

WPI

SPRING 2006

transformations

A JOURNAL OF PEOPLE AND CHANGE



Water The Next Oil?

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Bioengineering Center at Gateway Park**



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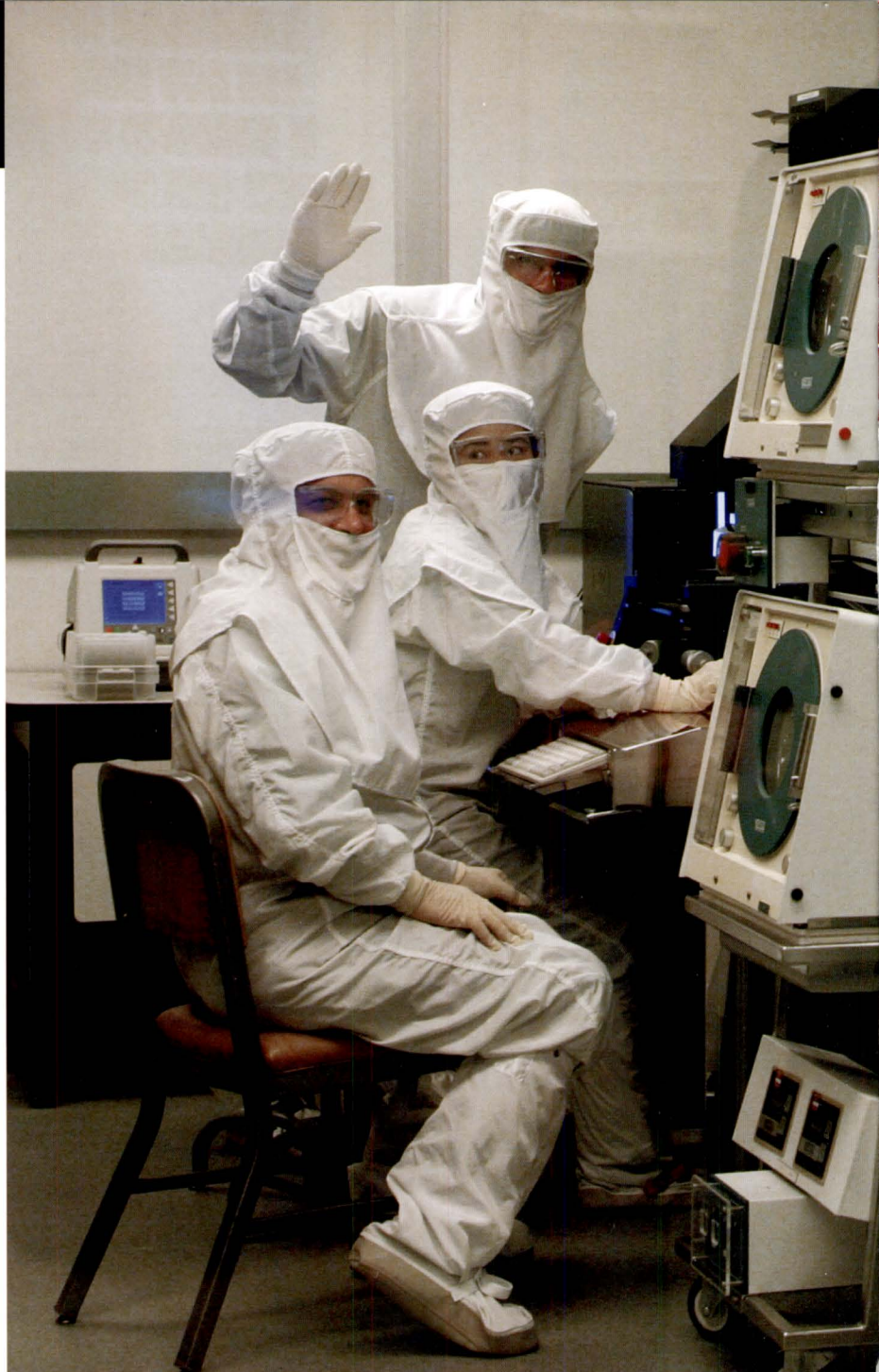
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Philip Giantris '65 believes in the global necessity for good, clean, accessible water for all.

Starting Point

"When drinking water, think of its source." —Chinese proverb

Growing up in the suburbs of Connecticut, I never worried about water. Not only was it clean, it was fluorinated. There was always enough to drink—unfiltered, from the kitchen faucet—and fill our bathtub, run our dishwasher, and water our lawn. And when summer came, my sister and I could run through the sprinkler.

During a childhood visit with my aunt in New York City, I filled a glass with tap water and noticed it looked discolored. "It's fine," my aunt said. "Sometimes you just have to let the water settle."

Settle? To a girl from the suburbs, dirty-looking water was anything but settling. (Of course, the water was perfectly fine; some even believe that New York City water is what makes the bagels so good.)

For most Americans, water has always been available in ample amounts. Perhaps we've never stopped to think about the 74 gallons of water each of us uses, on average, every day, or how lucky we are to have good, clean, cheap access to it. It is, after all, one of our most basic needs.

Yet populations around the globe aren't as fortunate. One billion people don't have access to clean drinking water. Another 2.6 billion lack basic sanitation. Every year, 7 million people die from water-borne diseases (including diarrhea) that are entirely preventable. And even though it's earth's most abundant resource, only about 1 percent of water is fresh and drinkable (2 percent is frozen, the remaining 97 percent is salt water). As the global population continues to rise, the demand for water is projected to double over the next 20 years. Meanwhile, population shifts are straining the current infrastructure. In the developing world, the number of people moving from rural to urban areas is so high that we in the western world can't even comprehend it, says Philip Giantris '65 (*see story page 32*).

These numbers and statistics, though startling, aren't meant to be depressing. But they do give context to the important work of the alumni, faculty, and students highlighted in this issue of *Transformations*.

George Oliver '82 and Dean Kamen '73, for example, are separately addressing the global water issue head on, in an effort to provide clean water to those who don't have it. Locally, at the Worcester DPW, Dino Eliadi '72 and Phil Guerin '82 watch over our water supply—an increasingly important task in our post-September 11 world. Steve Rubin '74 and Paul Vanslette '84 have developed technology to stand guard at municipal water facilities. Jo Anne Shatkin '85, meanwhile, identifies the microorganisms in water that we should (or shouldn't) worry about.

There's more in this issue, including a column by President Berkey on the core of science and engineering. We detail the future of research at the university (the WPI Life Sciences and Bioengineering Center at Gateway Park is scheduled to open next year). Indeed, WPI is investing simultaneously in the future of research and in the economic vitality of Worcester. And as we go to press, the Bartlett Center—future home to admissions and financial aid—is about to open. It's certainly an exciting time to be at WPI and in this city. Whether it's the article on Gateway Park or our package on the future of water, I hope we've given you something to think about and enjoy.

Thanks for reading.

Charna Westervelt, *Editor*

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LETTERS

Job well done

I was moved to write after reading the Winter 2005 issue. I found the diversity of human perspectives on technology to be very inspiring. I applauded the breadth of the arts covered by your magazine. Dean Kamen (p. 4) is a shining example of a caring engineer who does not see technology as an end in itself. The article on the Little Theatre brought back many fine memories of performances in Alden Hall, from theatre to entertainment to provoking discussion. I still think of Lens and Lights movie nights, when I hear the Beatles' "Here Comes the Sun." I remember speeches by Isaac Asimov and Tracy Kidder (*Soul of a New Machine*), which were influential in my education. I recall Asimov saying something to the effect that science fiction predicted the technology of television, and also predicted the moon landing, but did *not* predict our *participating* in the latter, using the former. The fact that I approach engineering with a people perspective is something so fundamental to my approach now that I don't often reflect credit on the WPI Plan, which planted the seed.

The piece on the Well-Rounded Technologist (p. 19) particularly hit home, since I find I draw from the insights gained in Prof. Schachterle's (pictured p. 32) Science and Technology Literature course (circa 1982). Over the years I have returned frequently to the themes raised in those discussions. In fact, I have recently just completed my third reading of Robert Pirsig's *Zen and the Art of Motorcycle Maintenance*. Being taught from this profound book was worth the price of admission; I turn to it again and again for new inspiration.

I look forward to reading future *Transformations* articles highlighting the individuals who shape our relationship with technology. Your magazine reminds me of the reason I am an engineer, and rekindles my appreciation for the WPI institution that shaped my education.

William Lees '85
Redmond, Wash.

Our technological culture

I was glad to read about Lance Schachterle's work with the WPI Studies in Science, Technology, and Culture series. I think this is even more important today than when I was at WPI, given the increasing pervasiveness of technology in our culture. It's hard to remember back to the early '80s when there were no cell phones, Internet, laptops, or PDAs.

David B. Damon '83
Mystic, Conn.

Linking science and humanities

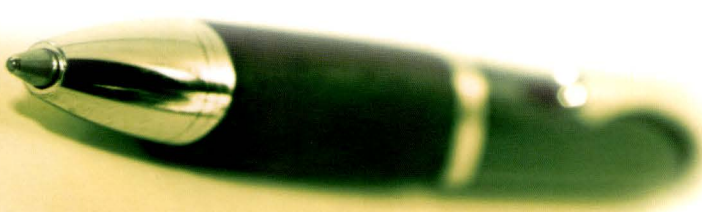
Congratulations to WPI on the Winter 2005 issue of *Transformations*. It's a fine piece, so full of inspirational stories and connections between the humanities and sciences. I keep sharing it with as many people as I can, particularly with those teachers in the Worcester Public Schools' large comprehensive high schools as they conceptualize and develop small theme-based schools within each high school. These Small Learning Communities have themes including business, engineering, visual and performing arts, and health and science, all of which offer rich humanities-science linkages.

Gale Hilary Nigrosh
Higher Education & Business Partnerships, Worcester Public Schools

Continually inspired by humanities

Thank you so much for spending an entire issue addressing an aspect of WPI that most people wouldn't consider being anything more than a requirement. At WPI, the strong technological culture was met with a fervent love of more right-brained pursuits. Looking back at my own experiences and class work, I remember most vividly my humanities classes. Ten years after graduating, I still correspond with Susan Vick, professor of drama/theatre. She was an inspiration while I was a student, and continues to be a muse of sorts in my life now. She supported me a few years ago as I pursued my love of improvisational acting. She motivated me to use my improv skills to write my first real play that was later performed at the New Voices festival that year. Every year since, she is on my mind as the January deadline approaches. New Voices gets my creative juices flowing in an area that terrifies me; occasionally I even submit something. And all because she simply exists as the wonderful person she is. So, thank you for spending time to talk about Susan and the others who keep us using both sides of our brains. It's the first time I've read *Transformations* cover to cover.

Jesse Parent '96
Salt Lake City, Utah



A message from President Berkey

The Core of Science and Engineering

I recently had the opportunity to present testimony to the U.S. Secretary of Education's Commission on the Future of Higher Education. During a public hearing in Boston, I made suggestions, based on WPI's successful experience with its distinctive approach to education, on how we can ensure our nation's colleges and universities are preparing students to compete in the new global economy. The work of this federal commission—including a final report later this summer—will serve as the blueprint for a twenty-first century model of higher education.

In my testimony I referred to Alfred North Whitehead's classic essay "The Aims of Education" and his skepticism about the teaching of "inert ideas," which he warned are "merely received into the mind without being utilized or tested. The details of knowledge which are important will be picked up ad hoc in each avocation of life," he wrote, "but the habit of the active utilization of well-understood principles is the final possession of wisdom."

It is Whitehead's "imaginative engagement" in learning that we seek every day at WPI—in our classrooms, in our labs, in our required projects, and in the academic discourse that extends beyond classroom walls. Indeed, our commitment to learning in and out of the classroom dates back to our school's founding principle: *Lehr und Kunst*, theory and practice. WPI's forefathers were remarkably insightful in taking this radically different approach to education as, 140 years later, their philosophy continues to guide our highly effective approach to science and engineering education.

Perhaps the most distinctive aspect of a WPI education today is the Interactive Qualifying Project, in which teams of students address problems at the intersection of technology and society. Under the direction of our Global Studies Program, the IQP experience extends our tradition of theory and practice literally around the globe. Whether they're working in Costa Rica to assist energy conservation efforts, in Namibia to improve sanitation, or in Worcester to assess brownfield redevelopment, our students learn how to solve problems as members of a team, in real time, in the real world.

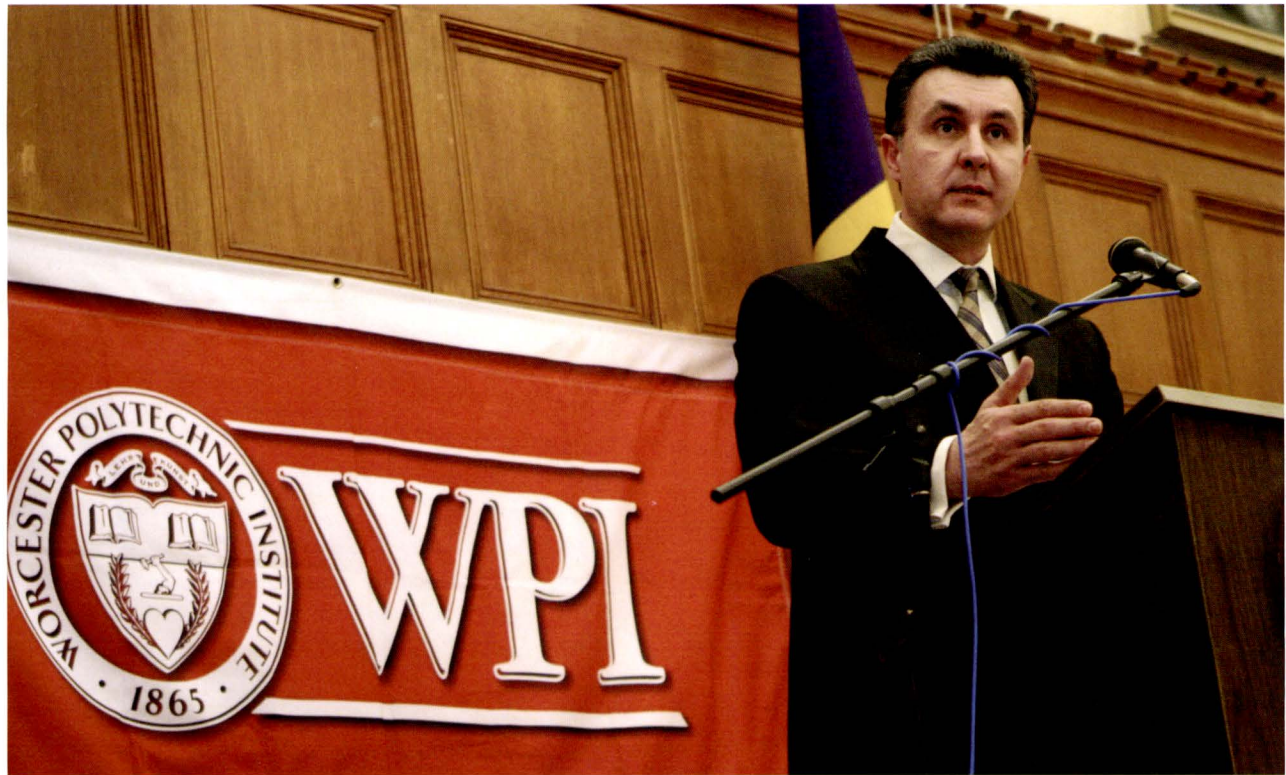
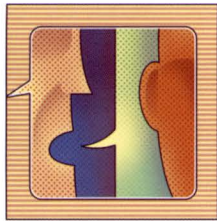
WPI's innovations in educational philosophy and pedagogy do not in any way detract from its traditional focus on engineering and basic science. Indeed, students continue to come here to study automotive and aerospace engineering (mechanical engineering remains our most popular major), robotics, building design, chemical processes and their applications, and computer and communications technologies and systems. The more recently developed programs in biomedical engineering and the life sciences, where the power of modern technology and science is applied to vitally important problems in health and medicine, are growing in popularity. (See page 18 for a related story on Gateway Park.) And WPI's programs in the management of technology prepare students for leadership in a world heralded by Tom Friedman as increasingly flat, global, and competitive.



In addition to our distinctive approach to education in both traditional and emerging areas of engineering, science, and management, WPI encourages real engagement with the arts and humanities as part of a complete education. Ours is a campus on which musical and theatrical groups abound and thrive, and where faculty advisors direct students to study deeply in one or two areas of the traditional liberal arts in preparation for a required project synthesizing and commenting on their experience in these courses. We do this because we understand the importance of broadly educated citizens—thoughtful individuals leading examined lives, motivated by compassion as well as passion.

We understand also that leadership and innovation, two qualities that we aspire to foster in all of our students, come not only from the collaborative experiences of working in teams and across boundaries of knowledge and culture, but also from the creative instincts fostered by the experience of different modes of thought and ways of working.

Succeeding in our rapidly evolving technological world—both personally and professionally as individuals, and collectively as a nation and a global community—is a highly complex challenge. That is why WPI continually strives to prepare its graduates extremely well, not only to be well-trained engineers and scientists, but to be broadly educated citizens of the world. Generations of alumni have benefited from this understanding and philosophy, as will generations to come.



A Royal Visit

WPI was honored to host HSH Radu, Prince of Hohenzollern-Veringen, during his inaugural Friendship Tour to the United States in February. As part of his full-day visit, he gave a free, public lecture on "Romania's Transatlantic Perspectives" in Alden Memorial. His visit to WPI was his only New England stop.

President's IQP Award Winners Announced

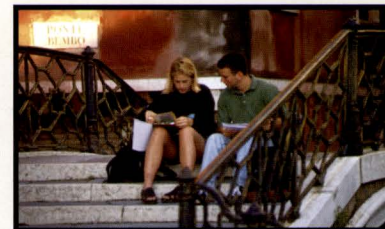
Student projects resolving water issues in a Thai village and reducing landfill waste in Puerto Rico took top honors in this year's President's IQP Awards. The awards recognize the best projects that examine a problem at the intersection of technology and society. In all, President Berkey and a panel of distinguished judges recognized five projects for student work performed in the corporate, government, and nonprofit sectors around the world.

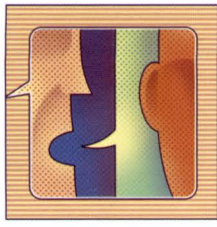
The two projects that tied for first place involved designing an irrigation system for a center for abused children in Thailand (see page 12), and developing a sustainable waste management system for McNeil Consumer Healthcare in Puerto Rico.

There was also a tie for second place. Students worked with the Department of Infrastructure, Water, and Technical Services in

Windhoek, Namibia, to assess a pilot study for a pre-pay water metering system in the city's informal settlements as a solution to nonpayment. The other team developed a low-cost robotics outreach and educational program in conjunction with the Worcester Public Schools as a way to teach basic engineering and programming principles, and encourage high school students to pursue an education in engineering or science.

Third place went to a team that helped to preserve the nautical traditions and maritime heritage of Venice, Italy. The students worked with Arzanà, an organization specializing in the study and conservation of historic Venetian boats.

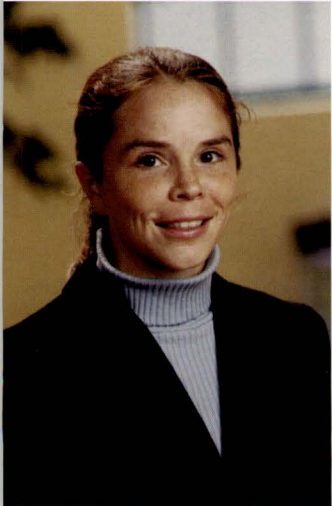




More Buzz

New Face of Engineering

Jennifer Wilcox, assistant professor of chemical engineering, was recognized nationally as one of 16 “New Faces of Engineering” by the National Engineers Week Foundation. Wilcox was nominated by the National Science Foundation for the honor, which is an annual tribute to the nation’s top young engineers. She is one of just five women recognized; she also is the only honoree from New England and is the only college or university faculty member.



As a result of the honor, Wilcox was featured in an ad that ran in *USA Today* and on the Engineers Week Web site (www.eweek.org) during National Engineers Week, Feb. 19–25.

Wilcox’s research focuses on finding ways to eliminate toxic metals—such as mercury, arsenic, and selenium—from the gases emitted by coal-fired power plants. She joined the faculty in 2004; soon thereafter,

she won an NSF CAREER Award, the agency’s most prestigious honor for young faculty members.

Record Year for Faculty Research

In 2005, the university set a new record by securing \$15.5 million in external research funding—the most in school history, and a 68 percent increase over 2004. The funding has led to significant WPI breakthroughs in the areas of wireless communications, alternative fuels, and the life sciences. WPI’s labs have developed technology to produce low-cost hydrogen for fuel cells, noninvasive medical sensors, and the world’s first wearable, untethered ultrasound system. In addition, WPI’s faculty has garnered a broad range of national and international recognition for their scholarship, research, and educational activities. Among these honors are 11 Fulbright Scholarships, 19 National Science Foundation CAREER Awards (for the most outstanding young scholars), and nearly 50 fellowships in national and international professional organizations.



