Like most Rose-Hulman students, I was constantly stressed out trying to squeeze many things into a 24-hour day," says Lukens, who is from Terre Haute. "Rose-Hulman gives you many opportunities to learn — in and out of class. I tried to take advantage of things that interested me."

Lukens is now working for Xetron Corp., a Cincinnati, Ohio-based company that specializes in custom communication systems. She is concentrating on digital hardware design.

"These are really exciting times to be an electrical engineer. I'm anxious to get started and see what I can do," Lukens said.

Scholar. Entrepreneur. Student leader. All of those qualities, and many more, helped Rose-Hulman 2003 electrical engineering graduate Rachel Lukens be chosen to the second team of the 2003 All-USA College Academic Team, published in *USA Today*.

Approximately 500 college students from U.S. four-year colleges and universities were nominated for this prestigious honor.

Other colleges having first- or second-team selections included Massachusetts Institute of Technology, California Institute of Technology, Harvard University and Stanford University.

Lukens received high marks for her academic credentials (3.8 grade point average) and involvement in a wide range of educational and community activities.

While working at Rose-Hulman's technology-based product development center, Rose-Hulman Ventures,

Setting the pace in the fast lane

Matt Smith captures national swimming championship by Kevin Lanke

National champion. Even Matt Smith himself has a hard time believing that those two words describe his accomplishments in the pool this winter. The eight-time conference champion and holder of eight Rose-Hulman school records achieved his top swimming goal in late March by winning the 100-yard breast-stroke NCAA Division III national championship at Emory University in Atlanta.

"I'm still amazed that I am a national champion. Since I came to Rose-Hulman, I have dreamed of winning the nationals. I saw the top times and knew that I could compete with the best, but it's still amazing that it actually happened," said Smith.

He became just the third national champion in school history and the first for the college's swimming program. Smith joined track and field standouts Chris Trapp and Ryan Loftus in the highest of victory circles. Perhaps more importantly to Smith, the mechanical engineering major became the first Verizon Academic All-American in the history of Rose-Hulman swimming.

"My parents made it pretty clear that academics would be the main concern at Rose-Hulman. I'm blessed to come from a smart family, and I have always had to organize my day well to get all of my work done," said Smith.

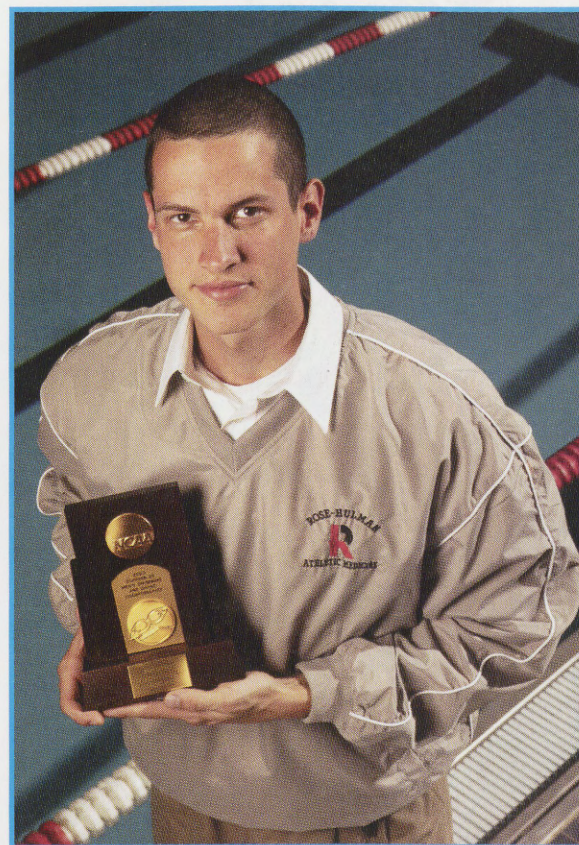
He followed up the national championship performance with a fifth-place finish in the 200-yard breaststroke the next day, capping his career with four All-American awards.

A career that attained the national spotlight nearly ended at age 15. Smith swam competitively for eight years, but then grew weary of the trials and tribulations that come with elite-level youth swimming.

"Growing up, I was very serious about swimming. I trained for four hours a day, lifted weights, and did all the things needed to succeed. Finally, my times weren't improving and I was tired of all the work. Looking back, taking a break was the best decision that I could have made," said Smith.

Although Smith now holds a Rose-Hulman degree and his collegiate athletic career is in the past, he will continue his swimming. His national championship time in the 100-yard breaststroke qualified Smith for the Phillips 66 U.S. Senior Nationals at the IUPUI Natatorium. After a successful venture against the nation's best, Smith has enrolled for graduate school at the University of California-Berkeley and will train for the upcoming Olympic Games.

"At the Senior Nationals, I found out that most elite swimmers practice about 16,000 yards per day. At Rose-Hulman, we practice about 6,000. I figured that if I could reach the Senior Nationals and swim against the nation's best with half of the training, then full-time training should lead me to be competitive against anyone in the country," said Smith.



In addition to success in the pool and the classroom, Smith improved his learning experience at Rose-Hulman by spending a year abroad at the University of Stuttgart in Germany. The year in Germany helped provide coursework that has allowed Smith to earn academic minors in computer science and European studies at Rose-Hulman.

Smith's well-rounded Rose-Hulman experience has included serving as a resident assistant in Skinner Hall.

Winning a national championship contains moments that last a lifetime. For Smith, those moments began during the event itself.

"There are only a few times in your swimming life when you are running completely your own race and are totally unaware of your surroundings. It's like you are in another world. I had that feeling during the last 50 yards of the championship swim," he said.

Smith has entered another world in 2003 – the world of a national champion.

A Flood of Achievement



Walter Flood IV receives national recognition by Dale Long

One of Rose-Hulman's clever student recruitment publications carries the simple statement "You've known it since you were a kid . . ."

Walt Flood knows that feeling quite well.

At the age of 4, Flood was following his father, alumnus Walter Flood (Civil Eng. '75), around Chicago area construction sites for the family-owned Flood Testing Laboratories, Inc. He wasn't playing in concrete, he was testing it.

In middle school, Flood became the youngest field technician (at 14) ever certified by the American Concrete Institute and has obtained nine state and national certifications in materials testing.

And now at 21 he is a Rose-Hulman graduate, has been recognized as one of the nation's top

undergraduate civil engineering students by CE News magazine, and is preparing to study geotechnical engineering in graduate school at the University of Colorado.

"I'm getting closer to my dream of following in my father's footsteps," Flood said. "One of my father's strengths is the ability to create a concrete mix that can meet very unusual specifications. Through helping my father develop mixes, I have grown to enjoy taking new approaches to develop an original product."

The Floods' latest innovation is developing an asphalt mix that will conduct electricity in order to provide heat to a pavement system — a product called "Snowfree" (US Patent 5,707,171). It would prevent ice and snow from accumulating on airport runways, roadways, and sidewalks.

Flood hopes to develop a less expensive concrete alternative with graphite that will achieve strengths of 4000 psi, something that has not yet been accomplished.

"I have been experimenting with different admixtures and aggregates for the past year, hoping to find the perfect combination," the Chicago native states. "When my design is completed, the concrete system can be used for de-icing roads, replacing the need for snowplows and salts."

Flood also helped design high-strength mortar mixes for a bridge in Venezuela and assisted in corrections to the South Bay Ocean Outfall near San Diego.

"I have learned to appreciate the degree of uncertainty in ground conditions and the 'on-the-fly' engineering decisions that are necessary for a successful project," he said.

Flood believes in keeping busy and enjoying life. At Rose-Hulman, he was a resident assistant for two years in Deming residence hall; also served as a Sophomore Adviser on the student life staff; was a two-year executive board member of the student chapter of the American Society of Civil Engineers; and was an executive board member of the Indiana Residence Hall Association.