Wireless Ultrasound System in Clinical Trials



The U.S. Army has begun clinical trials of the first wearable, untethered medical ultrasound system, which was developed by researchers in the Center for Untethered Healthcare, part of WPI’s Bioengineering Center. The voice-activated, battery-powered system is fully integrated into a lightweight vest, enabling a physician to bring the ultrasound scanner to the patient, rather than transporting the patient to a hospital or clinic. The system is completely untethered—no power cords, signal cables, or other constraining wires are needed.

Funded by the Army’s Telemedicine and Advanced Technologies Research Center, the wearable system can be used in situations where it is currently impossible to use medical ultrasound, such as in combat support hospitals, inside ambulances and transport aircraft, and at accident and disaster scenes.

Graduate student Philip Cordeiro wears the untethered, battery-powered ultrasound scanner developed at WPI. The research effort has been led by associate professor James Duckworth, left, and professor Peder Pederson, both of the Electrical and Computer Engineering Department.



Left, George Thorn, program officer at Bank of America's philanthropic management, presents President Berkey with a plaque during the dedication of WPI's new MEMS Fabrication Facility. Above, a student suits up before entering the new clean room.

When the Little Things Count

WPI celebrated the dedication of a laboratory designed for research and education in micro/nanoscale fabrication, expanding the university's research strengths in MEMS (micro-electrical-mechanical systems). The new Lufkin MEMS Fabrication Facility, also known as a clean room, will give undergraduate and graduate students hands-on experience for projects and research studies.

The growing bioengineering and biotechnology sectors require professionals trained in this technology, since MEMS are

increasingly important to both areas, as well as to the communications and manufacturing industries. MEMS are found in airbag deployment systems, aircraft controls, and biochemical sensors.

Located on the lower level of Higgins Laboratories, the facility is named in honor of a generous investment from the Richard H. Lufkin Memorial Fund, Bank of America Trustee. Intel Massachusetts provided much of the vital laboratory equipment for this new resource.

WPI Venture Forum
Dinner with Entrepreneurs
CEI@WPI ALL-OUT Business Plan Challenge
Robert H. Grant Invention Awards
Strage Innovation Awards
Networking Events
Spotlight on Entrepreneurs
Elevator Pitch Clinics
CEO East Collegiate Entrepreneurship Conference
42 Workshops and 4 Interactive Seminars
Invention to Venture
Weekly Radio Program
Vantage Newsletter
Resources, vast networks, and much more



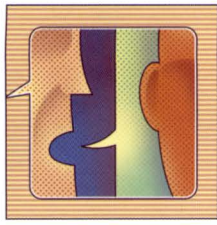
An entrepreneurial mindset

WPI takes entrepreneurship education seriously.

Just how much more seriously is up to you.

Our students are saying great things about WPI's new entrepreneurship programs. But, they want more. To innovate the future of business. You can help them attain the entrepreneurial mindset they need by working with the Collaborative for Entrepreneurship & Innovation in its Entrepreneurial Mindset Initiative.

For information call 508-831-5761 or visit www.wpi.edu/+CEI



Carlson to Speak at Commencement

Curtis R. Carlson '67, who is internationally renowned for his technological and entrepreneurial leadership, will speak at WPI's 138th Commencement, on May 20.



Carlson, a WPI trustee, is president and CEO of SRI International—a nonprofit, scientific research institute in Silicon Valley. Since 1998, he has led an organization that has been called “the soul of Silicon Valley” and whose innovations range from household detergents to the computer mouse.

He has been an advocate for WPI's Silicon Valley Project Center, which was established in 1999. In 2002, he received the Robert H. Goddard Alumni Award for Outstanding Professional Achievement.

Curt Carlson's career began in 1973 at RCA's Sarnoff Laboratory, where, as head of ventures and licensing, he helped found more than a dozen new companies. He started and led the high-definition television program at Sarnoff that became the U.S. standard, winning an Emmy for outstanding technical achievement in 1997. Another team he started and led won an Emmy in 2000 for a system that measures broadcast image quality.

He is a member of the board of directors of Nuance Communications, a leading speech recognition company, and has served on the Air Force Scientific Advisory Board as well as the Defense Science Board. He is also a member of the Highlands Group, which makes recommendations to senior government officials about technologies of importance to the U.S. government. He holds more than 15 U.S. patents and has published or presented more than 50 technical publications.

WPI Hosts Biotechnology and Bioengineering Forum/Career Fair

With the tremendous growth in the biotechnology and bioengineering fields, the demand for well-rounded professionals is increasing at a rapid pace. In March, WPI brought together leaders from industry, academia, and government to discuss how these groups can better work together for future research and development. Speakers at the corporate forum included U.S. Rep. James P. McGovern and Thomas Finneran, president of the Massachusetts Biotechnology Council. Following the forum, WPI hosted a biotechnology and bioengineering career fair to provide companies with a rich pool of graduates ready to make significant contributions.

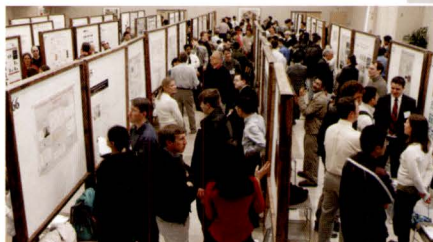
New Symposium Highlights the Breadth of WPI: Graduate Research

Nearly 150 graduate students participated in WPI's first Graduate Research Achievement Day in March. Sponsored by the Office of the Provost, the symposium represented the first in what will be an annual showcase of research in science, engineering, the life sciences, and bioengineering.

Awards were given out in the three categories. In engineering, Alexandra Levshin '05 took first place for her research on “Performance of Hydrofoils with Humpback Whale-like Leading Edge Protuberances.”

In the life science and bioengineering category, Yatao Lin took top honors for “Investigation of Molecular Scale Mechanisms of Cranberry on *Escherichia coli* Leading to Prevention of Urinary Tract Infections.”

John Hayward won first place in the science category for “Mining Oncology Data: Knowledge Discovery in Clinical Performance of Cancer Patients.”





Record Number of Applications

The popularity of WPI among high school seniors is at the highest level in the university's history. WPI broke its all-time record for the number of freshman applications received, four weeks ahead of the Feb. 1 deadline. This unprecedented demand for WPI's undergraduate curriculum—a model of educational innovation—builds upon several consecutive years of high-achieving freshman classes. Last year's admitted Class of 2009 boasted an average SAT score of 1304 and average class rank in the top 15 percent.

Inspiring a lifetime of learning *in math, science, and engineering*



The WPI K-12 Outreach Program is challenging students to grow academically and is making a difference in educating the next generation of technological humanists.

www.wpi.edu/Admin/K12



On Top of Their Games

By Adam Bowles

In the second-round NCAA tournament game last year against Western Connecticut State University, Brett Dickson '06 was suddenly thrust into a pressure moment. With about six seconds left, WCSU tied the game, leaving WPI players in a daze, recalls Coach Chris Bartley. But Dickson knew his coach didn't want to call a timeout. So he quickly in-bounded the ball to the team's top scorer, who made the winning basket. "He's the type of player who understands what is going on in a game so well that he really is the extension of the coach on the floor," says Bartley. "He's always thinking about the next play. And, he's almost always right."

This New Hampshire native and the son of a college basketball coach plays point guard and has been captain of the WPI team since his sophomore year. As a member of Bartley's first recruiting class, he helped the team set a university record last year for regular season wins, capture the NEWMAC regular season and tournament titles, and advance to the NCAA Division III championships for the first time in 20 years, going as far as the Sweet 16. This year, the team again advanced to the championships, after they won the NEWMAC tournament in February.

Dickson's leadership abilities extend beyond the court; he is active in Big Brothers Big Sisters of Central Massachusetts. "You develop a great relationship with the kids," Dickson says. "I enjoy going every week."

As of February, the electrical and computer engineering student boasted a 3.8 GPA. "His ability to balance basketball, academics, and community activities, and his ability to manage the other kids on the team, as well as himself, is remarkable," says Bartley.

On the soccer field, Megan Holmes '05, an Idahoan, was a standout on a team that boasted winning seasons in three of her four years. She scored 13 goals and made 33 assists during her career; last year, as a senior, she was second-team All-New England Women's and Men's Athletic Conference.

Holmes graduated with high distinction with a degree in biomedical engineering last year. As an undergraduate, she received top awards—the Marietta E. Anderson

Quintessential student-athletes
Brett Dickson '06 and **Megan Holmes '05**
are a triple threat: they excel in team sports,
in the classroom, and in life.

Award and the Ellen Knott Award—in recognition of her academic excellence, her athletic prowess, and her significant community involvement through the service fraternity Alpha Phi Omega.

Following her impressive career on and off the soccer field, Holmes, now a biomedical engineering graduate student, found time to join the women's field hockey team as a center forward this winter. She even scored the first goal of the season, making the transition to another sport look easy, says Coach Johanna DiCarlo.

"She's a great example for the underclassmen," DiCarlo says. "She works hard at practices. She has a positive attitude. She's one of those rare student-athletes you get only every four or five years."

It's that combination of success in sports and academics, as well as their leadership qualities, that make Holmes and Dickson stand out on a campus where more than half of the student body is active in varsity sports, club sports, or intramurals.

"They are charismatic," says Dana Harmon, director of physical education, recreation, and athletics. "People are drawn to them because of their leadership skills."

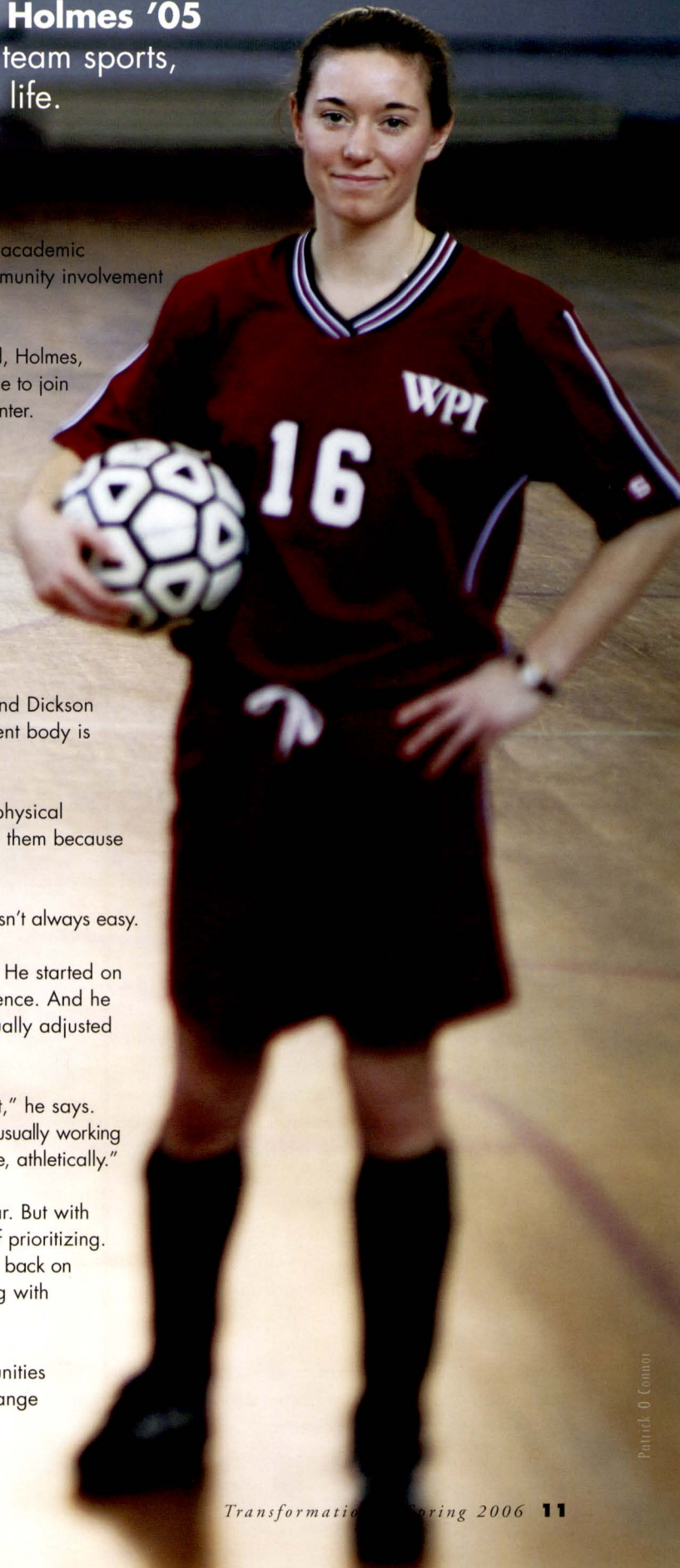
But Holmes and Dickson agree the path of a student-athlete isn't always easy.

Dickson's time of turmoil came during his freshman year. He started on a basketball team that struggled all year due to inexperience. And he was intimidated by his academic workload. But he gradually adjusted to college life and learned to excel.

"The biggest thing to concentrate on is time management," he says. "I don't sit around and watch TV or play video games. I'm usually working out for athletics or studying for a test. I've done it all my life, athletically."

Holmes' stress began to take its toll during her junior year. But with friends' encouragement, she recognized the importance of prioritizing. She eased up on some of the off-season training. She cut back on work hours and became more selective about volunteering with her fraternity.

"In hind site," Holmes says, "I realize how many opportunities I've had and the amazing people I've met. I wouldn't change my undergraduate experience for the world."



Patrick O'Connor



Explorations

By Eileen McCluskey



Field of Dreams



Student Project Gives Impoverished Children a New Life

Simon Beckwith, Julia Cohn, Leigh Duren, and Kyle Lewis haul surveying equipment and water collection containers onto a field in Kanchanaburi Province, ready for another day of data collection. Their mission: to design a model irrigation system for a planned 80-acre oil palm tree plantation some 125 miles northwest of Bangkok. In doing so, they would also help sustain the lives of Thailand's deprived children.

The New Life for Abused Children Project in Thailand is a nonprofit organization that helps children who, for various reasons, have not enjoyed the benefits of safe, loving homes. Some were trafficked from nearby countries into Bangkok's sex and drug trades, others suffered abuse at caregivers' hands. New Life houses them, counsels them, and sends them to local schools. It also teaches them employable skills. That's where the IQP team came in.

The students developed an irrigation system for the organization's oil palms. The trees will serve double duty as New Life teaches the children oil palm-based trades and uses revenues generated from the trees to help them expand and become self-reliant. New Life has been assisting Thailand's children since 1998, when it was established by the country's Duang Prateep Foundation (DPF).

"The children at New Life are learning how to convert the oil into soap, fragrances, lamp oil, and other locally traded commodities," notes Rob Krueger, assistant professor in the Global Perspective Program of WPI's Interdisciplinary and Global Studies Division. "These skills are incredibly useful in Thailand's economy." Krueger served as one of two advisors to this IQP.

The four WPI seniors visited the country from January through March 2005 for the on-site portion of their IQP, which tied for first place in the President's IQP Awards.



In researching the best irrigation system to implement, the students weighed ecological and geological factors and considered New Life's plans to quadruple the number of oil palms it hosts over the next 10 years.

"I think we all felt excited about this project, because it could have such a lasting, positive impact on people's lives," says Duren.

Indeed, agriculture plays a critical role in feeding and employing Thailand's population; 60 percent of Thais work as farmers, according to the *Bangkok Post's* Mid-Year Economic Review 2004. Thailand is also the world's largest rice and rubber exporter. But perhaps even more significant, says Krueger, "most Thais eat locally available foods, period."

All this in a country that relies heavily on rainfall for most of its water.

"Even though Thailand is a reasonably well-developed country, water is still a seasonal commodity," Krueger says. "The natives are dependent on rainfall to sustain them. DPF and New Life chose these trees not only for the oil's commercial value, but because these trees can grow in this environment, with available water."

Fielding Solutions

In researching the best irrigation system to implement, the students weighed ecological and geological factors and considered New Life's plans to quadruple the number of oil palms it hosts over the next 10 years. They collected data and observed workers at the plantation, sought out local equipment suppliers, and worked on their report at Bangkok's Chulalongkorn University (Chula), where WPI students stay when they travel to Thailand.

One field day found Cohn and Lewis photographing different points along the test field's perimeter and along the reservoir closest to the field, using Chula-loaned surveying equipment. They calculated the field's area and measured the water source's position relative to the field, while Duren and Beckwith collected water samples for later analysis.

On another day, Lewis rowed out to the middle of the reservoir in a tiny craft, and computed the lake's slope to determine its depth.

The team also took to the streets, traveling by taxi, bus, and foot—sometimes by sky train—to investigate local irrigation outfitters.

At Chula, the students plugged their data into AutoCAD and Excel to determine the length of lateral and main tubing for a drip irrigation system, and to estimate their recommended system's cost to New Life. Their water analyses helped them choose the best pump and filters for the plantation.

With the painstaking background work completed, Duren says, "it was fun to run a mock irrigation trial. We bought emitters and tubing from a local supplier and rigged up a model drip irrigation system, to see if the soil would absorb the water without pooling. We didn't want it to evaporate or run off."

It didn't, and the students recommended their drip irrigation system for the plantation. The highly efficient, low-tech approach will keep the oil palms' delicate, horizontal root systems moist, and ensure an easily maintained arrangement that works with New Life's existing reservoirs.

The students went beyond their assignment and wrote a maintenance manual and fund-raising brochure, which provided drip irrigation system specifications.

"DPF will have to raise funds to get this project off the ground," says Beckwith. "But once it's built, we want the system to last. Our extra documents can help accomplish those goals."

"This IQP was an alignment of extraordinary students and an extraordinary project," says Steve Pierson, who served as advisor with Krueger. Pierson taught physics at WPI from 1996 to 2005, and has worked with IQP teams in Namibia and Thailand.

"WPI does the IQP so well," says Pierson, who is now head of government relations with the American Physical Society. "The students have two years of classroom training behind them, but they are not yet aware of what they can accomplish. Then they go out and do their IQP, and their eyes open to their capabilities."

They also see new worlds. Says Cohn, "I spent my last IQP weekend at New Life with the children and staff, just to experience life with them. I want to go back to Thailand. I miss it every day."



Photography by Leigh Duren, Simon Beckwith, Julia Cohn, and Kyle Lewis



Entrepreneurship



Getting Their Feet Wet

Through their patent-pending technology, two alumni are on the ground floor of a new venture to protect the nation's water supply.

Patrick O'Connor

As research and development was under way for start-up company Longwatch Inc., its sales operation was having its own success, albeit in an unconventional, though convenient, office space: the neighborhood Starbucks. There, nursing a cup of coffee for several hours, the sales team took advantage of the coffee shop's Wi-Fi connection.

Now, three years after its founding fathers came together, this start-up has developed technology to help protect the water that flows out of household faucets—and even into the cups of freshly brewed coffee—one municipality at a time.

“The issue of security is something that will be with the country and with the world for a long time,” says Paul Vanslette '84, who, along with WPI trustee Steve Rubin '74, are two of Longwatch's founding partners. “I think our technology 'has legs,' as they say.”

The company's patent-pending technology, which recently won an Editor's Choice Award from *Control Engineering*, offers local cities and towns a way to monitor their water pumps, wells, and tanks using remote video surveillance. The market outlook appears promising, especially following recent federal legislation that puts added pressure on communities to provide safe and reliable water to residents.

In 2002, Congress passed the Bioterrorism Act, which requires municipalities serving more than 3,300 customers to assess the vulnerability of their water facilities, based on a possible terrorist attack or other incident that could disrupt the supply of clean, drinkable water. The results of these mandated assessments are leading local officials to Longwatch in search of a cost-effective way to securely monitor their facilities.

◀ Paul Vanslette '84 and Steve Rubin '74 tour the Littleton, Mass., water facility, where their patent-pending technology safeguards the municipality's supply of water.

How it works

The technology includes a device—fundamentally, an embedded computer with four video channels—that is placed at a remote water site. The device monitors and collects video signals that are then archived and transmitted to a central computer, using the town's existing low-bandwidth infrastructure.