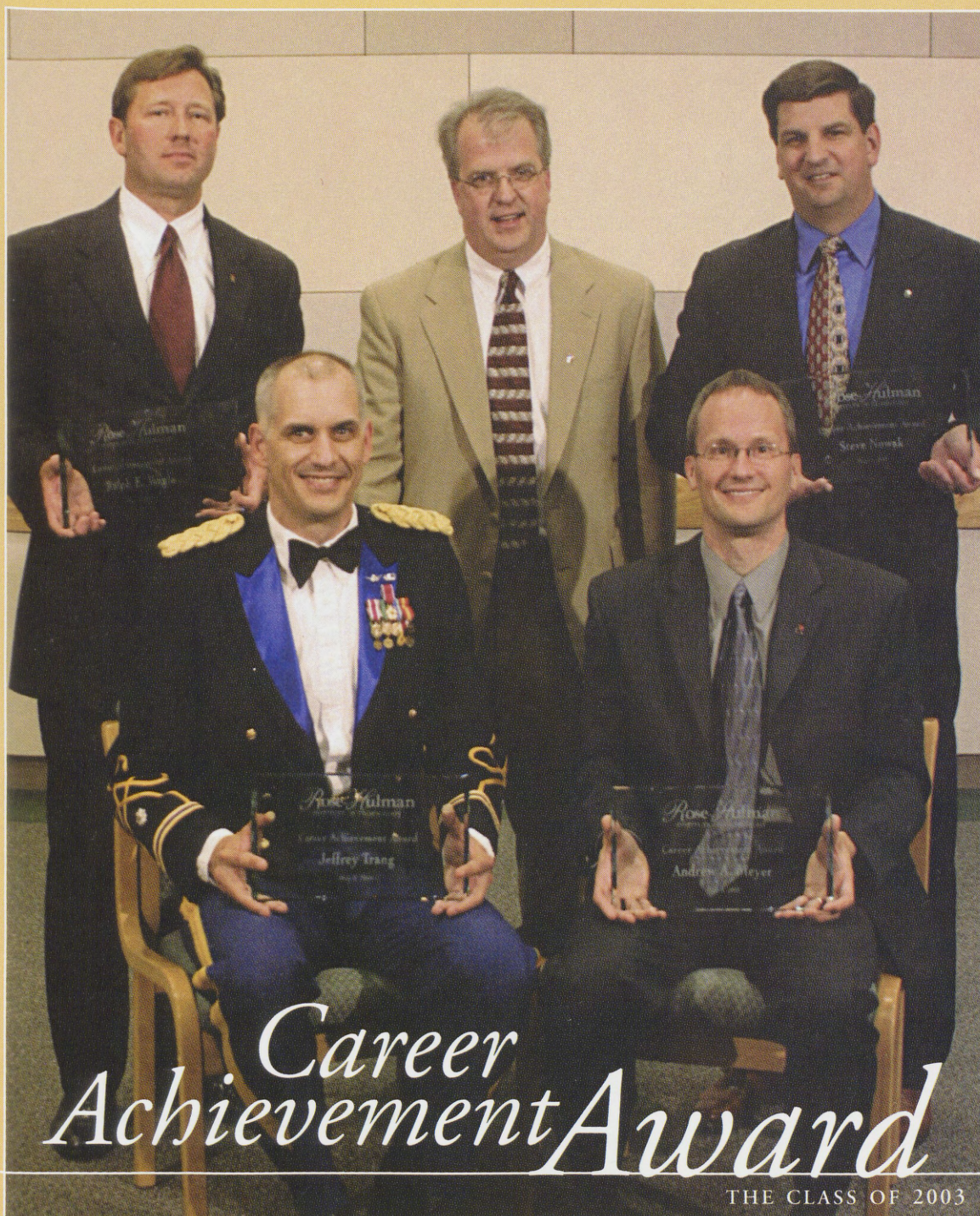
Flood also found time to join Delta Sigma Phi Fraternity; be a swing dance instructor; go scuba diving, snow skiing and rock climbing with friends; and undertake wilderness camping adventures in Canada.

"I fell in love with helping people grow," he stated. "Rose-Hulman has been very instrumental in my personal development . . . I've matured a lot, basically because I had to. I also learned very well how to work with people the right way."

Not surprisingly, Flood listed time management as the biggest challenge of his collegiate career.

For the future, Flood is striving to learn more advanced and accurate techniques for analyzing and designing foundation systems. He plans to return to work for the family business, possibly adding a consulting agency to the thriving firm.

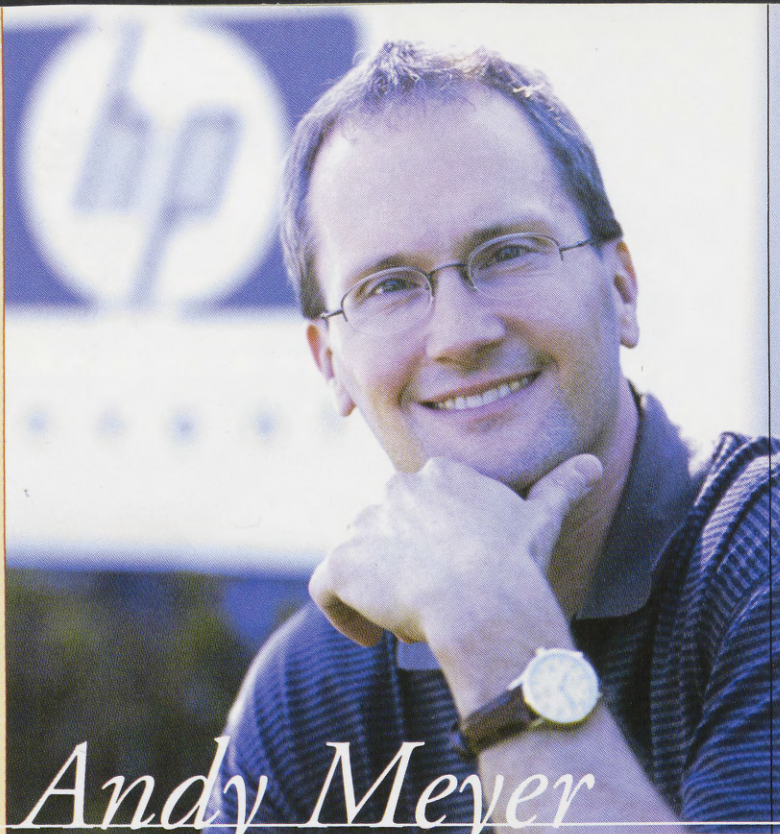
"I want to follow in the footsteps of the great engineers that I learn from and become a business leader," he stated. "Most of all, I want to have an opportunity to affect people's lives . . . In my dream job, I would have the opportunity to change the world."



Beginning this year the Distinguished Young Alumni Award has been renamed the Career Achievement Award. This change was made to reflect more accurately the reason the award is given. The criteria for the award remain the same. The committee, which is made up of longtime faculty and staff as well as a few retired faculty, endorsed the change and encouraged the Alumni Affairs staff to look for other ways to honor alumni from different eras. Plans are under way to add additional awards for young alumni, those out ten years or less, and also possibly alumni who have retired.

FROM LEFT: RALPH WAGLE, JEFFREY TRANG, ALUMNI DIRECTOR BRIAN DYER, ANDY MEYER, AND STEVE NOWAK

This year's Career Achievement Award winners come from different career fields, but each is making an impact in his respective area. This year's award group consists of Andrew Meyer, director of worldwide consumer support and customer relationship management, Hewlett-Packard Co., San Jose, Calif.; Stephen Nowak, vice president and controller, Owens Corning Composites Systems Business, Plymouth, Mich.; Lt. Col. Jeffrey Trang, United States Army test pilot, Yorktown, Va.; and Ralph Wagle, principal in charge, Hannum, Wagle and Cline Engineering, Terre Haute. All four are members of the Class of 1983. Read about their achievements on pages 20-23.



BY DALE LONG

Andy Meyer

A Front Row Seat

ANDY MEYER ENJOYS THE HIGH-TECH RIDE IN SILICON VALLEY

Working for one of the world's leading technology companies, Andy Meyer has had a front row seat in the heart of the Silicon Valley to sit back and enjoy the explosion of the high-tech industry during the past two decades.

And, he has liked the ride, so far.

As director of worldwide consumer support marketing and customer relationship management for Hewlett-Packard Company, Meyer is responsible for directing the development of HP's award-winning support solutions, providing self-help and assisted-help for consumers responsible for about one-third of the \$72 billion in corporate revenues for the 2002 fiscal year.