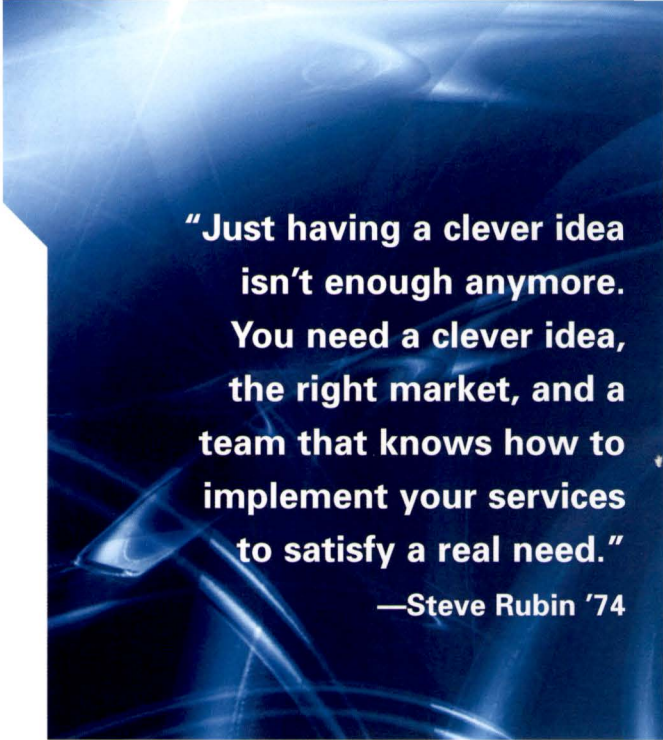
The remote video is then transmitted to a video control center—a software application that can be installed on existing computers—where the information is processed, archived, and integrated into the control room operator's computer screen.

When Longwatch's system detects an alarm, a control room operator is paged; he or she can then view a video clip of the recorded event on a cell phone or home computer to determine what, if any, course of action is taken. Typically, security systems at water facilities show when an alarm occurred, but Longwatch's technology also shows how and what was happening before and after that alarm went off. And because cities and towns are required to investigate any and all possible security violations, this technology "is a much more effective use of everybody's time and money," Vanslette says.

Video surveillance isn't new, nor are wireless networks. However, most water treatment systems have their critical assets (such as pumping stations, wells, and water towers) located far from typical networks such as broadband cable. Many wireless technologies are limited in speed, capacity, availability, or security. Because Longwatch addresses these issues by using the utility's existing low-speed, high-security telemetry network, it currently has no known competition. "All the clients we speak with ask, 'Where have you been?'" Rubin explains. "This kind of product is long overdue."

Vanslette adds, "Most municipalities don't have 24-hour security monitoring. They don't have the people or the budget. And, they don't have the bandwidth in terms of a communication system."

The system works well for cities and towns where control room engineers find themselves fixing problems in the field, rather than solely monitoring the water facility's security system. Longwatch is the military term for overnight guard patrol, much like this technology's function at the remote sites.



"Just having a clever idea isn't enough anymore. You need a clever idea, the right market, and a team that knows how to implement your services to satisfy a real need."

—Steve Rubin '74

While this particular venture is new to the Longwatch management team, their knowledge of the water industry is not. Many were already familiar with it, for they had worked at Intellution, a company that Rubin started in 1981 to develop and supply process automation and control software to various industries, including the water sector. [Emerson Electric Company acquired Intellution in 1995.] "We understood the existing protocols and how Longwatch could integrate with those systems," says Vanslette, who was at Intellution for 18 years.

Longwatch was incorporated in September 2005, but unofficially, the company came into being a couple of years earlier, when two of its founders, familiar with the new federal requirements, asked themselves: How do we integrate video over low-bandwidth radio infrastructure?

Shortly thereafter, Vanslette was called in as vice president of software engineering. "I knew we had a really strong team and a compelling business opportunity," he says.

Six months later, Rubin became involved as chairman of the board. While he was immediately intrigued by Longwatch, he says it was the market research that really piqued his interest. "I realized that [this company] could be a lot larger than any of us first thought."

In the foreseeable future, Rubin says he expects the growing company to become a leader in video surveillance for water facilities, as well as for remote infrastructure in other industries, including oil and gas. But, he notes, what will ultimately determine the success of the company goes beyond its technology.

"The technology is certainly important. But even more critical is having a great team of people who understand what products and services will sell," he says. "Just having a clever idea isn't enough anymore. You need a clever idea, the right market, and a team that knows how to implement your services to satisfy a real need." —CW



Generating Clean Water

Keeping our drinking water free of harmful chemicals and microorganisms is a constant and growing technological challenge.

Indeed, it is one that occupies a number of research teams at WPI.

Here is a look at two current programs that are developing innovative technologies for removing contaminants from drinking water before it reaches our taps.

***Cryptosporidium*, an intestinal parasite**, is one of dozens of harmful microorganisms that can live in municipal water supplies. To destroy it, water treatment plants can use a tried and true weapon: chlorine. Unfortunately, protozoans like *cryptosporidium* can be resistant to chlorine. But adding larger doses of the chemical can have an unwanted side effect, as it reacts with organic material in water to generate harmful chemicals, including known carcinogens.

Jeanine Plummer, associate professor of civil and environmental engineering, is developing a new treatment technique that largely avoids the generation of byproducts. Over the past few years, Plummer has been testing the effectiveness of sonication, in which water is bombarded with ultrasonic sound waves to destroy the unwanted parasites.

“Chemical-free disinfection is something the drinking water industry has been looking into for some time,” Plummer says. “While some larger plants have adopted ultraviolet technology, it has been too expensive or complicated for many facilities. We’re hopeful that sonication will prove to be economical for smaller, rural plants, and maybe even for use in homes.”

With sonication, sound energy creates miniscule bubbles in the water. As the bubbles collapse, they generate extremely high temperatures and pressures on a microscopic scale, which can severely stress microorganisms. The collapsing bubbles also produce free radicals—highly reactive compounds that can destroy cell membranes.

In laboratory tests, the one-two punch of sonication kills off virtually all bacteria, viruses, and protozoa, given enough time. Since *cryptosporidium* is notoriously tough to kill, Plummer is also testing sonication in combination with chlorine. Multiple disinfectants may be just what is needed, she notes, for sonication and chlorination together can inactivate pathogens in as little as 10 seconds of exposure.

An added benefit, Plummer says, is that the heat and the free radicals also seem to destroy certain organic contaminants in water. Ongoing work in her lab is focused, in part, on further exploring the ability of the technology to attack these chemicals, and on developing new prototypes of the sonication system and testing them on a range of microorganisms.

Soaking Up and Breaking Down Contaminants

In the mid-1990s, Robert Thompson, professor of chemical engineering, and graduate student Arjan Giaya ('98 MS, '02 PhD), were asked by a local company to see if they could find a better technology for removing toxic organic compounds from water than activated carbon filters. Carbon filters can miss some compounds, and once they fill up, they must be thrown away or regenerated, which can put the harmful chemicals back into the environment.

Thompson and Giaya, now manager of advanced materials at Triton Systems Inc. in Chelmsford, Mass., discovered that high-silica zeolites were better at adsorbing organics than carbon. Zeolites, which can be thought of as molecular sponges, are highly porous minerals that have long been used in industry as



Don Vaillancourt

catalysts and ion exchange agents. The tiny pores in zeolites are ideally suited for trapping organic molecules, Thompson says. But, like carbon filters, once the zeolites have done their job, one is still left with concentrated organic waste that needs to be disposed. To deal with this nagging problem, the molecular sieves have been married to advanced chemical oxidation processes being developed by John Bergendahl, assistant professor of civil and environmental engineering.

Oxidizing agents, which break down organic compounds, are commonly used in water treatment. The advanced oxidation chemistry is designed to target specific compounds—for example, MTBE (methyl tertiary-butyl ether, a gasoline additive) or TCE (trichloroethylene, a widely used industrial solvent)—that are found commonly in drinking water and that pose serious health risks.

This combination of zeolites, to filter organics, and advanced oxidation chemistry, to destroy them and renew the filter, has earned Thompson and Bergendahl a provisional patent. They are currently working with other faculty in the Chemical Engineering Department to extend the technology to various scales and for other compounds.

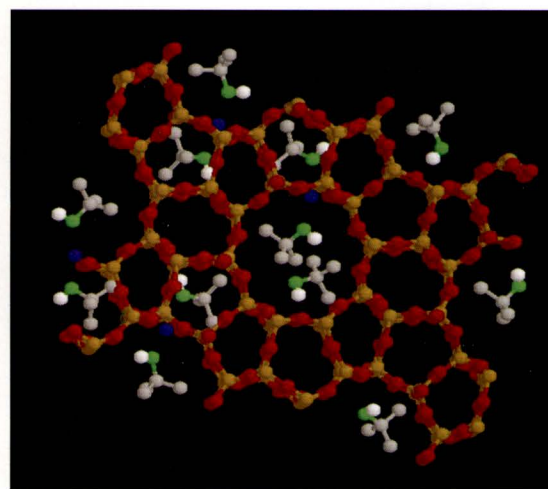
With help from associate professor Nikolas Kazantzis and assistant professor Jennifer Wilcox, Thompson and Bergendahl are exploring ways to custom design zeolites that are perfectly matched to specific organic compounds. These “designer sorbents” should be far more effective at soaking up the compounds than any current technology, Thompson says.

The organics removal and oxidation work is one of the first projects to come under the umbrella of a proposed Water Research Center, to be part of the university’s Bioengineering Institute in recognition of the diverse strengths of WPI’s water-related research and the fundamental importance of a safe, clean water supply to public health, Thompson says.

“We’re in a building phase,” he says. “Our initial researchers have a track record of collaborating and publishing together.

“As we move forward,” he continues, “we’ll be looking to broaden the scope of the center, bringing in additional faculty and additional areas of expertise. We are also actively seeking support from corporations, foundations, federal agencies, and individual alumni who may have an interest in or applications for the technologies we are developing.”

For more information about BEI, as well as its faculty and their research, visit www.wpi.edu/+BEI.



Above, Simulation of tertiary butyl alcohol adsorbed in the open nanopores of a high-silica zeolite. The pores are ideal for filtering out toxic organic molecules found in water. Simulation courtesy of Ozgur Yazaydin, chemical engineering graduate student.

Top, Assistant professor Jennifer Wilcox and professor Bob Thompson (holding model zeolites) are collaborating to best filter harmful organics out of water, while associate professor Jeanine Plummer is using sonication to destroy parasites in water.

Creating sy

The future of research at WPI

By Michael W. Dorsey



Patrick O'Connor

Grant McGimpsey (BEI), Alex Dilorio (BBT), Kristin Wobbe (CBC), Yitzhak Mendelson (BME), Eric Overström (BBT), and Kristen Billiar (BME), are just some of the faculty who will do research in WPI's new facility at Gateway Park.

energy



Dan Vaillancourt

The new **WPI Life Sciences and Bioengineering Center** is designed to encourage collaboration across key disciplines and produce the kind of synergy—and even serendipity—that can lead to innovative areas of research and development.

While the image of the lone scientist lives on in Hollywood movies, science now is almost exclusively a team effort. The challenges that today's scientists tackle are highly complex and multidimensional. More often than not, expertise, ideas, and technology from an array of disciplines are needed to find answers; it takes other players, from engineers to entrepreneurs, to translate those answers into life-changing products and processes.

On a parcel of former industrial land near downtown Worcester, the university is putting this new scientific paradigm into practice with the WPI Life Sciences and Bioengineering Center, a 124,600-square-foot, \$40 million complex. Scheduled to open in early 2007, the four-story structure is the embodiment of two strategies for the future: investing in the development of WPI's home city, and fostering the growth of life sciences education and research at the university. On the economic front, the center is the first new structure to rise within the larger Gateway Park complex, an 11-acre life sciences-based campus that WPI is building with the Worcester Business Development Corporation (*see page 23*).

The new building “is a significant step forward for WPI, for our partnership with the WBDC, and for the city,” President Dennis Berkey said in June 2005, as ground was broken for the new facility. “Locating our life sciences and bioengineering research and graduate education programs here in state-of-the-art facilities will bring an important scientific core to this development, which will enrich WPI’s educational efforts and attract potential collaborators to the site, both academic and corporate.”

On the academic side, the center will give WPI an enhanced presence in a field that promises to drive the future of education, business, research, and innovation. “Next to defense, the life sciences represents the biggest chunk of money the government awards for research,” says W. Grant McGimpsey, director of WPI’s Bioengineering Institute (BEI). “Its importance can only grow, driven by an aging population and ever-increasing requirements for new therapies, new treatments, and new medical devices.”

“We’ve got the people, we’ve got the enthusiasm, and we’ve got the expertise,” adds Carol Simpson, WPI’s provost

and senior vice president. “As an institution, we can’t sit back and let that wave of research sweep by us.”

To catch the wave, many universities have invested in life sciences and medical research centers in recent years. WPI’s approach to creating such a center should set it apart, Simpson says. “We will have a true life sciences and engineering group with strengths that most life sciences programs don’t have,” she notes. “Most research-intensive universities have biologists and biochemists, but they don’t have many researchers who think about the engineering side of the life sciences—about making products, and about the innovation and entrepreneurship involved in getting those products to market.

“The WPI experience that we instill in our students—to recognize the social component of our work, to take our research and apply it in some way—is also part of the faculty culture,” Simpson adds. “That transition between the pure and the applied is something we do very well. There aren’t many universities, honestly, that can do this.”

The faculty who will call the new center home will come from four departments: Biology and Biotechnology,



Here’s a quick look at the major interdisciplinary research groups that will share space in the **WPI Life Sciences and Bioengineering Center**. The researchers come from the departments of Biology and Biotechnology (BBT), Biomedical Engineering (BME), Chemistry and Biochemistry (CBC), and Chemical Engineering (CHE), as well as from the Bioengineering Institute (BEI).

Tissue Regeneration and Stem Cell Biology

Who David Adams and Eric Overström (BBT); George Pins (BME); affiliated faculty from University of Massachusetts Medical School

What Developing bioengineered scaffolds on which soft tissue can be grown, laying the groundwork for growing tissue from a patient’s own stem cells; developing improved methods to isolate and grow stem cells; genetically engineering new drugs for stroke.

Why Engineered cells/tissue can repair or replace damaged skin and other tissue more successfully and naturally than grafts.

Tissue Mechanics and Mechanobiology

Who David Adams (BBT); Kristen Billiar and George Pins (BME); affiliated faculty from Mathematical Sciences and UMass Medical School

What The group studies how mechanical forces—stretching, for example—affect, or can be necessary for, proper growth and healing of connective tissue.

Why Artificial heart valves wear out; replacement valves from pigs can be rejected. A properly designed—and mechanically stimulated—artificial valve may last for life.

Plant Systems

Who Alex Dilorio (BBT, Bioprocess Lab, and BEI); Pamela Weathers (BBT); Jose Argüello and Kristin Wobbe (CBC)

What Studying mechanisms plant cells use to transport metal ions across their membranes; uncovering techniques plants employ to defend themselves against pathogens; developing techniques for enhancing the production and recovery of valuable chemicals made by plants.

Why Understanding plant resistance mechanisms could reduce the need for pesticides; enhancing production of artemisinin, a potent anti-malarial agent produced by the wormwood plant, could help combat this global scourge.

Researchers and graduate students will work side by side with others who are tackling similar problems, but from different directions or with different techniques.

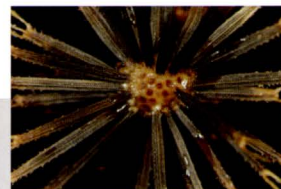
Biomedical Engineering, Chemistry and Biochemistry, and Chemical Engineering. They will bring with them a wide array of interdisciplinary research programs, many of which bridge fundamental investigation and practical application.

The center will also house the Bioprocess Laboratory—which conducts applied research for biotechnology companies—and BEI, an interdisciplinary research and development organization. With its seven centers, comprising faculty from nine science and engineering departments, BEI is dedicated to developing cutting-edge life sciences-based technology, and finding ways to turn it into new products and enterprises.

“Putting the researchers who are developing the technologies in the same building with BEI will give us the opportunity to match new ideas, even before they are fully formed, with entrepreneurs and investors who may have the interest and ability to bring them to market,” McGimpsey says. “That’s very exciting.”

Some of those new ventures, he notes, may become tenants in the new building, or in the three other structures that will eventually be built at Gateway Park. They’ll join other companies that will choose to locate at Gateway to be close to WPI’s life sciences research group and BEI. “We see this new center as the signature building for Gateway Park,” Simpson says, “a facility that will attract related companies and interests to the area.”

For the departments that will transplant their graduate research programs, the new building offers a host of advantages. First is the lure of new space, expressly designed and outfitted for modern research in the life sciences. A new facility dedicated to research will give departments added leverage as they search for new faculty members, notes Eric Overström, head of the Biology and Biotechnology Department. “We are seeking to hire mid-career faculty who already have resources and support,” he says. “They will bring immediate presence and



Molecular Nanotechnology and Molecular Sensors

Who Christopher Lambert (BEI); Grant McGimpsey (BEI and CBC); Terri Camesano and Susan Zhou (CHE); James Dittami, John MacDonald, Venkat Thalladi (CBC)

What Creating devices with surfaces that have precisely engineered physical and chemical properties for sensing and other applications; studying bacteria at the molecular level to learn how to prevent harmful biofilms from forming on medical devices.

Why Tiny devices with engineered channels and pores may become implantable labs that can monitor blood chemistry and transmit the results as needed.

Applied Molecular Genetics

Who Lauren Matthews, Sam Politz, Reeta Prusty, Elizabeth Ryder (BBT)

What Studying the genetic mechanisms a tiny nematode uses to evade its host’s immune system; uncovering chemical signals that switch fungi from benign to pathogenic mode; understanding the molecular basis for ecological adaptation by shrimp and other crustacea.

Why Fungal infections are notoriously difficult to treat; new drugs that exploit these chemical signals may work far better than current medicines.

Advanced Technologies in Biological Imaging and Sensing

Who Yitzhak Mendelson, Christopher Sotak (BME); affiliated faculty in the BEI Center for Untethered Healthcare (BEI-CUTH); James Duckworth, Reinhold Ludwig, William Michalson, and Peder Pederson (Electrical and Computer Engineering); and John Sullivan (ME) work on this research, but will not relocate to the new center.

What Through BEI-CUTH, developing noninvasive optical sensors that can monitor vital signs and transmit them wirelessly; in the MRI (magnetic resonance imaging) lab, developing advanced techniques for detecting stroke and seeing how it responds to therapies; in the ultrasound lab, developing portable 3-D ultrasound for diagnosing injury.

Why Wireless physiological sensors may enable doctors to monitor patients at a distance, improving the quality and lowering the cost of health care.



Putting a significant number of people together under one roof to work on the same general theme creates opportunities to develop new projects and new areas of research.

prestige, but you can only attract them if you can show them a facility like this.”

New recruits and existing faculty researchers will benefit from sharing a building with researchers from multiple disciplines. “Putting a significant number of people together under one roof to work on the same general theme creates opportunities to develop new projects and new areas of research, and an enormous opportunity to go after major funding,” McGimpsey says. “In fact, almost all of the projects currently funded by major federal agencies are multidisciplinary projects.”

The Life Sciences and Bioengineering Center is expressly designed for collaboration. The center is actually two buildings linked by a connecting structure. A former industrial building will house faculty offices, with space available on the first floor for tenants. A new building will have laboratories, shared research facilities, and some tenant space. Conference and break rooms will be located in the connector.

The lab space of open bays with rows of benches will be allocated based not on department affiliation but according to research interest area. Researchers and graduate students will work side by side with others who are tackling similar problems, but from different directions or with different techniques.

In addition to lab benches, each wing will have small offices for graduate students, shared equipment, and specialized facilities, such as warm and cold rooms, tissue culture rooms, a microscopy suite, and facilities for laboratory animals. Space in the lower level has been allocated for a magnetic resonance imaging (MRI) research laboratory.

Planning is already under way to determine how best to reuse the space that will be left vacant by the move. Goddard Hall is likely to house an undergraduate life sciences education center—with teaching labs in biology, biochemistry, biomedical engineering, and biotechnology—while space in Salisbury Labs may be used for new classrooms and offices—both in short supply on campus.

What is not lacking at WPI these days is enthusiasm for the Life Sciences and Bioengineering Center and for the statement it makes about WPI’s future. “It’s a very focused point that we can look to,” Simpson says. “The building, the commitment of WPI to put money into it, the commitment of the faculty to pick up and move their labs there—all that is a reflection of the fact that we are moving ahead in an area that will really bring a great deal of recognition to the university.” ■

Textiles to Technology

BOILER HOUSE

1899

SAFETY FIRST
ALWAYS

Gateway Park, a potentially \$250-million, 11-acre mixed-use life sciences complex, is just one of a number of high-end development projects downtown—including CitySquare, a new courthouse, and a new Hilton hotel—poised to turn around a city that has struggled to find its rhythm.

Indeed, the economic development drivers in central Massachusetts agree: Worcester is a city on the move. How else do you account for all the cranes downtown? Or the \$1.3 billion that developers are pouring into the city's numerous ongoing projects?

"The magnitude of this investment, both public and private, signifies the renewal and rebirth of Worcester," says City Manager Michael O'Brien. "These projects reveal a new sense of community pride and confidence."