The 1983 computer science and electrical engineering double-major oversees a 20-member HQ team with extended teams in three regions (Americas, Europe-Middle East and Africa-Asia) that define the next generation of capabilities to support HP customers. These include self-diagnostic solutions on HP products, troubleshooting provided via the Internet, and chat and e-mail communications with support contact centers.

Meyer's team is also driving the development of HP's consumer registration solutions, customer information management (protecting customer privacy) and outbound marketing communications systems (customer e-mail alerts about new products or services and special HP product offers).

"There is a delicate balance in supporting consumers in the most cost-effective manner possible, while enhancing customer loyalty," said Meyer of the value-added communications process. "Technology opens new ways to maintain and build relationships with customers." (Web-based solution systems are less than five percent of the cost of conventional telephone help centers.)

Seeing things from the customers' perspective has been a big part of Meyer's role throughout most of his 20 years at HP. He began as a sales support engineer for the company's real-time manufacturing control systems before moving into a variety of software and hardware product

marketing roles, including involvement in the launch of HP's entry into the commercial Unix market.

"My engineering background provides the technical knowledge to understand new product innovations, while my marketing role keeps me close to the customer. I love seeing and understanding how technology provides benefits to people," Meyer said.

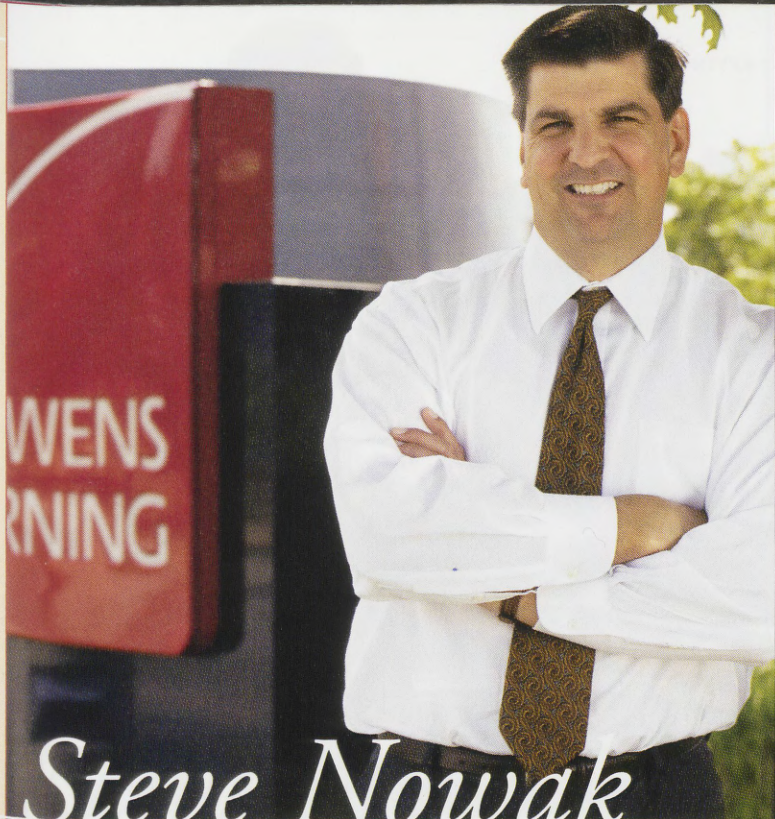
A series of roles in information technology followed, including director of engineering and chief technology officer for hpshopping.com, HP's internet sales subsidiary, at the height of the dot-com expansion.

"Being in the Palo Alto (Calif.) area, there were opportunities for me to go and explore the great start-up environment. Fortunately, hpshopping.com came along at the right time," said Meyer, who lives in San Jose, Calif., with his wife, Maureen, and their two children. "hpshopping.com allowed me to experience a start-up environment without leaving the large safety net of HP."

The career challenges continued in 2001 when Meyer was asked to join the integration team responsible for planning the merger of HP and Compaq Computer Corporation, the largest ever in the technology industry. He was part of the team analyzing and recommending HP's go-forward strategy for consumer e-Commerce (Internet and contact center purchasing) as well as systems to support retail sales partners.

The HP-Compaq collaboration has forged a dynamic, powerful team of 140,000 employees with capabilities in 160 countries. The company has the No. 1 global market share in imaging and printing products, personal computers, UNIX and Linux servers, enterprise storage and management software.

"HP is large enough (four divisions) that I can move around in many areas, stretch myself professionally and feel that I'm making a difference," said Meyer, who returned to Rose-Hulman for the first time since graduating to accept the Alumni Career Achievement Award. "I look for things I enjoy and learn from. I haven't enjoyed every spot along the way, but I believe I made a positive impact in everything that I have done."



Steve Nowak

BY DAVID PIKER

Outside the comfort zone

STEVE NOWAK MANAGES GLOBAL FINANCIAL SOURCING AND STRATEGIC PLANNING

Most people don't look forward to job assignments that take them outside their comfort zone. Steve Nowak is different. He seeks that kind of experience.

As an executive with Owens Corning, Nowak pioneered the development of the company's first composites plant in India and expanded its commercial efforts in other Asian countries. He helped develop the company's Plan of Reorganization that was presented to the United States Bankruptcy Court. And, Nowak led the process of creating the strategic blueprint for the future of the company's 28 business units.

"I don't have a problem dealing with change," he said. "Stepping outside your comfort zone is how you learn," says Nowak, vice president and controller of Owens Corning's Composites Systems Business.

Nowak is responsible for all global financial, sourcing and strategic planning functions of the division. At \$1.6 billion in sales, the Composites Systems Business is Owens Corning's largest and most global division. It consists of 11 different business units and employs 6,000 people in 53 manufacturing facilities around the world.

Nowak offers the following advice about handling change in a business environment. "You've got to be good at adapting based on new information," advises the 1983 Rose-Hulman mechanical engineering graduate. "Often, speed is critical. You've got to push for execution of a plan, then adjust it responsibly as new information becomes available."

Another rule he uses to succeed is straight forward, "It's all about people. As a leader, you've got to be excellent at selecting the right people at the right time for the right responsibilities," he emphasized. "Let people be accountable."

He began his career as a manufacturing engineer with Delco Electronics in Kokomo, Ind. After four years, Nowak decided it was time for change.

"At Delco I was involved with state-of-the-art technology and multimillion dollar projects to develop new manufacturing processes, but, I wanted to

learn how to run a business, so I quit my job and earned an MBA at the University of Michigan," Nowak said. "All of a sudden I had to prove myself all over again."

After earning his MBA, Nowak went to work for Owens Corning because the company offered him the opportunity to develop into a general manager. Nowak's first assignment put him in a situation where he was again facing new challenges.

"The company said my assignment would provide a non-traditional learning curve; I forgot theory and learned how things work," said Nowak, who lives with his wife, Mara, and their three children in Plymouth, Mich.

"I worked with people on a production line and learned what they needed to succeed. I discovered how decisions made by higher management impacted those people's lives," he said in recalling his assignment in an Anderson, S.C., plant.

International experience would be the next thing to take Nowak out of his comfort zone. He was sent first to India, and then to Hong Kong with the charter to establish markets throughout Asia, and deal with licensees and joint ventures in five different countries.

Three years later, he moved to California, and became president of the company's Cultured Stone Division. He was also named an officer and vice president.

Then it happened again. In 2001, Nowak found himself confronted with change. He became restructuring chief of staff. A year later, he was given a special assignment by the company's chairman. Nowak was asked to lead the development of the company's long-range strategic business plan ultimately approved by the Owens Corning board and used as part of the Plan of Reorganization filed with the U.S. Bankruptcy Court.

Nowak said competing in Rose-Hulman's rigorous academic environment was one of the first experiences that took him out of his comfort zone. There's no doubt he'll continue to find ways to expand his comfort zone.



Testing the cutting edge

JEFF TRANG LOGS MORE THAN 3,000 HOURS AS EXPERIMENTAL TEST PILOT

Lieutenant Colonel Jeff Trang expected to begin his postgraduate career in the military before making a transition into civilian life. Twenty years later, the experimental test pilot continues to fly on the cutting edge of the United States Army.

Trang has logged approximately 3,000 flight hours in more than 50 different models of United States and foreign rotary-wing and fixed-wing aircraft. Trang, a 1983 graduate and one of this year's Career Achievement Award recipients, serves as an experimental test pilot at Fort Eustis, Va., where he evaluates emerging technologies for use in Army aircraft.

Some of his recent activities have included night-vision, radar, communication and safety/survivability systems.

"My father served his country, so it just seemed right for me to serve in the military. I thought that I would work in the Army for four years, and then go to work in industry. The timing has always worked out for me in the military; I have always received what I've asked for," said Trang.

A distinguished military graduate and four-year Army ROTC Scholarship recipient, Trang began his military career as a second lieutenant in Field Artillery. The electrical engineering graduate then moved on to air cavalry and attack helicopter assignments in Nurnberg, Germany and Fort Hood, Texas. Trang met his wife Dianna while in Germany and the two were married in 1987.

In 1990, Trang deployed with his Apache unit to Saudi Arabia during Operation Desert Shield. When he returned to the United States, Trang was one of five aviators selected to attend fixed-wing training en route to the U.S. Naval Test Pilot School in Patuxent River, Maryland. The year of training led to his first position as an experimental test pilot.

"I was nervous going into test-pilot school, because I had received no hard-core engineering training in eight years. I was worried that my skills were out of date, but I quickly realized that my skills from Rose-Hulman had made me well-rounded," said Trang.

For the next four years, Trang worked at the Edwards Air Force Base in

California, where he tested several of the Army's new helicopters. His job description included developing and testing the airworthiness qualification for the Army's newest attack, reconnaissance and special operations helicopters.

In 1995, Trang received an Army graduate fellowship to pursue a master's in electrical engineering from Texas A&M University.

"I reached a point where I felt like the only person without a master's degree," said Trang. "The Army was willing to pay for a graduate school program that concentrated on electrical engineering, aerospace and computers. They wanted a test pilot that could help with hands-on research and development projects."

The major challenge of Trang's military life is the constant moving of his family. Jeff and Dianna have two children, Allen (14) and Amy (12). The Trang family has moved 12 times in the last 16 years.

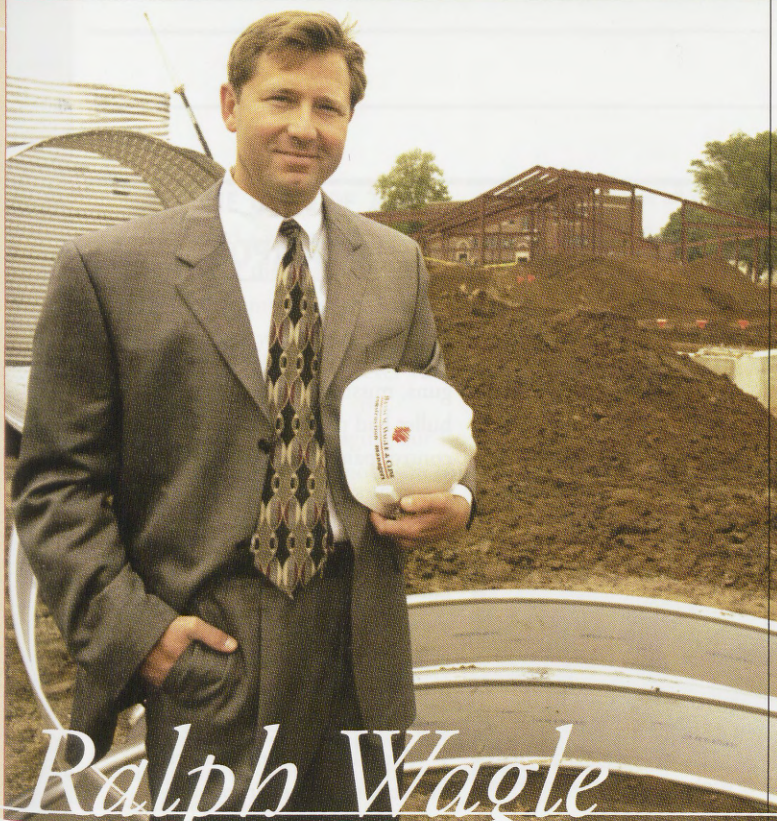
"It seems like every time that I am assigned a new role, it takes a year to learn my responsibilities and then it's time to move the family again. Fortunately, we've been in Virginia longer than anywhere and maybe that's a trend," said Trang.

In 1998, Trang was assigned to his current position in Virginia. He continues to balance the challenges of working on the technological edge with the fiscal realities of the 21st Century. "The best part of my job is being able to make products that can make a difference. We have recently completed air-bag installations and completed tests on a new fueling system for some of our best helicopters. Making a product come from start to finish in just two years has been especially rewarding."

"Usually the process of developing a new product is challenging. It can take from 10-15 years to develop a product, but here we've seen a quick turnaround," said Trang.

One trend that will continue is Trang's enjoyment of a cutting-edge military assignment.

"I can definitely wake up every day and say that I love my job."



Ralph Wagle

People form the bottom line

RALPH WAGLE ATTRIBUTES SUCCESS
TO HIS FIRM'S TEAM

Multimillion-dollar projects generate the revenue for Ralph Wagle's company, but he'll be the first to tell you that people form the bottom line of success.

"If I have done anything worth noting, it's pulling together talented people and providing them opportunity to do what they do to the best of their abilities," said Wagle, managing partner and principal in charge of Hannum, Wagle & Cline Engineering. He is one of this year's recipients of the Rose-Hulman Career Achievement Award.

Based in Terre Haute, Hannum, Wagle & Cline Engineering is a civil engineering consulting firm that plans, designs and sometimes builds various projects.

Samples of recent projects include:

- serving as construction manager for the three new school projects for the Vigo County School Corporation, whose construction cost exceeded \$30 million dollars;
- serving as program manager of a \$50 million combined sewer overflow program; and
- serving as one of six design consultants for a section of the new 160-mile I-69 all-terrain highway through southern Indiana.

"The type of work we do is very straight forward," explained the 1983 civil engineering alumnus. "There are many qualified consulting firms that do what we do, so reputation is critically important to a firm's continued success."

That's where the people factor comes into play. "The market and business we're in is extremely competitive, and the best people are in great demand," Wagle said. "Our top objective and biggest challenge is to get the most talented people available."

One place to which the company continually turns is Rose-Hulman. Of the company's 14 engineers, 12 are Rose-Hulman graduates. "It is the caliber of these people that has led this organization to the top of our field," Wagle said.

Of the company's six partners, five are Rose-Hulman graduates: David Hannum ('81), Dick Weigel ('86), Eric Smith ('93), Cory Whitesell ('95) and Wagle.

In addition to hiring Rose-Hulman graduates, Hannum, Wagle & Cline has created a scholarship that is awarded to freshman, sophomore or junior civil engineering students. The company also participates as a corporate representative for civil engineering senior design projects, is a corporate sponsor of the Rose-Hulman ASCE chapter, and has an extensive internship program available to Rose-Hulman students.

As he discusses the firm's history, people continue to be a prime part of the story. "The business has evolved into much more than we could have anticipated," Wagle said. "I take personal satisfaction from helping create and nurture a business from infancy to a point five years later when our growth became exponential."

Wagle's engineering career started with W.D. Bartlett & Associates, a building and bridge contractor in Indiana. In 1987, he returned to Terre Haute as city engineer. His next career move came in 1990 when he joined with Ken Hannum (class of '56) and David Hannum (class of '81) to form Hannum and Wagle Engineering. The younger Hannum and Wagle continue to manage Hannum, Wagle & Cline along with Garmong Design Build Construction, and together they own Hannum & Wagle Real Estate, LLC, a commercial real estate development company.

Day-to-day, Wagle's job entails overseeing the company's three major functions: production, marketing, and human relations/finance. He provides support and direction to supervisors in those areas, but one of his most important responsibilities is the development of new business. That's when things get back down to the personal level. "It's the talent of our staff that continually sets us apart," Wagle said.

The firm's success has been recognized by others as it was honored in 2000 and 2001 as one of Indiana's rapid-growth, high-potential entrepreneurial companies by the Johnson Center for Entrepreneurship and Innovation at Indiana University.

For Wagle, the potential lies in the people.