"Gateway Park is a piece of the much larger puzzle," adds David Forsberg, president of the Worcester Business Development Corporation. "What excites me most is that it's not just going to be a biotech park, but the building of a community, based in the life sciences."

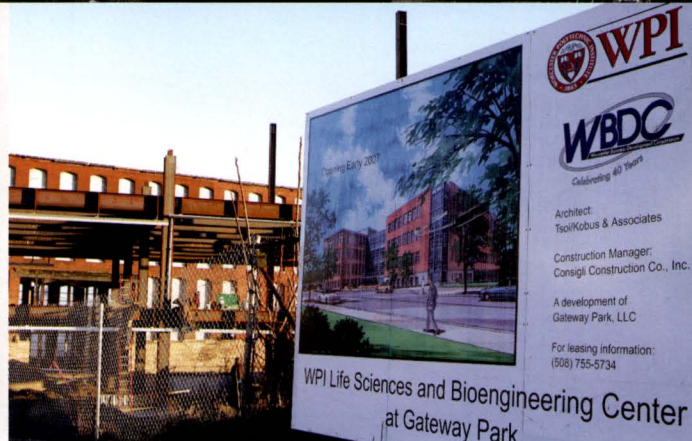
Gateway Park, a partnership between WPI and the WBDC, aims to reclaim the region by turning brownfields into state-of-the-art life sciences facilities. "The fruits of Gateway Park will be more than jobs and real estate improvements," says President Dennis D. Berkey. "The research and graduate training carried out in its facilities, and the collaborative relationships developed across constituencies in this park, will strengthen our labor force, fuel our life science companies, and enhance WPI's research capabilities."

Located on a parcel of land that previously housed some of the city's old factories, Gateway Park is a transition to the region's future, as well as a fitting tribute to the past.

"It will be a place where life-changing advances in science and medicine will meet the precision manufacturing our city has long been known for," says U.S. Rep. James P. McGovern.

The Life Sciences and Bioengineering Center at Gateway Park will create an estimated 300 jobs and will provide the city with more than \$250,000 in tax revenue, a significant increase over the taxes collected on the vacant building. The space, located at 60–68 Prescott Street, will primarily house the WPI Bioengineering Institute and other university programs. Additional life sciences-related companies will also occupy the new building.

"Placing our researchers alongside these businesses will create a dynamic synergy in the area," says D'Anne Hurd, vice president for business development at Gateway Park and WPI's general counsel.



Hurd—whose background includes a number of VC-backed technology and biotech companies—began her new WPI post earlier this year. She is responsible for attracting tenants and other partners to Gateway Park. "We are simultaneously investing in the future of the life sciences field and the economic vitality of Worcester," she says.

The partnership between WPI and the WBDC represents a nationwide trend in which universities and their hometown cities are seeking creative ways to work together. "We're all in this together," says Steve Hebert '66, university vice president. "This has been a win-win for everyone—for the WBDC and WPI, for Gateway Park LLC, and for the city and state."

In fact, the project has already garnered recognition. In June, the Environmental Business Council of New England will present its Brownfield Project of the Year Award to Gateway Park.

The Life Sciences and Bioengineering Center comprises a piece of the larger Gateway Park. Once completed, the complex will include housing, shops, and restaurants. Most important, it will provide jobs—an estimated 2,500—that will create residual economic activity.

"Gateway Park is important for the transition to the new [biotechnology] industry," says Worcester Regional Chamber of Commerce president Richard Kennedy '65. "I come from a traditional industry background, and those types of jobs just aren't here anymore."

Through Gateway Park and the other development projects, city officials hope to keep one of Worcester's biggest assets: its 30,000 college students. "As the economy changes, businesses want to be where there are well-trained, well-educated people, of which we have a plethora," says Mayor Timothy Murray. "We want to market that and build upon it."

The project will also soften an area that, until recently, has been heavily industrial. By putting a new face on the entry point to Worcester, many people (140,000 cars drive along Interstate 290 every day) will begin to see a revived city. "People are used to seeing the backs of old buildings," says state Sen. Edward Augustus. "But now they will see a very different picture of Worcester. They'll see more modern buildings with glass, green space, and housing. It's going to give Worcester a different kind of aura." —CW

A photograph of a waterfall with a person's arm in the foreground. The waterfall is on the left, with water splashing. The person's arm, wearing a purple long-sleeved shirt, is on the right, reaching towards the water. The background is a lush green forest.

Tapping Solutions

By Eileen McCluskey

Access, or lack thereof, to good, clean water is reaching global crisis proportions. Each month, 200,000 people in developing nations die from water-borne diseases, many of which are preventable. Through their different approaches, George Oliver '82 and Dean Kamen '73 share the same sense of urgency to solve this worldwide problem.

▲ George Oliver soaks up the view at the Atlantic Salmon exhibit at the New England Aquarium in Boston.



[Photography by Patrick O'Connor]

They come to the issue from different backgrounds, yet Dean Kamen and George Oliver are working toward the same goal. Kamen, founder of DEKA Research and Development Corporation, takes the one-on-one approach. His solution to the water scarcity problem comes in the form of a 225-pound purification system, which, through innovations closely guarded by DEKA, can be operated and maintained by anyone. Though it is still under wraps as DEKA finalizes its entry to market, this black box takes vapor compression distillation technology, like that developed for submarines, to a small scale with greatly improved efficiency over traditional distillation.



Photo courtesy of DEKA

“This technology can enable financial and social change in the developing world,” says Kamen, who holds an impressive track record for inventing products that take off—some literally. Perhaps his best-known invention is the Segway® Human Transporter. Kamen also invented the INDEPENDENCE® iBOT® 4000 Mobility System, a wheelchair that climbs stairs and traverses uneven terrain.

Kamen envisions water entrepreneurs across the developing world, armed with the DEKA box, making a decent living by selling water in their villages.

“We could wait decades for the developing world to build all the necessary infrastructure,” Kamen says. “Or, you can take this box, put the hose on one end into anything wet, no matter how toxic or dirty, and out comes pure, clean water.”

Oliver, meanwhile, comes to the issue via large-scale tactics. The president and CEO of GE Infrastructure Water & Process Technologies has spent the last four years expanding the corporation’s water scarcity-related business, mainly through acquisitions of leading water purification and processing companies. GE’s strategy encompasses the global proliferation of purification technology that turns seawater into fresh water, as well as the broad adoption of technologies and practices to greatly reduce and reuse industrial wastewater.

“We’re moving fast,” Oliver says. “We have engineers on the ground in more than 50 countries, and are operating well over 200 industrial water and process treatment plants.”



As a leading water purification and processing company, GE's strategy encompasses the global proliferation of purification technology that turns seawater into fresh water, as well as the broad adoption of technologies and practices to greatly reduce and reuse industrial wastewater.

But can Oliver, Kamen, and the world's concerned nations move quickly enough? Some experts have warned that, with dwindling supplies and burgeoning populations, nations may start fighting over water much as they do now over oil. In the Middle East, for example, Israelis and Palestinians draw upon shared aquifers for their water. Both groups have legitimate claims to the water, but as demand outpaces supply, experts question whether the area will succumb to further conflict, or if the groups will be able to peacefully resolve their differences.

But history does not support water war theories, says Marcia Brewster, senior officer with the United Nations Department of Economic and Social Affairs' Division for Sustainable Development. "Historical evidence shows that human beings have generally demonstrated a willingness to cooperate on sharing water, even between nations fighting over other political issues or, for that matter, over gold and other precious resources," she says.

The notion of water becoming the next oil, simply doesn't hold she says. "The two are very different issues. We know, for example, that oil has substitutes. But there is no substitute for water. Access to safe water is widely recognized as a basic human right."

Currently, more than 1 billion people lack access to safe drinking water. Another 2.6 billion people, about 40 percent of the world's population, lack access to basic sanitation. "And we are not talking about taps and toilets in every home," says Brewster, who spoke at WPI's Water Management Challenges and Solutions conference in June 2004.

Indeed, the World Health Organization defines adequate access as just 20 liters—five gallons—per person per day, within one kilometer walking distance from the home. Compare this modest requirement to typical household water consumption in the United States, which averages 74 gallons per person per day.

Last year, the U.N. launched an international "Water for Life" decade, calling on the international community to redouble its efforts to make safe drinking water and sanitation

available to everyone. U.N. officials hope to halve the proportion of people without access to these two basic needs by 2015.

Of course, it would be better if water supplies were accessible in the first place. GE sees two major ways to ease the water shortage now, and solve it in the future. "Our strategy is to desalinate seawater to supplement the supply of fresh water," says Oliver. "At the same time, we're working to better manage existing supply."

Typically, Oliver notes, industries waste 80 percent of the water they use. To urge its customers toward increasingly efficient water consumption, GE publicly recognizes industrial clients, via its Ecomagination awards, when they achieve considerable savings. Ford Motor Company, for instance, won a 2005 Ecomagination award. Using a GE antifoaming agent during its discharge process, Ford reduced water consumption by 230,400 gallons per year at its Kentucky Truck Plant in Louisville.

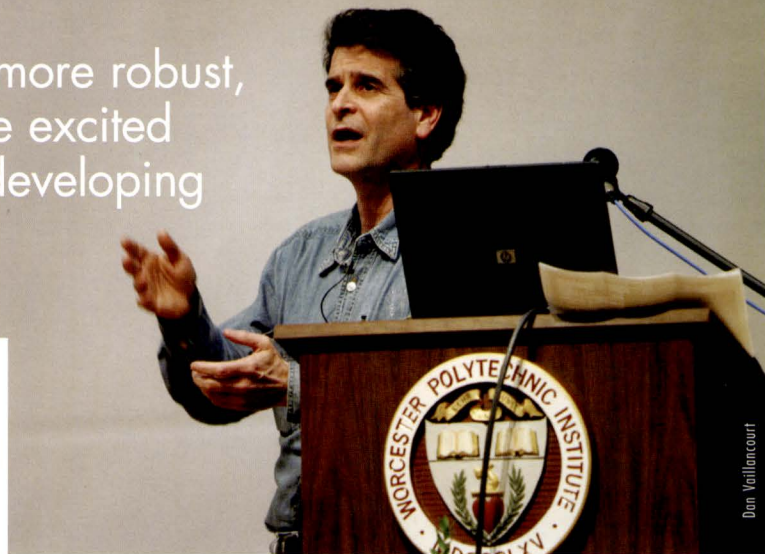
GE has also plunged into desalination technology to swell available water through reverse osmosis (RO) technology.

RO has been around since 1959, but the polypropylene membranes at the heart of the process have rapidly evolved. Through recent acquisitions, GE Infrastructure Water & Process Technologies is demonstrating the corporation's commitment and confidence in desalination as the wave of the future.

Using reverse osmosis, high-pressure pumps push seawater or brackish water across the membranes, which remove contaminants down to the ionic and molecular levels—from salts and sugars to bacteria and viruses.

Though highly effective—RO removes more than 99 percent of contaminants—the technology's spread has been hindered by high energy consumption and waste water levels. "In the typical desalination plant today," Oliver says, "50 percent of operating costs go to the energy it takes to pump the water across the membranes." RO recovers only 5 to 15 percent of the water entering the system.

“As the technology has grown more robust, I have become more and more excited about its ability to help solve developing countries’ water shortages.”



Don Vaillancourt

For now, this process is attractive only in the Middle East, where electricity is inexpensive. A GE-engineered and -operated RO plant in Algeria, for instance, slated to go online in 2007, will supply the city of Algiers with 25 percent of its water.

While GE runs plants like the one in Algeria, “We expect to accelerate the technology’s advancement by continually leveraging our materials science expertise,” Oliver says.

Ramesh Rengarajan, general manager of GE Global Technology, works on desalination’s front lines. In the coming decade, “desalination processes will see 20 percent greater efficiencies, and will be cost-efficient even for energy-expensive regions,” he predicts. “New chemistries, new materials science, and new molecular structures will reduce pressure requirements for RO membranes.” Pumps, too, will grow more efficient, while reduced friction and recaptured pressure will lower necessary energy levels. “The emerging membrane designs, engineering designs, and technologies will drive significant energy savings and reduce the waste discharge. This will put RO technologies ahead of traditional methods in use today.”

For DEKA’s little black box, however, energy consumption is not the issue. The water purifier processes 10 gallons of water an hour using just 600 watts, or less than 3 percent of the electricity required for traditional distillation.

This efficient purifier will weigh just 225 pounds when it’s released, so that a couple of reasonably strong individuals should be able to haul it to the nearest water source. It should also be relatively affordable and durable, Kamen says. DEKA estimates its manufactured cost will be about \$1,000, while preliminary tests indicate a five-year life in the field.

“The remaining questions are social and political,” says Kamen. Also electrical. The box, though no energy hog, needs an electrical outlet to run. This fact will place some

limitations on its use in developing countries, although, according to DEKA, many poorer nations have more reliable and widespread electrical infrastructure than they do clean water. Kamen remains steadfast: “We need to get this into people’s hands.”

To that end, says Kamen, “We’ve met individuals who think this is worth a shot. We’ve assembled a 501(c)(3) organization, and we’re receiving serious support from some well-recognized global leaders. We expect to roll out this new technology, and test out the idea by summer 2006.”

While their approaches differ, both Oliver and Kamen see hope for the world’s water ills. For Kamen, the ability to place pure water technology in the hands of individuals increases by the day. “As the technology has grown more robust, so that it can handle any type of water,” he says, “I have become more and more excited about its ability to help solve developing countries’ water shortages.”

“The water crisis absolutely can be solved,” Oliver declares. “In the four years I’ve been building out GE’s water scarcity business, I’ve seen awareness of the issue expand tremendously. When we recognize the problem, we converge around the problem to solve it. Increasingly, ways to reuse, reduce, and recycle will become the infrastructure, rather than an afterthought.”

Brewster, too, looks toward the day when such responsibility is the norm. The current crisis, she says, “is preventable, if we begin now to respect water and stop wasting it. We need to place basic human needs at the top of the priority list. Then we can accomplish great things.” ■

By the numbers

2.6 billion people lack access to basic sanitation

7 million people die each year from water-borne diseases

1.5 billion people lack access to clean water

74 gallons of water is the average amount consumed by each American, per day

5 gallons is the amount of water a person needs per day, as determined by WHO

1 percent of Earth’s water is drinkable

A photograph of two men standing in a water treatment plant. The man on the left is wearing a dark suit, a white shirt, and a patterned tie. The man on the right is wearing a light blue button-down shirt, a dark tie, and dark trousers. They are standing in a large industrial space with large blue pipes and machinery in the background.

Worcester Water Fact Sheet

Konstantin "Dino" Eliadi '72 (**'81 MS, '87 MBA**),

Director of Water & Sewer Operations,
Worcester Department of Public Works

Philip Guerin '82, Director of
Environmental Systems, Worcester DPW

Responsible for

- 23 million gallons of water delivered daily to DPW customers
- 10 surface reservoirs (7-billion-gallon capacity)
- 41 square miles of watershed area
- 50-million-gallon daily capacity treatment plant

Bottle or Tap?

- Eliadi refills a Poland Springs bottle with Worcester tap water.
- Guerin drinks Worcester water, but says, "My neighbors warn me not to touch it, or even shower in it!"

Who's Watching

By Joan Killough-Miller

[Photography by Patrick O'Connor]

In an old brick building on East Worcester Street, just off Shrewsbury Street, Phil Guerin '82 and his boss, Dino Eliadi '72, work to safeguard Worcester's drinking water. They do daily battle against the usual challenges: microbial pathogens, chemical contaminants, water main breaks (old hat, to them), and the occasional phone call about "funny-looking" water. They also face newer pressures—from real estate developers, environmentalists, terrorists, and an increasingly vigilant public.

Eliadi calls water the "blue collar" of utilities. "People don't flinch at paying \$30, or even \$50, a month for cable TV. But water is their most important utility. They think you just turn the tap and it comes out," he says. "You could find ways to live without electricity, and surely without cable. Water, there's no option. You have to have water."

Guerin, a buff of Worcester's rich industrial heritage, says, "The roots of the water profession are on the construction end. Back then, you fixed the leaks and made sure the water was flowing. Water quality and public education weren't on anyone's agenda. It was a 'silent industry.' The less people knew, the better."

Today the picture has changed, with vigorous daily testing and mandatory reporting to consumers. "Our ability to find things in the water today is far ahead of our ability to understand what those things may mean for public health," Guerin elaborates. "The big challenge for water systems now is trying to get the public to understand that just because we detect 1.5 parts per billion of this or that doesn't mean it's anything new—or that it's causing anyone any harm."

Safe Water

"We have people who swear that back in the 1930s, Worcester water was the best in the world," Guerin says. "Looking back, we know that there were certainly bacteria, viruses, and parasites swimming in it, but no one knew about those things."

Those who bad-mouth Worcester water today may be recalling the past, when excessive bacterial levels made headlines, and local water was banned on train routes and airplane flights out of Worcester. Ever since the city's new treatment plant in Holden went into operation in 1997, advanced disinfection processes have reduced the need for chlorine while improving protection against microorganisms. The result is safer, clearer, better-tasting water.

"What comes out of the tap now gets compared to bottled water," says Guerin. "If it's not as clear as Poland Springs, we hear about it."

The general public, Guerin says, has high expectations for its water. "At the same time, people don't expect that they should have to pay for it. They see it as something city government should be providing," he says. "The reality is, it's a very fair system: You use it, you pay for it." Local residents pay about \$0.003 per gallon for their water, or, Guerin estimates, approximately \$200 annually.

Part of the problem is that people don't realize what it takes for water to get from a reservoir to their homes, contends Eliadi, citing maintenance and upkeep costs from the treatment plant, the collection of samples for testing, and the repairing of main breaks, for example. "Yes, the end result is

Your Water?

Dino Eliadi '72 and Phil Guerin '82 (pictured at the Holden Water Treatment Plant) explain what it takes to keep Worcester water drinkable, plentiful, and affordable.

that you turn the spigot and you have water, but all the prep time that goes into it should not be taken for granted.”

The industry does not take the work of these alumni for granted. In December 2005, the Massachusetts Water Works Association honored Guerin with its Special Achievement Award, and Eliadi with the Paul F. Howard Award.

Modern demands, antique infrastructure

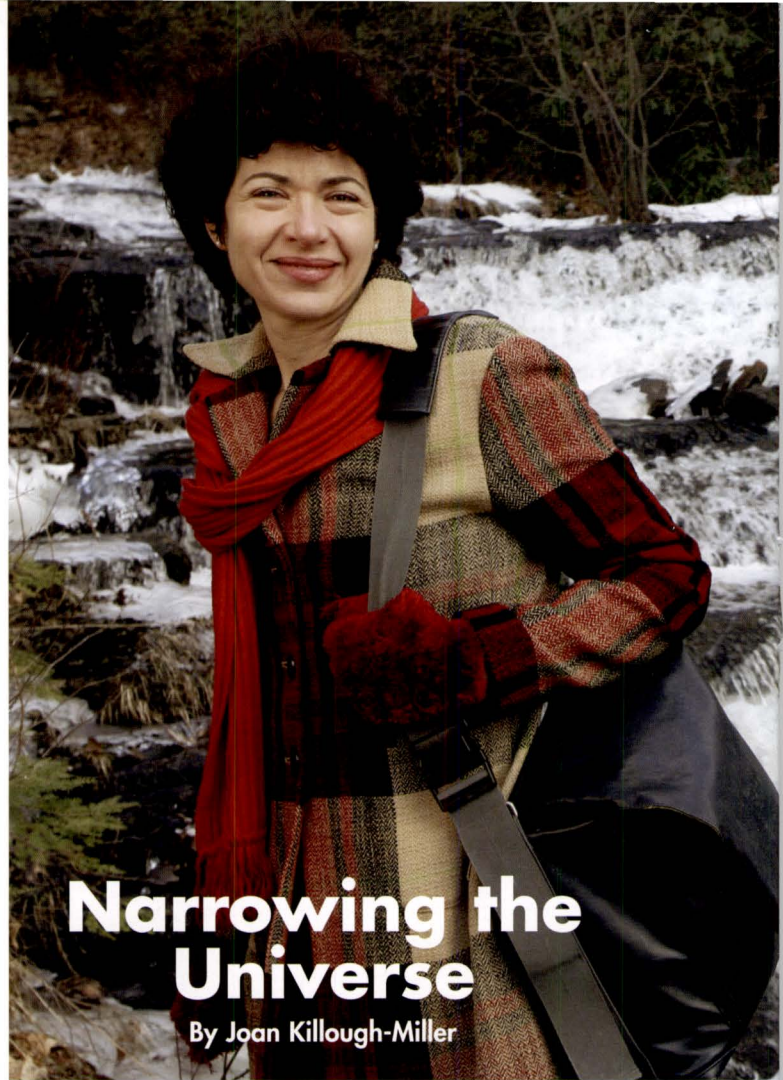
Dating back to 1848, Worcester’s public water system now includes 500 miles of pipes supplying 200,000 customers. “We have some underground pipes from the 1870s that are still in use,” Guerin notes. In the mid-1980s, the water department converted to an “enterprise” system, and must now finance its operations solely with water bill revenues. “I think the cost of water is becoming a big issue,” he says, “not so much the consumer price, but the towns’ ability to keep their water systems operating.”

Water safety begins at the source, and suburban sprawl can pose threats to Worcester’s remote reservoirs. “You have developers in surrounding towns eyeing the watershed—which they see as empty acreage—and drooling,” says Eliadi. “We have to compete against them, either through conservation restrictions or by buying the land outright. Last year we spent over \$2 million to buy huge tracts of land. It’s money well spent for us, because it guarantees nothing’s going to be built, no septic systems are going to be there, and it prolongs the purity of the water. Just because you have a treatment plant doesn’t mean you don’t need some buffer.”

Worcester already had fences and No Trespassing signs in place well before the passage of the Bioterrorism Act of 2002, Guerin notes, and new security measures monitor any irregularities. (See page 14 to learn about two alumni involved in a start-up venture to monitor municipal water facilities.)

Eliadi is nostalgic for the good old days, when “you only had to worry about the guy who used to fish in the reservoirs, and kick him out of there.” He harks back to a time when the department used to distribute student handouts with detailed infrastructure maps to schoolchildren who came in looking for help with homework projects. These days, Worcester’s federally mandated vulnerability assessment report is closely guarded. A single copy was hand delivered to the EPA, where it rests in a locked vault.

Another change is a shortage of qualified engineers interested in safeguarding the local water supply. “Some might not see it as a high-profile, exciting way to make a living. But the problem solving we do is critically important to everyone’s health and safety, and to the economy of the city. It touches every aspect of everyone’s life,” Guerin says. “The interesting—and difficult—part is, you can’t be in the pipes to see what’s going on. You’ve got to collect samples and data to understand what’s happening. Once you’re in the field, you can actually see where there’s real application of those equations that you learned at WPI.” ■



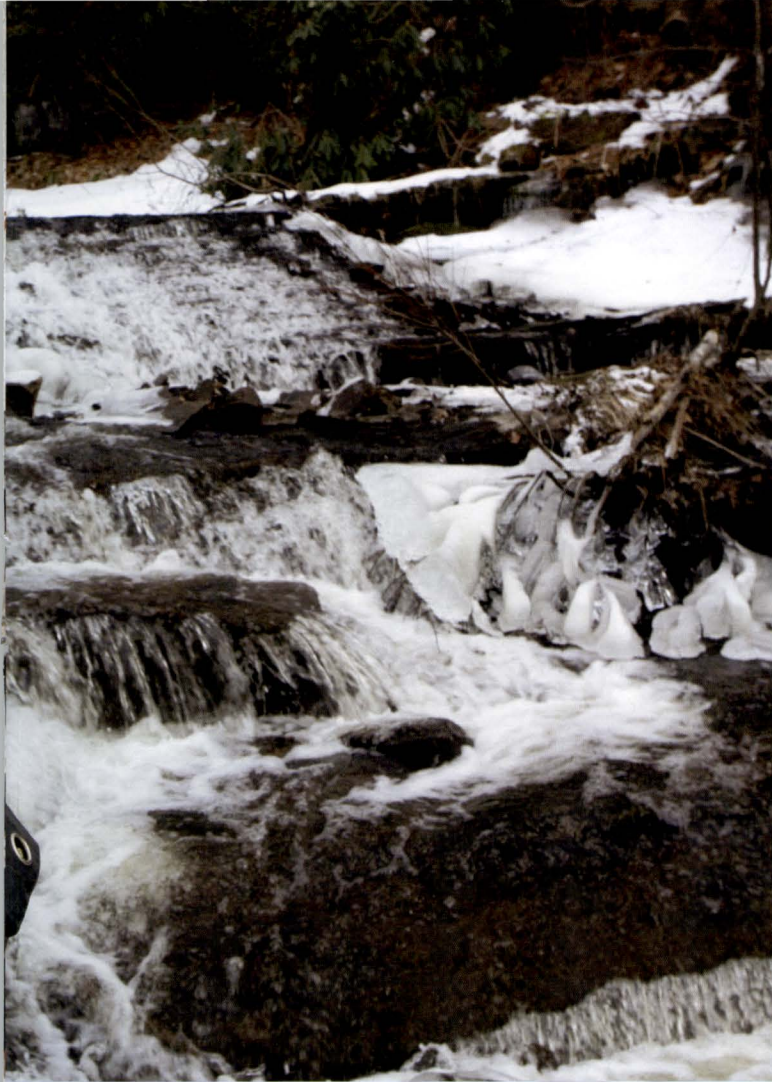
Narrowing the Universe

By Joan Killough-Miller

There are millions of molecules in our water. Which ones should we worry about?

Inspired by a breaking news story in the early 1980s that revealed a leukemia cluster in Woburn, Mass., Jo Anne Shatkin '85 was moved to help people understand how environmental threats could affect their well being. Her IQP analyzed the quality of bottled water, using research conducted in the Worcester DPW laboratory of then recent WPI graduate Phil Guerin '82 (see page 28).

Shatkin’s commitment to public safety and awareness continues today with her work at Watertown, Mass.-based The Cadmus Group, where she consults with private and government agencies to assess the human health risks of environmental contaminants. Much of her time is spent providing technical support for the EPA’s drinking water Contaminant Candidate List (CCL), to determine which contaminants warrant further study for possible regulation. As an adjunct professor in the Interdisciplinary and Global Studies Division, Shatkin has advised student project work to identify health hazards in the Worcester community.



What is the significance of the CCL?

We're trying to identify, and narrow the universe of, potential drinking water contaminants. We then decide which ones are the most important for the EPA to invest its resources in. The chemical universe includes hundreds of thousands of manufactured chemicals. We follow a similar process for biological contaminants, working with a team of expert microbiologists to agree upon a methodology for deciding how to effectively prioritize among microorganisms.

The CCL is published every five years. It directs the EPA's drinking water research for the coming years. Every five years we develop a new list, but we may not necessarily be able to walk away from the prior list. It's a substantial commitment, when something winds up on the CCL. [The EPA then carries out studies to develop analytical methods for detecting the contaminants, determines whether they occur in drinking water, and evaluates treatment technologies to remove them from the water. —Ed.]

What is risk analysis, and how do you use it to narrow down the data?

Risk analysis is a relatively new field that gathers and analyzes information to evaluate how things behave in the environment, and their potential to impact our health or our

environmental quality. For drinking water, we look to see what could cause adverse health effects and the contaminants that have the potential to occur in water; from there, we build a database of the available information. Then we come up with criteria to prioritize among them. We also consult a range of experts in the field, to compare the results and evaluate how well our models worked. Risk assessment is a tool that helps frame a variety of issues for environmental decision making, not just for drinking water. It can be applied to new technologies, such as nanotechnology, as well as decisions about site usage, such as brownfields, and biological issues.

What are some emerging issues in drinking water safety?

There are recent developments, for instance MTBE (methyl tertiary-butyl ether, a gasoline additive meant to replace lead), which is not highly toxic, but is very mobile. There are naturally occurring substances such as arsenic, which is a carcinogen. There's quite a bit of arsenopyrite, or "fool's silver," in New England's bedrock. There are also localized issues related to the region's role in the Industrial Revolution. However, when we compare the potential for chemicals versus microbiological contaminant occurrence, pathogens become significant concerns, particularly in developing countries where water is less adequately controlled.

How safe is our drinking water, overall?

I think people worry about their drinking water too much. The water quality in the United States is high. The systems are very tightly regulated. Not that there aren't issues in some areas. People worry about tiny levels of things in the environment, when there are big issues in front of them that they could do something about. For example, they might worry about the one-in-a-million risk of getting cancer from low-level pesticides in their water, but continue to smoke cigarettes. Here in New England, our water sources are local, so we have much more control over them than other regions do.

Do you drink tap water?

I do. Millions of dollars are spent to treat it. Why should I buy it and haul it home from the grocery store? I do have a filter on my tap, to filter out lead, which can come from the pipes. Municipal drinking water is more regulated than bottled water. I'm never afraid to drink tap water. Sometimes it doesn't taste great, because they put chlorine in it, but in Worcester, where there's ozone treatment, the quality is excellent.



Reaching Out to Water-Stressed Countries

By Joanne Silver

Water in many parts of the world has become a fragile commodity. The work of Philip Giantris '65 addresses the global need for good, clean, accessible water for all.

No wastewater is too murky, no infrastructure too fragile, and no bureaucracy too clogged for Philip Giantris to seek a solution. He has led training programs in Indonesia on water, wastewater, and solid waste management. In Egypt, he conducted an assessment of the Cairo General Organization for Sanitary Drainage. From Kosovo and Montenegro to Jordan and South Africa, he has aided governments and utilities in improving water systems. At the Water Africa '99 conference, held in Cairo, Giantris spoke about Water for All, South Africa's program to increase private sector participation in the delivery of water supply and sanitation services. Despite the decidedly unglamorous title, the subject gets to the heart of a situation that is approaching crisis proportions throughout the globe. It has been estimated that, for a billion people, this essential resource is compromised—either unavailable or filthy enough to cause serious illness.

"On today's course," Giantris explains, "we are headed for some major water-based catastrophes in the underdeveloped and developing world. We may see incidents of water system failures that will cause deaths in the tens of thousands. The movement of populations from rural to urban or peri-urban areas in the developing world continues at a rate that is not understood in the Western or developed world. The

estimates are one million people per week. It is straining water supply systems around the world, and at the current rate of capital investment is a recipe for disaster."

Belief in the global necessity for good, clean, accessible water motivates Giantris in the work he does. During the past four decades, he has combined his passion for water with what he learned at WPI and Boston University, where he earned his M.B.A., to tackle a wide range of projects. Numerous American municipalities, as well as a dozen countries scattered over four continents, have benefited from his expertise. Through his company—Valu Add, a small consulting practice based in Tirana, Albania, concentrated on the water supply and wastewater sector in developing countries—Giantris is keeping his promise to his mother to give back to his family's native land. And he loves what he does. "It is not easy, but it is a dream job," the first-generation Albanian American says.

Giantris has always felt a connection to water. Growing up around the corner from the Worcester YMCA, he learned to swim at the age of 8, and competed in swimming through his college years. At WPI, he worked at the Alden Research Laboratory in Holden (*see page 48*); although the majority of projects there involved water, Giantris recalls one particular experiment in which he tested two rectangular blocks of



[Photography by Albes Fusha]

Philip Giantris, at Albania's first wastewater treatment plant with the facility's director, Hysni Shamata, tackles the social and political aspects of water management.

Through his consulting firm, Giantris, seen here in Tirana's Skanderbeg Square, gives back to his family's native country of Albania.

wood in a wind tunnel to simulate the effect of wind on the planned Twin Towers in Manhattan. Even during his two-year stint in the Army, he was never far from water. In Vietnam, he served as a Port Construction officer, using some of the skills he had gained at WPI as a civil/sanitary engineering major. Twenty years at the Wakefield, Mass.-based water and wastewater firm of Metcalf & Eddy provided him with ample opportunities to explore a field as it was being transformed by new federal regulations. Now, as a resident of an oceanfront home on Southport Island, Maine, Giantris and his wife often find themselves mesmerized by the view. "As crazy as it sounds, my wife and I are like children, who, every day, see the ocean as if for the first time," he says.

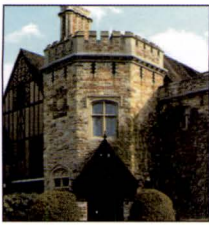
Water never represented a mere technical challenge for Giantris. He has always focused on the people who are affected by the issues he addresses. "Overall," he says, "we need to better protect our resources and manage the demand for water in a more enlightened and informed way. Through our continuing disregard for the environment, we constantly strain and pollute our water resources and waste water, causing supplies to appear to be inadequate. It is a gift from God, but it is not free."

When Giantris steps in to assist with water issues, he must be fluid in his approach. The awe that he feels in the

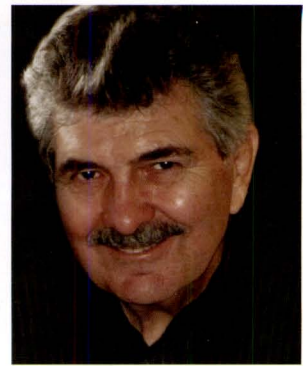
face of the ocean becomes tempered by pragmatic strategies, as he draws upon both his engineering experience and his business acumen. He says, "It is not enough today, in managing public water supply and wastewater infrastructure, to be technically accurate and operationally reliable. Water supply and wastewater utilities must also be commercially competitive and financially self-sustaining."

How does Giantris decide what approach to take? "At the simple level, it is training," he responds. "But water is much more complex than that, and therefore it requires a philosophical change in the way governments address this essential public service. It is important, when you take on an assignment, to quickly try to figure out who or what is really driving this interest. Who are the stakeholders, and what do they want out of it?"

Then the hard work can begin. Business plans can be developed, manuals written, water analyzed and accounted for, regulations reviewed, contracts prepared. The possibilities are extensive, the obstacles even more so. Philip Giantris remains upbeat. In the midst of his work in the Balkans, he thinks back 40 years and says, "I survived WPI academically through persistence—not necessarily brains—and it continues to serve me well here in Albania." ■



AlumniConnections



Morgan Rees '61 became the 62nd president of the Alumni Association during Reunion weekend last June. He and his wife, Janet, reside in Florida and Ohio. An active alumnus, Mo Rees has served as a member of his Class Board of Directors and the President's Advisory Council, as chair of his 40th Reunion Class Gift Committee, and as a Reunion volunteer. He shares his thoughts as Association president:

What are your goals for the coming year?

Volunteerism or increasing alumni involvement with WPI is one of our two principal objectives. During recent meetings of the Class Boards of Directors meeting and the Alumni Leadership Council, we discussed different ways to increase alumni involvement. A critical part of this effort is reestablishing an extensive Regional Club Program. Under the leadership of Joe Ferrantino '67 and Roger Lavallee '73, the Hartford-Springfield Club is up and running, and groundwork for other clubs is under way in New York, Washington, and southern New Hampshire. We hope to add several clubs each year. Other volunteer opportunities include participating in class activities and GOLD (Graduates of the Last Decade) events, or becoming an Alumni Ambassador to represent WPI at a high school or college fair. In the coming months, the Alumni Association Cabinet will publish a list of other specific volunteer opportunities.

Tell me about the Regional Club program.

Over the past few years, regional events have been sponsored in the Boston area, Cape Cod, Hartford, Providence, New York City, Washington, D.C., California, and Florida. Events have focused on discussions with WPI faculty, theater outings, and sporting activities. In connection with revitalizing the Hartford-Springfield club, Joe and Roger and their committee created a template for how to launch a Regional Club. Efforts will focus on four regional clubs in 2006 to allow us to refine the operating model. Anyone looking to help with these activities should contact the Alumni Office. We welcome your ideas on events and target cities.

What's your second principal objective?

Career development, support, and mentoring is an important initiative launched by the Alumni Association within the last two years. Led by Bill Krein '62, we are working to strengthen this program, which links alumni seeking new employment with alumni who have employment opportunities. It also

matches those making a career change with other alums who can provide career mentoring on a confidential, one-to-one basis. Job listings are now posted in *The Bridge*, the monthly alumni e-newsletter. The response to the Career Development Program has been extremely positive and we have opportunities for many more alumni to assist us with organization and implementation.

How can alumni keep up to date on Association events?

There are a number of ways. The Alumni Association Web site, alumni.wpi.edu, is the best single source of information on alumni activities. It contains information on events, reunions, class Web sites, the organization of the Alumni Association, and more. I encourage folks to bookmark the site and visit it often. *The Bridge*, the monthly alumni e-newsletter, provides an ongoing link to WPI for alumni and friends and helps to keep them informed about association activities as well as news and events on campus. New subscribers may sign up for *The Bridge* at wpi.edu/+bridge. Right now, fewer than 4,000 alumni receive this e-newsletter. I'd like to set a goal to increase that to 6,000 by the end of 2006. We also believe in continuous improvement and strive to provide relevant information to our alumni. We have posted a survey at alumni.wpi.edu/News/Bridge/Survey that seeks feedback on how we communicate. The survey covers *The Bridge* and other forms of electronic communication.

How will you define the success of your presidency?

We can define success by continuing the culture of service to WPI and to all alumni that has characterized the Alumni Association leadership for many years. In my relatively brief time as an Association officer, I have been impressed with the quality and quantity of effort and dedication to WPI by the Association officers, cabinet members, and other volunteers. As long as this culture continues, the Association will thrive. In recognition of this dedicated service, we will highlight the contributions of various cabinet members in forthcoming issues of *The Bridge*. We can also define success by achieving the principal goals I described earlier. I believe these two initiatives will go a long way toward providing valuable services to all alumni and continuing the legacy of excellence at WPI.

For more information on the programs and activities listed, contact alumni-office@wpi.edu or 508-831-5600.

Happy Returns

Former Director of Alumni Relations **Beth Howland** returned to WPI in February as assistant vice president for alumni relations and annual giving. She joined WPI as a senior development officer in 1998, and was promoted to director of alumni relations in 2002. In 2004, she was recruited to Amherst College as associate director of major gifts.



Howland's new role is a merger of two positions, the previous directorships of alumni relations and of annual giving. She holds an associate's degree in

medical technology and a bachelor's degree in health education from the University of Vermont and a master's in professional higher education administration from the University of Connecticut.

"I am so pleased to be back at WPI. I look forward to reconnecting with our alumni as we continue to build and strengthen our programs. This is a unique community of which I am proud to be a part."

Howland and her husband, David Gouin, live in Brimfield, Mass., with their beloved chocolate lab, Hershey.

"I am so pleased to be back at WPI. I look forward to reconnecting with our alumni as we continue to build and strengthen our programs."

— Beth Howland

Spotlight on Alumni Volunteers

Paula (Fragassi) Delaney '75 chairs the Lifelong Learning Division of the Alumni Association Cabinet. The division's mission is to provide traditional and nontraditional learning opportunities for alumni at all stages of life. "My goal is to work with the other divisions, particularly the Regional Clubs, to add an educational component to programs and activities," she says.

Paula's career has kept her close to the educational environment, working in WPI's Computing and Communications Center, and at several area colleges. She recently became acting registrar at WPI.

"As students, what we did here at WPI was learn how to learn," says Paula. "Now we need to provide opportunities for continued learning experiences for our alumni." Topics can range from career development and graduate education, to investment management and retirement planning. The Alumni College program at Reunion offers updates on the research specialties of the WPI faculty. The division also supports programs external to WPI, such as the RE-SEED program, which recruits and trains alumni to bring their science and technology skills into middle school classrooms to assist teachers.

One of Paula's priorities is to find ways to leverage WPI's information technology resources to facilitate the work of the Alumni Association. She is exploring existing software packages to create an online community for alumni volunteers, where committee members can communicate easily and share documents. Web and telephone conferencing are other technologies that can empower alumni groups who may be scattered around the country.



New volunteers and fresh ideas are always welcome. Contact Paula at pdelaney@wpi.edu, or go to alumni.wpi.edu and click on the Careers link to learn more about Lifelong Learning opportunities.

"My goal is to work with the other divisions, particularly the Regional Clubs, to add an educational component to programs and activities."

— Paula (Fragassi) Delaney '75

Class Notes

Staying Connected with Old Friends

Material for Class Notes comes from newspaper and magazine clippings, press releases, and information supplied by alumni. Due to production schedules, some notes may be out of date at publication, but may be updated in future issues. Please allow up to 6 months for your news to appear in print. Submit your Class Note at www.wpi.edu/+Transformations or alumni-editor@wpi.edu. You may fax it to 508-831-5820, or mail it to Alumni Editor, Transformations, WPI, 100 Institute Road, Worcester, MA 01609-2280.

1950s

Correction: The Duryea race car designed by the grandfather of **Clayton Roberts '50** was built in 1892, not 1842 as we stated in his class note. Thanks to **Bob Martin '39** for pointing out the error, and for informing us that the late **Richard Messinger '40** worked with Frank Duryea to restore one of the early cars for a 50th anniversary celebration.

Paul Snyder '53 was awarded the 2005 Environmental Partnership Award by the Northeast Pennsylvania Environmental Partnership. He has taken on numerous roles in retirement, including board member of the Tobyhanna Creek/Tunkhannock Creek Watershed Association, volunteer coordinator of the Stream Watch Program, and monitoring coordinator for the Northeast office of The Nature Conservancy. Gov. Edward G. Rendell wrote to Paul, "You have proven the tremendous impact that one person can have on the world, and I thank you for helping us keep Pennsylvania beautiful for generations to come."