ALUMNUS JOEL MAGSIG AMONG FIRST TO LAND AT LIBERATED BAGHDAD AIRPORT

BY STEVE LIEWER, STARS AND STRIPES EUROPEAN EDITION, MONDAY, APRIL 7, 2003

This article is about alumnus Joel Magsig, a 1994 mechanical engineering graduate of Rose-Hulman, who was on duty in Iraq during Operation Iraqi Freedom. Article and photo by Steve Liewer of the European Stars and Stripes. Reprinted with permission from Stars and Stripes, a Department of Defense publication. Copyright 2003 Stars and Stripes. <http://www.stripes.com>

U.S. ARMY AVIATION BASE CAMP, Central Iraq —

With their guns jammed and radio dead, Capt. Joel Magsig and Chief Warrant Officer 4 Greg Inman guided their battered AH-64A Apache, Blackjack 6, to Baghdad International Airport just after noon on Friday.

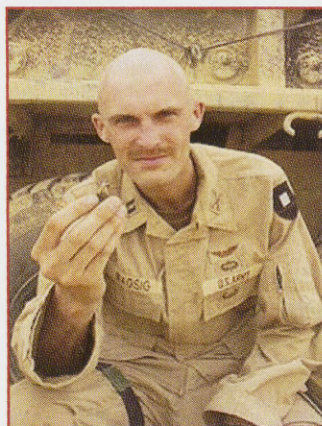
The fleeing Iraqis had left piles of sand on the runway and scattered airport ground equipment across the tarmac. American M1 tanks and Bradley fighting vehicles had parked at key intersections, Magsig said.

Then it dawned on them: Theirs was the first coalition aircraft to land at the newly liberated airport.

"Everybody was waving as we flew by," Magsig, 31, of Homestead, Fla., recalled the next day. "It could have been under better circumstances, with a little more pomp, but it was just as well. I was glad to have a place to put it down."

Magsig and Inman, from the 2nd Squadron, 6th Cavalry Regiment in Illesheim, Germany, had been escorting a medical evacuation UH-60 Black Hawk carrying two badly injured 3rd Infantry Division soldiers to a combat surgical hospital in the rear.

They ran into a burst of ground fire from a sport utility vehicle in a grove of trees. They turned around and flew toward it,



Magsig displays bullet recovered from his cockpit

but Magsig couldn't fire his guns, missiles or rockets. A bullet had pierced the fire-control panel that controls the weapons systems.

Other bullets severed the radio antenna, pierced the tail-rotor gearbox and flattened a tire. A mangled bullet jacket penetrated the cockpit, brushing Magsig's flight suit and landing between his legs.

After landing and a short inspection on the airport taxiway, Magsig concluded the

Apache, nevertheless, could fly. He and Inman climbed in and flew back to the base camp well south of Karbala.

"Some would call it luck," Magsig said. "I would call it God watching out for us."

Blackjack 6's unexpected landing at Baghdad International Airport highlighted a morale-boosting three-day campaign for the three squadrons of Task Force 11th Aviation during the battle for the Iraqi capital.

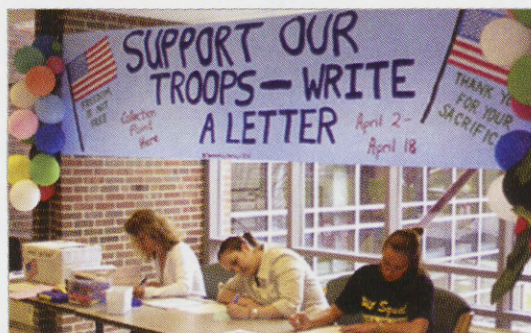
The task force, flying daylight missions with all three of its Apache units, destroyed between 40 and 50 Iraqi tanks, personnel carriers, air defense guns, artillery systems and armed vehicles, said Maj. John Lindsay, the task force's operations officer. ■

CAMPUS COMMUNITY SUPPORTS TROOPS OVERSEAS

Operation Iraqi Freedom also affected campus. Three students had to withdraw from classes after being activated for military duty, and students, faculty and staff showed their support for troops overseas.

Students, faculty and staff conducted letter writing campaigns, support groups and remembrance walls. The letter-writing campaign was organized by Blue Key Honor Society and local Veterans of Foreign Wars posts. Jacob Meyers, a senior electrical engineering major, organized the letter campaign.

Elsewhere on campus, a Wall of Honor was established in Moench Hall with pictures of students, children of Rose-Hulman faculty and staff, and friends currently overseas.



WELCOME CLASS OF 2003

I extend a welcome to each of the graduates of the Class of 2003 to the Rose-Hulman Alumni Association. I would like to encourage your continued involvement in your association wherever your career or further education take you.

We will be encouraging our Rose Alumni Clubs throughout the country to hold a welcome reception for 2003 new grads in their area. Make it easy to keep in touch by letting the alumni office know about address changes.

Let the Alumni Association know how you would like to serve or the services you would like to receive. Remember that participation is always voluntary but the invitation is always open to you, and the personal rewards are great.

We have committees to serve on and I'd ask for you to give me a call at 317-842-7480 or email me at meharg@juno.com to offer your help. You can also call Brian Dyer in the Alumni Office at 812-877-8359. We'll look forward to hearing from you.

Owen Meharg

Class of '54

President, Alumni Association

YOUNG ALUMNI COUNCIL CONTINUES GROWTH TREND

Rose-Hulman's Young Alumni Council (YAC), now finishing its third year of existence, continues to grow in organizational structure and in the number of activities offered. For the record, young alumni are defined as having graduated from Rose-Hulman during the last 10 years. More than 37 percent of our alumni have graduated in that time frame.

The goal of the YAC is to involve young alumni in the life of Rose-Hulman. This is done through various special events, including social events and trips. Major events during the past year included the Young Alumni Homecoming party, a pub tour of Ireland and a "Bump Day" party that drew more than 200 to the Indianapolis Motor Speedway qualifications. Future activities in the works include a trip to Spain in 2004.

Not all of the group's activities are of a social nature. Philanthropic events in different regions of the country are being planned. For example, a group in a city may adopt a project such as Habitat for Humanity and work on it as a group of Rose-Hulman alumni.

City events have been or will be conducted in Indianapolis, Chicago, Detroit and Washington, D.C.

"The Young Alumni Council is a way to keep our young alumni involved in the life of Rose-Hulman," said Bunny Nash, assistant director of alumni affairs and special events and YAC liaison. "At many colleges, young alumni are a neglected group, but we want them to feel as much a part of Rose-Hulman as older alumni do."

Five committees have been established to focus council activities. They are: homecoming, philanthropy, city events, trips and communications.

Committee members are Jill Riley ('99), Jamie Funk ('00), Becky Smith ('99), Erica Snyder ('02), Amanda Burch ('99), Carlos McGowan ('00), Chris Inman ('00), Erik Hayes ('97), Sharon Foltz ('00), Breck Schmidtkofer ('95), Brian Meents ('00), Dan & Anellia Hohne (both '99), Leo Morand ('02), Eric Haenlein ('00), and Chad Alojipan ('02).

TOP 24 EMPLOYERS OF ROSE-HULMAN ALUMNI

1. Eli Lilly and Company - 237
2. Delphi Corporation - 150
3. General Electric Company - 138
4. Naval Surface Warfare Center - 128
5. General Motors Corporation - 118
6. U.S. Air Force - 103
7. Raytheon Company - 102
8. Self-Employed - 95
9. Cummins Incorporated - 92
10. Motorola - 91
11. U.S. Army - 90
12. Ford Motor Company - 81
13. Rose-Hulman Institute of Technology - 77
14. Caterpillar Incorporated - 75
15. Rolls-Royce Corporation - 71
- T16. U.S. Government - 51
- T16. Lockheed Martin - 51
18. State of Indiana - 49
19. Accenture - 48
- T20. The Boeing Company - 40
- T20. Procter & Gamble - 40
22. Texas Instruments - 39
23. Dow Chemical Company - 38
24. Cinergy Corporation - 37



Carolina Alumni Outing

Jared Tatum, Matt and Darlene Weir, and Greg and Michele Roberts take part in a zoo outing, which was part of a South Carolina alumni outing this spring in Greenville, S.C.

LEGACIES

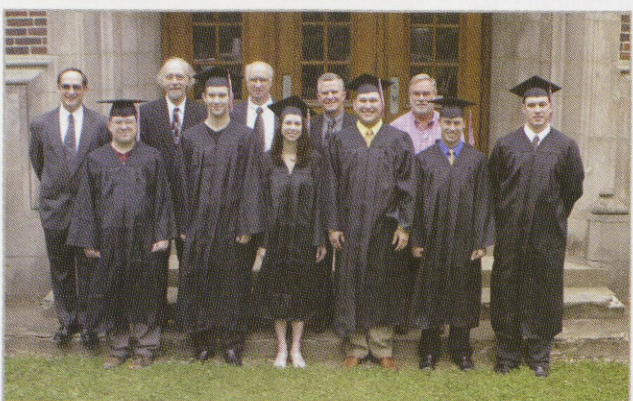
Each year, Roes-Hulman is proud of its legacy graduates. This year, 16 graduates had fathers or grandfathers who received the diplomas from Rose-Hulman. The three pictures on this page show this year's legacies. Unless otherwise specified, the graduates listed are sons or daughters of the legacies.



From left: Keith Moench, grandson of Robert Moench (Class of '32), Jeff Caldwell ('74), Andrew Caldwell, Rob Harrison ('71), R. Martin Harrison (grandfather Harry Harrison was a '52 graduate), Steve Huckaba ('75), Ben Huckaba, Walter Flood ('75) and Walter Flood IV.



Bill Art ('70), William Art, Jim Trueblood ('77), Anne Trueblood (her late grandfather John R. White was a '47 graduate), James Ingle ('53), grandson Michael Phillips, Lee Ziegler ('68), Adam Ziegler, Mike Privette ('78) and Nickolas Privette.



Dean Ford ('72), Matthew Ford, William Hildebrand ('73) William Hildebrand, Don Shook ('75), Elizabeth Shook, Ralph "Ed" Fain ('76), Stephen Fain, Steve Isbell ('78), Matthew Isbell, and Tom Lautenschlager, grandson of the late Glen Lautenschlager ('33).

PERMANENT E-MAIL ADDRESS AVAILABLE



Rose-Hulman alumni now can have a permanent Rose-Hulman e-mail address through a new e-mail forwarding program. To learn more about it, visit the Rose-Hulman web site at <https://alumni.rose-hulman.edu/directory/index.asp>. After you are in the online directory, click the e-mail forwarding link. Or call Alumni Director Brian Dyer at 812-877-8359.

1944

Bernie Vonderschmitt (E.E.) has announced his retirement as chairman of the board of Xilinx effective on Aug. 7. He co-founded Xilinx in 1984 and served as CEO until 1996. He received an honorary doctorate of engineering from Rose-Hulman in 1979, and has been a major benefactor of the college.

1963

John W. Toole (M.E.) retired in February from International Truck & Engine Corp. after 40 years of service. He resides in Columbia City, Ind.

1970

Roger M. Sweany (E.E.) is now president and director of electrical engineering for Rotz Engineers, Inc. He resides in Brownsburg, Ind.

1974

Richard Haut (M.E.) is now director of engineering for the Houston Advanced Research Center, a nonprofit organization that works on technology, social, policy and environmental issues.

1980

Joseph Carr (E.E.) has been named president and CEO of OSRAM Opto Semiconductors, Inc., located in San Jose, Calif. OSRAM Opto Semiconductors is a division of OSRAM GmbH, one of the world's largest lighting manufacturers.

Ted C. Fultz (C.E.) has been promoted to the rank of colonel in the U.S. Army Corps of Engineers, U.S. Army Reserve. He currently is assigned to 1st Brigade, 85th Division (training support).

1981

Karl Menke (M.E.) has relocated to northern Virginia with Eli Lilly and Co. He is engineering project manager for insulin formulation/filling facilities at Lilly's new manufacturing site in Manassas, Va.

1982

Mark Renholzberger (Ch.E.) updates us he and his wife, Mary Ellen, became parents upon the adoption of Ann Si Miao and Ellen Si Lu Renholzberger. They became a family on March 10. Like any proud father, he notes they are no doubt Rose-Hulman material, but he does express some concern about double tuition.

Daniel E. Wolodkiewicz (M.E.) is now managing partner of Premier Financial Solutions. The firm helps

successful business owners and their families with financial planning. He resides in Beavercreek, Ohio.

1984

Jerry Payonk (C.E.) and his wife, Janet, announce the birth of their second child, Cassandra Jane. She joins sibling Anwyn. Jerry recently received a promotion to manager of Clark Dietz, Inc.'s Champaign transportation department. His new title is vice president, and he's been appointed to the company's board of directors.

1986

Steve Gress (E.E.) has joined Ingersoll-Rand as manager of enterprise program management. He continues to reside in Mooresville, N.C.

KEEPING IN TOUCH WITH ROSE-HULMAN

My alumni record should include this important news:

Name _____
 Class Year _____ Degree _____
 Address _____
 City _____
 State _____ Zip Plus Four _____
 Telephone: Home _____ Work _____
 Fax _____
 E-mail: Home _____
 Work _____
 News for Echoes _____

- ☐ Promotion
- ☐ New Job
- ☐ New Address
- ☐ New Telephone
- ☐ Marriage
- ☐ Death
- ☐ Birth
- ☐ Award, Honor

SEND TO: Editor, Echoes, Rose-Hulman Institute of Technology, 5500 Wabash Avenue, Terre Haute, IN 47803
 OR E-MAIL: bryan.taylor@rose-hulman.edu

SUMMER 2003

Dennis Koopman (Ch.E.) has relocated to Venice, Fla., to take the position of vice president of engineering and principal owner of UltraPure Group.

Sean Maher (M.E.) reports the birth of a sixth child, Patrick O'Brien. He joins sisters and brother, Colleen, Meagan, Shannon, Christopher and Erin. He still lives in the Kansas City area, and is in his 17th year with Johnson Controls.

1987

Bill Daugherty (C.E.) has accepted a new position as branch manager for US Voice and Data, Indianapolis.

Jeff Myers (E.E.) has a new position with Wabash Valley Power in Indianapolis. He has moved to the position of manager of rate strategies. He now is responsible for wholesale rate strategies, coordinating strategies in relation to electricity deregulation in Michigan and Illinois. He also oversees the integration of customer-owned generation into the Wabash Valley system. He also leads the technical investigation of the company's demand-side management programs. He received his Master of Science in engineering management from Rose-Hulman in May.

1988

David C. Becktel (Ch.E.) married Jean Ruble last year in Peoria, Ill.

Jim Companik (Ch.E.)

now has been promoted to senior engineering manager for Motorola, Inc.

Dave Land (M.E.) has been promoted to the position of manager of design engineering at Toyota Industrial Equipment.

Christopher D. Ruppel (E.E.) married Seemein Shayesteh last February. They reside in Carmel, Ind.

1989

Todd Alan Cartwright (M.E.) and his wife, Maria, announce the birth of Todd Alan Cartwright, Jr. on Feb. 27. He joins big sisters Annika and Abigail. On the job front, Todd recently transferred to Tyler, Texas, with Howe-Baker Engineers as director of business development.

Andrew Murray (M.E.) updates Rose-Hulman with news about the birth of second son, Julian Scott, last November. Andrew has received the School of Engineering Award for Excellence in Teaching at the University of Dayton, where he has been promoted to associate professor and received tenure.

1990

Joe Hentz (M.E.) reports the birth of son Anthony William on March 9.

1991

Chad Elmore (Chem.) announces the birth of third child Teaghan Veronica. She was born in January and joins brothers Finn and Luke.

John Huss (E.E.) has left the world of engineering to become a full-time student at Concordia Seminary in St. Louis. He is working on a Master of Divinity and plans to be a pastor in the Lutheran Church Missouri Synod.

Mark Schuld (Ch.E.) reports the birth of Logan Mark, born on Feb. 6.

Bob Shea (M.E.) has been promoted to vice president of systems engineering at BSA LifeStructures. He will oversee facility planning, project management and staff development. He has been with BSA since 1991, and was named a principal in 2000. Projects in which he has been involved include the Medical Science Center at Indiana University and the critical care towers at Community Hospitals in Indianapolis.