1960s



Richard Brewster '60 represented Mercy Ships as photographer at the inauguration of Liberian President Ellen Johnson-Sirleaf. He serves aboard the Mercy Ships hospital vessel *Anastasis*, along with his wife, Ellen. They recently celebrated their 40th wedding anniversary on shipboard, by purchasing ice cream for the almost 400-member crew. He has also coordinated service projects with his local Rotary Club, bringing 500 wheelchairs to needy people in Sierra Leone, visiting

Rotary Clubs all over Scotland to drum up support for the planned visit of the *Anastasis* to Dundee, and raising funds for new water wells in Monrovia, Liberia. "Our three daughters have blessed us with five grandchildren," he writes. "Retirement has been the most exciting and fulfilling time of my life!"

Jesse Erlich '62, a partner with the Boston law firm Perkins Smith & Cohen, was ranked among the top 5 percent of Massachusetts "Super Lawyers" for the second year in a row. The listings are published annually in a supplement to *Boston Magazine*. Jesse, a specialist in intellectual property, is a former president of the Boston Patent Law Association and an appointee to the United States-Israel Science and Technology Commission Task Force. He also serves on the board of the National Defense Industrial Association's New England Chapter and the advisory council of the National Institute of Justice. This year Jesse and his wife, Laura, became grandparents.

Al LaPrade '66 is chief engineer for the Mount Washington Cog Railway. His work was detailed in a recent story in *Railfan & Railroad* magazine.

Robert Sinuc '66 joined Cyclics Corp. as vice president of manufacturing. He will direct manufacturing in Germany and lead efforts to site future plants.

Pete Picard '67 retired from a 32-year career with the Federal Highway Administration in 1998. He then served as executive director of the Nebraska Concrete Paving Association. He retired in 2001 and moved back to New England. "I'm now doing a few fun retirement tasks and some consulting, but primarily assisting my wife, Nancy, with her in-home antiques and collectibles business," Pete writes.

WPI Transformations: Submit an Item for Class Notes

WPI Transformations

Class Notes

Submit an Item for Class Notes

New job? New baby? Got married? Same old stuff? Tell us what's happening in your world. Please include your sponsor's full name when sending along wedding or birth announcements.

Transformations reserves the right to edit class notes for style, clarity and length. We endeavor to print all class notes we receive in the magazine. If you wish, you may also submit your news by e-mail (alumni-editor@wpi.edu), by fax (508-831-5820), or by mail (Alumni Editor, Transformations, WPI, 100 Institute Road, Worcester, MA, 01609-2280). No phone calls please; information must be in writing.

Picture It! While you're at it, why not send us a photo of yourself for publication. Photos in electronic format may be e-mailed to alumni-editor@wpi.edu. Prints or slides should be sent to Alumni Editor, Transformations, WPI, 100 Institute Road, Worcester, MA, 01609-2280. Please identify each person in the photo. Make a note on the back if you would like your original photo returned after publication.

Double Duty. With one click, you can send your class news to Transformations and post it on the Transformations Web site. We'll only post your note online if you so indicate.

Your name: _____
Your primary class year: _____
Other class year(s) and degree(s): _____
Your e-mail address: _____
Would you like your e-mail address to appear with your class note? Yes No
Your home address (not to be published): _____
Is this address new? Yes No
Your business address: _____

John Trudeau '68 joined the University of California Santa Cruz Extension as director of Engineering and Technology/Business and Management Programs. His business development experience includes positions at Hewlett-Packard and Apple Computer.

1970s

William Coblentz '70 married Randi Marla Cohen on Sept. 18, 2005. He works for DARPA in Arlington, Mass.

Jack Keenan '70 was elected senior vice president of generation and chief nuclear officer for Pacific Gas and Electric Co. in San Francisco.

Peter Rado '70 was promoted to vice president of worldwide operations and quality at Silicon Image in Sunnyvale, Calif.

Phil Sharry '71 joined Xenon Corp. as vice president, worldwide sales and marketing.

Edward D'Alba '73 was honored for his work with the Chamounix Mansion International Youth Hostel, located in Philadelphia's Fairmount Park. D'Alba, president and CEO of Urban Engineers, has been active in local conservancy issues.

Norton Bonaparte '75 was elected president of the New Jersey Municipal Management Association. He continues as city administrator of Plainfield, N.J.

Robert Donle '75 was profiled in *Hawaii Business* magazine's list of leading executives. The vice president of operations for Nordic Construction Ltd., he served as project manager for the state's tallest building, the First Hawaiian Center.

Raymond Houle '76 married Debra Bessette on Aug. 13, 2005. He is vice president of H. B. Precision Products.

Tom McAloon '76 is principal consultant for PA Consulting Group of Washington, D.C. He is working in Tbilisi, Georgia (a former USSR republic), for the Georgian United Electric Distribution Company, organizing and managing its wholesale and retail metering installation programs. Tom started working overseas in 1994 in the humanitarian relief and international development sectors, after 10 years as chief engineer of Pennichuck Water Works in Nashua, N.H. He and his wife of 21 years, Beverly, have also lived and worked in Azerbaijan, Kosovo, Afghanistan, and Iraq.

Mike Ahern '78 was recently promoted to vice president, Utility Group, at Northeast Utilities in Hartford, Conn. His new role includes responsibility for distribution engineering, IT, customer services integration, training, revenue stream operations, corporate transportation, and emergency preparedness.

William Alexander '78 founded Precision Machine Tools in 2002.

Robert Brown '78 was inducted into the Ben Franklin Society of PIA/GATE, a new group formed by the merger of two separate societies of the Printing Industries of America and the Graphic Arts Technical Foundation. Brown is CEO of Goss International.

Roland Roy '79 works for Pratt & Whitney Power Systems as regional director of after-market sales. He lives in Cheshire, Conn., where he has been active on the environmental commission.

1980

Gareth Kucinkas and his wife, Deborah, teach math and science in the Baccalaureate Diploma Programme of the College Alpine International Beau Soleil in Villars-sur-Ollon, Switzerland, where they live with their son, Asa. "While the teaching is a wonderful challenge," he writes, "the real fun is in managing a dormitory of 20 boys and participating in all the activities and adventures available at this type of school." Gareth recently returned from Tanzania and Kenya, where a group of 92 students, faculty, and alumni climbed Kilimanjaro.

In the Public Eye

The **New York Times** Sunday magazine featured an article on the career of **Bernie Tetreault '60**, who has spearheaded programs for affordable housing. A veteran of the Montgomery, Md., and District of Columbia housing authorities, and founder of the

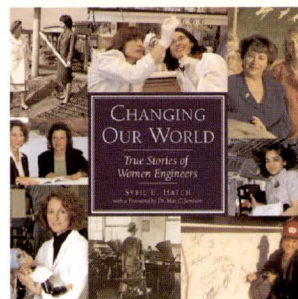
Innovative Housing Institute, Tetreault was praised as "an accomplished creator of homes for the poor," who, unlike other housing advocates, doesn't "wax utopian," but "grounds his conversations in hard numbers and terse sentences." ... **Dave Emery '70** threw his hat back into the ring for **Maine's 2006 gubernatorial election**, after a fellow Republican candidate withdrew. He is a former state legislator and U.S. representative ... **Maryann (Bagdis) Goebel '73**, chief information officer for GM, was named one of 100 Leading Women in the North American Auto Industry by **Automotive News** ... National Institute of Aerospace president **Robert Lindberg '74** was interviewed by **Aerospace America** on the future of NASA programs, new space technologies, and graduate education ... **Gregory Koss '78**, CEO of Savaje Technologies, was profiled in **Mass High Tech** recently ... **Bob Hart '79** was featured in a **Chicago Tribune** article on the career benefits of an MBA degree. After graduating from the business program at UCLA, Hart is senior managing director of Kennedy Wilson Inc., an international real estate and investment firm based in Beverly Hills, Calif. ... the **Providence Journal** celebrated **Noah Forden '90** for his design contributions on the Stardust space capsule, which recently returned to Earth bearing samples from Comet Wild 2 ... Firesafety expert **Glenn Corbett '91** (MS FPE) was quoted in the **Christian Science Monitor** on improving emergency exits from older high-rise buildings ... the **Boston Globe** Sunday magazine featured **Jay Silva '91** with his home wind turbine, which he had installed on the roof of his Scituate, Mass., home.

Changing Our World



Photo by James Keigley, for the Extraordinary Women Engineers Project

Judy Nitsch '75, president of Judith Nitsch Engineering Inc. and WPI trustee, is featured in the new book *Changing Our World: True Stories of Women Engineers*, written by Sybil Hatch and published by the American Society of Civil Engineers (ASCE). The book, launched during Engineers Week 2006 at the National Press Club in Washington, D.C., is the first product of the Extraordinary Women Engineers Project Coalition (www.engineeringwomen.org).



Changing Our World documents the true stories of 238 inspirational women engineers. Nitsch's section describes how engineers at her firm work to make the environment better through ecohydrology, which allows land to absorb rainwater more naturally. In addition to serving as a mentor to the female engineers in her firm, Judy sponsors an annual "Introduce a Girl to Engineering Day," and often speaks to girls about her career.

"Although things continue to improve, the underrepresentation of women in engineering fields is an issue that needs to be addressed," Nitsch says. "By encouraging more young women to pursue careers in this industry, the

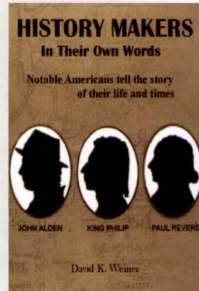
world of engineering can only benefit. I love being able to guide young women toward a career that combines creativity and science, that offers excitement and stability, and that has brought me a level of fulfillment that many only dream of."

Bookshelf

Recent and new publications by WPI alumni, faculty, staff

History Makers in Their Own Words: Notable Americans tell the story of their life and times

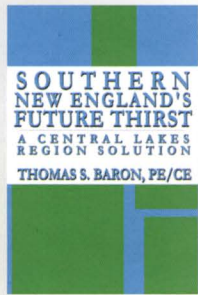
by David K. Weiner '48 *PublishAmerica*



Weiner explores the life and times of three important figures in American history: John Alden, King Philip, and Paul Revere, with fictionalized first-person accounts of the Mayflower crossing, the Battle of Lexington, and other historic events. Instead of the usually tedious facts and dates, these "autobiographies" present their stories in an interesting and easy-to-read manner. Weiner, a decorated veteran of the 44th Infantry Division and former design engineer, took up creative writing and the study of history and genealogy in retirement. He is a published poet and the author of short stories and children's books.

Southern New England's Future Thirst: A Central Lakes Region Solution

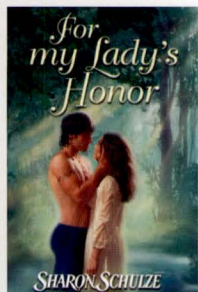
by Thomas Baron '64 *RoseDog Books*



Could Massachusetts's Quabbin Reservoir be built today? Could it provide a feasible model for addressing the water supply and quality issue that the region faces? Thomas Baron, a former military engineer and the retired director of operations for Boston's MDC/MWRA, set out to explore these questions. Rather than looking at solutions that have succeeded in the past, he advocates farsighted regional planning to prevent conflict and competition over limited resources. By sharing in the cooperative development of larger reservoirs, he says, the Southern New England region can realize lower costs, greater efficiency, and environmental gains.

For My Lady's Honor

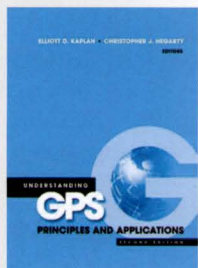
by Sharon (Cottrell) Schulze '80 *Harlequin Historical*



Schulze recently brought to press the seventh installment of her medieval romance series, "The l'Eau Clair Chronicles," which is set in the Welsh Marches in the year 1222. Strong-willed Lady Alys Delamare yearns for a life of her own choosing—which includes the handsome (but landless) knight Sir Padrig ap Huw. Schulze, who was profiled in the *WPI Wire* and has spoken on campus about writing careers, was a finalist in the Romance Writers of America's Golden Heart Contest. She is a four-term past president of the Connecticut Chapter and serves as liaison to the Published Authors Special Interest Chapter.

Understanding GPS: Principles and Applications (Second Edition)

by Christopher J. Hegarty '90 ('92 MS) and Elliott Kaplan *Artech House*



This update of Artech's popular 1996 guide covers the latest advances in technology and applications of the Global Positioning System (GPS). The second edition includes new chapters on the integration of GPS with vehicles and cellular telephones, new classes of satellite broadcast signals, the emerging GALILEO system, and new developments in the GPS marketplace. Hegarty is a senior principal engineer at MITRE Corp. He holds a DSc in electrical engineering from George Washington University and currently serves as editor of the Institute of Navigation's quarterly journal, *NAVIGATION*.



Charles Sullivan was appointed vice president and portfolio manager in Trust Investments at Citizens Bank in Providence, R.I. He was previously vice president of investments for Smith Barney.

1981

Ernie Cormier joined British cable TV and broadband provider ntl. He is based in London as senior vice president of corporate strategy. Before moving abroad, he writes, "Jan and I took a spontaneous 5,600-mile, 14-state driving vacation across the U.S. Our oldest two kids are out of school, living in San Francisco, while our youngest is a sophomore at Smith College. I continue to regard WPI as a key enabler of everything I've accomplished in my career."

Jack Healy is a senior engineer at Environmental Resources Management and an adjunct professor at Naugatuck Valley Community College. He lives in Litchfield, Conn.

Owen Murphy (MS CS) joined the faculty of the University of Arkansas at Little Rock Donaghey College of Information Science & Systems Engineering, which is commonly called CyberCollege. He chairs the information science department.

Greg Phipps is vice president of marketing for Indium Corp. of America in Clinton, N.Y.

1982

Anni Autio was elected ASCE vice president for Zone I. A senior project manager for CDM Federal Programs Corp. in Cambridge, Mass., she is a past president of the Boston Society of Civil Engineers.

James Diemer is managing director of Pace Global Energy Services Division. He continues to reside in Fairfax, Va., with his wife, Maureen, and children, Matthew, 17, and Emily, 15.

Michael Donati and his wife, Michelle, completed the adoption of their 5-year-old son, Alejandro, in July 2005. Their daughter, Michaela, 7, accompanied them to Guatemala to meet her new brother. "They are wonderful together, and he is a joy," Michael writes. The family lives in Newfields, N.H.

Former football captain **Bob Montagna** lives in Attleboro, Mass., where he works for Contracting Specialists. He and his wife, Cheryl, have three sons.



▲ For 23 years, classmates from 1982 have gathered for their annual Christmas Eve brunch, a tradition unbroken since graduation. From left, (kneeling) **Joe Amarello**, **Steve Jolicoeur**, **Todd Dean**; (standing) **Deb Madamba Jolicoeur**, **Gail Miranda Hudek**, **Susan Keegan Amarello '87**, **Donna Martin Dean**, host **Steve Brodeur**, and **Ann Sullivan Schofield**.

Recycle this issue!

Donate your copy of *Transformations* to your dentist's office, auto mechanic, or other locations, so others may learn about WPI.

1983

Don Montgomery moved from the Philadelphia area to San Diego in June 2005, and joined Akonix Systems Inc. as vice president of marketing and customer support. "I am living in Pacific Beach and adapting to West Coast life," he writes.

1984

David Collette was promoted to vice president of manufacturing and technology at Argotec Inc. in Greenfield, Mass. He lives in South Hadley with his wife and four children.

Richard Madamba is vice president and general manager of Thermal Management Systems within AMETEK's Aerospace & Defense division. He is responsible for the company's Rotron Military & Aerospace Products and its Hughes-Treitler business units.

1985

William Astore joined the faculty of Pennsylvania College of Technology as an associate professor of history.

1986

John Bleyer supports National Grid's field operations in the New England area as a senior substation equipment maintenance engineer. His article on power factor testing appeared in *Transmission & Distribution World*.

John Jezowski joined Wachovia Wealth Management as a vice president, relationship manager. He is based in Hartford, Conn.

Mercedeh Mirkazemi Ward and her husband, Bruce, moved to Denver recently. She continues to consult for MGA Entertainment as senior director for girls' and preschool toys. "I also teach 8th grade math to children with learning disabilities, which is a challenge in itself everyday," she writes. "Our son, Kyle, 13, and daughter, Arianna, 11, are on the slopes every weekend snowboarding. We would love to hear from alumni who live in the Denver area."

Cmdr. **Frank Weber** was recalled by the Navy for a three-year assignment as assistant professor in the mechanical engineering department at the U.S. Naval Academy in Annapolis. He also coaches the women's fast-pitch club softball team. Frank, his wife, Tracy, and their two children have settled into their new home in Maryland.

1987



Gary Allen '87 and **Deborah Murphy Allen '88** are thrilled to announce the birth of their fifth child, Roland, on Nov. 13, 2005. He was happily welcomed home by his siblings, Zach, 12, Tess, 8, Ben, 6, and Grace, 4. In January, Gary celebrated his 10th anniversary at Intel, where he is a staff engineer. Deb writes, "I am still taking a break from my career as an actuary to be home with our children... and loving every minute."

Kevin Biernacki married Kathleen Corbin in May, in a private ceremony in Maui. A ceremony and a reception were held in Pittsfield, Mass., on Sept. 15 and 16. Kevin is director of global, environmental health and safety for EMC Corp. in Hopkinton.

William Cotter married Sherrylynn Warner. He works for Garofalo & Associates in Providence.

Keith Noe was made a partner at the intellectual property law firm Lowrie, Lando & Anastasi. He joined the Cambridge, Mass., firm in 2004.

1988

Andrew Bruce joined UtiliPoint International in Houston as vice president of the Trading & Risk Management Practice.

Mike Hartnett is a district construction engineer with the Mass. Highway Dept.

Donna (Grimaldo) Jordan is vice president of quality control and quality assurance at Biovest International.

Lt. Col. **Eric Pauer** serves as commander of the 102 Civil Engineering Squadron at Otis Air National Guard Base in Massachusetts. He is also director of R&D at DTC Communications in Nashua, N.H.

1989

William Bennett continues as vice president, Americas Management, for Brown Brothers Harriman in New York City. He was recently elected to the American Bankers Association Marketing Network Council.

Christopher Ferrari is a project manager at J. W. Peters in Burlington, Wis.

Brian Freeman was awarded the Bronze Star for his California National Guard service in southern Babil Province, Iraq, where he was deployed as team engineer for a civil affairs unit from April 2004 to February 2005. Brian established a model reconstruction program, for which he created database management tools and designed a point source sand filter water purification. He also worked with local Iraqi government and tribal leaders, as well as the U.S. State Department, USAID, and Corps of Engineers. A senior systems Engineer for ITT Gilfillan, Brian lives in Sherman Oaks, Calif., with his wife, Liz, and their two sons.

Kim and Michelle (Townsend) Knight are pleased to announce the birth of their first child, Katherine Michelle, on Aug. 26,

2005. The family lives in a 115-year-old house in charming downtown Rochester, Mich. Michelle has been an attorney at Young & Basile, specializing in intellectual property, since graduation from UConn School of Law in May 2000. Kim is a consulting engineer with Doshi & Associates, performing commercial, industrial, and institutional electrical design.

Frank Ricard and his wife, Jennifer, are happy to announce the birth of their son, Thomas Anthony, born Oct. 22, 2005. His sisters, Emily, Madeline, Caroline, and Sophia, love having a real baby to play with, Frank writes. "But no one is more thrilled than big brother Sam—finally, another boy!" Frank works for GE Energy Services and is the engineering manager at the Twinsburg, Ohio, facility.

1990

Jonathan Bird's new film, "Sharks of the Ocean Desert," a *National Geographic* documentary, premiered at the National Heritage Museum in Lexington, Mass., in October. The event was a benefit for the newly established scholarship program of his nonprofit organization, Oceanic Research Group, dedicated to conservation of the world's oceans through education.



Steven Brightman married Jennifer Martin, Sept. 17, 2005. He is a senior software engineer at Zebra Technologies in Warwick, R.I.

Eric Lindgren joined Honeywell as vice president and CIO for the company's Environmental & Combustion Control division. He and his wife, Ellen, relocated to Victoria, Minn., with their daughter, Noelle, and twin sons Aidan and Brandon, who were born on July 12, 2005.

Gerald Mancini (MS EE) is vice president of engineering at Fidelis Security Systems in Bethesda, Md.



Pennie Turgeon (MBA) left WPI to become CIO and vice president for Information Technology at Clark University.

Neil Urie married Kristin Erickson on Oct. 16, 2005. He owns and operates Bonnieview Farm in Craftsbury Common, Vt., where he raises sheep and produces cheese from their milk. The farm, formerly a Holstein dairy, has been in his family for four generations.