Douglas Tougaw (E.E.) has been appointed to the Leitha and Willard Richardson Professorship of Engineering at Valparaiso University. He is chair of the Department of Electrical and Computer Engineering and he has been at Valparaiso since 1996.

1992

Ken Koziol (C.E.) has left Northwest Airlines in Detroit for a new position with Aviation Capital management as senior

project manager for the new Indianapolis Midfield Terminal Project. He is responsible for the design of the new terminal.

William S. Meyers (A.O. and M.S.A.O. 1994) and his wife, Annie, welcomed their third child, Andrew William on Feb. 11. He joins siblings Katie and Nate. Bill is a patent attorney with the law firm of Bose McKinney & Evans LLP in Indianapolis.

Help Preserve Rose-Hulman's Heritage



Items are being sought for the new Alumni Center in Hatfield Hall. Display cases in the center's rotunda allow us to display memorabilia from Rose-Hulman's past. If you have some items from Rose-Hulman's history, get in touch with us. Currently on display are items from beanies to pennants to programs to historical photos.

For more information on how to assist with this project, contact Alumni Director Brian Dyer at 812-877-8359 or via e-mail at brian.dyer@rose-hulman.edu

1993

David Fischer (A.O.) completed his Ph.D. in optics at the Institute of Optics, University of Rochester. He currently is employed in the commercial and government systems division of Eastman Kodak Co., Rochester, N.Y., as an optical metrology engineer.

Bryan Hales (A.O.) and his wife, Holly, had their first child, Mia Katharine, on March 17. On the career front, Bryan has made partner at the law firm of Kirkland & Ellis.

1994

Aaron Barr (A.O. and M.S.A.O. 1996) welcomed daughter Lauren Clair, born on March 1.

Geoff Wise (C.E.) announces the birth of son, James Russell, last November. He and his wife, Krystina, and James live in Parker, Colo.

1995

Craig Baker (C.P.E.) recently moved to Cleveland, Ohio, to start a new job in ASIC engineering at Efficient Channel Coding.

1996

Todd Adams (M.E.) and his wife, Jill, became parents in January when first child, Madeline Helene, was born.

Eric J. Hansen (E.E.) has taken the responsibility at Flint & Walling, Inc.,

Engineering company as liaison for overseas ventures in Asia. He passed the P.E. test last October.

Frederick Schurger (E.E.) has moved to Palmer College of Chiropractic in Davenport, Iowa. He begins that career after six years in the automotive industry.

Rob Waller (M.E.) has accepted a new job with DSM Engineering Plastics in Evansville, Ind., as a process engineer. He and his family are relocating to Boonville, Ind.

1997

Kathleen (Knabe) Muhlbachler (M.S.B.E.) completed her doctorate in chemical engineering summa cum laude at the Otto-von-Guericke University Magdeburg. Research for this work was performed at the University of Tennessee Knoxville and the Oak Ridge National Laboratory.

Brian L. Wessel (C.E.) exchanged wedding vows with Kandice M. Mowrer last fall.

1998

Ryan L. Willis (Ch.E.) is a patent attorney in Cincinnati, Ohio, with the firm of Taft, Stettinius & Hollister.

Seth Wurzel (C.E.) has been admitted to the MBA program at UC Davis. He will be relocating to the Sacramento/Davis area.



OCTOBER 3RD AND 4TH
2003
HOMECOMING
COMING HOME
ROSE-HULMAN
INSTITUTE OF TECHNOLOGY

Plans are coming together for the annual get-together. Scheduled events include:

- Reunion dinners for '03 and '08 classes
- Alumni golf outing
- Bonfire
- Fun Run
- Kid Zone
- Football
- Departmental Open Houses
- Alumni Awards Breakfast

Don't miss out. For more information, contact Alumni Director Brian Dyer at 812-877-8359 or via e-mail at brian.dyer@rose-hulman.edu. Or visit the Homecoming web site at <http://www.rose-hulman.edu/homecoming/>

1999

Rahul Laxman Iyer (M.E.) has received a Master of Science in engineering (mechanical) from Western Michigan University. He has a new job as process engineer for Spicer Driveshaft Assembly, Inc., Dana Corporation.

Hanna (Pekinpaugh) Fortwendel (M.E.) and her husband Philip became parents on Jan. 28 with the birth of daughter Sydney Rae. The family resides in Hawesville, Ky., and Hanna is a project engineer with Weyerhaeuser Co.

David Stanley (M.E.) has changed jobs and currently is the plastics engineer for Keihin-IPT in Greenfield, Ind. His company makes intake manifolds for Honda. Also, he married wife Kristen last year. They live in New Palestine, Ind.

Ann Talbert (Ch.E./M.E.) and **Matthew Talbert (Ch.E./M.S.E.V.)** report the birth of daughter Grace Ann, born on Jan. 20. On the career front, Matthew now is an environmental protection engineer for the State of Illinois. The family lives in Monticello, Ill.

MAJOR ABBREVIATION KEY

A.O. — Applied Optics
Bio. Eng. — Biomedical Engineering
C.E. — Civil Engineering
Ch.E. — Chemical Engineering
Chem. — Chemistry
C.O. — Computer Engineering
C.S. — Computer Science
Econ. — Economics
E.E. — Electrical Engineering
Math. — Mathematics
M.E. — Mechanical Engineering
M.S. — Master of Science
Phy. — Physics

2000

Rita Lo (Ch.E.) took the oath of citizenship in March in Indianapolis.

Erin (Swango) Shea (M.E.) married Lt. Michael Shea last December.

Eric Willeke (C.P.E.) married Marian Heather Hartman last December in England.

2001

Vinay Basavaraja (M.E.) has returned to the USA to race in the Skip Barber racing series. He has been racing outside the United

States. For more information about Vinay's racing adventures, visit www.VinMotorsports.com.

Dave Ciarrocchi (M.E.) joined First Energy Corp. last December as an associate nuclear engineer.

Mark R. Gildersleeve (E.E.) married Erin Delay last September. He has graduated from Georgia Tech with a master's degree in electrical engineering and computer science. He works for the Southwest Research Institute.



Cliff Notes

The Rose-Hulman Young Alumni Council sponsored an Ireland pub tour earlier this year. Among the stops along the way were the Cliffs of Moher. Posing for a Rose-Hulman photo opportunity at the cliffs were, from left: Erik Hayes ('97), Dave Moser ('02), Anthony Primozich ('00), Chuck Requet ('99) and Chris Inman ('00).

MEET YOUR NEW ASSOCIATION LOGO

The Rose-Hulman Alumni Association has created a new logo to bring more visibility for the association.

"As our number of alumni has grown, we have more volunteers and people wanting to take advantage of our services," said Brian Dyer, director of alumni affairs and special events. "The new logo provides an identity to our organization and helps focus attention on what we can provide our constituents. It will identify where the alumni

association is working for them."

Another audience for the logo will be current students. "The logo will bring more visibility to undergraduates so they will know more about us before they receive their diplomas and become alumni," Dyer explained.

The alumni association advisory



board did preview the logo and make suggestions as to what should be included in the final version.

OBITUARIES

1930

Claude R. Nicholson (C.E.) died during February. He was a retired chief bridge consultant.

1932

Robert W. Broadhurst (Ch.E.) died April 4. He was a retired process superintendent for Conoco.

1933

Homer W. Fisher (C.E.) died last January. He was a retired self-employed consulting engineer.

1935

Gordon Burt (C.E.) died last November. He was a retired public health engineer for the County of Riverside, Calif.

1938

Wendell E. Carroll (E.E.) died during January at the age of 86. He was the retired president, chairman of the board and founder of Regent Controls. Survivors include two sons, Douglas and Stephen, and three daughters, Elisabeth Vettori, Dana Carroll and Lora Murphy. He was a life member of the Rose-Hulman Board of Trustees, having joined the board in 1963. In 1993, he received an honorary doctorate of engineering from Rose-Hulman.

1939

Luther L. Yaeger (Ch.E.) died last February. He was a retired remote consultant.

1942

Hulit L. Madinger (Ch.E.) died Feb. 13. He was a patent attorney residing in Dallas, Texas. Survivors include his wife, Betty.

1943

James H. Shultz (E.E.) died April 2. He resided in Zionsville, Ind., at the time of his death, and he was president of Kadko, Inc. Survivors include his wife, Mary; sons William, Daniel, Joseph, Timothy and John; daughters Elizabeth Jones, Susan McKinley, Janet Chance, Mary Gordon and Nancy Jasper; and stepchildren Dan Kindler, Cynthia Jones and Eric Kindler.

Frank H. Winters (M.E.) died March 28 at the age of 80. He was a retired vice president of engineering and research for Caterpillar Inc.. Survivors include his wife, Corrine; a son, Richard; two stepdaughters, Laurie Rose and Dianne Taylor. He received an honorary doctor of engineering degree in 1982.

1947

William G. White (M.E.) died last September. He was retired from FMC Corp., and resided in Fort Jones, Calif., at the time of his death.

1948

Maurice Bowers (M.E.) died last September. He was retired liaison engineer for the U.S. Navy.

Joseph T. Neill (E.E.) died April 16. He was a retired chief engineer for Ford Motor Company.

1949

Kenneth R. Engstrom (E.E.) died last January. He was a retired manager for a public utility district in Washington State.

1950

Allan W. Long, Sr. (C.E.) died last December. Survivors include his wife, Vilate. He was a retired vice president of construction for H.H. Robertson Co.

1956

Horace N. Norton (Ch.E.) died during January. He was a retired advanced senior engineer for Marathon Oil Co.

1960

Gerald Lee "Jerry" Gaskins (E.E.) died Feb. 14 at his home in Indianapolis at the age of 66. He was retired as a project manager for Naval Air Warfare Center and Raytheon. Survivors include his wife, Sally, and daughters, Beth Gootee and Diane Marret. He was a member of Lambda Chi Alpha fraternity.

1996

Ryan J. Eichstadt (Ch.E.) passed away at home on Jan. 26 after a long battle with brain cancer. Survivors include his wife, Elva, and his parents, Sandy and John Eichstadt.

FACULTY/STAFF

William Ritter, former professor of mathematics, died March 26, at the age of 71. Survivors include his wife, Mary Louise; two sons, John and Stefan; and two daughters, Mary E. Walter and Sara M. Ritter. He was chairman of the Department of Mathematics from 1976-80. He previously had taught at Dartmouth College, the University of Washington and the University of the Pacific. A 1953 graduate of Harvard University, he received his Ph.D. from MIT in 1962.

Helen Backfish

Facilities Custodian Helen Backfish died April 1 at the age of 74. She had served on the Rose-Hulman staff since the fall of 1983. She received the President's Outstanding Service Award in 1999.

Looking Back

STUDENT DEMOGRAPHICS — 1883 STYLE

by John Robson, Librarian and Archivist

Every year it seems the all-around quality — especially academics — of the new freshman class improves. Students come better prepared for the challenges of the classroom. Rose-Hulman draws an applicant pool of 3,100 from which a class of 450 is selected, an enviable position. SAT scores place Rose students in the 90th percentile nationally. Recent profile data show that only 25% are first-generation college students. Less than a third of our new matriculants can call small town America or the farm home. The majority come from outside Indiana, with most of the states having some representation.

The students who arrived in 1883 were a little different from those of today in one important area. Each was taking a risk on a college with no track record and no reputation — certainly no Number One rating by U.S. News & World Report.

That first year, 58 were invited to come to Entrance Examination Day. They were tested in five areas: algebra, arithmetic, grammar, geography, and history. The stated minimum was to be an average score of 60, but records show that “Admissions” was willing to make a few exceptions. Those with scores as low as 39 percent were passed to fill the seats of the new school.

There were 48 matriculants that first year and all were male. Of the 48, a whopping 37 came from Indiana, not much geographic diversity there. Illinois was home to six and Kentucky, Iowa, Michigan, and Massachusetts provided the rest. And it was a hometown body, with 23 calling Terre Haute home. Interestingly, though none were international, a number had parents who were immigrants.

Parents’ occupations were diverse, but different from those of today. To begin, nothing in the records indicates that anyone’s mother held a job outside the home. It is a fairly prosperous list of occupations. Six of the 48 were lawyers; five worked for the railroads in some capacity. Three owned milling operations and one a hotel. The odd ones that catch the eye are the two blacksmiths, harbor contractor, and coal dealer.

Most surnames appear to be English in origin with a solid smattering of German. Terre Haute had, at the time, a population that was heavily German and published two German newspapers.

For first names there is nary a Jacob, Michael, Austin, Tyler, or Ryan — the most common names of today, according to a recent survey. Opening day in March of 1883 a cry of “John” would have caused six heads to turn in response. Charles was the given name of five, Frank and William for four and three for William Henry — perhaps for Hoosier hero William Henry Harrison. Oscar, Ferdinand, and Adolph were represented too.

The choice of majors was slim in those days. Mechanical Engineering claimed the imagination of 44 students, with Civil

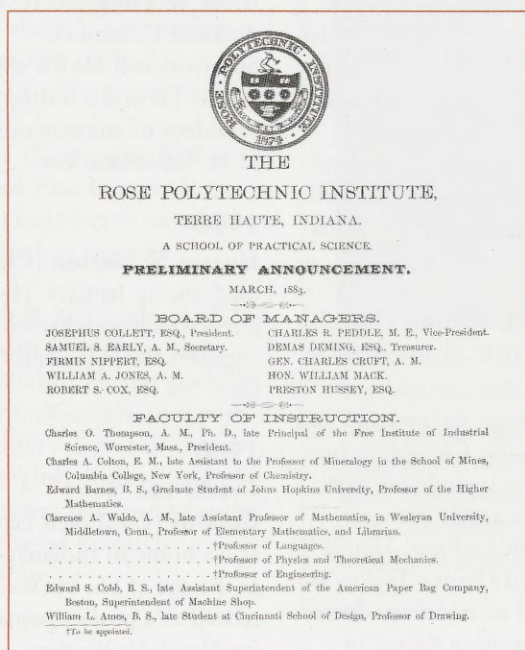
Engineering picking up three and a lone Chemistry major, the son of President Thompson, a renowned “chemical engineer”. At the end of the fall semester the boys had earned an average of 71, a very low C—not much grade inflation in those days. These averages ranged from 47 for Oscar Bauer, who was encouraged to take a year off (he was 16) and mature a bit, which he did; to a high of 91 earned by Henry St. Clair Putnam, who had already earned a bachelor’s degree in law from Iowa in 1882.

The attrition rate was high. Approximately 44 percent of the boys failed to stay the course and earn a degree and nine individuals did not make it through the first two semesters, seven because of grades or behavior. Registrar notes tell us that the first declared CE major was

expelled for immoral conduct “acknowledged before the faculty.” (Wouldn’t our enquiring minds like to know what he did?) Another particularly hapless scholar was examined by Prof. Waldo who stated the student “knew nothing and admitted as much.” He was asked “to retire,” and did so.

Perhaps the saddest departure of all was President Thompson’s own son, Lewis, who was also the youngest student at 15. The record states the he “withdrew ... on account of the sickness and death of his father, President Charles O. Thompson.”

From alumni records we know that those who stayed and earned their degrees remained loyal to their fledgling alma mater. Some became professors; one became a doctor, and another a prestigious Fellow of the American Institute of America. Most were absorbed by American industry, often manufacturing and railroads, doing their part to build up the country. ■



The original announcement for Rose Polytechnic

LEAVE A LEGACY



You have a chance to leave a legacy for yourself or a family member in the soon-to-be-constructed Reflection Plaza on the front lawn of Rose-Hulman's campus. You can purchase a brick that will be part of the plaza surrounding the recently erected sculpture Flame of the Millennium.

For more information, contact Karen O'Rourke in the Office of Alumni Giving at **800-248-7448**, ext. **8159**, or via e-mail at karen.orourke@rose-hulman.edu

Three sizes of bricks available for purchase are:

4 x 8 inches for \$150,

8 x 8 for \$500 and

12 x 12 for \$1,000.



PARTING SHOT

Graduating seniors receive applause from faculty members as they begin the processional for Rose-Hulman's 125th commencement on May 31. Photo by David Piker.

Echoes
ROSE-HULMAN INSTITUTE OF TECHNOLOGY

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Terre Haute, IN 47803

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