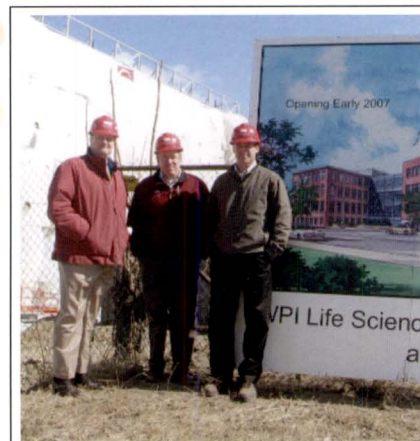
Ker Zhang (PhD), of Orange County, Calif., visited WPI in October, during a business trip to the East Coast. As CEO of Via Telecom Inc., Zhang oversees the operations of this fabless semiconductor company, including its development of software for CDMA (code division multiple access) chips. His successful career in the lucrative wireless communications industry was born at WPI, with the encouragement of professor of electrical and computer engineering Kaveh Pahlavan. Zhang was on a track for a PhD in physics when Pahlavan intercepted. "My whole career is based on that moment when I knocked on Dr. Pahlavan's door," Zhang says. "It has been an exciting career in the wireless industry."

1992

◀ **Kristin (Conley) Resca** competed in the Bikram Yoga International Yoga Asana Annual Competition held in Los Angeles in February. After placing third in the New England regional competition, she was slated as an alternate, until another competitor was injured and had to withdraw only 10 days before the Los Angeles event. Her husband, **Peter Resca '93**, encouraged her to go for it, and although she did not place in the finals, she told the *Sharon Advocate* that she learned much from the experience and would certainly do it again. Kristin and Peter live in Sharon, Mass., with their two children, Lindsay and Tim.

1993

Kimberly (Philipp) Chotkowski writes, "Alex and I welcomed our first child, Emily Alexandra ("Lexi"), into the world on Oct. 5, 2004. It was an eventful time since daddy was away in Iraq defending the USA as a major in the U.S. Marine Corps when she was born. Six months later he was intro-



Constructing WPI's Future

Mike Walker '78, Brian Hamilton '89, and Steve Johnson '94 have a unique perspective on WPI's future. Through their work with Consigli Construction, these alumni are helping build Gateway Park, a collaboration between the university and the Worcester Business Development Corporation. (Full story on page 18.)

duced to her bright blue eyes. The love bond was immediate! I have been promoted to senior director, intellectual property strategy and litigation, at InterDigital Communications Corp. We reside in West Chester, Pa., where Alex also practices law. We are looking forward to the birth of our second child in July 2006."

Derek Ezovski joined EDR as vice president of business development and head of the lender and insurance services division.

Joan Fallon (MM) won the Mary Ann Sessions Excellence in Education Award for the 2004-05 school year. She has taught at Nashoba Regional High School in Bolton, Mass., since 1983.

Al Grasso (MS CS) was appointed executive vice president of MITRE Corp. in September. He will become president and CEO when the current president retires in 2006.

1994

Doreen Burrell transferred back to Florida to work as a structures sub-system engineer on the Space Shuttle program. She has been with Boeing for 10 years and says that she is enjoying the warm weather again after being "up north" in Alabama for two years.

Jean Marie (Henault) Kennamer has taken on a new job as city engineer for Nashua, N.H. She and her husband live in Salem with their daughter, Christina Elise.

1995

Craig Boucher holds the post of firestopping product technical engineer at Grace Construction Products.



Suzanne Timmerman Edmonson and her husband, Michael, are happy to announce the adoption of their daughter, Sophia Maria, born May 19, 2005, and united with her forever-family on Nov. 28, 2005. Suzanne writes, "The photo was taken in Guatemala City, on Sophie's "Gotcha Day," which is what many adoptive families call the day they receive custody of their child. Sophie is a bright-eyed baby who likes to cuddle and blow raspberries. Our son, Nathan, is very excited to be a big brother. We were all happy to have Sophie home in time for her first Christmas."

Eli Garrett married Jennifer Malloy on Sept. 17, 2005. He works for Shine Racing Services in Walpole, Mass.

Stacey (Watrous) and **Rob Jackson** had a second daughter, Allison Catherine, on Oct. 3, 2005. She was welcomed into their Holden home by big sister Megan.

Doug Nashold works for Fallon Community Health Care as data warehouse administrator. He and his wife, Kristiana, live in Millbury, Mass.

Len Zheleznyak completed his MBA at the University of Denver's Daniels College of Business in June 2005. He is employed as a product manager at IHS Inc. and holds an adjunct professorship in the management department of Colorado Technical University. Residing in Denver, he hopes to hit 30+ days on the slopes again this year.

1996

Doug Borden joined Booz Allen Hamilton in McLean, Va., as a subject matter expert supporting the U.S. Army Installation Management Command's performance excellence programs based on the Malcolm Baldrige National Quality Award criteria.

1997

Danielle Batey is a software engineer for Digimarc in Amherst, N.H. After her induction into the WPI Athletic Hall of Fame in 2005, her hometown paper ran an article on how her high school and college athletic success influenced her work ethic.

Zachary Cobb married Meghan O'Neal on June 10, 2005. After a honeymoon on Nantucket, they live in Sutton, Mass.

1998

Brian Bresnahan and **Kellie Martin '01** were married on April 30, 2005. Alumni in the wedding include **Luke Poppish**, **Doug Sullivan**, and **Sara (Briggs) Misra '01**. The couple lives in South Grafton, Mass.

Richard Cournoyer was promoted from senior manufacture engineer to operations manager at Ducommun. He and his wife, Celia, reside in Arcadia, Calif.

Take the survey! Win an iPod!

Let us know what you think about
*The Bridge, Transformations, the Alumni
Web site, and other WPI communications.*

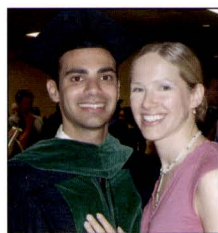
alumni.wpi.edu/News/Bridge/Survey

Stephen Davis joined Advanced Signing in Medway, Mass., as senior project manager.

Adam Fowler is engaged to Nancy Tryder. They are planning a September 2006 wedding in Cabo San Lucas, Mexico.

Brian Libby (PhD) joined Verrill Dana in Portland, Maine, as an attorney specializing in business law and intellectual property.

Andrew Marsh (MS MFE) was named president of Rolls-Royce Naval Marine Inc. based in Walpole, Mass.



David Melton married Claudia Curole on March 4, 2006, in New Orleans. David is completing an internship at the Hospital of the University of Pennsylvania. In June they will move to Baton Rouge, where David will begin a residency in the Louisiana State University Health Sciences Center Emergency Medicine Residency Program. He is a 2005 graduate of Tulane University School of Medicine and a member of the Alpha Omega

Alpha medical honor society. He did his final medical school clerkship rotation in Uganda, at the Bwindi Community Health Center.



Many alumni gathered for the wedding of **Josef Scherpa** and **Christianne Magee '01** in November 2005. Tiana graduated from Tufts Veterinary School in 2004 and is now an equine reproduction resident at Colorado State University. Joe completed a master's degree in human factors engineering at Tufts in 2003 and is a visual design lead for IBM/Lotus. They live in Fort Collins, Colo.

New & Novel

Who: Shannon (Gallagher) Beauregard '93, Dan Beauregard '94, Eric Jacobson '96

What: Chip Shots Grill and Sports Pub

Where: Littleton, Mass.

Why: Come for the food, stay for the drinks, watch tonight's game on the 60" plasma screen—and play golf all year 'round on state-of-the-art golf simulation machines.

Web: chipshotspub.com

Who: Liz Stewart '93

What: Lush Beads

Where: Lowell, Mass.

Why: Supplies, classes, and inspiration are offered to area beaders. A monthly "beaders challenge" kit is available at a nominal fee to foster creativity.

Web: lushbeads.com

Who: Jeetandra Mahtani '03 (MS), Peter Caputo '98

What: WhizSpark Corp

Where: Westborough, Mass.

Why: Online event-planning tools for every occasion, from parties to business conventions. Mentioned in *Newsweek* as an ad-free alternative to free e-invite services.

Web: whizspark.com

Japa Volchok and his wife, Allison, welcomed their first child, Benjamin Zollie, born Feb. 20, 2006.

1999

Fernando Correa is the proud parent of a baby boy, Mateo, born on the 20th of December, 2005.

Anthony Frederico married Megan Reilly recently. He is a project manager at EMC in Hopkinton, Mass.

Thomas Jenai married Sarah D'Oench on Sept. 10, 2005. They met during their veterinary internships at Tufts, where he is now a third-year surgical resident. Sarah is an associate with the Massachusetts Equine Clinic.

Heath Therrien is a project engineer with Granite Construction in Santa Barbara, Calif.

2000

Correction: **Anne-Marie Chouinard** ("Mongolia to Moscow—by Train," Winter 2005) graduated with the Class of 2000, not 2002. *Transformations* regrets the error.

Jason Bacon works for Odeh Engineers in North Providence, R.I. He married Kathryn McCorry on July 24, 2005.

Sumedha Bahri is a graduate of Northeastern University School of Law, and an associate at Hamilton, Brook, Smith & Reynolds, P.C.

Kristin Connarn joined Hamilton, Brook, Smith & Reynolds, P.C., as a patent agent. She is a graduate of Suffolk University School of Law.

Seth Sienkiewicz married Meagan O'Brien on May 14, 2005. She is a fellow employee at Kidde-Fenwal, where Seth is a fire protection engineer.

Holly Weymouth married Rob Fanjoy on Sept. 24, 2005. They live in Ann Arbor, Mich., where Holly is completing her residency in emergency medicine at the University of Michigan.

2001

John Bottino married Marsha Dufort recently. He is an engineer at BAE Systems in Nashua, N.H.

Emily (Gilbreath) Ciulla was appointed senior quality control engineer at Intertech Engineering Associates in Norwood, Mass.

Ryan Kilgore and his wife, Lauren, are thrilled to announce the birth of their first child, William Bradford, born June 30, 2005. "The happy parents could not be prouder," he writes. Ryan is on track to finish his PhD at the University of Toronto in the spring of 2006.

While in Rome on R&R leave from Iraq, Army Capt. **Nick Macsata** proposed to his girlfriend, Kathleen Towers. She is a 2001 graduate of the University of New Haven. A wedding is planned for next December.

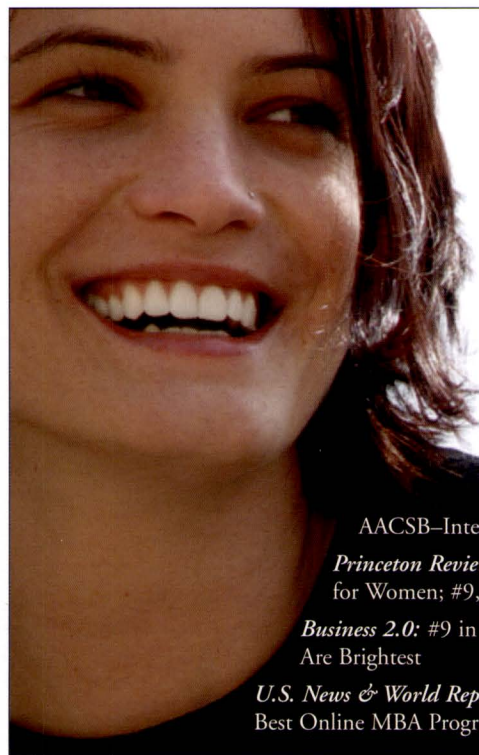


Kathy Pacheco married Daniel Czerwiec on July 3, 2005. Their maid of honor was **Jenn Patoulidis**. After a honeymoon in Maui, the couple lives in Feeding Hills, Mass.

Andrew Stone and **Kristen Lafond '03** were married June 25, 2005. They live in Hudson, Mass. Kristen works for the U.S. Department of Defense, and Andrew serves as new technology specialist at the WPI Computing & Communications Center.

Eric Tapley and his wife, Katharine, had a healthy baby boy, Samuel David, on Jan. 30, 2006. See photos at his personal site, www.etapley.com.

Mark Whiteman wed Sarah Phaneuf (Worcester State 2000) on Nov. 3, 2005, at Magens Beach, St. Thomas, in the Virgin Islands. The couple is planning a wedding celebration in May 2006 at their residence in Southborough, Mass.



Which university offers the only MBA east of the Rockies that ranked in the Top 10 in both Career Prospects and Opportunities for Women? Yours.

We know that when choosing an MBA program, nothing matters more than the doors it opens for you. The MBA at WPI launches more rewarding careers and provides greater opportunities to move into desirable career paths that will inspire and challenge you for a lifetime.

Know where you want to go? Choose the MBA that will get you there.

AACSB—International Accredited

Princeton Review: #2 in U.S., Greatest Opportunities for Women; #9, Best Career Prospects

Business 2.0: #9 in U.S., Where Your Career Prospects Are Brightest

U.S. News & World Report: Top 55 National Universities; Best Online MBA Programs



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www.mgt.wpi.edu

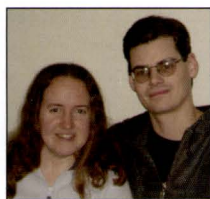
2002

Jessica Brown and **Joe Wimbrow '03** were married Oct. 9, 2005. They live in Orange County, Calif., where Jessica is a biomedical engineer for Edwards LifeSciences, and Joe is a mechanical engineer for Parker Hannifin.

Meghan (Fraizer) and **Marc Cryan** had their first child, Emma Claire, on Oct. 7, 2005. They live in Maynard, Mass.

Amy Fuller married Matthew Lagueux on Sept. 10, 2005. Her brother, **Kyle '04**, gave her away. Many WPI alumni and graduate students attended the wedding, including classmates **Cheryl Drake, Nicholas Hatch, Brian Laplume, Rabin Tamang,** and **Benjamin Woodacre**. After honeymooning on an Alaskan cruise ship, Amy and Matt live in Sterling, Mass.

Lori Luiz and James Dascoli were married Sept. 17, 2005, with **Tiffany Howland** and **Elena Kozulin** as bridesmaids. After a honeymoon in Riveira Maya, Mexico, the couple lives in Marlborough, Mass.



Melissa Morgan and Norman Topp became engaged on Christmas morning 2005. The happy couple is planning a spring 2007 wedding in their hometown of Warwick, R.I.

2003

Maeghan Bergeron and James Johnston got engaged over Veterans Day weekend 2005, while vacationing on Cape Cod. The wedding is planned for Oct. 6, 2006.

Robert Desmarais married Cynthia Forbes on June 11, 2003. After a honeymoon in Hawaii, they live in Portland, Conn.

Kristopher Jeschke married Dorrie Lachance on July 30, 2005. They live in North Providence, R.I.

2004

Congratulations to **Erin Bliven**, who ran the 2005 New York City Marathon in November, finishing with a time of 4:58. She graduated from Emory University in December with a master of public health degree in epidemiology. She is now working as an infection control epidemiologist at Grady Health Systems in Atlanta.

Sean Coughlin recently completed his master's in statistics at Columbia University. He

now lives in Morristown, N.J., and works for marketRx as a consultant in the pharmaceutical industry.

2nd Lt. **Vincent Fusca** deployed to Iraq with Vermont Army National Guard Company C, 3-126 Aviation Battalion. He plans to continue his job at Seldon Laboratories when he returns.

Benjamin Grimshaw married Carrie Duteau recently. They live in Spencer, Mass.

Meg Lindberg recently accepted a job as a business underwriter with Liberty Mutual, where she is the only engineer in her group. She was recently tapped to be part of a Liberty panel speaking to Boston college seniors about succeeding as a non-business major in a business environment. Meg lives in Brighton, Mass.

Lauren O'Connell and **Aaron Vanney** are engaged to be married on Sept. 3, 2006, in Portland, Conn. They currently live in Chicago. **Conor Casey '05** is slated to serve as best man, and **Jillian Garrity** will be the maid of honor.

Sarah Walsh works for International Specialty Products in Wayne, N.J., as a technical consultant, while completing her master's degree in biomedical engineering/medical physics at Stony Brook University in Long Island, N.Y.

2005

Kristine Sjogren (MME) married Jonathan Miller recently. She is a mathematics teacher at Wachusett Regional High School. They live in Rutland, Mass.

Maria Barcinas married Bonrad Aguila in July 2005. They recently moved to Long Island, N.Y., with daughter Gabrielle. Maria has joined Con Edison as a junior designer in Transmission/Civil Design.

William Herbert joined Empirix in Bedford, Mass., as a Web application specialist supporting the company's load-testing and Web-monitoring products. He still resides in Worcester.

Master of Natural Science

Sue Fontaine '82 is 2005-06 Teacher of the Year in Tolland, Conn., where she has taught high school for 15 years. She is pursuing a master's degree in technical education at Lesley College.

Alumni Association Awards

The following awards will be presented during Reunion Weekend, June 9-11:

Robert H. Goddard Award for Outstanding Professional Achievement

Peter B. Myers '46, retired director,
National Academy of Sciences

Robert L. Diamond '56, CEO
and co-founder, Xanboo Inc.

John P. Casey '76, president,
General Dynamics Electric Boat

William N. Giudice '76, vice president
and general manager, Micromachined
Products Division, Analog Devices Inc.

Herbert F. Taylor Award for Distinguished Service to WPI

John Lott Brown '46

Mary Sherman '76

Frederick Rucker '81

William R. Grogan Award for Support of the Mission of WPI

William R. Grogan '46

Stephen J. Hebert '66

Ichabod Washburn Young Alumni Award for Professional Achievement

James P. Baum '86, president and CEO,
Endeca Technologies

Ajay V. Chauhan '86, executive director,
Parle Products Limited

Barry C. Fougere '86, president and CEO,
Colubris Networks

Joseph A. Gammal '86, principal,
Synectics Inc.

Richard D. Willett '91, COO,
Teleglobe Inc.

John Boynton Young Alumni Award for Service to WPI

Amy L. Marr '96

WPI Award for Distinguished Service

Robert M. Taylor, lead technician, ME
(posthumously)

Humanitarian Leadership Award

Richard C. Liebich '66

Obituaries

Transformations recently learned of the death of **Charles E. Moss '24** in 1998. He was retired from Westinghouse Corp. His wife, Betty, died in 1992.

C. Stanley (Clarence) Knight '32 (Phi Sigma Kappa) of Summerville, S.C., died Nov. 6, 2005. He was the retired president and owner of the C. H. Knight Chevrolet dealership in Southbridge, Mass., founded by his father. He was the husband of the late Charlotte (Corey) Knight, and the father of three children, who survive them.

Paul G. Guernsey '33 (Sigma Alpha Epsilon) of Southern Pines, N.C., died Dec. 5, 2004. He is survived by his wife, Mary (Rolls), and two children. His first wife, Helen (Whitehead), predeceased him. Guernsey retired from a 40-year career with Mobil Oil Co. as sales manager for the North American division. He later served as president of Sun Travel Co.



Ralph J. Voigt '33 (Phi Sigma Kappa) of Honolulu, died Sept. 20, 2005. He was a retired sales representative for Narragansett Electric Co. Survivors include his three children.

Leonard B. Almy '34 (Theta Chi) of Seal Beach, Calif., died Aug. 15, 2005. He was the president and founder of Digit Co. A longtime resident of Marblehead, Mass., Almy was a former captain of the Marblehead Auxiliary Police. Survivors include his wife, Liliana, his son, Christopher Almy '64, a daughter, three stepdaughters, and his grandchildren, two of whom are WPI alumni.

Charles C. Puffer '35 (Phi Sigma Kappa) of Osprey, Fla., died Oct. 25, 2005, leaving his wife, Jane (Coffee), and three children. He was a mechanical engineer at Chapman Valve Co. and previously worked for the H. C. Puffer Grain Company.



Harold I. Johnson '37 (Sigma Phi Epsilon, Skull) of Walnut Creek, Calif., died June 27, 2005. His wife, Frances, survives him. He was retired from Bethlehem

Steel Corp. as assistant to the district manager.

Maurice Pressman '38 of Silver Spring, Md., died Oct. 13, 2005, leaving his wife, Edith, and two children. A retired chemical engineer, he served in the U.S. Army's research and development laboratories.



John P. Alcock '39 (Alpha Tau Omega) of Marshall, Va., died Oct. 25, 2005. He leaves his wife, Mariana (Collins), and three children.

Alcock worked for E.I. DuPont de Nemours until 1967. He then began a second career with Alpilar, a company he founded in Argentina, working with farmers near Buenos Aires to supply urban supermarkets with chickens. In retirement, he researched and published several books on his family's genealogy.



Transformations has learned of the death of **Thomas F. Beatty Jr. '39** (Phi Kappa Theta) of Worcester in 2002.

Survivors include his wife, Mary (Thayer), and two daughters. He was a retired electrical engineer for G.T.E. Sylvania Co.



Professor Emeritus **Fred N. Webster '39** of Princeton, Mass., died Oct. 27, 2005. Webster earned a master's degree in mechanical engineering at WPI in 1941 and

taught for 24 years, retiring in 1972. He previously taught at Tufts University and the University of Maine. His wife, Ruth (Toutellotte), died two months before him. Survivors include two children.

Richard F. Scharmann '40 (Sigma Alpha Epsilon), a longtime resident of Hatboro, Pa., died Dec. 30, 2005. Predeceased by his wife, Jane (Bevan), in 2004, he leaves two daughters. Scharmann was a Navy veteran of World War II, who pursued a civilian career at the Naval Air Development Center and retired as a branch manager.

Walter S. Knight '41 (Alpha Tau Omega) of Spring Hill, Fla., died Aug. 19, 2005. He leaves his wife, Lois, and two children. Knight was retired from Wyman-Gordon Co. after 42 years as a mechanical engineer in the Worcester and Chicago plants.

Herman "Hank" Medwin '41 of Pebble Beach, Calif., died Jan. 9, 2006. He was the founder and CEO of Ocean Acoustics Associates. An early violin prodigy, Medwin

enjoyed playing string music at college and later endowed the Medwin String Ensemble and the Medwin Chamber Music Scholarships at WPI. He was presented with an honorary doctorate in 1992. His wife, Ella, survives him.

Transformations recently learned of the death of **John W. Morse '41** in 1999. He was founder of Engineering Plastics in Worcester. His wife, Martha, is also deceased. They had two sons.

Henry Palley '41 of Worcester died Jan. 16, 2006. His wife, Marsha (Sherman) died in 1976. Two sons survive them. Palley was retired as co-owner of Louis Palley Tobacco.



F. Gordon Merrill '42 (Lambda Chi Alpha) of Tinton Falls, N.J., died Sept. 12, 2005. He retired from Bell Laboratories in 1982. Survivors include his wife, Lola,

and three children.

Frederick W. Schneider '42 (MS ChE) of Durham, N.C., died Oct. 7, 2005. He leaves his wife, Jean, and two children. Schneider retired from West Virginia University at Parkersburg in 1985 as associate professor emeritus of physics.



Calvin B. Holden '43 (Lambda Chi Alpha) of Doylestown, Pa., died Dec. 14, 2005, leaving his wife, Frances (Britton), and four sons. He was retired from PPG as a

chemical engineer. A devoted volunteer and collector of Scout memorabilia, he turned his home into a museum. He also worked on books and displays for Doylestown's sesqui-centennial history.

Transformations recently learned of the death of **Frank McNamara '43** (Phi Kappa Theta) in 1998. His wife, Mary, is now deceased. He was retired from Caterpillar Inc.

Transformations recently learned of the death of **James S. Proctor '43** in 2004. A former resident of Nova Scotia, Canada, he retired from DuPont de Nemours as a chemist.



C. Raymond (Carl) Peterson '44 of Silver Spring, Md., died Nov. 12, 2005, leaving his wife, Pauline (Mullis), and a daughter. An Army veteran of World War II,

Peterson served as a civilian mechanical engineer at the Naval Surface Weapons Center.

Paul I. Pressel '44 of Vestal, N.Y., died Jan. 16, 2006. Predeceased by his wife, Rivella (Levin), he leaves three children. He worked as an electrical engineer for Allied-Signal Corp/Bendix and Amphenol Corp.



Transformations recently learned of the death of **Warren A. Schilling '44** (Phi Gamma Delta) in 2003. A longtime resident of Moorestown, N.J., he worked for Cooper Hospital as senior maintenance engineer. He was predeceased by his wife, Sylvia, and a daughter. Four children survive them.

Bertrand A. Rankin '45 of Newington, Conn., died July 25, 2005, leaving his wife, Beatrice (Kraus), and two children. An accounting graduate of the University of Hartford, he worked at Wiremold Co. as an accountant for 30 years.



Transformations recently learned of the death of **Irwin G. Benkert '46** in 2003. His wife, Kathryn, is also deceased. He worked for M.W. Kellogg Co.

Transformations recently learned of the death of **Henry Sau Chin '46** in 2003. Survivors included his wife, Naida, and five children. He was a stockbroker and served as vice president of several brokerage firms.

Louis P. Copian '46 of Cerritos, Calif., died Aug. 2, 2004. He was an engineering manager for Bechtel Corp.

Joseph L. Fischer '46 of Annapolis, Md., died Oct. 19, 2005. Predeceased by his wife, Rita, he leaves two children. During his career in naval engineering, Fischer conducted research on amphibious vehicle design and developed the first computerized schedule for submarine repairs. He retired as technical director of the Office of Naval Research.

Transformations recently learned of the death of **Warren E. Hall '46** (Sigma Phi Epsilon) in 1994. He and his wife, Evelyn had two children. Hall worked in sales for Viking Instruments.

Willard F. Heintz '46 of Plainville, Mass., died July 19, 2005. His wife, Joan (Mitchie), predeceased him. After retiring as an architectural engineer, he taught high school mathematics for several years.

Gordon E. Hitchcock '46 of East Brookfield, Mass., died Sept. 26, 2005. He lost his wife, Virginia (Anderson), in 1990,

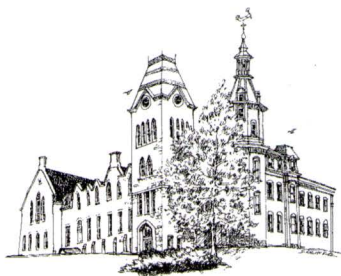
SAS Seeks "Stories From the Hill"

For nearly 150 years, WPI has stood atop the hill, and thousands of students have passed through its doors. In an effort to gain a better understanding of what WPI once was and what it has become, the Student Alumni Society (SAS) is working with the Office of Alumni Relations on a project to span the decades and bring all alumni of WPI closer together. This project can only work with help from you, the students who have preceded us at WPI. We seek stories from alumni of every decade, and from the faculty who once called WPI home.

For those of us attending WPI in 2006, it is nearly impossible to imagine life without our Campus Center or the computer network, but these are actually very recent additions to campus. We want to know what life was like without these modern conveniences. Where did students go on Friday nights for a little fun? Where did you study? Where did you live? What activities did you enjoy?

These are just a few of the questions this project aims to answer. Tell us about the Rope Pull in 1958, or watching the first moon walk with your classmates in 1969, or surviving the Blizzard of '78, which brought New England life to a stop. Share your stories at wheniwas@wpi.edu, or mail them to SAS, Alumni Relations, WPI, 100 Institute Road, Worcester, MA 01609-2280. You also may submit your story using the form on the SAS Web site. Go to wpi.edu/~sas and click on When I Was at Tech.

—Liz Kinnal '08, SAS Historian



and is survived by three children. Hitchcock earned an MBA from Clark University and worked for Rockwood International Sprinkler and Cincinnati Milacron Heald Machine.

John L. Jopson '46 of Bristol, R.I., died July 16, 2005. Predeceased by his wife, Elizabeth (Pratt), he leaves a son and three stepchildren. Jopson graduated from Trinity College and retired as owner of Todino Engineering Sales.

Thomas. M. McCaw '46 (Sigma Alpha Epsilon) of West Lafayette, Ind., died Nov. 26, 2005. He is survived by his wife, Dorothy (Newby), and three children. McCaw was the retired president of Fairfield Manufacturing.

Charles D. Seaver '46 (Phi Sigma Kappa), formerly of Muncie, Ind., died Oct. 31, 2005. He leaves his wife, Catherine (Clark), and three children. He was retired from Ball State University as an energy conservation engineer.

William T. Wells '46 of Bowling Green, Ky., died Oct. 26, 2005. A former engineering specialist with Chrysler Corp., he was part of the design team for the company's original minivan and developed suspension, steering, and brake systems for other product lines. Survivors include his wife, Helen, and two sons.

James S. Nims '47 (Theta Chi) of Greenfield, Mass., died Sept. 17, 2004, leav-

ing his wife, Carolyn. He was a retired engineer for Greenfield Tap & Die.

Transformations recently learned of the death of **Sydney R. Shell '47** in 2002. His wife, Norma, survives him. He was retired from Unisys Corp.

John R. Murtha '48 (Phi Gamma Delta) of Roseville, Calif., died Feb. 18, 2004, leaving his wife, Alice, and three children. A graduate of St. John's University School of Law, he was a private practice patent attorney.



James R. Fitzgerald '49 of Holyoke, Mass., died Oct. 17, 2005. He was retired from Hamilton Sunstrand as an electrical engineer. Predeceased by his wife, Agnes (Moriarty), he leaves two children.

Daniel B. Levenson '49 (Alpha Epsilon Pi) of Wayland, Mass., died Jan. 30, 2005. Predeceased by his wife, Phyllis (Goldstein), he leaves his companion of many years, Thelma Myers. Levenson was president of E.D.E. Inc.

Jacob L. Breitbord '50 of Framingham, Mass., died Nov. 3, 2005. He leaves his wife, Ethel (Firemark), and three children. He was retired from Iotron Corp.

Robert B. LaRocque '50 (Phi Kappa Theta) of Kennebunkport, Maine, died Dec. 25, 2005. He leaves his wife, Jean (O'Malley), and two children. An electrical superintendent

ent, he was retired from Boise Cascade with 25 years of service.



John R. Taylor '50 of North Wales, Pa., died Dec. 30, 2005. He leaves his wife, Marion (McCurdy), and three children. Taylor, a veteran of the mainframe era of

computing, joined Eckert-Mauchly, which later became Unisys Corp., in the 1950s. He earned several patents for a power-supply device, a laser printer, and other innovations.

Arthur L. Fisher '51 (Phi Sigma Kappa) of Melbourne Beach, Fla., died Dec. 9, 2005. A former chemical engineer, he received a master of natural science degree from WPI in 1972 and taught mathematics and science in the Suffield, Conn., school system for the last 20 years of his career. Survivors include his wife, Judith (Hart), his son, James Fisher '78, and two other children.

Sidney Kessler '51 (Alpha Epsilon Pi) of Centerville, Mass., died Oct. 24, 2005, leaving his wife, Mildred (Oven), and three sons. He was predeceased by his first wife, Charlotte (Gordon). He worked for Thiokol Corp.

Vartkes K. Sohigian '51 (Lambda Chi Alpha) of Andover, Mass., died Dec. 26, 2005. He leaves his wife, Matilda

(Germagian), and two children. He earned an MBA at Northeastern University and worked in human resources before founding Varkey K. Sohigian & Associates.

George K. Tucker '51 (MS EE) of Medford, Ore., died Nov. 5, 2005. He leaves his wife, Jane, and four children. Tucker joined SRI International in 1968 and retired in 1986 as a senior consultant.

John E. Allen Jr. '53 (Phi Sigma Kappa) of West Hartford, Conn., died Dec. 7, 2005, leaving his wife, Sally (Hutchinson). He was retired from a 45-year career with The Foxboro Company.

Arnold G. Sharp '53 (MS ME), a former instructor at WPI, died Sept. 3, 2005, in Cape Cod Hospital. A senior engineer at Woods Hole Oceanographic Institute, he also had a private consulting practice in stress analysis and structural design. He leaves his longtime friend Bernice Salmonsens.

Gerard E. Grise '54 (Phi Kappa Theta) of Chicopee, Mass., died Oct. 3, 2005. A longtime chemical engineer, he worked for several companies before retiring from Dexter Corp. Survivors include his wife, Corinne (DeLuca), and four children.

Carl A. Hammar '54 (Sigma Phi Epsilon) of North Palm Beach, Fla., died July 9, 2005. He leaves his wife, Cynthia, and two

children. Hammar was a retired marketing engineer for United Technologies Corp.

Robert W. Meyer '54 (Phi Kappa Theta) of Rockville Centre, N.Y., died Sept. 11, 2005. He leaves his wife, Norma (Scarlinzi), and a daughter. His son, Charles Meyer '87, died in 1992. Meyer was retired as vice president of Johnson & Higgins.

Henry Utter '54 (SIM) of Worcester died Sept. 5, 2005, leaving his wife, Barbara (Loeffler) and three children. He was retired from Crompton & Knowles Corp., where he began as a machine operator and later retired as a manager.

Robert T. Betchley '56 (Sigma Phi Epsilon) of Mattapoisett, Mass., died Oct. 29, 2005. He was retired from General Dynamics Electric Boat, where he spent 30 years as a nuclear engineering specialist. He is survived by his wife, Brenda (Creamer), three children, and three stepchildren.

Robert R. Heath '56 (Sigma Phi Epsilon) of Waltham, Mass., died Dec. 11, 2005. He is survived by his wife, Patricia (Nichols), and three children. Heath worked for Vibro-Meter Corp.

Vilho A. Lucander '56 (Alpha Tau Omega) was killed in a tractor accident on his Westminster, Mass., farm on Oct. 27, 2005. He was retired from New England Power Company as a plant operator. Survivors include his wife, Eleanor, and three sons.

WPI Plan Author

C. William Shipman, former professor of chemical engineering and dean of graduate studies at WPI, died Nov. 24, 2005, in Prospect Harbor, Maine, after a brief illness. At WPI, Shipman is best remembered as the chair of the Faculty Planning Committee that drafted the WPI Plan, the university's innovative approach to undergraduate education.

Shipman earned a BS, MS, and PhD in chemical engineering at MIT and taught at the University of Delaware and at the MIT Fuel Labs before joining the WPI faculty in 1958. He was known for his award-winning research on combustion and jet propulsion and for his novel approach to teaching chemical engineering by having students solve open-ended problems.

His suggestion in the late 1960s that WPI needed to reform its academic program caught the attention of President Harry P. Storke, who appointed a planning

committee of young faculty members and asked Shipman to serve as chair. Over the course of two years, the committee outlined the basis for the program we know today as the WPI Plan. The Plan was approved by the faculty in May 1970.

After the Plan's passage, Shipman became dean of graduate studies at WPI. In 1974, he accepted a position as director of research and development at the Carbon Black division of the Cabot Corporation in Alpharetta, Ga. He retired in 1986, and he and his wife, Louise, became permanent residents of Prospect Harbor, where they had summered for many years. He is survived by Louise, his wife of 59 years, three children, and two grandchildren.



John H. Britt '59 (Sigma Alpha Epsilon) of Canton, Mass., died Nov. 30, 2005. He leaves his wife, Loretta, and two children. Britt was retired as executive director of the Massachusetts Hospital School.

William C. Hees '59 (Theta Chi) of Dix Hills, N.Y., died Sept. 23, 2005. A manufacturers representative for R.P. Luce & Co., he authored numerous papers on the design of electro-mechanical components, and specialized packaging and cabinetry for electronics equipment. Three sons survive him.

Erdic G. Nichols '59 (SIM) of Paxton, Mass., died Oct. 7, 2005. He was 91. A longtime employee of Rexnord, he retired as manager of quality control. His wife, Marian (McGovern), survives him.

William E. Shumway '59 (SIM), a former vice president and production manager at Woodbury & Co., died Nov. 25, 2005, at age 81. He was a longtime resident of Worcester. Survivors include his wife, Charlotte (Crandall), and three children.

Donald E. Cloud '60 (Sigma Phi Epsilon) of Fort Myers, Fla., died May 20, 2005. He leaves his wife, Kristine, and three children. Cloud was the retired president of Country Home Development Corp.

John F. Kane '60 (MNS) of Rutland, Mass., died Dec. 31, 2005. He was 74. A former high school mathematics teacher and professor at Anna Maria College, he also owned and operated Jack's Trains hobby shop in Rutland. His wife, Ila (Sundin), and three children survive him.

Donald C. MacMillan '60 of Methuen, Mass., died July 21, 2004, leaving his wife, Phyllis, and three sons. He worked for Textron Defense Systems as a project manager.

Edward F. Bedard '61 (SIM) of Worcester died Jan. 15, 2006, at the age of 91. He leaves his wife, Constance (Waitkus), and four daughters. Bedard was a factory manager at Lodding Engineering Corp.

E. Randall Morse '61 (Theta Chi) of Amherst, Mass., died Dec. 2, 2005. Morse began his career with the Federal Aviation Administration after graduation and retired from the Boston Air Route Traffic Control Center in 1994 as principal software engineer. His accomplishments included authorship of the *Optimization and Integration Handbook for the Common Digitizer (CD-2)* and design specifications for data reduction software. His wife, Denise (Wild), and three sons survive him.

Ralph S. "Stan" Jacobsen '62 of West Boylston, Mass., and Moody Beach, Maine, died Oct. 3, 2005. He leaves his wife, Irene (Gedymin), and two children. He was a longtime traffic manager for G. F. Wright Steel & Wire Co.

Earle R. Laste Jr. '67 (PhD) of Westford, Mass., died Nov. 27, 2004. He was retired from the University of Massachusetts Lowell as professor emeritus of electrical engineering. He is survived by his wife, Thelma (Williams), and three children. A son predeceased him.

Rachael N. Stone '67 (formerly Raymond J. Fortin) of Westford, Mass., and Worcester, died Dec. 31, 2005. A former self-employed real estate appraiser and sales executive for Digital and MITRE Corp., she was active in the transgender community. She is survived by two daughters.

Gregory C. Cox '68 (Sigma Alpha Epsilon) died Aug. 28, 2005, at his home in Burke, Va. His first wife, Polly (Carmean), died in 1984. He is survived by his wife of 18 years, Pam (Butterbaugh), two children from his first marriage, and two stepsons. Cox retired from a chemical engineering career with the Naval Surface Warfare Center in 2000 and then did consulting work on computer networks.

Mohammed E. Habib '74 of Worcester died Dec. 11, 2005, after a short illness. He leaves his mother, Shamsun Habib, and five siblings. He worked as a taxi driver in the Worcester area.

Elmer J. Suomu '74 (SIM) of Palm Beach, Fla., died Dec. 16, 2005. He was 83. Survivors include his wife, Miriam, and two sons. Suomu retired from the marketing division of Riley Stoker Corp. as manager of proposals and pricing.

Ahmed "Steve" Shahbazi '76 of Worcester died Oct. 19, 2005. He leaves his wife, Susan (Guinee), and three children. He was self-employed as a painting contractor.

Thomas C. Beaudin '83 of Woburn, Mass., died unexpectedly on Nov. 18, 2005. He leaves his wife, Barbara (Smith), and four children. Beaudin served as property management supervisor for Honeywell (now Bull), and also worked for CB Richard Ellis Properties.

Police detective **John M. Piskator '87** of Key West, Fla., died Jan. 23, 2006, after he collapsed while jogging with fellow officers. A former airborne ranger and intelligence officer for the U.S. Army, he joined the Key West police force in 2004, after graduating

from the Institute of Criminal Justice at Florida Keys Community College. He also held a master's degree from the Military Intelligence College. He is survived by a son.

Raymond J. Noel '89 (SIM) of Auburn, Mass., died Sept. 13, 2005, at the age of 72. A former machinist for Norton Co., he returned to school to earn his diploma from Doherty High School and a certificate from the School of Industrial Management from WPI, and retired from Norton in 1991 as an industrial engineer. Survivors include his wife, Esther (Staples), and two children.

Alicje A. Cornelissen '93 (MS FPE) of Aylmer, Quebec, Canada, died Dec. 12, 2005, from complications related to lupus. She leaves her husband, Rory Gooderham, and two children. An expert in fire safety and building code development, she worked for the Cement Association of Canada.

Corrections: In obituaries that appeared the Winter 2005 issue, *Transformations* misidentified **Richard T. Gates '42** and **John P. Morrill '53** as members of Sigma Alpha Epsilon. They belonged to Sigma Phi Epsilon.

Alumni who wish to make contributions in memory of classmates and friends may contact WPI's office of University Advancement at 508-831-5660 or acolgan@wpi.edu.



Time Capsule

Testing the Waters



During the 1940s, much of the work at the Alden Hydraulic Laboratory in Holden (now Alden Research Laboratory) centered on then-classified research involving high-speed water entry of projectiles, such as torpedoes, for the U.S. Navy. Here, in a photograph dated from the same period, students use current meters to map the flow upstream of a spillway in order to optimally position a diversion wall. Students frequently conducted course laboratories at AHL, exemplifying the practical application of their classroom theory. The research laboratory was founded in 1894 by George Alden, as an extension of the Mechanical Engineering Department. Today, as an independent entity, it remains the oldest continuously operated hydraulic laboratory in the United States, maintaining close connections to WPI. Students in the ME and Civil and Environmental Engineering departments often use the lab for their MQP research. Additionally, ARL houses a firefighter clothing test facility, sponsored in 2001 by the U.S. Navy's Clothing and Textile Research Facility in Natick, Mass., which is used by WPI's fire protection engineering students and faculty.

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*Information
Session*

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Fall classes start week of September 5.

By 1880, Washburn & Moen's North Works was one of the largest factories in America. (The North Works complex includes three groups of buildings, built between 1861 and the 1930s.) Washburn & Moen employed more than 2,000 people and manufactured barbed wire, as well as wire used in textile machinery, telegraph systems, pianos, corset stays, hoop skirts, and in the construction of bridges. Washburn & Moen eventually became part of American Steel & Wire Company, which, in turn, became U.S. Steel. Abandoned in 1943, the complex now serves a diverse group of commercial and small manufacturers. *North Works photograph, circa 1927, courtesy of the Worcester Historical Museum.*

